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Indian Machine Tool  
Manufacturers' Association

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# In Search of the Right Machine



**MECHATRONICS:  
DRIVING EFFICIENCY IN  
COMPLEX ENGINEERING**

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Managing Director & CEO  
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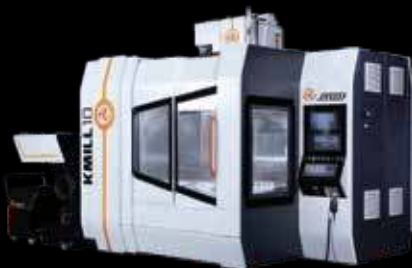
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Aristotle

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# IMPRINT

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**CHANGING THE  
MANUFACTURING  
LANDSCAPE IN INDIA**

**T**he Indian manufacturing landscape is undergoing a rapid change. Industries are gearing up to meet customers' demands, both in terms of quality as well as quantity. But human efforts alone are no more enough in their endeavor to bring out products with the required precision and safety. To tackle this, companies are increasingly using automation and robotics on shop floors.

India is progressing well in this line of manufacturing evolution. Today, even the smallest industry unit in the value chain looks forward to bring in automation in its manufacturing process.

However, domestic manufacturing industries are encountering countless hurdles in their strive to reach the level of international competitiveness and bring forth the products that can strike an instant chord with the buyers. To this end, we need a robust upgradation by deploying automation and robotics in shop floor activities. Economical solutions in smart manufacturing have to emerge so that more and more industries can implement them.

To showcase the most advanced manufacturing solutions for the industries worldwide, various trade events are lined up. One of the largest manufacturing exhibitions in the world, IMTS 2018 is being held at Chicago this month. On the home turf, We, Indian Machine Tool Manufacturers' Association (IMTMA), are organizing the second edition of Pune Machine Tool Expo (PMTX) 2018 from September 27-30 at Auto Cluster Exhibition Centre at Pune, Maharashtra. The event is expected to attract visitors from various engineering and auto industries in and around the western region.

This issue of MMI has its focus on automation and robotics. It includes an opinion piece from IMTMA on the role these technologies play in the manufacturing space.

We look forward to see you at PMTX 2018 where a lot more is in store for you.

**P RAMADAS**  
President  
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Dear MMI Readers,

**T**he Indian manufacturing industry has changed its course and taken a different path, the policy framework for which was set forth by the Government of India around three to four years ago with its 'Make in India' initiative.

The industry is now progressing towards fulfilling the aspirations and goals that were set back then. As a result the consumer perception towards the products manufactured in India are also changing for good. This indeed is a positive sign.

As ever, the current issue of Modern Manufacturing India (MMI) brings to you the fast-changing manufacturing scene with some important aspects of automation and robotics which are essential for the growth of the manufacturing industry of the country and its 'Make in India' initiative.

The compiled articles and interviews are for you to stay in tune with the happenings in the industry, far and closer home. I hope you find them useful. Hence, a feedback from you is deeply valued since it lets us know what more is required from us.

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*Soumi Mitra*

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## THE THRILL OF GETTING UP, CLOSE AND PERSONAL

**I** have often been asked what drives me to continent-hop and travel across the length and breadth of the globe to visit trade shows so religiously. Why, some wonder, do I need to be in the thick of things, almost always.

Post IMTS 2018 visit turned out to be the opportune time to pen my thoughts on why, despite the internet offering limitless opportunities and learning at no cost, people, including yours truly, still throng exhibitions in droves.

The fact sheet of this IMTS edition sports an impressive visitor registration of 129,415 footfalls with 2,563 exhibitors occupying a space of 1,424,232 sq ft in 2,123 booths beating all its previous records.

The above numbers validate that manufacturing shows make for an ideal terrain to network and connect with local and global market players, breeding innovative ideas and forging business bonds.

Then there is the learning part where you get introduced to the awe-inducing cutting-edge technologies, and one cannot help but marvel whether they are in a time machine at the speed at which innovations are happening. The trendy stall designs add to the charm and lure you inside the booths, leading you to the ever-evolving branding and marketing strategies.

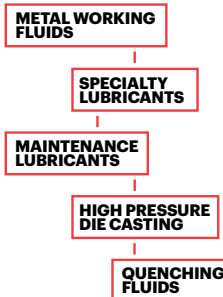
*“While online is nice, learning in person is a whole different experience. We all know that synergies in person are not the same as online.”*

The interactive sessions are my favorite, where I get to satisfy all my queries on their product and service offerings. All in all, I find myself a tad transformed as I exit one and start preparing in my head for the next one.

Until I take off for another such mind-blowing show, I keenly look forward to your valuable feedback.

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The Largest Machine Tool Group In India



Source: Magic Wand Media

Automation is crucial to build innovative products and achieve the target of increasing the share of manufacturing to the country's GDP.

## **AUTOMATION AND ROBOTICS:** TWIN-HEADED ENGINES DRIVING SMART MANUFACTURING

From increasing productivity of high precision products to freeing humans of menial jobs, manufacturing organizations have started acknowledging the benefits derived through the adoption of automation and robotics. Harnessing the limitless potential of these technologies can further enhance the Indian industry's position on the global map.

**C**ustomer needs and perceptions are essential for any change to take place in the manufacturing arena. The demands which arise

from customers drive industries to do research, innovate, communicate through digital communications and bring forth innovative products into the market through

smart manufacturing. Technologies such as automation and robotics help industries respond to consumer demands and simultaneously prosper.

### Industrial automation

Simply defined, industrial automation is the application of automation to control and monitor the production of goods and services in the manufacturing process. This is achieved through the use of control systems such as computers, robots or other information technologies to handle different processes and machinery in an industry replacing human efforts. There is a fusion of physical and digital worlds. This enables managers to streamline, compile and convert plant level data into meaningful insights and find a solution to address demand versus supply gaps, machine operations, system usability, etc. In short, it helps to take control of the production process.

### Indian companies using automation

A significant number of micro, small and medium enterprises (MSMEs) dot India's manufacturing landscape. Shifting them from manual operations to IT- and automation-enabled ones is a daunting challenge. Though most MSMEs consider automation as an expensive affair, many of them look forward to implement it somehow in their manufacturing processes to serve the needs of their customers. These MSMEs need automation which is economical. Such price-competitive automation once developed will enable MSMEs bring out larger volumes at lesser costs and benefit original equipment manufacturers.

One way to change the mindset is by spreading awareness. Manufacturers in Japan, for example, found out that a combination of human skillsets and appropriate automation would give rich dividends. We too can move ahead on the same lines.


Technologies such as automation and robotics help industries respond to consumer demands and simultaneously prosper.

An awareness can be created on the payback (return on investments), simplicity in operation, design, flexibility and maintenance results if companies adopt automation. The Government of India has set an ambitious target to increase the share of manufacturing to 25 percent of the country's GDP. This can be achieved only if we bring out innovative products. Automation is crucial to us from that perspective. Therefore, manufacturers who can automate their processes should not shy away from doing so.

### Application of robots in smart manufacturing

Industrial robots are used for mass production and material handling. Robots are employed in factories for safety and precision. With robots we achieve superior repeatability with every job which, otherwise, is difficult to do with human hands. Tasks such as part selection, transferring of a part, packing, loading and unloading, and machine feeding can be done accurately with robots. Tool changing happens in a shorter time. A significant chunk of robotic applications are used for welding. Robots can be guided by a pre-determined program and a machine vision.

### Impetus to industry

Automation and robotics are used in engineering industries, pharmaceuticals, logistics, food processing industries, automotive industry, FMCG companies, and many more. As the manufacturing industry embraces automation and robotics in its manufacturing process, it will give a good output of high precision products which will enable the manufacturing industry to expand its footprint at the global level. 



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## Blaser celebrates success with customers

**Gurugram, Haryana** - Blaser Swisslube India recently organized an award ceremony of the Productivity Trophy 2017-2018 to acknowledge and honor its customers' cooperation and celebrate mutual success. The winners in the following categories were evaluated: Tool optimization - Bajaj Motors Ltd; Total costs of ownership - OSG (India) Pvt Ltd, Carbide Cutting Tools Pvt Ltd; Metalworking fluid optimization - Highway Industries Ltd; Productivity increase - Mahindra Vehicle Manufacturers Ltd; and Process

optimization - Cummins Technologies India Pvt Ltd.

The Chief Guest was Rajiv Gandhi, Sr. Executive Director - Production, Maruti Suzuki India Ltd who spoke on 'Productivity & Competitiveness in the Automotive Industry'. Patrick Mathys, Managing Director, Blaser Swisslube APAC spoke on what takes to 'Being a True Partner in the Industry'. Harbhajan Singh, Director - General & Corporate Affairs, Honda Motorcycle & Scooter India Pvt Ltd also addressed the audience.

Punit Gupta, Managing Director, Blaser Swisslube India, said, "The power of Liquid Tool is that it helps our customers be competitive. If they are more competitive, they succeed and if they succeed then we have a chance to work with them on a long term."

"All processes, machines, tools, and the people who are operating the machines are all unique. The key element is how strongly, transparently, and holistically we can make an analysis and dive deep into the customers' process," he added.

## EuroBLECH 2018: Step into the digital reality

**Hanover, Germany** - EuroBLECH 2018, the 25<sup>th</sup> international sheet metal working technology exhibition will take place from October 23 - 26, 2018 at the Hanover Exhibition Grounds in Germany. Around 1,550 exhibitors from 40 countries including Germany, Italy, Turkey, China, the Netherlands, Spain, Switzerland, Austria and the USA are to participate. "The biggest challenge for companies in the sheet metal working industry is to create an intelligent manufacturing environment based on the secure exchange of data and the networking of machines

and processes. EuroBLECH 2018 offers its visitors the possibility to find solutions for these challenges and to connect with business partners to help them with the integration of these processes, machines and systems into their production," said Evelyn Warwick, Exhibition Director, Mack Brooks Exhibitions Ltd addressing a press conference.

Source: Mack Brooks Exhibitions



(L-R) Susanne Neuner, PR & Marketing Director, Mack Brooks Exhibitions Ltd; Evelyn Warwick, Exhibition Director, Mack Brooks Exhibitions Ltd; and Geeta Bisht, Director, International Fairs, Hannover Milano Fairs India Pvt Ltd

## Siemens' 'Ingenuity Tour'

**Mumbai, Maharashtra** - Siemens Ltd has launched one of the largest industry initiatives, the 'Ingenuity Tour' in the form of a road show which will cover 23 states, 120 cities and travel more than 30,000 km. On display is a wide array of Siemens' latest products covering Electrification, Automation and Digitalization from the fields of industry Software, Automation, Power Distribution, Drive Technology, Digital & Cloud services, Industrial Training as well as customized Financing solutions. "Our focus is on helping our customers generate performance improvements across the entire value

chain, from design to production and operations to maintenance. The Ingenuity Tour will bring our innovations live in action, right to the door step of our customers," said Ashish Bhat, Executive Vice President and Head of Digital Factory, Siemens Ltd. The tour is an effort towards encouraging SMEs to adopt new technologies



The Tour will cover over 23 states and 120 cities across India over a period of 2 years.

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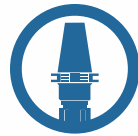
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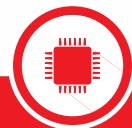
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## ExxonMobil™ unveils breakthrough Mobil SHC™ Elite



Source: ExxonMobil™

Imtiaz Ahmed, General Manager - Marketing Deployment (Commercial marketing), ExxonMobil Lubricants Pvt Ltd, and Glen Sharkowicz, Director of Brand Strategy - Commercial marketing, South Asia Pacific, ExxonMobil, Asia Pacific Pte Ltd, launching Mobil SHC™ Elite

**Pune, Maharashtra** - ExxonMobil™ recently launched Mobil SHC™ Elite, a breakthrough synthetic gear and bearing circulating oil that is specifically engineered to deliver long lasting protection for machines operating under extreme temperatures in industries such as general manufacturing, metals, energy, and pulp and paper.

Extensive testing shows that Mobil SHC Elite can deliver 12 times the oil life of mineral oils and double the oil life of Mobil SHC 600 synthetic oils in continuous operating temperatures as high as 130°C (266°F), potentially replacing glycol-based lubricants in high temperature systems. This helps reduce the potential risk of mixing glycol-based products with incompatible mineral oils and most synthetic lubricants. The oil also protects equipment during intermittent temperature spikes of up to 150°C (302°F) and provides up to a 3.6 percent energy efficiency benefit versus mineral oils.

“Protecting advanced equipment from high in-service temperatures can be a major challenge for industrial operators, especially if that equipment is difficult to access or take offline,” said Glen Sharkowicz, Director of Brand Strategy-Commercial Marketing, South Asia Pacific, ExxonMobil Asia Pacific Pte Ltd. “With Mobil SHC Elite, equipment owners now have an advanced lubricant that can deliver much better oil life and the assurance of extra protection during high temperature excursions during peak production rates.”

India is the first country that the company has introduced the product this year. “This is the place to be. Technology is evolving here, and the market is very exciting. We feel Mobil SHC Elite series is the right product for India,” added Sharkowicz.

Imtiaz Ahmed, General Manager - Marketing Deployment (Commercial marketing), ExxonMobil Lubricants Pvt Ltd, seconded him, “Our Indian industry is an extremely dynamic one and that’s what makes it interesting. It’s receptive and open to change.”

Mobil SHC Elite is the newest member of the Mobil SHC™ family of synthetic lubricants that provide performance advantages far exceeding the capabilities of conventional oils. These lubricants can help extend equipment longevity and generate potential energy savings, while their significantly longer life lowers maintenance costs and reduces worker exposure during oil changes.

## New facility for BFW

**Hosur, Tamil Nadu** - Bharat Fritz Werner Ltd (BFW) recently inaugurated a smart manufacturing facility in Hosur, Tamil Nadu.



Source: BFW

The first phase is spread across 35,000 sq ft that includes a significant number of modern mother machines to enable integration of existing foundry facility with machining capability. The second phase will expand to 60,000 sq ft.

Speaking at the inauguration ceremony, Ravi Raghavan, MD & CEO, BFW, said, “This wonderful machine shop will be converted into a smart manufacturing set up when fully operational in the next few months. This plant will be a true example of what modern manufacturing should be.” With the facilities, BFW aims to double its machine building capacity and help meet the growing industry demands. Congratulating BFW, AK Kothari, Chairman, Kothari Group, said, “Now BFW can be called truly a one stop shop or one window company where all range of machines are available in the metal cutting machine tool industry.”



Source: Hurco

## Hurco opens Chennai tech center

**Chennai, Tamil Nadu** - Along with celebrating its 50 years of innovation in CNC technology, Hurco Companies, Inc. recently inaugurated its technology center and an office in Chennai. The center will provide its customers an easy access to Hurco’s advanced metalworking technology with applications support and training.

