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Indian Machine Tool
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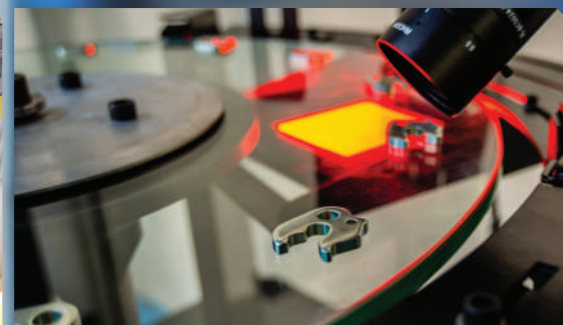
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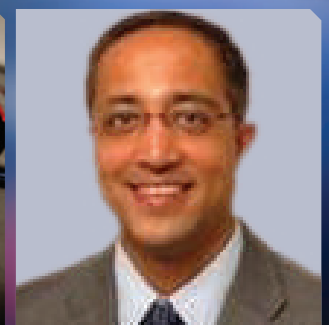
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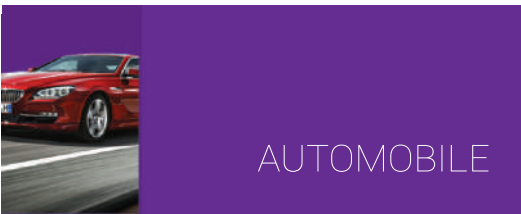


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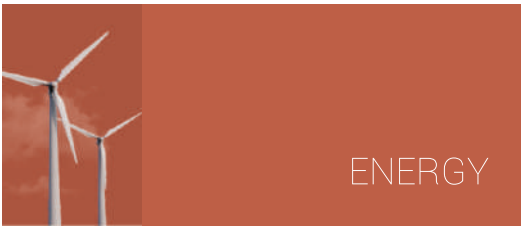
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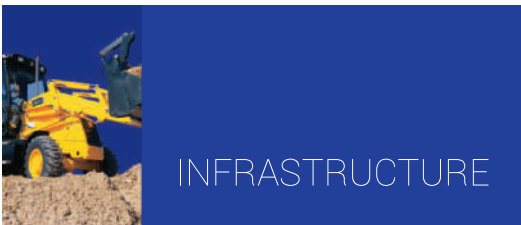
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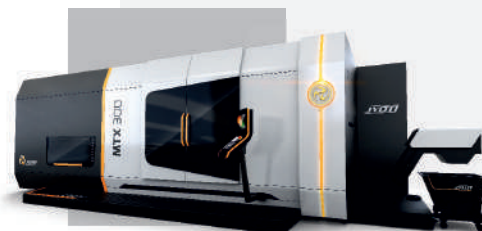


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IMPRINT

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TOWARDS A STRONG COMEBACK



INDRADEV BABU
PRESIDENT
INDIAN MACHINE TOOL
MANUFACTURERS' ASSOCIATION
(IMTMA)

Dear Readers,

The Indian Manufacturing industry has stayed resilient and is working to overcome all the challenges over the past two years due to the impact of the Covid-19 pandemic and the overall economic situation.

It may take some time for disruptions in the supply chain, logistics, and cash flow to stabilize but the consensus is that the Indian Machine Tool industry may see demand increasing in the medium to long term. Although the entire manufacturing supply chain was perhaps poised to embrace new-age technologies in their manufacturing processes before the Covid outbreak, the current situation is but fast-tracking.

Last year, the Government of India launched the Emergency Credit Line Guarantee Scheme to provide ₹3 lakh crore of unsecured loans to MSMEs to mitigate the distress caused by the coronavirus-induced lockdown. Recently, the Government increased the limit to ₹4.5 lakh crore, which will boost confidence among manufacturers in an industry dominated by MSMEs.

This is expected to open new avenues for companies to continue serving their traditional customer base besides exploring opportunities in sectors that offer scope for growth. Some of these sectors such as Medical Equipment, Pharma, Aerospace, Defence, Railways, etc. are being looked at more closely.

Indian Machine Tool Manufacturers' Association (IMTMA) has rescheduled IMTEX - the International Machine Tool and Manufacturing Technology Exhibition. The combined 'IMTEX (with focus on metal cutting), IMTEX FORMING (with focus on metal forming), and Tooltech 2022' will be held at Bangalore International Exhibition Centre (BIEC) in Bengaluru from January 20 - 26, 2022.

With India undergoing one of the biggest vaccination drives, things are expected to be normalized by the end of this year, which would build confidence among exhibitors and visitors to travel within and from outside India to participate in IMTEX and other exhibitions in the country.