The center and the office was inaugurated by Himat Patel, Executive Vice President, R&D and Product Development, Hurco Companies Inc USA.

James Fluker, Commercial Consul, US Commercial Service; Hetal Mehta, Chairman SETU foundation Surat; D Ravi, Managing Director, Classic Moulds Chennai; and Malkit Singh Panesar, Managing Director, Panesar Agriculture Works, Ludhiana were the guests of honor for the program that was attended by Hurco’s 150 customers from all over India.

The company provides high precision 5-axis machines, 3-axis vertical machining centers, double column machining centers, horizontal machining centers, turning and turn mill centers. It also offers innovative software and CNC controls. Hurco also has technical centers in Coimbatore and Pune, and regional offices in Delhi and Bengaluru.

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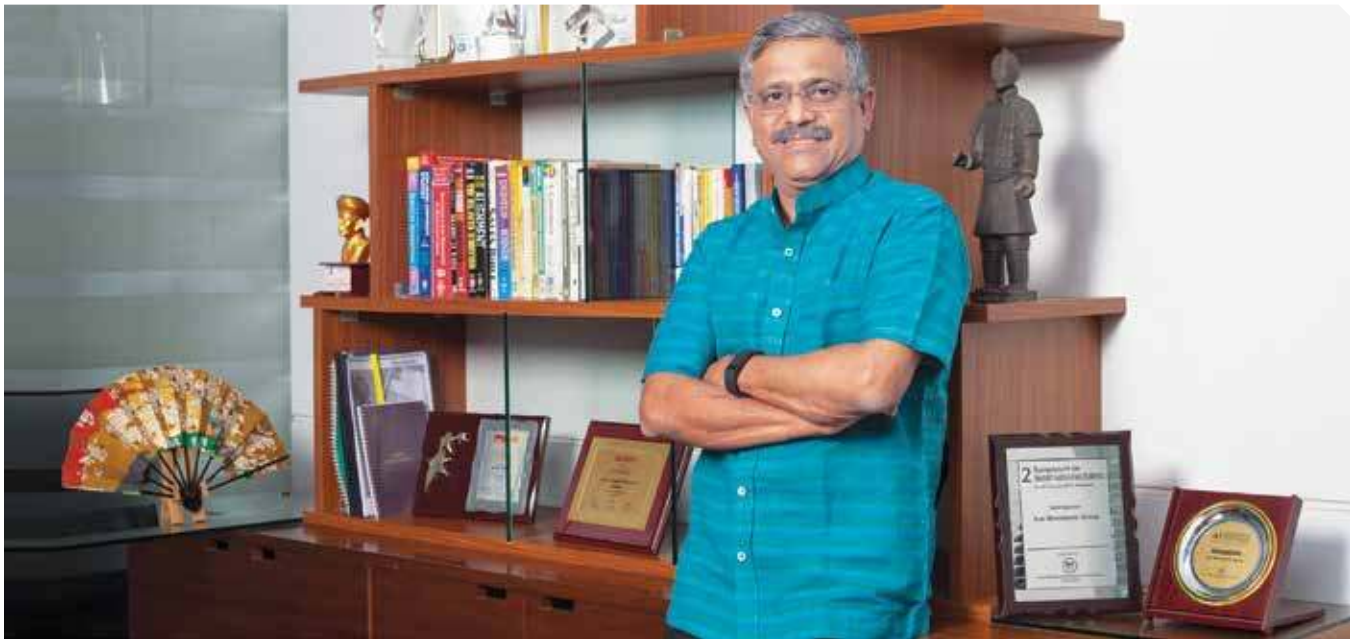
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## DOES STRATEGIZING WORK IN YOUR ORGANIZATION?

**O**rganizations strategize to achieve their key objectives. However, the achievement is largely dependent on the actions on the ground floor, which means the top floor and shop floor should act in unison. A strategy is largely an intent which must be made actionable and measurable, and which should integrate with the past in creating the future. There are tests that must be continually done to measure a strategy and ensure whether it is working and that the intent is being transformed into results. A strategy is confirmed to be working if it:

### **Translates ideas into action**

Effective strategies should primarily be actionable. They should be able to bridge the gap between thinking and acting. In fact, they must be part of the process to build new organizational systems that create clear decisions, metrics of performance, and strong incentives to align individual behavior with the objectives of an organization.

### **Integrates**

Strategies should integrate data and insights from different disciplines, departments and perspectives. An integrated choice is not self-limiting; it frees itself from conventional wisdom and, thus, creates opportunities for breakthrough thinking.

### **Reconciles past with future**

Strategies should neither ignore past realities, nor be limited by them. They should attempt to build a bridge between previous results and future actions while maintaining an honest assessment of current realities.

### **Creates clear options**

Strategies should create clear options for the future. This includes both detailing the implications of the current set of choices and outlining options to escape the past patterns.

### **Is explicit**

Strategies, in order to bring about change, must be explicit. Everyone makes choices, but not everyone communicates both the choice and the underlying reasoning behind that choice to the people who must take action. Expressing things distinctly enables people to make the trade-offs necessary to create change.

Strategies should neither ignore past realities, nor be limited by them. They should attempt to build a bridge between previous results and future actions while maintaining an honest assessment of current realities.

**T K RAMESH**

Whole time Director and CEO  
Micromatic Machine Tools Pvt Ltd

The views expressed by the author are personal and he can be contacted at [rameshtkr@gmail.com](mailto:rameshtkr@gmail.com)

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Main spindle Power rating / Torque 100 % ED 22 kW / 140 Nm



# 3D PRINTING TO DO OR NOT TO DO

Andrew Tordanato of Diversified Manufacturing Technologies enlists the questions one must answer before adding 3D printing capability to their manufacturing operations.

STEPHANIE  
HENDRIXSON  
Contributing Editor  
Modern Machine Shop  
shendrixson@  
mmsonline.com



**D**iversified Manufacturing Technologies not only prints parts, but also helps manufacturers who are thinking about adding their own additive manufacturing (AM) equipment to their shop-floor operations.

Today, Diversified Manufacturing Technologies manufactures parts for customers ranging from small job shops to large original equipment manufacturers (OEMs). The equipment at its Middletown, Connecticut, facility includes metal 3D

printers such as a 3D Systems ProX 300 as well as half a dozen polymer 3D printers from MarkForged capable of laying a continuous thread of fiberglass, Kevlar or other fiber along with plastic filament to increase part strength. Diversified is also

3D printing enables Diversified Manufacturing Technologies to rapidly manufacture parts such as these without the tooling and set-up time that it would take to machine them. The pipe fittings, swirlers, lattice cubes and exhaust manifold seen here were printed on the company's 3D Systems ProX 300 metal 3D printer in stainless steel 17-4PH.



Source: Modern Machine Shop



Legacy continues..

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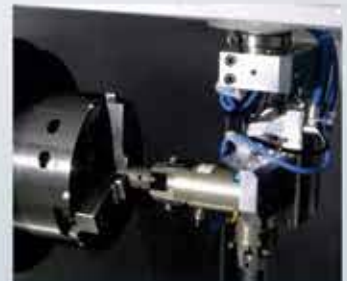
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Source: Modern Machine Shop

Diversified encourages customers to be flexible in manufacturing and to think about how designs could be improved with 3D printing. The two brake/clutch levers seen here were 3D-printed on a MarkForged Mark II 3D printer with the fittings placed in the parts as they were built—no assembly required. The top lever is nylon while the bottom is nylon reinforced with continuous carbon fiber (which MarkForged says is strong enough to replace machined aluminum parts).

equipped with CNC machining and EDM capability, primarily used internally for finishing 3D-printed parts.

On the metals side, most of the company's work is in prototyping, aerospace R&D and production parts, and short runs for the jewelry industry. With its polymer printers, the focus is jigs and fixtures, brackets, and short runs of items such as cases and handles. The work is often overflow for customers trying to meet tight production deadlines. Diversified is able to print parts on short notice, without the set-up that would be required at a CNC shop.

Successful jobs often result in repeat orders and can lead to a better part design—converting a two-piece assembly down to a single 3D-printed piece, for instance. Sometimes customers go on to add their own 3D printers and bring production back in house. Recently, these types of customer relationships have led Diversified into con-

sulting work to help companies decide whether to add 3D printing capability.

**Questions that help decide**

When working with a shop, there are three key questions that help determine if the addition of a 3D printer is appropriate:

**What kinds of materials are you working with?** 3D printers are compatible with a limited number of materials, so if a specific metal or polymer is required, that might sway the decision in one direction or another. However, an exact match is not always necessary, Tordanato says. For instance, carbon-fiber-filled parts made with the MarkForged printers can be strong enough to replace metal ones in the right applications.

**Is there flexibility in the manufacturing or design of the parts you make?** In other words, does the way it's made matter? In industries like aerospace, where process certification

is important, there may not be flexibility to move a part from a machining workflow to a 3D printing one. On the other hand, parts with less stringent process or geometry requirements such as jigs and fixtures make good candidates for 3D printing and could even be improved by additive manufacturing (think reduced weight and consolidated assemblies, for instance).

**What is the part's end use?** Shops don't necessarily know the destinies of the parts they make, but this information is critical before transitioning work. Understanding the function of the part, where it will be installed, and performance requirements is necessary to determine which parts are matches for 3D printing and which are not.

The answers to these questions will help determine whether a shop is ready for 3D printing based on the parts it currently makes, and if so, what type of AM equipment might be best. In many cases, shops can add polymer-based printers without needing any additional staff, Tordanato says (though he notes that metal systems tend to require deeper training and benefit from dedicated operators).

Of course, the specifics don't matter unless the shop can answer the most basic question: Are you willing to change your thought process?

"The only way to take advantage of AM is to think additively," Tordanato says. Initially that might mean identifying current parts suited to in-house 3D printing but deciding when and how to implement AM is an ongoing process. To make the best use of the technology, shops should consider 3D printing as an option from the beginning of new jobs.

**The specifics don't matter unless the shop can answer the most basic question: Are you willing to change your thought process?**

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# CREATING EFFICIENCIES

India witnesses a spurt in its demand for industrial robots pointing to the fact that domestic manufacturers are rapidly embracing automation to remain competitive. An overview of this trend that has been growing at a phenomenal pace worldwide and overhauling the ways in which we operate...



Source: Magic Wand Media

Rising labor costs, quality considerations and hazardous tasks are making Indian manufacturers opt for industrial robots despite the relatively high capital costs.

**T**echnology is a core essential for every business today and is evolving rapidly, bringing changes to processes across sectors. The new era of robotics is set to reshape India's entire economy.

With India's automotive, electronics and white goods sectors witnessing phenomenal growth in recent years, demand for industrial robots is also soaring. Both international and domestic auto manufacturers use robots these days for a range of activities on the shop floor including welding, paint finishing and material handling operations.

Besides ensuring accurate handling, robots also ensure consistent

quality. Rising labor costs, quality considerations and hazardous tasks are making Indian manufacturers opt for industrial robots despite the relatively high capital costs. Manufacturers are realizing the benefits of installing robots in their plants as in the long run they save costs. Robotics is slated to play a major role in strengthening India's production capabilities, giving a massive boost to the 'Make in India' campaign. There is also ample evidence that robotics does not lead to a loss of jobs – a re-allocation of both jobs and tasks can have robots complement and augment human labor by performing routine or dangerous tasks. This, in

turn, places a premium on higher-skilled labor in sectors that feature automated labor, while also creating new lower-skilled jobs in other sectors due to the spill-over effect.

## **Mounting demand world over**

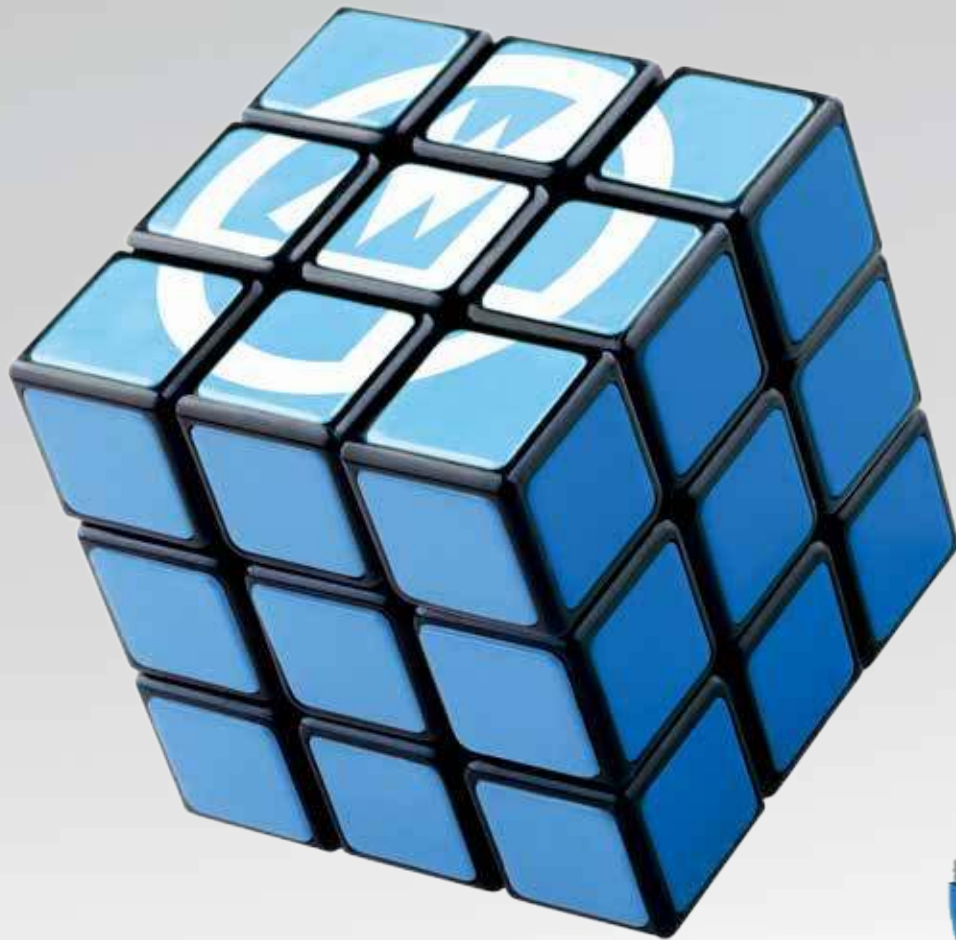
The demand for industrial robots has accelerated considerably due to the ongoing trend toward automation and the continued innovative technical improvements in industrial robots. In 2017, about 3,81,000 industrial robots were installed globally, 30 percent more than in 2016. There is considerable increase in all regions. However, Asia is the main driver with

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an increase of 37 percent to 2,62,000 units. Robot sales increased by 27 percent to a new peak of 2,627 units in India. It is estimated that over 3 million robots will be in operation globally by 2020. Out of which, 1.9 million will be operating in Asian factories.

### Meanwhile in India

Factory automation market in India is projected to witness a CAGR of around 12 percent during 2015-2020. Growing use of robots on factory floors for increasing efficiency, reliability and accuracy of the production processes is driving the country's factory automation market. Moreover, increasing domestic manufacturing on account of government initiatives like 'Make in India', is expected to stimulate growth in automation solutions market in India through 2020. Western and Northern regions are the major markets for factory automation in India due to continuing industrial growth and presence of Special Economic Zones and various automotive hubs in these regions.

### Automotive industry, the main customer

Between 2010 and 2014, the automotive industry, the most important customer of industrial robots, had considerably increased investments in industrial robot worldwide. In 2015, robot sales increased by 4 percent to about 97,500 units establishing again a new peak for the fifth time in a row. The share of the total supply in 2015 was about 38 percent. Automotive is still the main customer with about 1,26,000 units installed in 2017, about 21 percent more than in 2016.

### Challenges India faces

Automation industry players in

India always have to 'justify' investments towards automation. One of the challenges is integration of various automation platforms in a manufacturing environment to avoid 'automation islands'. Other major challenge is to convey and realize the true value of the offered automation solution to the user, avoiding commoditization in the process. One of the focus areas is to understand customers' processes and thereby requirements and offer/execute optimum solutions to meet such requirements. This results in the implementation of optimum solutions, leading to customer satisfaction.

Today, increasing labor costs in China have caused countries like Bangladesh to grab opportunities on the basis of cost competitiveness. Hence for India the challenge is to grow without diluting its strengths and make sustainability and environmental protection an essential part of the solution. To effectively implement the global technologies, global and local players should be brought together, as global players have best of the technologies and local players know their customers best.

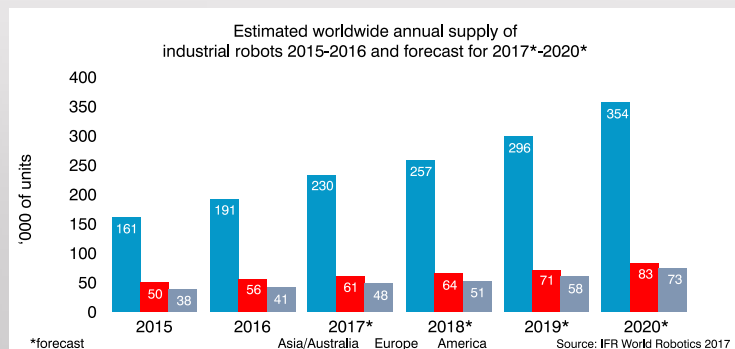
### The way forward - Industry 4.0

The field of Industrial Automation deals with automation of

manufacturing processes which helps to increase the productivity and maintain the highest quality of the end product. Different factors such as stringent quality requirement of the end products, higher production quantities, high profit margins and shorter time to market push the Industrial Automation industry to grow at a rapid pace. To meet these demands, the industry is on a lookout to implement latest technologies with smart integrated concepts. According to the latest trends, the Industrial Automation market in India is expected to grow by 15 to 20 percent based on the present capacity.

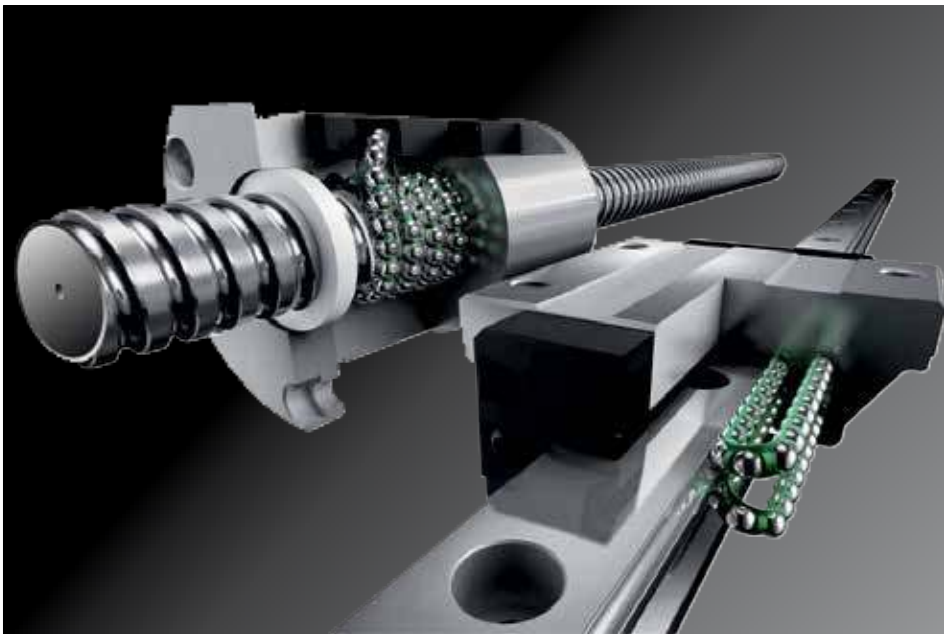
The new concept of Industry 4.0 aims to achieve the smart production with the help of its design principles namely interoperability, virtualization, decentralization, real time capability, service orientation and modularity. India, with its new 'Make in India' initiative, should consider these principles and implement the same in line with the advanced economies of the world to create a sustainable future of smart production factories. 'Make in India' should not only be about manufacturing but should be about smart and intelligent manufacturing with the possibility of customization to manufacture different products.

### Main driver of the growth: Asia



**Robot sales increased by 27 percent to a new peak of 2,627 units in India. It is estimated that over 3 million robots will be in operation globally by 2020. Out of which, 1.9 million will be operating in Asian factories.**

Source: YDMA India Services Pvt Ltd



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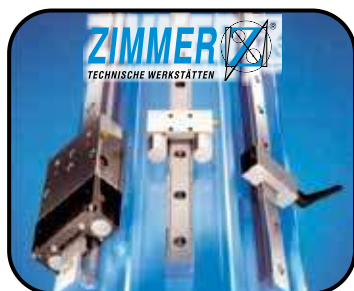
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# In Search of the Right Machine

Source: Magic Wand Media

There are general purpose machines and there are those meant for specific applications. The following guidelines can prove to be extremely helpful in narrowing down the hunt for the machine that fits the bill.

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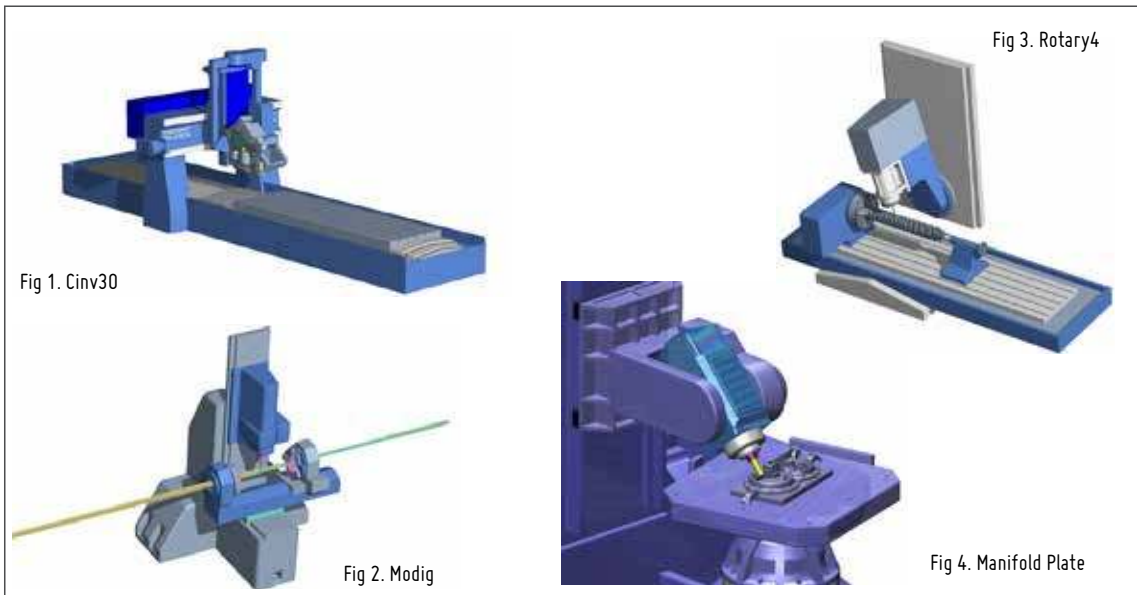


**M**ost small shops enter the multiaxis arena with the addition of a single or dual rotary device to their existing 3-axis vertical machining center. This allows them to manufacture parts quicker and make more complex parts that were out of their reach before. This causes a chain reaction; they get better at producing complex parts, are able to charge more for

those parts and look for even more challenging parts to make. This, in turn, stretches the limits of their equipment's capabilities, prompting a consideration of a new equipment purchase. The available budget is always a huge factor to be considered. The price of a machine reflects its quality but at the same time, just like cars, it may be affected by its brand name.

## Support's equally important

Machine manufacturers spend a lot of time on not just developing machines, but also on their sales and marketing efforts. Reputable manufacturers have applications teams who install and provide training on the new equipment and offer technical support along the way. They also employ dedicated



applications specialists who can prepare benchmarks or turnkey solutions for prospects and customers.

Most CNC equipment is sold by a dealer network. Not all dealers maintain the same quality of service. A visit to the peers who have different CNC equipment and talking to them about their experiences can come real handy. Answers to questions such as – How is the equipment performing? What is the service like if there is a problem? Does the manufacturer provide good training? Are they under-promising and over-delivering or the other way around? Most importantly do they deliver on their promises? – can help zero in on a manufacturer who can offer the much-needed support going forward.

### Questions that guide

Once a machine manufacturer is chosen who suits one's criteria, it is essential to take stock at the variety of parts one currently manufactures and then project into the future to see what parts they intend to manufacture in a few years.

Questions like the following must be posed:

- » Did one just get a request for a huge quote and have to base their decision on the return of investment numbers?
- » How many parts are a typical run between set-ups?
- » Does one's shop or company strive to take up challenging work because they know they will get the best return on the time invested this way?
- » Does one's shop or company dedicated to a single manufacturing field like automotive, aerospace, die & mould, medical, oil, etc.?
- » Are their existing CNC machines waiting for programs or are their CNC programmers waiting for free machines?
- » Are they happy with their CAD/CAM System's performance and are they using it to its full potential?

If one is quoting for 5,00,000 units of the same part per year, they will definitely be looking for a dedicated machine for that part. They will be looking at a

complete turnkey solution from the manufacturer. This may include a complete machining cell, possibly with multitasking machines and robotic loaders.

The polar opposite of high-volume manufacturing is an adaptive take on any challenging work philosophy. The machine one needs for work like this has to be just as capable and adaptive.

The manufacturing field in which one belongs will also affect the choice. There are different torque, speed and precision requirements in all the fields. If one's existing equipment is sitting idle waiting for programs, they will have to scrutinize their work flow (are they organized enough?), CAD/CAM System's capability, and also the programmers' and operators' proficiency.

If the programmers are waiting for machines to get free, the CAD/CAM System's capability needs to be checked. Is it possible to improve the cutting strategy? Are right tools being used? Imagine running old style high-speed steel tools on a modern CNC machine capable of 40,000

**Regardless of what specific machine type one is looking for, a good start is to do some research on the reputation of the support provided by different manufacturers.**



Fig 5. Mould

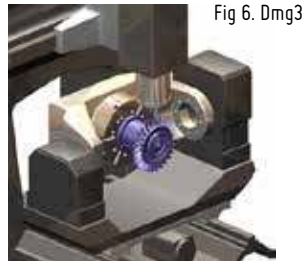


Fig 6. Dmg3



Fig 8. Gantry: Water-jet/mill combination



Fig 7a. Rotor



Fig 7b. Cage



Fig 9. Huron: A good compromise between long reach and rigidity.

Source: CNC Software, Inc

If one's existing equipment is sitting idle waiting for programs, they must scrutinize their work flow, CAD/CAM system's capability, and also the programmers' and operators' proficiency.

rpm and 1500 ipm – the limitation in an inexpensive tooling would hold back a highly capable and expensive machine. In the same way, if the CAD/CAM System is obsolete, one cannot use their CNC equipment to its full potential. Also, it is essential to ensure that the CNC programmer is up to date on their training on that CAD/CAM System in order to use it to its full potential.

It is always an exciting time if one is determined that they are running full out and now need additional new equipment. It's being on the edge of new horizons and new possibilities.

#### Size of the machine

The first obvious consideration is the physical size of the machine dictated simply by the size of the parts that are to be cut. Closely tied to this is the material one wishes to cut which will determine the rigidity needed. The quality requirements of the machine are also determined by the expected tolerances while balancing the budgetary requirements. Aside from these, obvious properties

of some multiaxis equipment are better suited for certain types of work than others.

#### Head/Head machines with long X or Y – axis linear travel but limited rotary axes travel:

Manufacturing aerospace wing and fuselage panels is a good fit for these machines. Wings are designed for strength but kept as light as possible. There are a lot of tapered wall pockets perfectly suited for Swarf type toolpaths. Typically these parts are made from solid billets in 2 set-ups.

Some parts are long but very slim. Wing stringers are a good example for this. They are typically made of special extrusions which can be over 15 m long. They were used to be made on similar machines as in Fig. 1, involving multiple set-ups and elaborate fixturing. The part would tend to deform between set-ups because material would be unevenly removed first from one side, then from the other side in a second set-up. The machine in Fig. 2 solves this problem.

This machine is well suited for machining long extrusions like the one shown in the figure. This is a 5-axis machine with X, U, Y, Z and A-axis. The U-axis moves parallel with the X-axis and it is used to grab and pull the extrusion between the 2 sets of rotary jaws. The cutting takes place in a narrow but rigid corridor in sections. The length of the parts is only limited by the support system on either side of the machine.

#### Head Table machines with long X-axis travel:

If the plan is to manufacture long parts which require a lot of rotary motions in one axis and limited rotary motions in the secondary axis, the head/table machine configuration should be considered (Fig 3).

This rotary pivoting configuration is highly suitable for manufacturing long rotary parts. The weight of the part is supported by a steady rest and the part is rotated around its center of mass. Inertia is an important consideration when using multiaxis machines.

Head/Table configurations are

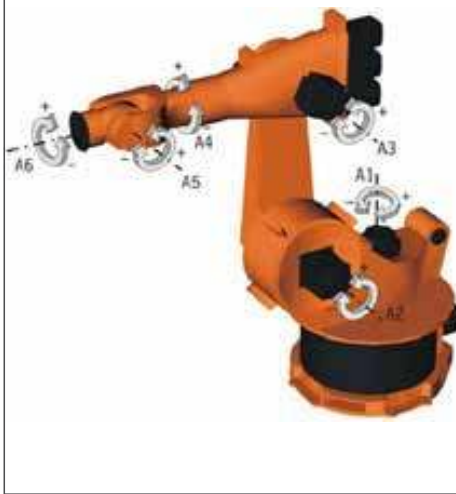
one of the most versatile choices for a variety of other multi-axis applications because the steady rest can be quickly removed and the space for mounting additional fixtures can be used and customized fixtures can be built to suit special jobs. Head/Table machines come in many forms and shapes.