Last but not least, it is highly important to prevent negative sentiments cascading into everyday life, avert collateral damages and keep ourselves going.

With India undergoing one of the biggest vaccination drives, things are expected to be normalized by the end of this year, which would build confidence among exhibitors and visitors to travel within and from outside India to participate in IMTEX and other exhibitions in the country.

Have a great year ahead and stay safe.



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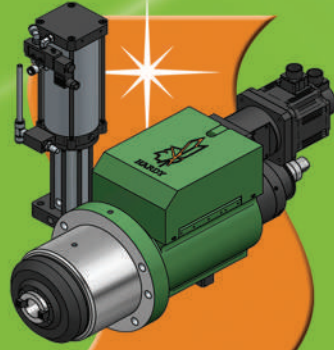
HARDY



Servo Type Drilling / Tapping Spindle Head Unit



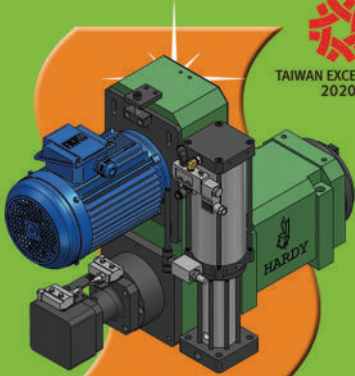
Built-in Motor Facing Head Unit - Flange Type



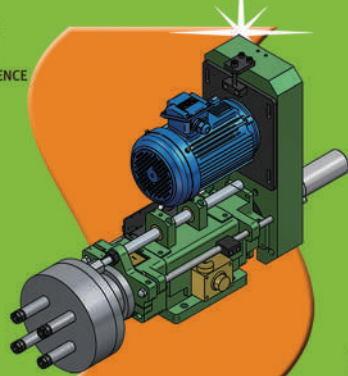
Built-in Motor Drilling/Tapping Spindle with ATC and Center Coolant



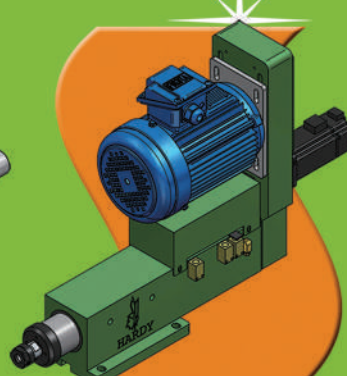
Built-in Motor Spindle Unit



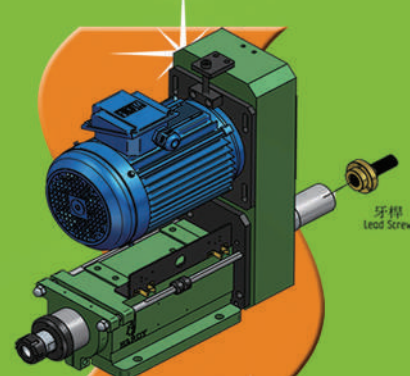
Boring/Milling Head Unit with ATC



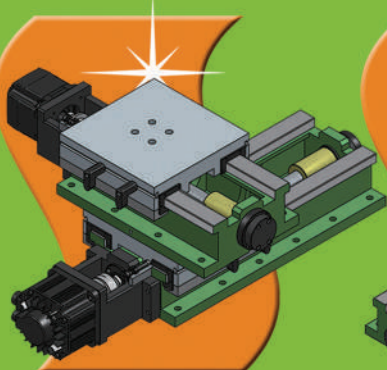
Multi-Spindle Head



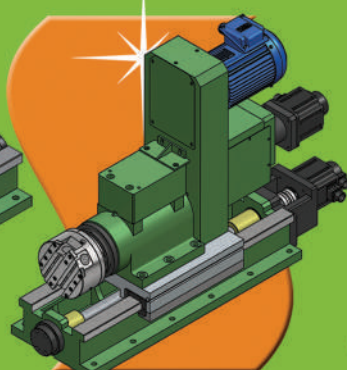
Servo Type Drilling / Tapping Spindle Head



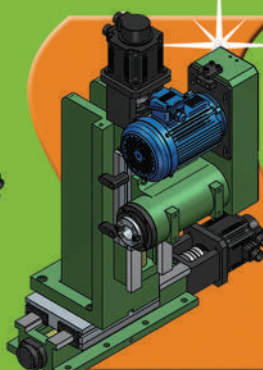
Tapping Spindle Head



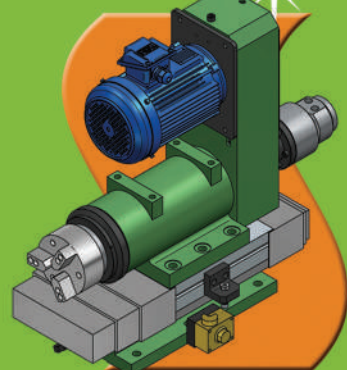
XY Servo Hardness Slide Unit



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3-Jaw Chuck Spindle + Slide Unit



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V ANBU
DIRECTOR GENERAL & CEO
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MANUFACTURERS' ASSOCIATION

The Machine tool industry has been adapting to the prevailing situation by focusing on completing its deliverables and working towards achieving the growth figures of pre-Covid years.