**Rotary Table - Tilting Head combination:** The Rotary Table and Tilting Head configuration (Fig. 4) is not suitable for long parts but is adaptive for a variety of multi-axis applications.

The common characteristic of rotary table, tilting head machines is that they tend to rotate the workpiece around its center of mass while maintaining the capability to reach all its features by tilting the head. These machines come in many sizes. They are used in a wide variety of applications: from manufacturing small medical parts where precision and speed are the main requirements to manufacturing large earth-moving equipment parts where rigidity and horsepower are needed.

In the die and mould industry (Fig. 5), most of the roughing operations are done on 3-axis vertical or horizontal machining centers. In this manufacturing field, the challenge is to cut deep cavities or tall cores. These deep cavities have shallow side angles, usually 1 or 2 degrees on the side walls and a lot of times an uneven floor with small fillets on the bottom. Cutting these fillets on a 3-axis machine requires long ball nose cutters. In such scenarios, one must only take small steps, causing long cycle times. Else, the tool would deflect from the cutting forces, causing vibration, excessive cutter wear and poor surface finish.

Fig 10. Kuka robot



Source: CNC Software, Inc


Using a 5-axis machine allows the use of tapered ball nose cutters. One can still have the same ball-nose diameter but the tapered configuration makes the tool way more rigid. The ability to tilt the tool also lets one use a shorter cutter. This allows to take more aggressive cuts shortening the cycle time. The rigid tool will not deflect, there will be no vibration caused by the change in deflection, tool life will be increased and a precise, good quality surface finish will be achieved (Fig. 6).

**Table / Table machines:** These machines are the most common configuration (Fig. 7). The part is fastened to a dual rotary table and is rotated around the tool. Here, inertia is a consideration. The dual rotary table is either mounted to a table or is a dedicated dual rotary component of the machine. These machines are not suited for manufacturing long parts. The work envelope is fairly limited especially when certain tool changer limitations are considered. Despite that, this configuration is highly popular. Table mounted units are not very rigid. But dedicated

It is essential to be sure to get a capable, well-supported CAD/CAM system and then learn how to drive multi-axis machines.

dual rotaries can be both agile and rigid. They are equally well suited for 3+2 indexing work and for simultaneous multi-axis work.

**Gantry type Head/Head machines:** These are used for large parts mostly in aerospace, marine, oil and wood industry. This configuration (Fig. 8 & 9) allows long linear travels. Some can change heads, not just tools. Rigidity and precision are not their strong suit, long reach capability is.

**Simplifying machine motion**  
This article covers only the most popular machines with some suggested applications based on experience. It is recommended to spend some time on the initial research when choosing a machine; research not only on the machine, but also on the intended use.  
It is essential to be sure to get a capable, well-supported CAD/CAM system and then learn how to drive multi-axis machines. The goal is to simplify machine motion instead of creating excessive motion to impress. 



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**Titan Gilroy**

TITANS of CNC: Academy, USA

# EXPLORING A HOLISTIC PERSPECTIVE

At the recently held National Productivity Summit organized by Indian Machine Tool Manufacturers' Association (IMTMA), AK Taneja, Managing Director & CEO, Shriram Pistons & Rings, offered his 360 degree take on manufacturing competitiveness. An excerpt of his keynote presentation on the concepts and practices that can lead to improvement in manufacturing productivity...



Source: IMTMA

AK Taneja  
Managing Director  
& CEO  
Shriram Pistons &  
Rings Ltd  
presenting his  
keynote  
presentation on  
manufacturing  
competitiveness  
at National  
Productivity  
Summit 2018.

## Immense opportunities ahead

India is growing, in fact brimming with opportunities. This is the best time to be in India and to be an Indian, because we have every reason to be optimistic. However, all opportunities available can be availed only by those who are prepared for them. While the demand for consumer durables, consumer goods and capital equipment is expected to grow for several years, the key differentiator of success of manufacturing enterprises will be how good is your management bandwidth and talent pipeline. If we continue to show People as an expense in the P&L Statement and show Machine Tools, Plant & Equipment as Assets, we will never be able to benefit from the opportunities and realise the full potential of our business. Because the only appreciating asset in a company is actually People. Customers expect more for less, and will expect even more, go-

ing forward. Therefore, continuous improvement is the only way forward to create a culture of competitiveness. Auto and Auto Component industry are great examples of continuous improvement. They are ceaselessly working to offer new features, new variants and new technology in cars, motorcycles, etc. and all this at a lower price. The Machine Tool industry in India is yet to show similar pace of improvement.

Without a vibrant and large Machine Tool industry, which is modern, sophisticated and competitive, one cannot expect India to become a manufacturing hub. It's a fact there is no country which has progressed from emerging market to a developed market without a solid Machine Tool industry.

## Mounting protectionism and deglobalisation

We witnessed globalisation in

the last three decades and supply chains have got built up accordingly. However, we are now entering an era of deglobalisation and protectionism. "Make in America", "Make in India", "Make in China" are the new headlines. All these countries feel the pendulum of open markets has swung too far and there have been significant job losses due to globalisation. The wave of protectionism we are witnessing is in response to this and will lead to the established supply chains getting disrupted; this will impact our business model and eventually affect our competitiveness.

In the changed scenario, if we want to remain competitive, we will have to think of deep localisation of raw materials, components, finished products. And for all this, the Machine Tool industry will have to play a much bigger role.

## Customer acquisition

Among the many serious changes taking place in the world around us, one of most significant is the crazy race for customer acquisition and customer retention. Companies are willing to pay huge price for acquiring new customers and retaining loyalty of the old ones. Simultaneously, we have entered the era of Sensors, Big Data and AI, and there is a mad rush to collect, store, analyse and use the data, to predict what the customer wants, sometimes even ahead of he himself knowing it!

Source: Team MMI

Data has become the new oil of the future.

The tolerance level of customers towards any shortcomings in Quality is going down and as they get more exposure to what is happening in the world, they are not willing to accept anything short of world class. This is great opportunity for us. However, it is not technology or capital that will decide how well we meet the changing expectations of the customers, but how passionate and aligned people in our companies are towards the company goals.

#### **Creating Alignment and Passion**

Have a relook at what is the Mission Statement of any enterprise. Does it give you goose pimples? Does it create Passion and give people the sense that they are working for a bigger cause than Profit?

Typically, Management wants higher profit, faster growth, high market capitalisation and increase in productivity. On the other hand, Employees are seeking fair treatment, recognition of good work, opportunity to grow, learn new skills and adequate wages that will allow their families to live a better life. Employees want to be able to lean on Management in times of crisis and, most importantly, they want to experience a sense of pride when they tell their neighbours and family that they work for a particular enterprise. Unless we create greater alignment between the goals of the Management and Employees, we can never realise their full potential. It is like sunshine: unless there is a lens that focusses the light, we cannot experience the full power of the sun.

#### **Walking the talk**

Another important aspect of creating Passion and Engagement in teams is consistency between

what we say and what we do. We want a safe working environment in our companies, but how many of us are willing to stop production if we see something unsafe? We claim we are like a family and want all Associates to contribute with good ideas; but we have different standards for our Permanent, Temporary and Contract Associates. We talk about teamwork, but when it comes to annual appraisal, we tend to reward individuals for their intelligence or hard work. We talk integrity, but there are so many examples of companies that do not hesitate to cosmetically treat their Balance Sheet to avoid or reduce taxes. We claim customer is the most important person for our business, but inside closed rooms, the tone of the conversation is completely different. It is not easy maybe not even possible to find a perfect balance. But we have to create a work culture where we walk the talk, where we are consistent. Because only this builds Trust. And when you have trust, employees are willing to not only to work for eight ours, but put their heart, mind and soul into it. And this stretch effort is what creates true competitiveness.

An excellent example is the Indian Army that recruits ordinary persons from our villages and small towns, and builds soldiers who are ready to die for the country. This is done by creating passion and building trust through fanatic discipline and consistent behaviour.

#### **Building a talent pipeline: Think of this like CSR**


Talk to anyone in the manufacturing industry and they will tell you that Engineers graduating from our colleges are not plug-and-play. They are simply not ready for a job, because what is taught in the colleges is not aligned with what the industry

needs. This is a valid 'Circle of Concern', because there is little that we can do about changing the quality of education.

However, what is within our 'Circle of Influence' is that we can transform our companies to behave like a University, where people are imparted training and also paid for it! Industry has to invest in class room and practical training in a bigger and more systematic way, to create Engineers who are trained for our specific requirements.

Indeed, many of the Engineers you train can leave for other jobs or pursue higher education after receiving good training. Even if 20% of the Engineers stay with the company, it will build a solid talent pipeline. The expenditure incurred on the balance 80%, who choose to leave the company after receiving training, is like CSR. These Engineers will go and work in other companies as ambassadors of your Company. And all the investment you make in their skill development will get repaid in one form or the other.

#### **Simplification and ease of doing business**

No company is small because it wants to be small. Companies are small because they haven't yet learned how to become big. All companies aspire to become larger, more profitable, with higher turnover. However, as companies grow bigger they also become more complex. And complexity is cost. More complexity is also more bureaucracy and slower decision making. Effort has to be focussed on simplifying procedures to speed up decision making and for faster response to continuously changing needs of customers. An essential mantra for competitiveness is speed and for that manufacturing enterprises must simplify, simplify, simplify. 

It is nearly impossible for a company to be good at everything. Therefore, building partnerships and creating synergy is becoming the modern way of doing business. For optimum utilisation of Assets and People, the 'Do-it-yourself' business model is giving way to partnering with others, to share even key technology and resources. Building partnerships requires a new mind set, but the essential ingredients remain the same: Trust, Transparency, consistent behaviour, mutual concern, and at all times, following a win-win approach

# PURSUING EXCELLENCE

Asia's leading fixture builder, Forms & Gears has been providing complete fixture solutions across the globe for the last 45 years. The company divulges its simple formula for success which is to keep honing one's skill as best as is possible while resorting to all the right approaches. An account of its applied wisdom and the height it has taken the company to...



Forms & Gears' facility in Chennai.

Source: Forms & Gears

**L**ike most successful organizations, Forms & Gears also has an inspiring tale of growth. The milestones it has been achieving throughout is a result of constant striving for innovation and a refusal to rest on its laurels.

Narrating it, Reji Varghese, Managing Director, Forms & Gears, says, "Our journey of over 45 years has been an incredible one. Back then there were no CNC machines. We started off as one of the first private tool rooms in the country offering Milling Fixtures, Drill Jigs, Receiver Gauges,

Inspection Fixtures, Press Tools etc. to industries across the country." However, it was the advent of Machining Centers into India in the 80s that made the company focus its efforts on machining centre fixtures, and over the years these have become its core area of expertise.

"The initial fixtures for machining centers were mostly with mechanical clamping but nowadays almost all the fixtures we make are hydraulic," he shares.

"Even though the end product has changed drastically over the decades, the heart of the company,

its tool room culture and heritage, is still what drives us. Whether its 5 micron on a receiver gauge or 5 micron on a machining centre fixture, it's the tight control of tolerances on all operations from start to finish that differentiates us," he says, emphasizing that this precisely makes for the reason why the company prefers to manufacture all the fixture elements from roughing to finishing in house.

### Quality speaks for itself

It's interesting to note that Forms & Gears never felt the need to

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resort to any promotional strategies in its operations for 44 years. "We have never had a sales person in our organization until a few months back when we hired a projects head to oversee our turnkey projects division. This is a testimony to the quality of the products that we offer," points out Varghese. Another being an awe-inducing long list of clients that includes Hyundai, Ford, Tata Motors, Mahindra Auto, Maruti Suzuki, Renault Nissan, Volvo Eicher, Ashok Leyland, John Deere, Cummins, Kirloskar Oil Engines, LMW, BFW, Makino, Toshiba - Japan, and Mazak - Japan, India, Singapore.

The company specializes in larger sized, complex fixtures that normally have to be imported. It has manufactured fixtures for small components for drill tap centers to machining fixtures for components over 10 m in size, weighing over 5 tonne.

The design of the fixtures are done keeping in mind the harsh conditions of the shop floor and the entire process of manufacture from roughing to finishing is controlled in house to ensure that the quality standards that the company has come to be known for over the last 45 years are met.

### Collaboration's the key

Recently, ASM Technologies Ltd, a publicly listed company in India, headquartered in Bangalore with global presence in the USA, Singapore, the UK, Canada and Mexico, has recently acquired a 70 percent stake in Forms & Gears.

It specializes in providing product design and value engineering, system automation and digital transformation solutions to the capital equipment, sub systems and supporting systems for Automotive, Semiconductor/Hi-Tech, Solar and Medical industry verticals.



Source: Forms & Gears

"We expect Industrial Internet of Things (IIoT) in workholding and in other areas of manufacturing to contribute to a large portion of our business in the near future."

**Reji Varghese**  
Managing Director  
Forms & Gears

With this joint venture partnership, ASM will leverage on Forms & Gears' strong capabilities in fixture development, manufacturing engineering and high precision machining to its clientele. In addition, it will utilize Forms & Gears' state-of-the-art facility to address its customers' demand in prototyping and manufacturing.

The two together will provide turnkey solutions to Automotive and Aerospace OEMs, Machinery manufacturers in Semiconductor, Machine tool and Medical Industries. The turnkey solutions include development, supply of Industry 4.0-enabled machines/equipment, smart fixtures, tooling and system automation.

The global reach of ASM Technologies will help Forms & Gears to expand its market to the US, the UK, Mexico, Canada and South East Asia and other parts of the world, thus enhancing the market shares for both companies.

Forms & Gears continues to operate from its current factory at the Industrial Estate in Guindy, Chennai with the same

operations, design and management team, and there will be no change to the day to day operations of the company.


### Growing export demands

The company has, over the years, exported its fixtures to companies in Germany, Japan and Singapore. "Many times these exports are to foreign machine makers for their turnkey projects in India and these fixtures come back to India after trials abroad," informs Varghese.

"Over the last three years we have seen an increased demand for our fixtures from companies abroad for their factories there. We now have fixtures running at factories in the UAE, Qatar, Thailand, Indonesia and Turkey," he adds.

### Future plans

"One of the reasons we have done the JV with ASM Technologies is to capitalize on its rich experience of Artificial Intelligence and Data Analytics. We've been through 45 years of change and feel the next wave is in making fixtures smarter," Varghese notes. The Forms & Gears and ASM teams have been jointly working on developing fixtures and automation equipment that could be monitored and controlled remotely using existing network infrastructures. They are designing fixtures to monitor parameters like vibration, pressure, temperature, humidity, oil contamination, intrusion sensors, clamp / declamp cycles etc. The huge amount of data of which is collected is then analyzed to give useful information using ASM's Data analytic tools and Artificial Intelligence.

"Companies could get useful real-time analysis of the data collected by the sensors monitoring the various parameters of the fixtures on their phones," he further adds summing up. 

ASM Technologies and Forms & Gears together are to provide turnkey solutions including development, supply of Industry 4.0-enabled machines/equipment, smart fixtures, tooling and system automation to various industries.



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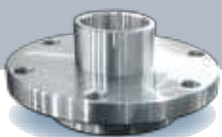
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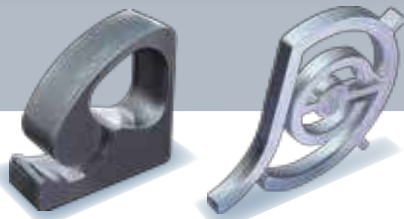




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## DRIVING EFFICIENCY IN COMPLEX ENGINEERING

In the world of integrated business processes, complex engineering platforms must work in tandem with the business. This arises the enterprises' need for a completely transparent, fully scalable, agile and efficient engineering configuration workflow in order to grow.

Every element in the product lifecycle has to be in perfect alignment to the business needs.



Source: EPLAN Software and Services Pvt Ltd

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**G**lobally, Industry 4.0 demands complete cooperation, seamless operability and design that allows integrated operations between various disciplines of engineering and machine workings, across networking, electronics, computing and every other bit that makes up the process. Overlying the seamless engineering and machine configuration is the

documentation and supply chain processes that complete the product lifecycle for any company. Any arbitrary and unmanaged changes to system artifacts like plans or designs, not to say software, hardware, testing data and documentation, could create incidents throughout the product lifecycle that could be extremely difficult to mitigate at a later date.

From a business perspective, increasing pressure on technology to be faster, cheaper, better, more scalable and even more customized creates an environment where all the productive resources need to be optimized. Every element in the product lifecycle has to be in perfect alignment to the business needs. The answer lies in a fairly simple concept - standardization

and configuration – that leads to automation of engineering processes. Every enterprise needs to configure each element in this process to not only create these standpoints, but also to ensure that each plan meets the business goal.

### **Standardization that drives efficiencies**

In any industry, a clear and binding database is the foundation on which automation and configuration processes can be created. This enables clarity on the roadmap and the business objective of a technology or engineering support. It also ensures higher productivity and streamlined costs since there is now a structured path to follow. The key here is consistency – definition of a centralized storage of reusable elements, templates and design rules, and reusable processes or products within the parameters of business requirement. This structure will help in creating standardized production and process documentation. Where there are inter-disciplinary technologies and tools being applied, the team needs to set clear construction guidelines, set the focus on data structure and the reports needed to keep all these running at the same frequency. Standardization, hence, is needed for project templates, reports, dashboard structures, macro variants and even value sets such as machine vectors and technical specs for designs.

The process secures project data, documents and knowledge at much more optimized costs and time, using much less resources. Due to complete transparency and clear structure, efficiency is also enhanced. Also, the automated documentation of reusable functions reduces engineering time significantly and frees up resources for more R&D,

When standardization is applied across the company, interdisciplinary standardization creates multiple efficiencies across all departments.

while providing a handle on complex variant management.

### **Mechatronic configuration for interdisciplinary integration and connect**

When this standardization is applied across the company, interdisciplinary standardization creates multiple efficiencies across all departments and ensures centralized visibility to all data, processes and operations. Interdisciplinary standardization highlights all departments – mechanical, fluid, machine design, electrical engineering and even customer facing operations like CRM and sales. This is done by breaking down reusable functional units of a machine or plant into manageable, mechatronic components.

This could require the use of a high-performing engineering configuration software, preferable with open architecture and numerous interfaces to different systems – sales data, mechanical, hardware, software and even machine documentation. Rule sets that describe dependencies between disciplines can be saved centrally, and this allows the standardization process by reducing complex lists to well-structured data sets that can be consulted immediately in case of need.


For complex engineering tasks, a customized tool is needed, one that can offer the support of knowledge-based libraries of predefined mechatronic components that consider all technical dependencies and connections, configuring the components automatically.

The advantages of this approach are many. There are no manual, repetitive tasks to be performed, and the production lead time to market is much reduced. However, this is a highly complex task which needs

a methodical, progressive approach and, of course, a team of expert consultants.

As a central link between product development, production and market objectives, a product configurator performs the task of helping the market facing teams to identify and connect with the variant they require based on the standardized configuration of parameters done earlier. When this is a customized offering, it is the best fit to the product portfolio and identifies tailored solutions to specified market sectors. It also simplifies the price quotation and vendor management process as well as helps in that magic move to online sales initiatives.

With this process in place, organizations can look for a seamless, cost-effective process flow across multi-disciplinary elements of an enterprise. The standardization offered could be the backbone of the automation configured by identified rules, structured data, clear reports and a centralized and structured storage of the company know-how. The advantages of a transparent and clearly structured engineering configuration processes tool that allows complex processes to cater to the needs of all departments, are varied and many. Cost-saving and efficient process flow is the biggest advantage but a consistent flow of information that saves data duplication and recurring reconciliation is yet another big plus. It allows functional components to be custom-made for the requirements of all disciplines within the enterprise.

All engineering and design needs have two biggest business objectives – cost saving and market growth. Encapsulating complexity in these structured flows allows the company to meet both these business needs. 

# UNLEASHING THE LIQUID TOOL

Blaser Swisslube could help Dantal Hydraulics maximize its profitability of machines and tools with its liquid tool Synergy 915 coolant despite it costing much more than what the company earlier used.



Dantal Hydraulics offers complete hydraulic solutions to varied sectors in India.

Source: Blaser Swisslube

**A**t its plant in Haryana, India, Dantal Hydraulics Pvt Ltd manufactures customized hydraulic cylinders and hydraulic systems, aircraft hydraulic service trolleys and car parking solutions. Established in 1990, the company has since then been catering to various sectors of the country including agriculture, earth moving equipment, waste management, material handling, mining, industrial applications, heavy equipment, renewable energy and defence.

Source: Blaser Swisslube

## A close look at parameters

“Blaser Swisslube India team explained to us in detail how they will first analyze the current machining process and structure their testing accordingly,” says Yogesh Tyagi, Deputy General Manager, Plant Engineering, Dantal Hydraulics. “We were curious and agreed on a test on their SIERRA for almost two months,” he adds.

“We found good chances to improve tool costs and overall savings for the skiving and burnishing process,” says Sandeep Kumar Bhat from Blaser Swisslube India. Based on his experience and the recommen-

dation from the headquarters in Switzerland, the coolant Synergy 915 was selected for the given machining situation at Dantal Hydraulics. “Synergy 915 is a synthetic; water-miscible; chlorine-, mineral oil- and ester oil-free metalworking fluid and suits perfectly for demineralized and soft water applications,” adds the Blaser representative.

## Outstanding outcome

The results from the testing were very promising. During the test phase, the tool costs were reduced by 22 percent. This resulted in an annual tool cost saving of ₹1.33 million.

## Challenge

Dantal Hydraulics was looking for a solution to maximize profitability of its machines and tools.



Source: Blaser Swisslube

## Solution

Blaser Swisslube's Synergy 915 coolant reduced the tool costs by 22 percent during the test phase itself. This resulted in an annual tool cost saving of ₹1.33 million, cleaner machines and no foam. Synergy 915 is a synthetic; water-miscible; chlorine-, mineral oil- and ester oil-free metalworking fluid and suits perfectly for demineralized and soft water applications.

Furthermore, the machine remained cleaner and the foam disappeared completely. "We are very happy with the new coolant from Blaser Swisslube, especially with the tailored



Source: Blaser Swisslube

The independent and family-owned Swiss company, Blaser Swisslube has grown from a small business into a global player, employing around 600 people worldwide.


on-site customer service. I was very sceptical at first. The coolant price per litre of the new Synergy 915 is 47 percent higher than our previous coolant. But the Liquid Tool solution pays for itself," says Tyagi.

### Growing symbiosis

After the first success, the Blaser coolant was used on two more machines. However, the potential has not been fully exploited yet. With Dantal Hydraulics' plan to invest in expansion, Blaser will be at its side as a trusted coolant partner for further continuous improve-

ments on the shop floor.

### The Liquid Tool by Blaser Swisslube

Productivity, cost-effectiveness and processing quality are factors that depend on the selection and quality of the metalworking fluid to the highest degree. "With our extensive machining know-how, customized services and first-class products, we can help our customers to fully exhaust the potential of their machines and tools and to convert the metalworking fluid into a central factor for success - a Liquid Tool," says Marc Blaser, CEO, Blaser Swisslube. 

**Productivity, cost-effectiveness and processing quality are factors that depend on the selection and quality of the metalworking fluid to the highest degree.**

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## COLLABORATION IS THE FUTURE

Human-robot collaboration enables the duo to work hand in hand with each contributing what they are best at. Together a formidable team, it promises manufacturing companies innumerable opportunities to be tapped.

Three robotic arms from Universal Robots, namely the UR3, UR5 and UR10 with respective payloads of 3, 5, and 10 Kg.



Source: Universal Robots

**D**riven by the need for high accuracy, precision and performance of industrial processes, all industrial processing systems are turning to automation, making it an indispensable part of the manufacturing industry. Thus, a majority of companies today are looking for lean manufacturing solutions and the industrial manufacturing robots provide many benefits that companies require to stay competitive. The speed, repeatability and efficiency that cobots provide can increase productivity, profits and reduce costs.

### Increased adoption of automation

The application of robotics and automation has been successfully achieved in a wide range of industries dealing with well-defined processes and products including manufacturing, FMCG, automotive, healthcare, and pharmaceutical to name a few. With this idea of higher

production rate and the need for human interaction with machine automation, collaborative robots - or cobots - were first developed in 2008 by Universal Robots. Universal Robots are the leading manufacturers of advanced user-friendly and light industrial robotic arms from Denmark. Human-Robot Collaboration, or HRC, is the primary differentiator that sets these cobots apart from traditional robots. The idea is for humans and robots to work together towards a common goal, with each doing what they do best. While some tasks require human effort and thought, the accuracy, precision and mass production at higher efficiency is taken care of by the cobots. This latest technological advancement is in line with Industry 4.0, which is in sync with the automated revolution in the manufacturing industry. Three robotic arms from Universal Robots, namely the

UR3, UR5 and UR10 (with respective payloads of 3, 5, and 10 kilograms) can be incorporated into various processes so that engineers can easily adapt the software to the specific needs of the required tasks. The easy programming, installation and collaborative nature of these robot arms allow them to work side by side with the workforce for efficient, high-quality products.

### Cobots ideal for SMEs

For manufacturing companies, collaborative, light-weight robots are the new, economic alternative to expensive, traditional industrial robots. They make automation affordable and thus are a realistic choice, especially for small and medium-sized enterprises (SMEs). Cobots can help them compete more effectively, offering new opportunities for employees, and even improving worker safety. They are specifically designed to work along with

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the human workforce, without any costly, space-grabbing protective installations. Therefore, they are ideal for companies that produce a wide range of products and small lot sizes.

SMEs, at a global level are the backbone of developing economies, and play a dominant role in the Indian manufacturing industry. They are constantly in search of solutions for recession and unemployment. Governments are encouraging entrepreneurship at a great scale for providing multiple benefits including job opportunity creation, increasing the productivity, increasing industrial output and exports, development of entrepreneurship, development of rural economy, healthy competitiveness, gradually eradicating poverty and achieving various societal goals. When it comes to automation, SMEs face two major hurdles - initial capital investment and the availability of skilled manpower to handle automation and new technologies.

This approach is particularly appealing to the Indian manufacturing industry because labor-intensive conditions and collaborative robots together can help the Indian market achieve the best of both worlds by making precise use of this distinctive technology. Universal Robots is supportive of the 'Make in India' and 'Digital India' initiatives which endeavor to further boost manufacturing, employment and productivity along with the adoption of newer technologies, thereby bringing the Indian manufacturing industry to compete on a global platform.

### Success stories

SMEW Textile Machinery Pvt Ltd, an MSME in Ahmedabad, collaborated with Universal Robots and deployed its first UR10 robotic arm in January

The easy programming, installation and collaborative nature of the robot arms allow them to work side by side with the workforce for efficient, high-quality products.

**For manufacturing companies, collaborative, lightweight robots are the new, economic alternative to expensive, traditional industrial robots.**



Source: Universal Robots


2017. The cobot was used for a pick and place application. It was a new addition to the workforce but the simplicity and operator-friendly features of the cobots made the completion of tasks easier and faster. After the addition of the cobot to its manufacturing, SMEW realized that its production increased from 30 pieces to 80-90 pieces per week - i.e. a 300 percent boost in production over a period of just eight months.

For employees, on the other hand, cobots are the perfect tool to free them from monotonous and wearisome tasks. As a result, they can dedicate themselves to more creative jobs and work as productively as possible. Thanks to additional safety functions, it is possible for the cobot to work alongside its human co-workers either completely without any safety fencing, or with very minimal fencing. But cobots can do much more for their human colleagues than just alleviate them from repetitive and strenuous jobs; they can help create a new, more positive image for their profession by turning assembly-line workers into automation experts in only a few easy steps. Therefore, it is one of the most outstanding characteristics of cobot technology to create additional val-

ue for both the company and its employees.

Thus, the incorporation of collaborative robots will be a timely introduction to revolutionize the Indian industry, bringing the optimization of processes, reduction of waste, improvement in production, and higher efficiency and precision. The functions that have already embraced automation will continue to prevail with incremental improvements from the normal cycle of technological innovation.

### Collaboration is powerful

Universal Robots has also taken a step forward from mass-customization to mass-personalization, which forms the base of Industry 5.0 - i.e. returning the human touch to manufacturing. Industry 5.0 products empower people to realize the basic human urge to express themselves, and cobots are exactly the tools manufacturers need to produce these personalized products according to their consumers' demands. By putting human beings back at the center of industrial production - aided by tools such as cobots - Industry 5.0 not only gives consumers the products they want today, but gives workers jobs that are meaningful and take a step ahead in manufacturing. 

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# WHY DOES **COMMON SENSE** ELUDE DISCRETE MANUFACTURING?

Lean Manufacturing has long since been a proven way to achieve effective improvements in productivity, quality, and lead time by eliminating waste. Surprisingly though many discrete manufacturing organizations are still shying away from it. The following fable serves as an eye-opener for those yet to embrace the philosophy that means pure gains.



Source: Magic Wand Media

**O**nce the Sales Manager had converted the customer order into a Visual Signaling Card at Mysore Kirloskar Hubli factory and placed it in its location on the assembly line, the entire execution thereafter was completely handled and controlled by the workmen. The production and procurement processes in the execution did not need the involvement of any supervision or managing, thereby leaving the Supervisors and Managers time to hone and improve the systems further. The workmen

ran the pull production like a symphony.