Dear MMI Readers,

Our country has been navigating through many uncertainties for quite some time now and although the threat of a third wave looms large with the discovery of Delta variant, state governments are perhaps more prepared this time to tackle emergencies.

Meanwhile, in order to boost the economy, the Government of India has announced a series of economic relief measures. It has expanded the emergency credit line guarantee scheme for small and medium businesses by an additional ₹1.5 lakh which bodes well for the Manufacturing industry in India that is dominated by MSMEs.

The Machine tool industry has been adapting to the prevailing situation by focusing on completing its deliverables and working towards achieving the growth figures of pre-Covid years.

Our MMI magazine has been consistent in bringing for you up-to-date information from the Manufacturing sector for its readers. With our research and analysis, we will continue to bring valuable information to your tables. This month's edition focuses on advancements in the Aerospace sector. Read the opinion piece by IMTMA on the opportunities in the Indian Aviation, Defence, Aerospace and Space industries.

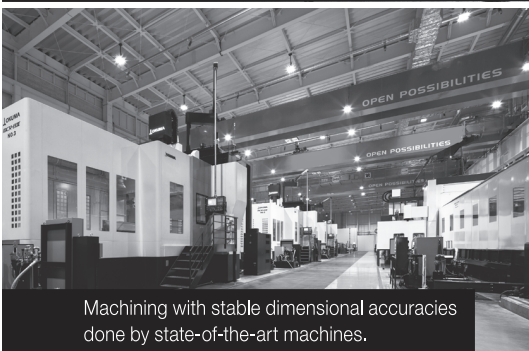
As we continue to share inspirational stories from across the world, we also reach out for your feedback which would be highly valuable in helping us understand your needs.

My heartfelt thanks to each and every one of you, the readers of MMI, for your continued interest and support.

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THE SUN ALWAYS RISES

Since time immemorial pandemics have brought moments of halt, helplessness, and despair, leaving a lasting effect on human civilization. To date, COVID-19 has been one of the direst threats the world has ever faced. If, on one hand, it has induced fear, dread, confusion, and anxiety, on the other, it has also created hope, resilience, solidarity, and a spurt of technological innovations.

The global pandemic has put a spotlight on the power of automation, technology, and digitalization. Companies that have leveraged the pandemic as an opportunity to migrate to digital technologies are able to outperform their peers. Albert Einstein's phrase, "In the midst of every crisis, lies great opportunity" resonates in these times of incertitude. Organizations are open to new initiatives as they seize the opportunity to emerge stronger.

Globally, countries are focusing on manufacturing and redeveloping their local supply networks to meet their own needs. Pandemic-

related accomplishments like deploying new technologies in a shorter time than before, making faster decisions, empowering teams, and moving to more flexible working models are providing a winning edge to entities in a competitive landscape.

"Most of the important things in the world have been accomplished by people who have kept on trying when there seemed to be no hope at all."

- Dale Carnegie

To this end, the present MMI issue highlights how the Fourth Industrial Revolution (4IR) is acting as a great enabler in driving digitization strongly across the manufacturing industries in this pandemic.

As always, we value your views and solicit to keep them coming.



When Goals Matter!

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FOCUSING ON GROWTH

Realizing the strategic importance of sectors such as defence, aerospace, space, and aviation, the Government of India has earmarked them for growth. The development in each of these domains gets percolated to other sectors and impacts the overall growth of technology and economy of the country, also providing significant opportunities for the Indian machine tool industry.



Source: Magic Wand Media

The Defence, Aerospace, Space, and Civil Aviation sectors are evolving in India, attracting bigwigs from various quarters. As per the Central Government estimates, India was among the top five countries with the highest military spending in 2019. It has the second-largest standing army in the world and the union budget of 2021-22 has proposed increased funding for Border Roads Organisation to boost infrastructure in frontier areas. Indian defence capital outlay is

expected to reach an estimated \$23 billion by 2025. It is to be noted that defence public sector undertakings invested an estimated \$95 million in plant and machinery while the demand outlay for plant and machinery by the Defence industry was approximately \$120 million per annum. The Defence Research and Development Organisation (DRDO), the premier agency under the Ministry of Defence, Government of India, has set up more than 50 labs in India for defence technology development.

More than 40 Ordnance Factories and nine defence public sector units (DPSUs) are involved in defence production.

The country has more than eight advanced technology centers for the development of futuristic technologies at premier academic institutions such as the Indian Institutes of Technology in Mumbai, Chennai and Delhi; Jadavpur University; Bharatiyar University; etc. The private sector has also been involved in the defence production in a big way since 2001 and more than 10,000

MSMEs are involved in the defence supply chain. India has allocated an estimated \$45 billion for defence budget for 2020-2021. India's defence exports have risen by over five times in the last four years with the total exports rising from an estimated \$204 million in 2016-17 to around \$398 million in 2020-21. The FDI limit for defence has been raised from 49 to 74 per cent in the automatic category and more than 5,000 products are expected to be indigenized by 2025. Foreign players establishing manufacturing set-up in India need to invest in plant and machinery which is favorable for the Machine Tool and Manufacturing sectors. With the Government launching the scheme for the promotion of MSMEs in Defence, preference is being accorded to indigenously designed, developed, and manufactured products. Conventionally, Bengaluru-based large public sector undertakings such as Hindustan Aeronautics Ltd (HAL), DRDO, Gas Turbine Research Establishment (GTRE), Aeronautical Development Agency (ADA), BEML (previously Bharat Earth Movers Ltd), Bharat Electronics Ltd (BEL), National Aerospace Laboratories (NAL), etc. along with Ordnance Factories in different parts of the country have been involved in defence production. However, the recent decision of the Government to corporatize the Ordnance Factory Board (OFB) is expected to encourage the entry of larger private entities in defence manufacturing, which may be a step in the right direction. The establishment of industrial corridors in Uttar Pradesh and Tamil Nadu will foster defence manufacturing in the medium to long run. The Indian Aerospace sector is growing significantly on the back of the progress made by the Defence and Civil Aviation sectors. We are witnessing an

increased demand for aircraft besides the rise in defence capital expenditure paving way for opportunities in defence and aerospace. In the long-term, the Indian aerospace and defence market is pegged to reach \$70 billion by 2030, providing significant opportunities for production, maintenance, repair, overhaul, and sales for civil and defence applications.

As per Economic Survey 2020-21, India spent about \$1.8 billion on space programs in 2019-20. FDI up to 100 percent is allowed in satellites establishment and operations, subject to sectoral guidelines by the Department of Space or ISRO (Indian Space Research Organisation). The Space industry is growing at a good pace with rocket production and an increase in the number of satellite launches by ISRO. India announced itself as a player in space exploration by launching the civilian moon mission – Chandrayaan 2 and is also planning for a manned space mission – Gaganyaan.

India's Aviation sector contributes \$30 billion to the national GDP and the domestic Aviation market is projected to rank 3rd globally by 2024. The country is one of the fastest-growing aviation markets with the International Air Transport Association (IATA) expecting India to cater to 520 million passengers by 2037.

Favorable policies

The Union and State governments are lending ample support through friendly policies and space for investments. To provide impetus to self-reliance in defence manufacturing, many announcements were made in the 'Atmanirbhar Bharat Package'. In furtherance to this, the Ministry of Defence released the Defence Production and Export Promotion Policy 2020 which envisages achieving a turnover

of around \$23 billion including export of about \$4.7 billion in aerospace and defence goods and services by 2025.

In a recent development that could have wider ramifications in the Aero-Defence sector, Karnataka is coming up with a new aerospace and defence policy. Industry analysts opine that the state is likely to announce some new investments that would encourage global companies that already have a presence in the aerospace park and aerospace special zone on the outskirts of Bengaluru. Other cities such as Hyderabad and Chennai are also emerging as aerospace, defence and aviation hubs attracting investments from large corporations for manufacturing aero-structures, fuselage, and engine spare parts.

Manufacturing galore

Undoubtedly, these sectors look for MSMEs with proven solutions to meet their supply chain and aggregate requirements. The Manufacturing industry needs to brace up to offer critical components and assemblies which are currently imported. The Manufacturing industry, particularly the Machine Tool industry, needs to consider deploying high-technology, high-precision machinery for ultra-precision machining, superfinishing, exotic material machining, multi-tasking, precision flow forming, 3D printing, etc. The industry needs to build high-quality machines with high-quality workmanship, which also means employing a workforce with good quality skill sets. India can stay in the race only through investments in technology and intense R&D. It is a challenging and demanding journey but with the Government and industry working together, tangible results can be achieved and the vision of Make in India and Atmanirbhar Bharat can be realized. 

India can stay in the race only through investments in technology and intense R&D. With the Government and industry working together, tangible results can be achieved and the vision of Make in India and Atmanirbhar Bharat can be realized.