### **A not-so-uncommon story**

The above is an example of an organization that brought in the Lean Manufacturing System. To drive the point home it's important to narrate this little fable which beautifully highlights the difference between lean and discrete / conventional or somehow / anyhow manufacturing organizations: Everyday a small Ant arrived at work and started working immediately. He produced a

lot and was happy. The CEO - a Lion - was surprised to see the Ant working without any supervision. He thought if the Ant could produce so much without supervision, wouldn't he produce more if he had a supervisor. So he recruited a Cockroach who had extensive experience as a supervisor and who was famous for writing excellent reports. The Cockroach's first decision was to set up a clocking in attendance system. He also needed a secretary to write and type his reports. He recruited a

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Spider who archived and monitored all his phone calls. The Lion was delighted with Cockroach's reports, and asked him to produce graphs to describe production rates and analyze trends so that he could use them for presentations at Board Meetings. So the Cockroach had to buy a new computer and a laser printer, and recruited a Fly to manage the IT department.

Meanwhile, the Ant, who had once been so productive and relaxed, hated this new plethora of paperwork and meetings, which used up most of his time. The Lion then decided that it was high time to nominate a head of the department where the Ant worked. The position was given to a Cicada whose first decision was to buy a carpet and an ergonomic chair for his office.

The new person - the Cicada - also needed a computer and a personal assistant, who he brought from his previous department, to help him prepare a Work and Budget Control Strategic Optimization plan. The department where the Ant worked was now a sad place, where nobody laughed anymore and everyone was upset. It was at that time the Cicada convinced the boss, the Lion, of the absolute necessity to start a climatic study of the environment.

The Lion then reviewed the charges for running the Ant's department and also realized that the production was much less than before. So, he recruited an Owl, the prestigious

B-school grad and renowned consultant, to carry out an audit and suggest solutions. The Owl spent three months in the department and came up with an enormous report in several volumes that concluded "The Department was Overstaffed". Guess who the Lion fired first? The Ant! Because he showed lack of motivation and had a negative attitude!

Like it or not, such thinking / decisions / actions / direction prevails in varied forms in non-lean organizations even today. This is also what happens when a lean leader either leaves the organization or is asked to leave, and the new management has no clue about how the lean leader's routine and behavior led or contributed to the successful transformation of the company.

#### **The lean benefits**


Employing lean philosophies is no rocket science and embracing them promises immense benefits in productivity and quality. Then why, one wonders, does common sense elude discrete manufacturing organizations?

Below are certain things listed which, if implemented, can aid to succeed in becoming lean:

- The top management must lead in building the lean culture. Their management style must change to make room for the principles and philosophies of lean manufacturing which they must live every day.

**With over a hundred tools and techniques to choose from the lean tool basket, becoming lean should be the number one strategic goal of an organization from top down.**

- Disruption from successfully implementing lean processes usually comes from the top management. By practising the above, they become enablers rather than disruptors.
- The most difficult situations or when you think you are too busy to think of lean are the best times to embed a lean culture.
- The intent to become lean gets realized when it ceases being a mere statement.
- With over a hundred tools and techniques to choose from the lean tool basket, becoming lean should be the number one strategic goal of an organization from top down.
- Merely implementing the tools will never make a company lean. Managing them routinely is what ensures an organization's success.
- Companies that consistently practise lean, succeed in getting better results and grow well organically, gaining a competitive advantage.
- It's the workers who run lean production, and the others improve systems, bring in new designs, innovate with new ideas, processes, reduce inventory, improve the workflow, build competitive advantage, enhance customer satisfaction etc.

While you mull over the common sense question and the above pointers, keep in mind that the CEO of a true lean company is also an Ant, never a Lion! 

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# FOR SMOOTH-RUNNING MACHINES

Lubricants play an integral role of reducing friction between critical components of CNC machines, resulting in equipment durability, longevity and continued uptime. Here's to know a few effective ones...

**C**omputer Numerical Control (CNC) machines automate machine tools by means of computers executing pre-programmed sequences of machine control commands. This is in contrast to machines that are manually controlled by hand wheels or levers, or mechanically automated by cams alone. Any particular component might require the use of a number of different tools - drills, saws, etc. Modern machines often combine multiple tools into a single 'cell'. In other installations, a number of different machines are used with an external controller and human or robotic op-

erators that move the component from machine to machine. Companies specializing in producing nuts and bolts, complex gear sets or high precision valves lay more emphasis on efficient functioning of the components of their computer-controlled cutting machines for long-term profitability. Lubrication plays an integral role in reducing friction between critical rotating and moving machine components, which then translates into equipment durability, longevity and continued uptime. To help ensure that the machine runs smoothly, it is important to choose a combination of

high-quality slideway oils and metal working lubricants such as water soluble cutting fluids or neat cutting oils.

## Slideway oils

Poorly formulated slideway oils may not separate readily from aqueous coolants. This results in the formation of 'tramp oil' which compromises the effectiveness of the coolant by shortening its effective life and adversely altering cutting performance. Tramp oil can also lead to bacterial growth resulting in foul odor, short service life and potential health as well as safety concerns.

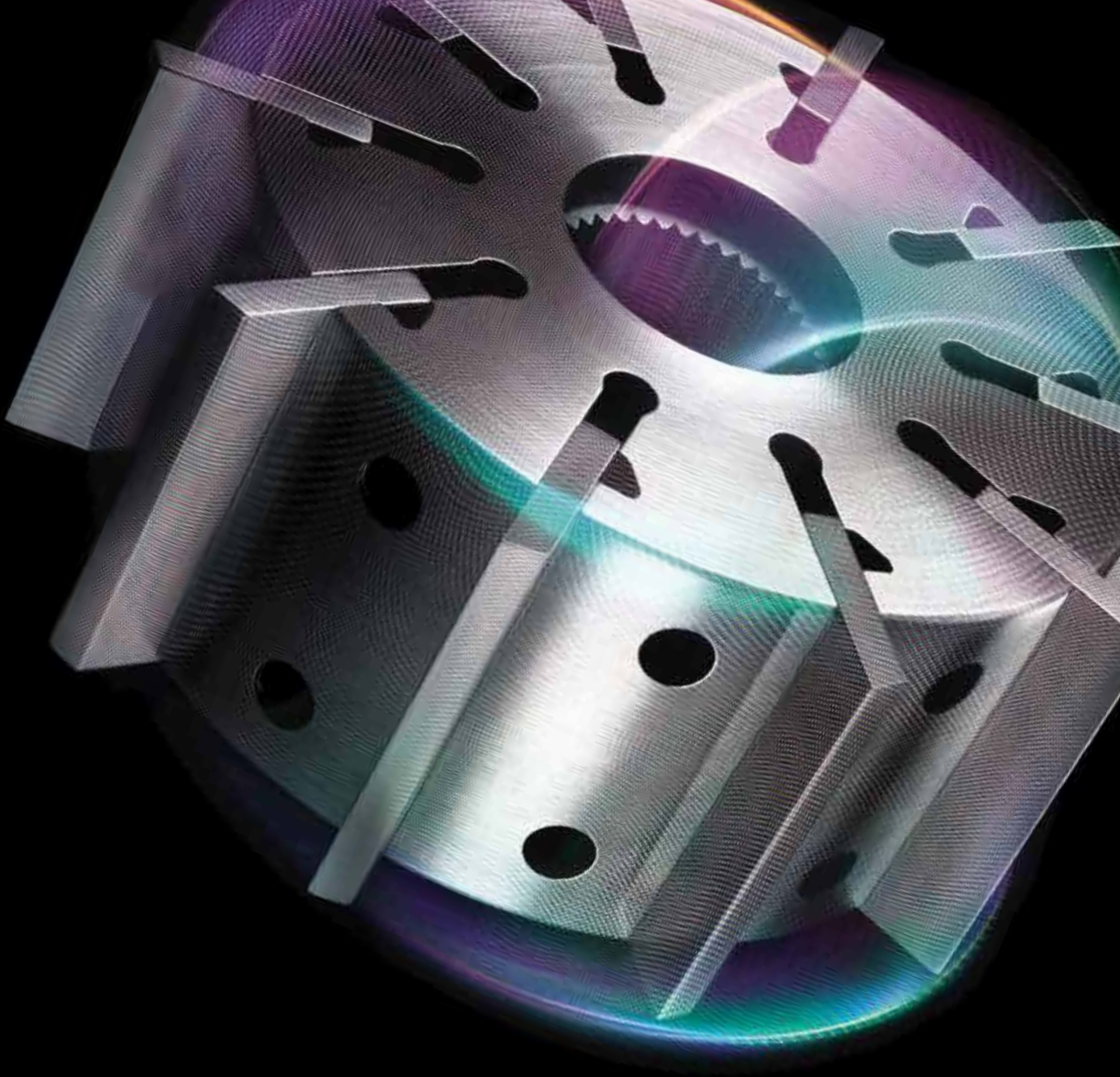
Whether a company specializes in producing nuts and bolts, complex gear sets or high precision valves, it has to keep its equipment efficient for long-term profitability.



Source: ExxonMobil

SHANKAR KARNIK  
General Manager  
Industrial  
ExxonMobil Lubricants  
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Source: ExxonMobil

To identify high-performance slideway oils, maintenance professionals should seek out products such as Mobil Vactra™ Oil Numbered Series of slideway oils with the following performance characteristics: Exceptional coolant separability which enhances the performance and life of water-based metal working fluids, outstanding frictional properties which enable increased machine accuracy and reduced chatter, and stick-slip.

Mobil Vactra Oil No.2 is a premium-quality ExxonMobil slideway lubricant specifically designed to meet the requirements for accuracy, aqueous coolant separability, and equipment protection of precision machine tools.

### **Water soluble cutting fluids**

To optimize productivity, it is very important to choose advanced aqueous coolants. The highest performing coolants can reduce maintenance requirements by resisting biological attack, thereby extending batch life. Ease of maintenance needs to be balanced with performance as well as protecting the CNC machine components from corrosion and sticky deposits. In addition, the fluids should meet the latest health and safety regulations, be easy to monitor and

maintain in service. Collectively, these properties will help deliver long service life, excellent cutting performance and reduced maintenance downtime. The new Mobilcut™ Series from ExxonMobil is comprised of milky emulsions, high-performance micro-emulsions and a fully synthetic grinding fluid. The high-performance, long life semi-synthetic cutting fluids, in particular, have been designed to meet the wide variety of applications and operations found in medium- to small-sized CNC machines.

Mobilcut 250 is a high-performance semi-synthetic fluid formulated to enhance performance when machining aluminum and aluminum alloys and where low staining potential is important on sensitive components. Containing high levels of lubricity agents, it provides high machining performance of carbon and alloy steels and yellow metals.

### **Neat cutting oils**

Neat or straight cutting oils are used in applications which are beyond the typical performance profile of aqueous coolants, such as tapping and threading of high alloy steels. They improve machining in high-speed automated machining centers through outstanding cutting performance, re-


duced tool wear and enhanced surface finish. Ideally they should be light colored to allow clear visibility of the workpiece; have low misting characteristics to help workplace safety and product usage; and should be chlorine-free to support environmental concerns, while balancing with a high degree of lubricity and machining performance.

Specially designed to meet the increasing demands of today's sophisticated machining centers, tooling trends and health and safety regulations, Mobilmet™ Series of cutting oils and the new series of Mobilgrind grinding oils from ExxonMobil have been developed for applications where excellent surface finish, high-precision machining and improved productivity are the primary objectives.

duced tool wear and enhanced surface finish. Ideally they should be light colored to allow clear visibility of the workpiece; have low misting characteristics to help workplace safety and product usage; and should be chlorine-free to support environmental concerns, while balancing with a high degree of lubricity and machining performance.

### **Spindle oils**

Spindle oils are used for high-speed spindle bearings and equipment where high speeds and fine clearances are involved. It provides exceptional lubrication of close-tolerance bearings which helps keep the bearings running cool and helps maintain the precision required by many of today's critical machine equipment. These are designed for spindle bearings and exhibit the required properties to function as low-pressure hydraulic and circulating oils as long as the proper viscosity is selected. This feature helps minimize inventory costs and reduce the potential for product misapplication.

The Mobil Velocite™ oils are premium performance products primarily designed for the lubrication of high-speed spindles in machine tools. They are also used in some critical hydraulic, circulation systems and airline oilers where the appropriate viscosity grade is selected. 

**Companies specializing in producing nuts and bolts, complex gear sets or high precision valves lay more emphasis on efficient functioning of the components of their computer-controlled cutting machines for long-term profitability.**



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# A BETTER TOMORROW

As the country gears up to define its goals for an electric future, industry insiders present their two cents on the advantages that entail this revolutionary shift from traditional gasoline-powered vehicles to electric vehicles, the roadblocks to it, and how the road ahead seems.



Source: Magic Wand Media

With EVs being more energy efficient than the traditional internal combustion engine-based vehicles, they are slated to be game changers.

**T**hat electric vehicles (EVs) are a cleaner alternative to the conventional gasoline ones and have a host of other advantages, including low operating cost, zero tailpipe emissions, low maintenance, high torque power etc, is the awareness that's seeping in, albeit gradually, among the Indian automobile consumers.

However, as the Indian customers are getting themselves ready for this shift in mobility and the EV industry is eagerly waiting for the launch of the second phase of the policy on 'Faster Adoption and Manufacturing of Hybrid and Electric vehicles' (FAME-II), Prime Minister Narendra Modi has unfortunately indicated a major change in

the thrust of the policy, delaying it further.

Raising his concern on the lack of a clear-cut long-term strategy on EVs, Ayush Lohia, CEO, Lohia Auto Industries (LAI), an automobile company that offers traditional as well as green energy mobility solutions, says, "FAME II is delayed and there are talks that customer-based incentives on the sale of the vehicles will be

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Source: Fronius India Pvt Ltd

“The knowledge, expertise, infrastructure, manufacturing cost and capital investment required for creating processing equipment for the induction of Aluminum parts are still rare in India. We are sure this will change with increasing volume.”

**V V Kamath**  
Managing Director  
Fronius India Pvt Ltd

withdrawn. Our request is that FAME II should continue with sales incentives and should be tapered down once EV industry gets stable with consistent growth and maturity.”

### **Building blocks concerns**

#### **Battery**

Dr Pranati Sahoo, Technical Manager, Automotive Electrification, Electronics Material Solutions Division, 3M India, points to the current EV design in which the Lithium-ion batteries are the single most important component of an electric vehicle, comprising 40 percent of the total production cost. “India imports a majority of its Lithium ion batteries from China, Europe, the US and Japan, which is further assembled by OEMs. The procurement lead time, transportation costs, duty fees and high forex exposure highly affect the final unit price of EVs.”