LIQUID ENGINEERING AT WORK

A coolant's function does not just stop at protecting an engine from heat and cold. It performs a wide range of critical functions, making its selection and maintenance of high significance.



Source: Perkins

There is nothing sophisticated about a coolant; just mix a bit of anti-freeze with some water and it is good to go. Right?

Well, the answer to that depends entirely on how long you expect your engine to last and how much you want to spend repairing it because a coolant does a lot more than simply move heat from the engine to the radiator. To those who design cooling systems, the coolant they depend on is a product of liquid engineering and it's anything but unsophisticated.

In addition to protecting an engine from heat and cold, a properly formulated coolant serves as a carrier for additives such

as pH stabilizers, anti-foaming agents, and protection agents for rubber and plastic components. It also contains additives that inhibit corrosion within the heat transfer system that typically includes components made of copper, brass, steel, cast iron, aluminum, and solder. Without that protection, corrosion can block the narrow spaces in a radiator, which can lead to overheating of the coolant causing damage to water pumps, oil coolers, cylinder heads, and gaskets.

A less obvious feature of the coolant is protection against cavitation and cylinder pitting, particularly in wet-cylinder diesel engines where the sleeve that contains the piston comes into

direct contact with the coolant. While this design allows more efficient heat transfer, it also transfers a lot of vibration and movement from the pistons to the cylinder sleeve and through the sleeve to the coolant which can cause cavitation.

Unless the coolant is formulated with additives to prevent cavitation, the tiny bubbles created can lead to pitting of the sleeves and premature failure. While this is less of a problem with parent bore engines where the cylinder is part of the block, and dry-sleeve engines where the liner is inserted into the block but does not contact the coolant, cavitation and corrosion still can occur and need to be protected against.

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Because it performs so many critical functions, proper coolant selection and maintenance can have a significant impact on the total cost of ownership (TCO) of a diesel engine. Home-brewed mixtures are seldom a good option for a number of reasons including unknown impurities and mineral content of the water and the exact amount and type of additives in the antifreeze.

Most engine manufacturers offer coolants specifically formulated for their products. Perkins, for example, offers a Long Life or Extended Life Coolant (LLC/ELC). Perkins® Extended Life Coolant provides optimum engine protection as well as reduced maintenance requirements over the life of the coolant.

Coolant management

If one's engine uses a conventional, commercially available heavy-duty or fully formulated coolant, the corrosion inhibitors are used up over time. Thus, the coolant requires testing every six months or every oil change to determine if a corrosion additive needs to be added. Testing can be easy to overlook and is often difficult to do when engines are in the field. Coolant testing typically involves a trip to the local service

center, but test strips are available depending on the corrosion additives being used. Using the wrong test strip, or one that has exceeded its shelf life, could result in incorrect results and improper dosing. If additives need to be replenished, only a product meeting the manufacturer's specifications is used.

If one's engine uses Perkins ELC or a similar product, the main requirement is to make sure that the system is properly filled and the coolant is changed at the correct period stated by the supplier. For Perkins ELC, the change interval is three years or 6,000 working hours. It is sold in a pre-diluted mixture using mineral-free distilled water to allow the cooling system to be topped up as necessary, straight from the container. When the coolant needs to be changed, the system can be flushed with clean water since no additional cleaning agents are required. Regardless of which type of coolant is used, the level needs to be checked often and topped up when necessary.

What is the difference?

For example, Perkins ELC uses an advanced formula with organic additive corrosion inhibitors. Instead of nitrates, silicates, phosphates, borates, and amines, Perkins ELC contains mono and dibasic organic acid salts that provide maximum protection for the metal alloys found in most heat transfer systems. In addition, some nitrites and molybdates are


added to help protect iron components and reduce steel corrosion and pitting effects.

The Perkins ELC formulation practically eliminates hard water deposits and extends water pump seal life. Removing phosphates and silicates helps prevent scale formation that can reduce heat transfer and encourage corrosion. Moreover, the additives that are used deplete very slowly allowing nitrite levels to be maintained up to 20 times longer than conventional coolants.

The bottom line

Both types of coolants will protect an engine, but one requires testing and periodic maintenance of additive levels, and the other does not. An extended life coolant like Perkins ELC also reduces disposal volume by up to 50 percent as well as the related costs, which in an era of increasingly stringent environmental regulations can be substantial.

While it is important to follow an engine manufacturer's recommendations, Perkins ELC and similar extended life coolants that meet or exceed the ASTM D6210 standard for heavy-duty, low-silicate antifreeze/coolants, and ASTM D3306 for light-duty and automotive applications are generally compatible with most OEM diesel, gasoline, and natural gas engines. That means only one coolant needs to be stocked for an entire fleet, saving additional time and money.

Extended life coolants are excellent examples of what can be achieved with today's liquid engineering technology. In the specific case of Perkins ELC, more than 20 years of extensive testing and commercial experience has provided customers with a robust level of protection of cooling system components, gaskets, seals, and hoses when properly used. 

Perkins ELC uses an advanced formula with organic additive corrosion inhibitors. Instead of nitrates, silicates, phosphates, borates, and amines, Perkins ELC contains mono and dibasic organic acid salts that provide maximum protection for the metal alloys found in most heat transfer systems.



Source: Perkins

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Source: Sandvik Coromant

IT'S TIME TO DIGITALIZE

A look at how Industry 4.0 technologies can boost production by increasing the efficiency of manufacturing, and how digitalization is revolutionizing the metal cutting industry...

India's potential to embark on a major digital transformation has been recognized by the World Economic Forum (WEF), which created a Centre for the Fourth Industrial Revolution (C4IR) in India in 2018. The C4IR is a hub for global, multistakeholder co-operation to accelerate the benefits of science and technology. With a network across India, the USA, Japan and China, the hub shares research, analysis and learning to design new technologies that harness Industry 4.0 and reinvent the way the industry operates.

The WEF also has a Global Lighthouse Network, which can be looked to for inspiration on how

to improve processes through widespread digitalization. The WEF Global Lighthouse Network is a community of manufacturers who show leadership in employing Industry 4.0 technologies to transform operations. Their resulting success and resilience is demonstrated in their latest performance figures. Despite the pandemic's disruption, 93 percent of Lighthouse facilities achieved an increase in the production output and found new revenue streams.

Lighthouse facilities
Manufacturers across the globe can gain insight into successful Industry 4.0 technology inte-

gration by studying Lighthouse facilities based across the globe. For example, Sandvik Coromant's industrial tool manufacturing plant in Gimo, Sweden, was recognized as a Lighthouse facility in 2019.

The highly automated facility is praised for its digital thread that runs through its production processes. Including inventory management, machine performance monitoring and predictive maintenance, the digital thread has substantially increased productivity at the factory.

A particular success is the Gimo factory's touchless changeover. Previously, operators would have to manually change de-

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sign patterns during their day shifts to prepare machines to run through the night. Now, with investment in digital technologies, such as smart automation and ultra-flexible robots, the design patterns can be changed without the need for human oversight, saving time and resources.

Important insights

Seeing the benefit of Industry 4.0 technologies in its own manufacturing facilities, Sandvik Coromant is committed to providing digital solutions to its customers and supporting them in incorporating the latest technologies across the factory floor.

Take its CoroPlus® MachiningInsights platform, for example, an expansion of the Sandvik Coromant CoroPlus® suite of connectivity software. Manual collection of data and documentation is an inefficient and tedious process. By installing a

digital program that can collect data and provide valuable insights in real time, such as the CoroPlus® MachiningInsights platform, manufacturers can streamline production and gain valuable insights into their workshops.

The platform can gather data directly from machines to provide accurate and instantaneous information to the operator. This allows facility managers to uncover opportunities for efficiency improvements along the production process. By comparing real-time and historical data, the platform can give insight into machine performance, such as developing faults and stoppage causes.

Being able to detect faults before they occur, such as by using vibration data, is an integral part of any predictive maintenance strategy. The ability to estimate when a piece of equipment might fail means maintenance can occur in an organized way before the failure occurs, avoiding the sudden and costly onset of unscheduled downtime. According to a recent report by Deloitte, predictive maintenance can reduce breakdowns by 70 percent and increase equipment uptime by 20 percent.

Continuous optimization

However, it is not only sudden breakdowns that can be a source of inefficiency in machining processes. A great deal of time can be taken during the design, planning, and set up of machines. By digitalizing these steps, machines can be up and running in a matter of minutes, with just a few touches of a screen.

In addition, a digital program can use insights from previous process runs to improve the next, allowing for continuous improvement and highly optimized processes. For instance, the CoroPlus® MachiningIn-

sights platform can use real-time and historical data to reduce time spent on design and planning, set-ups and machining by 5 percent.

Once machining begins, all of the data collected by the platform can be displayed on a dashboard that is accessible from a browser on any device. The information can be used for activities such as resource planning, asset management and cost prediction. A collaborative feature is also integrated into the platform, allowing workshop-wide problem solving and communication.

Resilient growth

By becoming digital, manufacturers can not only optimize production to increase productivity in the present, but also prepare for the future. The pandemic has highlighted the need for manufacturers to be resilient, by displaying agility in the face of global and industry challenges. By connecting machines and digitalizing processes, changes to production can be carried out quickly and seamlessly.