Seconding Sahoo’s opinion, Ajay Gurjar, Deputy COO, Sales Operations - Robotic Division, Yaskawa India Pvt Ltd, suggests, “Indian Government must focus its



Source: Yaskawa India Pvt Ltd

“Robotic solutions will be the key for automakers’ success. Battery manufacturing, special material welding, assembly of power trains, battery charging stations are main applications that will be taken care of by robots.”

**Ajay Gurjar**  
Deputy COO, Sales Operations -  
Robotic Division,  
Yaskawa India Pvt Ltd

efforts to reduce the battery cost with domestic manufacturing and lowered taxes. EVs are more expensive than traditionally propelled vehicles due to high cost of Li-ion batteries, which makes for 40-50 percent of the vehicle cost. Add to that 28 percent GST. EV adoption will be highly dependent on the strategies to reduce battery cost significantly.”

“It is, hence, important to encourage domestic battery manufacturing firms to work on better energy density as well as low cost battery technology. We should have a deep reservoir of technology as well as the capability to address consumers’ concerns for efficiency, power and comprehensive safety,” Dr Sahoo adds.

“Indian R&D efforts on battery raw materials, reusability and energy storage with grids infrastructure is equally challenging for EV segments,” she notes.

“A robust supply ecosystem of charging stations has also remained a key challenge which is creating range anxieties among customers,” she adds further.



Source: Lohia Auto Industries (LAI)

“There are talks that customer-based incentives on the sale of the vehicles will be withdrawn. Our request is that FAME II should continue with sales incentives and should be tapered down once EV industry gets stable with consistent growth and maturity.”

**Ayush Lohia**  
CEO  
Lohia Auto Industries (LAI)

#### **Automation**

According to Gurjar, manufacturers can no longer rely on the traditional manufacturing lines to meet the growing demand for EVs. Flexible and scalable automation solutions are needed to cope with new and complex processes such as EV battery assembly. “Since EV is a new market, automakers will encounter a number of issues. Under such circumstances, robotic solutions will be the key for automakers’ success,” he states.

Battery manufacturing, special material welding, assembly of power trains, battery charging stations are main applications that will be taken care of by robots. Yaskawa’s huge product range of arc, spot, handling and paint robots, and recently launched collaborative robots are going to play a key role in EV manufacturing, claims Gurjar.

#### **Lightweighting**

“Lightweighting is another key requirement in EV manufacturing as it is directly related to the performance of battery and

**Flexible and scalable automation solutions are needed to cope with new and complex processes such as EV battery assembly.**



Source: 3M India

“Focus towards more futuristic technologies like display solutions, sensor technologies, thermal management of batteries and power electronics would help to drive the electric vehicle revolution in more efficient ways.”

**Dr Pranati Sahoo**  
**Technical Manager**  
**Automotive Electrification**  
**Electronics Material Solutions**  
**Division**  
**3M India**

charge per travel,” points out VV Kamath, Managing Director, Fronius India Pvt Ltd.

Solution to this scenario is using Aluminum, which is already being used by many leading EV manufacturers like Tesla and others in the western countries.

“The knowledge, expertise, infrastructure, manufacturing cost and capital investment required for creating processing equipment for the induction of Aluminum parts are still rare in India. We are sure this will change with increasing volume,” he notes.

Fronius is recognized as a technology leader in welding technology. For several decades, it has been tackling difficulties and successfully made technologies for Aluminum welding. “All leading automotive manufactures like Audi A8, Mercedes AMG and Tesla Electric S Model are welded using Fronius Technology,” he shares.

#### Power

Another concern is whether our electricity grid can handle the future demand. The coal-



Source: Sun Mobility

“As part of National Solar Mission, we have set for ourselves ambitious targets for solar energy generation over the next 10 years. If we stay focused to attain it, we can very well leverage solar energy for powering the EV fleet.”

**Yuvraj Sarma**  
**Senior Manager Strategy**  
**Sun Mobility**

fired power again will not end up being environment-friendly. Hence, the answer seems to lie in renewable energy that is wind or solar energy to charge EVs.

“We believe that to create a completely sustainable form of mobility ecosystem, it needs to be electric and powered by renewable energy,” states Yuvraj Sarma, Senior Manager Strategy, Sun Mobility.

“As part of National Solar Mission, we have set for ourselves ambitious targets for solar energy generation over the next 10 years. Due to this, solar energy generation today costs (₹ ~ 2.4/kWh). It has become a fraction of what it used to be (₹ ~ 7.4/kWh) and the trend is expected to continue. If we are on track in achieving our targets, we can very well leverage solar energy for powering the EV fleet,” he observes.

“We expect the Government to create supporting regulatory and pricing framework to enable charging infrastructure operators to wheel renewable energy to power this infrastructure,” adds Sarma.

#### Perceiving the way ahead

“The current modes of conveyance and infrastructure will not suffice in the coming years to cater to the requirements of over 1.30 billion population. There is an incremented need to prepare for a green future for Indian mobility and reduce dependence on imported crude oil,” notes Gurjar. Recognizing this aspect, the regime of India, is working towards developing a mobility option which is ‘Shared, Connected and Electric’.

“Taking into account Indian market conditions and infrastructure, it will take a long time for EVs to take over the gasoline engine but with the same kind of Government efforts and approach, it can be the good solution for intercity travel system like city buses, e-autos, e-bikes, delivery vehicles where the travel distance will be within the limit of battery capacity,” he adds. Dr Sahoo presents her view, “Focus towards more futuristic technologies like display solutions, sensor technologies, thermal management of batteries and power electronics would help to drive the electric vehicle revolution in more efficient ways. For this, all the technology platforms need to be more connected to provide a comprehensive solution basket to achieve these ambitious goals of automated driving.”

“The Government certainly needs the interest and platform for global collaborations, technology and market sharing mechanisms, and economies of scale to enable these requirements. Lastly, it is just not the push from the Government, this vision is also being emphasized by collaborated efforts from material technology focused private firms and research institutes to address the growth with divergence of business models and technologies,” she concludes. 

**Another concern is whether our electricity grid can handle the future demand. The coal-fired power again will not end up being environment-friendly.**

# Block your dates this November !

## SYMPOSIUM ON APPROPRIATE AUTOMATION IN INDIAN CONTEXT

23 November 2018, Hotel Westin, Pune



Manufacturing is becoming highly automated and IT-enabled. The developments in the sphere of Automation are witnessing rapid strides in areas such as Robotics, Artificial Intelligence, Machine Learning, Digitalization and so on. For Indian manufacturing companies to be globally competitive, it is imperative to automate their operations to reduce costs, enhance productivity and reliability, to effectively manage the complexities of varying business cycles.

To understand and address the real-time application and benefits of Automation, Indian Machine Tool Manufacturers' Association (IMTMA) is organizing a Symposium on Appropriate Automation in Indian Context, on 23 November 2018 in Pune

The symposium is a combination of technical presentations, application case studies, plant visits, interactive sessions and panel discussions.

### FOCUS AREAS

#### ▶ Application Case Studies

- ▶ Machine Shop Automation
- ▶ Assembly Lines
- ▶ Foundry
- ▶ Welding
- ▶ Sheet metal working

#### ▶ Enabling Technologies

- ▶ Robotics
- ▶ Digitisation
- ▶ Smart Sensing & Vision Systems
- ▶ Machine learning
- ▶ Artificial Intelligence

#### Plant Visits (22 November 2018)

Leading manufacturing companies open their doors to participants on 22 November 2018 (a day prior to the event) to showcase latest developments and practical implementations of Automation on their shop floor.

**TOUR A : BOSCH CHASSIS SYSTEMS & VOLKSWAGEN**

**TOUR B : BAJAJ AUTO & MAHINDRA HEAVY ENGINES (To be Confirmed)**

#### Who Should Participate

CEOs, Top Management, Senior Executives, Practicing engineers, Industry consultants and R&D Specialists from Automotive, Auto components, Aerospace, Consumer durables, Machine Tools, Tool rooms, Defence & Railway units, General Engg. and other manufacturing industries.

## EVENT CALENDAR

EVENT NAME	CONTACT	DATE & VENUE
<b>31.BI-MU</b>	T: +39 0226 255 860 E: bimu.esp@ucimu.it www.bimu.it/en/home	October 09-13, 2018 fieramilano Rho Italy
<b>VDMA SYMPOSIUM ON "OPC UA - THE FOUNDATION OF INDUSTRIE 4.0"</b>	T: +91 (80) 2559 5901 E: info@vdmaindia.org www.india.vdma.org	October 22, 2018 The O Hotel, Pune Maharashtra, India  October 23, 2018 The LaLiT Ashok, Bangalore Karnataka, India
<b>EuroBLECH 2018</b>	T: +91 22 267 2135 E: priya.sachdeva@hmf-india.com www.euroblech.com/2018/english/	October 23-26, 2018 Exhibition Grounds Hanover, Germany
<b>Myanmar MACHTOOL</b>	T: +01 901 0753 E: myokyiphyutun25@gmail.com www.myanmar-expo.com	November 01-04, 2018 Yangon Convention Center Yangon, Myanmar
<b>JIMTOF 2018</b>	T: +81 (03) 5530 1333 E: jimtof@tokyo-bigsight.co.jp www.jimtof.org/en	November 01-06, 2018 Tokyo International Exhibition Centre Tokyo, Japan
<b>TAIWAN INTERNATIONAL MACHINE TOOL SHOW (TMTS) 2018</b>	T: +886 4 2350 7586 E: tmts@tmba.org.tw www.tmts.tw/en/	November 07-11, 2018 Greater Taichung International Expo Center Taichung City, Taiwan
<b>INTERNATIONAL METAL TECHNOLOGY TAIWAN SHOW (iMT)</b>	T: +886 2 2595 4212 E: imt@kaigo.com.tw www.imttaiwan.com	December 05-07, 2018 Taichung International Exhibition Center (TCIEC) Taichung, Taiwan
<b>IMTEX 2019</b>	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
<b>TAIPEI INTERNATIONAL MACHINE TOOL SHOW (TIMTOS) 2019</b>	T: +886 2 2725 5200 E: timtos@taitra.org.tw www.timtos.com.tw	March 04-09, 2019 Taipei Nangang Exhibition Center, Taipei, Taiwan
<b>INTEC 2019</b>	T: +91 (422) 222 2396 E: intec@codissia.com www.intec.codissia.com	June 06-10, 2019 CODISSIA Trade Fair Complex Coimbatore, India
<b>EMO HANNOVER 2019</b>	T: +91 22 6687 550 001 E: info@hmf-in www.emo-hannover.de	September 16-21, 2019 Hanover Fairground, Messegeleände Hannover, Germany

To suggest an event, please send details to [soumi.mitra@magicwandmedia.in](mailto:soumi.mitra@magicwandmedia.in)

## A MORE PRODUCTIVE FUTURE

With the view to put spotlight on some of the best practices in the manufacturing industry, Indian Machine Tool Manufacturers' Association (IMTMA) organized the 12th edition of National Productivity Summit 2018 on August 24-25, 2018, at ITC Grand Chola, Chennai. The theme of the summit was 'Showcasing Competitiveness in Manufacturing'. Highlights...



Winners of the IMTMA-Ace Micromatic Awards 2018 with IMTMA members and seasoned manufacturing players

**I**ndian Machine Tool Manufacturers' Association (IMTMA) organizes its annual National Productivity Summit (NPS) to highlight and reward projects that have excelled at achieving improved process performance and enhanced productivity.

This year NPS 2018 was graced by the presence of MM Murugappan, Executive Chairman, Murugappa Group and Dr V Sumantran, Chairman, Celeris Technologies who did the honors of inaugurating the summit. Sharing their space were P Ramadas, President, IMTMA; Indradev Babu, Vice President, IMTMA;

and V Anbu, Director General & CEO, IMTMA.

Setting the tone for the summit, Murugappan emphasized on the Indian companies to embrace technology to gain competitiveness. "We must realize the fact that we acutely need to be competitive and it does not matter which industry one is in. A very classical approach is through robust processes that get enhanced by the use of technology," he stated.

"We must essentially focus on growth because if the GDP per capita income is growing and if 85 percent of our business is within the defined geography of India,

we need to necessarily grow and be competitive. Our targets need to be higher than the GDP growth," he further added.

He also stressed on the importance of having the right talent and cash flow to make a business successful. "Another point to focus is the quantum of profit and cash flow which has a direct bearing on efficiency. Being frugal with enhanced cash flow gives us an even better opportunity, especially in a country like India," noted Murugappan.

Speaking on the 'Pathways to Productivity for Indian Manufacturing,' Dr Sumantran, said, "It is imperative to leverage the

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combination of quality and productivity to meet the competitive demands of the industry. Manufacturing units need to embrace modern technology including Industry 4.0 to raise the collective input in manufacturing and boost India's share of medium and high-tech activities in manufacturing exports so that manufacturing activity can be sustainable and contribute further to GDP."

P Ramadas, President, IMTMA, said, "It is imminent now for companies in India to enhance competitiveness in manufacturing by reducing costs and improving productivity, by building a sustainable competitive advantage. Summits such as these are platforms that address learning and best practices requirements of manufacturing industry and to raise its competitiveness."

**Insightful keynotes**

As part of the summit, seasoned industry players, rich in experience and expertise, offered their take on things. A '360° perspective on Manufacturing Competitiveness' was presented by AK Taneja, Managing Director & CEO, Shriram Pistons & Rings



Source: Magic Wand Media

"We must realize the fact that we acutely need to be competitive and it does not matter which industry one is in. A very classical approach is through robust processes that get enhanced by the use of technology."

**MM Murugappan**  
Executive Chairman  
Murugappa Group

Ltd. The way to 'Drive Growth through Productivity' was shown by VN Vijayaraghavan, Managing Director, IM Gears, and Dattatri Salagame, Vice President & Head of Digital Business, Robert Bosch Engineering & Business Solutions, offered his take on 'IoT implementation in Indian manufacturing'. Abhay Dixit, Senior General Manager, Mahindra & Mahindra, Farm Equipment Sector, listed 'Inno-



Source: Magic Wand Media

"Manufacturing units need to embrace modern technology to raise the collective input in manufacturing and boost India's share of medium and high-tech activities in manufacturing exports so that manufacturing activity can be sustainable and contribute further to GDP."

**Dr V Sumantran**  
Chairman  
Celeris Technologies

vative Ways of Improving Paint Shop Productivity'.

**Rewarding the worthy**

NPS 2018 featured case study presentations on productivity improvement projects from various companies such as Bajaj Auto, Akurdi; Hero MotoCorp, Haridwar; L&T MHPS Turbine Generators, Surat; L&T MHPS Boilers, Surat; Mahindra & Mahindra, Foundry Division, Kandivali; Toyota Kirloskar Auto Parts, Bengaluru; and TVS Motor Company, Hosur, all of which contested for the IMTMA-Ace Micromatic Productivity Championship Awards 2018.