With each manufacturing step optimized, digitalization creates efficient operations that can be leveraged to make a quick recovery from impediments to production. Manufacturers who ensure their production processes are agile and resilient will continue to prosper, even in the face of unexpected challenges.

Digitalization is revolutionizing the manufacturing industry, making production fast, efficient, and flexible, therefore helping manufacturers to meet company targets in an evolving landscape. The metal cutting industry in India can leverage emerging Industry 4.0 technologies from across the globe to increase productivity and help progress towards the country's five trillion-dollar economy goal. 

Seeing the benefit of Industry 4.0 technologies in its own manufacturing facilities, Sandvik Coromant is committed to providing digital solutions to its customers, and supporting them in incorporating the latest technologies across the factory floor.



REVIEW & APPRAISAL: YARDSTICK

In our last discussion of chasing goals in a crisis, we spoke of how our previous success can at times come in the way of our future success. Hence, reviewing our goals at key milestones is crucial. While we associate reviewing with looking at either how far we have come or how far we still have to go, it is also about several other things such as direction, purpose, and the experience of the journey to ourselves, team, customers, organization, etc.

It is highly important to stay in touch with ourselves, and acknowledge what we are doing and what is happening around us in our field and in the environment that we operate in. This is what being engaged and leading is all about.

It is about the purpose that leads to data, information, and knowledge or wisdom that culminate to help us make appropriate decisions because of which action is taken. It is all about thoughts, decisions, and actions in a timely manner.



The starting point has to be the thought. While this happens in many cases, the thought or purpose can at times become clearer as the journey progresses. The decision part is perhaps the most complex. Taking the right decision cannot be taught, learned, or even written about but we all know about wrong decisions and their consequences. While decisions must be objective, I believe the process of decision-making is highly subjective; decision-makers treat the same situation differently basis their unique ways, capacities, experiences, and styles.

The data, knowledge, and wisdom part is akin to having everything available to cook up a meal, what is now needed is the cooking.

The action is where all come together. Acting on the decisions made is a continuum, which is about keeping on doing things while taking stock of what is helping and what is hampering. The criticality is to be aware that it is not about the right or wrong action, or even the good or bad action but the appropriate and the inappropriate action. It is crucial to be aware that there is even a state of inaction or no action. It is in the action that the leadership culture plays its churning role to ensure the concept of organizational effectiveness.

While decisions must be objective, I believe the process of decision-making is highly subjective; decision-makers treat the same situation differently basis their unique ways, capacities, experiences, and styles.

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

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ELECTRIC VEHICLES: SEEING THE BIG PICTURE

Powering the electric vehicle segment will need concerted effort from all stakeholders to make it truly safe, secure and sustainable.



Source: Magic Wand Media

There is no denying the power of an electric vehicle as it zaps its way through the traditional Automotive industry, changing our perceptions of what a car should be, and revive how we get from point A to point B.

Amidst the global conversation about our carbon footprint and dangerous emissions, the black smoke belching vehicles of the past are long due a massive overhaul. To be sure, every major automotive player is coming on board – from BMW to Nissan, Mercedes to

Ford – leaving no company out of the race towards electric vehicles (EVs).

Tesla, possibly now the world's most valuable and talked-about company, saw sales of its first plug-in EV, the 2013 Model S, soar from 2,500 units in 2014 to over 10,000 in 2015. And in 2020, it delivered over 5,00,000 of its vehicles, translating to 16 percent of the global market share and becoming the world's largest provider of fully electric plug-in light vehicles.

Tesla's meteoric success further proves that the hunger for EVs

is indeed growing, and it is no exception in India.

As the world's second most populous place on earth, with a domestic consumer market that dwarfs all nations, India offers the world's biggest untapped prospects for EVs with a market valued at \$5 billion. This is expected to reach \$47 billion by 2026, registering a CAGR of above 44 percent between 2020-2027 with the annual sales expected to reach 6.34 million units. In parallel, the annual demand for batteries is expected to grow by 32 percent by 2027, of

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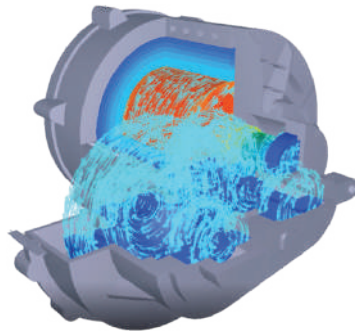


which as much as 80 percent of it will be on lithium-ion batteries to a value of \$14.9 billion.