The awards acknowledge outstanding efforts from the short-listed case studies of companies that have excelled in achieving superior performance and reward them with cash prizes worth ₹10 lakh.

Irrespective of the size of a manufacturing organization, boosting productivity is essential to enhancing profits and sustaining competitiveness. IMTMA, in its capacity, is being instrumental in their endeavor to achieve their best.

The awards acknowledge outstanding efforts from the short-listed case studies of companies that have excelled in achieving superior performance and reward them with cash prizes worth ₹10 lakh.

**The IMTMA-Ace Micromatic Productivity Championship Awards 2018**

Prize	Winners	Case Study
First	Toyota Kirloskar Auto Parts	Productivity Improvement in Transmission Lines
Second	Mahindra & Mahindra	Frugal Automation in Vent Poking Process for High Pressure Moulding Line
Third	L&T MHPS Turbine Generators	Capacity Enhancement and Process Optimization of Blade Manufacturing
SME Productivity Award 2018	Distinct Productivity Solutions	Productivity Approach as a Tool for Price Sensitive Critical Component Manufacturing

# GROWING FROM STRENGTH TO STRENGTH

After having garnered immensely favorable response in the first edition of Pune Machine Tool Expo (PMTX), Indian Machine Tool Manufacturers' Association (IMTMA) organized its sequel at Auto Cluster Exhibition Centre, Pune from September 27-30, 2018. Highlights of the event that had its focus on the country's flourishing western region...

Indradev Babu, Vice President, IMTMA, lighting the lamp during the inauguration ceremony of Pune Machine Tool Expo 2018 along with Executive Committee Members.



Source: IMTMA

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**I**MTMA's regional machine tool expos is an endeavor towards addressing the manufacturing requirements of the Original Equipment Manufacturers (OEMs) of various industry sectors in Tier II and Tier III cities of India. With this aim, the second edition of Pune Machine Tool Expo (PMTX) was organized to celebrate manufacturing capabilities of the region around the city of Pune and facilitate its connection with

the manufacturing players of the rest of India and beyond. The presence of leading manufacturing companies makes the expo a significant one for the western region.

### Strong stats

With over 85 exhibitors, PMTX 2018 covered the entire gamut of metal working machine tools for both metal cutting and metal forming including automation and robotics, tooling

systems, CAD/CAM and other technologies which are essential for today's manufacturing.

The four-day expo, spread across three halls covering 4,200 sq mt, hosted over 11,019 visitors (49 percent increase as compared to 2016) and a trade delegation from 86 companies from various industry sectors such as Auto Component, Automobiles, Capital Goods, Dies And Tool, Defence and Aerospace. Along with host city Pune, the event



Source: IMTMA

“Regional machine tool expos such as PMTX will play an important role in the further development of the manufacturing industry in the region. They provide an ideal platform to connect, network and do business.”

**Indradev Babu**  
Vice President  
IMTMA  
Managing Director  
UCAM Pvt Ltd



Source: IMTMA

“The speed at which Indian manufacturing is growing, manufacturers are increasingly in need of smart solutions comprising Industry 4.0, additive manufacturing and robotics. This is the context in which the role played by the machine tool industry becomes very important.”

**V Anbu**  
Director General & CEO  
IMTMA

attracted an impressive number of delegates and visitors from the Tier II and Tier III cities such as Aurangabad, Nagpur, Kolhapur, Mumbai, Satara, Ahmednagar, Nasik besides the neighboring states of Gujarat and Madhya Pradesh. Business orders worth ₹250 crore were generated.

Visitors from Germany and Poland attended the event, while latest technologies from countries like Germany, the US, the UK, China, Switzerland, Spain, Japan, France and Italy were also on display.

### Optimism abounds

Indradev Babu, Vice President, IMTMA, did the honors of inaugurating the expo along with V Anbu, Director General & CEO, IMTMA and other executive council members of IMTMA.

Highlighting the current positive sentiment in the industry, Babu said, “The year 2018-19 has so far been promising for the machine tool industry. Machine tool production for the financial year 2017-18 was around ₹7,293 crore. There was a growth of

around 26 percent in production and around 27 percent in consumption. For the year 2018-19, production is estimated to grow by 20 percent and consumption may grow around 15 percent during the period.”

Seconding Babu’s view on the industry’s growth, Anbu said, “India today is one of the fastest growing economies in the world. We are growing at 8.2 percent. If we look at the user segments such as Auto or Auto Components, it’s never been this vibrant.”

“The speed at which Indian manufacturing is growing, manufacturers are increasingly in need of smart solutions comprising Industry 4.0, additive manufacturing and robotics. This is the context in which the role played by the machine tool industry becomes very important,” he noted.

### Exhibitors’ views

**Hydax Hydraulics Pvt Ltd** displayed its wide range of hydraulic accessories at the event. For company Director, Meetali Mukherjee, PMTX 2018 proved to be a perfect platform

to consolidate existing ties and forge new bonds.

India’s leading manufacturer of CNC Turning Solutions, **Micromatic Machine Tools Pvt Ltd**, also participated at the expo. “Regional shows like PMTX help in bridging the gap between us and the region’s local industry and enable us to showcase customized solutions and machines to cater to its needs,” said Harish B, Vice President, Micromatic Machine Tools.

**Jyoti CNC Automation Ltd** took part the second time in the expo since being at Pune, it offers the company a great locational advantage to get in direct touch with the industries of the surrounding states. “PMTX 2018 was yet another opportunity to meet quality customers, consultants and decision makers from the region,” stated Pankaj Bandal, Regional Manager - Sales, Jyoti CNC Automation.

For **Lakshmi Machine Works (LMW) Ltd**, the Pune region being an automobile hub, is one of the largest markets for the company’s impressive range of CNC Lathes and CNC Machining Centers. It was LMW’s first time at PMTX but the company, well versed with its reach, participated with considerable enthusiasm. Indraneel Bhattacharya, Vice President - Marketing & Sales, LMW, Machine Tool Division said, “Our focus at the event was on the Automotive sector and its ancillary suppliers, as well as Die & Mould, Pumps & Valves and other Engineering sectors.”

The leading manufacturer of Precision CNC Rotary Tables, Index Tables and Pallet Changing Systems, **UCAM Pvt Ltd** also displayed its latest innovations at the expo. Explaining why regional shows like PMTX matter to the company, Vijay Zaritaklikar, National - Sales Head, UCAM,

**PMTX 2018 hosted over 85 exhibitors, attracted over 11,019 visitors (49% increase as compared to 2016) and a trade delegation from 86 companies. Business orders worth ₹250 crore were generated.**



Impressive visitor turnout during PMTX 2018

Source: IMTMA

said, “Customers make a point to visit regional exhibitions like PMTX. The show is for 4-5 days generally. Due to this, not only the decision makers, but also the opinion makers, users like shop floor supervisors and operators make a point to visit and see the latest products on display. This enables us to engage with all levels of people which otherwise is very difficult.”

Pune being a focus market for **Zavenir Daubert’s** Cut Clean Protect & Pack proposition, the show was of significant help to the company in examining Pune area’s recent market trends and emerging opportunities in metal working, shared Balwant Bains, GM - Product Management & Marketing, Zavenir Daubert India. The company displayed next generation technologies and trends in Metal Working

Fluids, Rust Preventives and VCI Packaging.

**Apsom Infotex** was another keen first timer. A distributor of technology products, it aimed at meeting serious visitors and also students seeking information on advancements in CNC Milling, CNC Engraving etc.

Engineering company **Batliboi Ltd** hails regional shows highly important in its overall strategy to have deep penetration in the market. At PMTX 2018, the company had its focus on Automotive, CVs, Tractors, Engineering, Moulds, Power, and Oil & Gas industry sectors.

**FARO Technologies** made its presence felt by displaying its prowess in leading-edge measurement technology and solutions that can improve the overall efficiency of manufacturing processes.

Kabelschlepp India had its wide range of cable carriers on display and aimed at expanding its customer base through PMTX 2018.

**Visitors’ take**

Ashish Bhosale of Ashish Industries had earlier visited IMTEX and felt PMTX 2018 as a similarly well-organized show. “The 4- and 5-axis machinery displayed were worth viewing. The overall experience was significantly good,” he said.

“We were highly satisfied with the exhibition. We were impressed with the innovative products displayed and hope to gain substantially from the show,” noted Sujit Mohanpurkar, Director, Prohab Services LLP.


For Shubhangi Jadav, Gestamp from Chakan, the expo opened up new business opportunities, “It was very well organized and the management was extremely cordial,” was what she had to say.

The next regional machine tool exhibition by IMTMA will be the third edition of Delhi Machine Tool Expo, which will be held in 2019 at Pragati Maidan, New Delhi, before returning to Pune in 2020.



Source: IMTMA

**Growing need for regional events**

The success of PMTX 2018 has further affirmed the need for regional expos. To continue fulfilling it, the next Regional Machine Tool Exhibition by IMTMA will be the third edition of Delhi Machine Tool Expo, which will be held in 2019 at Pragati Maidan, New Delhi, before returning to Pune in 2020. 

# JIMTOF 2018: MAKING THE RIGHT CONNECT

Save your dates to be part of one of the largest machine tool exhibitions in the world, JIMTOF 2018. Organized by Japan Machine Tool Builders' Association and Tokyo Big Sight Inc., the 29th Japan International Machine Tool Fair will be held at Tokyo Big Sight, Tokyo from November 01 - 06, 2018. Here's what's waiting for you at the event...



Source: JIMBA

JIMTOF has become one of the most sought after mediums used by manufacturing companies to expand their business and reach out to potential buyers.

**H**ailed as one in the league of prominent technology exhibitions in the world, JIMTOF has been introducing the latest and most cutting edge technologies and products in the area of machine tools for over 50 years since 1962. The biennial event has been significantly contributing to the development of the industry and trade promotion by providing an ideal platform for international transactions and technical exchanges of machine tools and their related equipment.

## Numbers mirror growing response

JIMTOF has steadily gained a reputation of being one of the most sought after mediums used by manufacturing companies to expand their business and reach out to potential buyers. That its popularity is growing can be gauged by the fact that its expected number of visitors this year is 147,602, which breaks its 2016 record of 140,000. The number of overseas visitors is 11,533 at the current edition. In addition, over 70 percent of the

visitors belongs to the manufacturing industry.

The sprawling total exhibition space area of 98,540 sq mt will have a net exhibit space of 49,500 sq mt and will host 969 exhibitors including 284 overseas exhibitors. Fourteen international associations will also be partaking the event.

JIMTOF 2018 is slated to feature the biggest-ever scale of products from a variety of industries including Machine tools (Metal cutting and Metal forming); Machine tool accessories, High

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speed steel tools; Diamond, CBN tools; Grinding wheels and Abrasives; Gears and Gear devices; Oil Hydraulic, Water Hydraulic and Pneumatic machinery; Precision Measuring machines and instruments; Optical Measuring instruments, Testing machinery, and Controller and related software (CAD/CAM, etc.).

### **CONNECT, the theme**

The current edition of JIMTOF has 'CONNECT' as its theme to highlight the value created by different kinds of connections in 'Connected Industries', a trend realized by proactive measures of the public and private sectors. "At JIMTOF 2018, with the theme of 'CONNECT by technology for the future', you will see a lot of attractive Visualization System solutions conforming to the times through the 'connection' on the IoT platform. Indian companies with their excellent IT engineers would realize the momentum of IoT innovation and a breakthrough solution making full use of IoT at the event," said Masayoshi Amano, President, Japan Machine Tool Builders' Association (JMTBA).

"Moreover, through the touch and feel of the latest technology at JIMTOF, the visitors can obtain the tools for contributing to productivity improvement and preventive maintenance etc.," he added.

The event's features comprise the following six connects:

**Connecting cutting-edge technology with the visitors** – This enhances the appeal of the event as an international technology trade show;

**Connecting the visitors with the exhibitors** – JIMTOF extends a platform that provides strong support for business meets;

**Connecting technology experience with the visitors** – Through joint programs and special exhibits, the show brings state-of-the-



Source: JMTBA

"Indian companies with their excellent IT engineers would realize the momentum of IoT innovation and a breakthrough solution making full use of IoT at JIMTOF 2018."

**Masayoshi Amano**  
President  
Japan Machine Tool Builders' Association (JMTBA)

art technologies closer to visitors and helps them gain a handle on them;

**Connecting Japan with the world** – JIMTOF spares no effort in attracting overseas exhibitors and visitors and get them to know Japan and vice versa;

**Connecting students with the future** – The trade event offers a conducive environment for students to develop projects that can further give their talent a boost;

**Connecting people with a space they can feel comfortable in** – JIMTOF, by providing high-quality services to the visitors, ensures they are well taken of.

### **Knowledge sharing**

Since trade events make for an excellent place for the exchange of knowledge, JIMTOF 2018 will be holding 31 sessions of conferences and seminars to offer the attendees a grasp on the latest in technologies.

While Hideyuki Sakamoto, Di-


rector, Executive Vice President, Nissan Motor Co., Ltd, will speak on the 'Technological innovation needed for EV performance improvement', Chiaki Ito, Former Vice Chairman, Fujitsu Ltd, will throw light on 'Monodukuri Revolution with AI and IoT'.

Seiji Yamada, Professor, National Institute of Informatics, will talk on the current hot topic of 'Building Adequate Relationship between Humans and Machines - Current state of AI applications and the possibility in future'. Whereas, 'The daughter of the small local factory - taking over her family business' is what Takako Suwa, President & CEO, Daiya Seiki Co., Ltd, will be speaking about.

In alignment with the theme 'CONNECT', a Special Exhibit will connect the displayed machines and the Special Exhibit booth by taking advantage of the exhibitors' IoT platforms already in use. Visitors can see the potential of IoT by, for example, checking the status of a connected machine on a large screen.

At another Special Exhibit at JIMTOF 2018 titled, 'Fighting for the Win - innovation and evolution in motor sports manufacturing', Honda's racing machines and engines that are actually being used in races will be displayed. Visitors will be able to take a close look at the sophisticated design and advanced engineering behind the products.

### **Why you should not give it a miss**

Japan is far ahead in the game when it comes to technological innovation. The host country has been offering technological creativity that the world just loves to emulate. That JIMTOF 2018 will display the hitherto unheard of technologies is a given. Hence, a firsthand experience on this thrilling technological ride is highly recommended. 

The sprawling net exhibit space of 49,500 sq mt will host 969 exhibitors including 284 overseas exhibitors. Fourteen international associations will also be partaking the event.

**CONNECT by technology  
for the future.**



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# **JIMTOF 2018**

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The RCG series Robotic Belt Grinding Machine is a preferred solution for grinding front axle beams.

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Source: Grind Master Machines Pvt Ltd

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Source: Beckhoff Automation Pvt Ltd

The TwinCAT IoT Communicator software and the IoT Communicator App provide convenient and secure access to process data via mobile end devices.

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