India getting EV-ready

Various reports suggest that the only way for India's EV market is up. The southwestern state of Kerala, for example, aims to put one million EV units on the road by 2022 and 6,000 e-buses in public transport by 2025. Meanwhile, the southern state of Telangana aims to have EV sales achieve 80 percent for two- and three-wheelers such as motorcycles, scooters and auto-rickshaws; 70 percent commercial cars which include ride-hailing companies such as Ola and Uber; 40 percent buses; 30 percent private cars; and an overall 15 percent electrification of all vehicles by this same period. Experiments with e-mobility for public transport have also led to the deployment of electric intercity buses across several other major cities.

While data from the Society of



Source: Hexagon Manufacturing Intelligence, India

Manufacturers of Electric Vehicles (SMEV) indicate that 2021 EV sales in India is down by 20 percent, this has been attributed largely to the pandemic.

Still, the momentum is growing. In February 2021, Ather Energy, India's first intelligent EV manufacturer, moved its \$86.5 million factory from Bengaluru to Hosur. Ather Energy's factory is said to have an annual production capacity of over 1,00,000 electric two-wheelers, up from its previous capacity of 25,000.

Furthermore, Ola Electric, the subsidiary of Indian ride-hailing start-up, Ola, also announced that it would be setting up the world's largest electric scooter

plant in Hosur at a cost of \$330 million. It aims to produce two million units a year, and in fact, by the next year, wants to scale up production to 10 million vehicles a year or 15 percent of the world's total number of e-scooters.

The uptake has also been bolstered by Government initiatives such as the Faster Adoption and Manufacturing of (Hybrid &) Electric vehicles (FAME), and more players are joining the market mix.

What will it take then to truly electrify this segment and charge it to the next level? How can all stakeholders - be it manufacturers or engineers, investors or sellers - come together to make EVs the future?

Putting the EV puzzle together

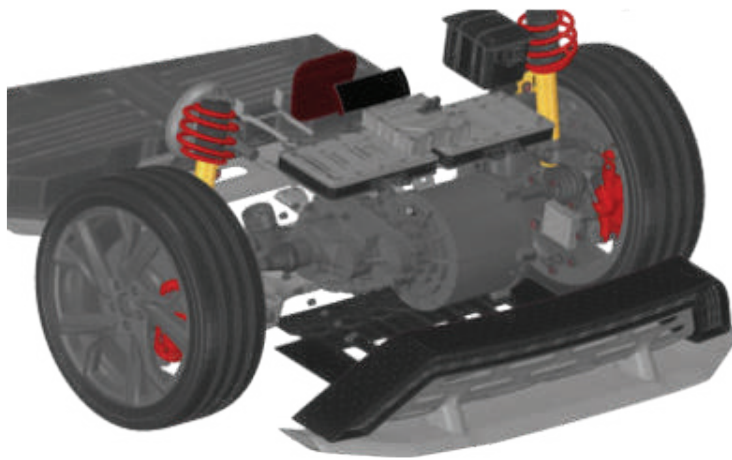
To be sure, there are concerns about safety, security, and sustainability. Many well-documented barriers to EV adoption remain, ranging from technology cost to infrastructure

India offers the world's biggest untapped prospects for EVs with a market valued at \$5 billion. This is expected to reach \$47 billion by 2026, registering a CAGR of above 44 percent between 2020-2027 with the annual sales expected to reach 6.34 million units.



Source: Hexagon Manufacturing Intelligence, India

Charging stations have also been on the upward trajectory. In January 2020, the Department of Heavy Industries (DHI) of India approved over 2,500 electric vehicle charging stations nationwide under the second phase of the FAME program in order to continue promoting e-mobility.



Source: Hexagon Manufacturing Intelligence, India

buildout to consumer behavior. Are there enough charging stations, for example, and is the production of lithium-ion batteries ramping up to match the manufacturing of EVs? The supercharging of EVs is akin to a jigsaw puzzle where every piece must be placed perfectly for the whole picture to come together. The first puzzle piece is most certainly a policy environment in which EV players can thrive, and in which EVs are encouraged as a transformation of the traditional internal combustion engine (ICE) cars.

There is every expectation that the policy environment will become more favorable. Over the years, we have already seen a lot of commitment from the Government without which any initiative on EVs would not pick up. The second jigsaw piece is sustainable manufacturing of EV batteries. India is likely to become a leading hub for manufacturing EVs and EV components. The Government has rolled out a Production-Linked Incentive Scheme (PLI) for ACC Battery Storage Manufacturing. This will go a long way to spur domestic production of batter-

ies and reduce dependence on imports. It aims to support the growing EV industry with the required infrastructure and will significantly cause a reduction in the cost of EVs. Many leading battery producers like Amara Raja Batteries are orienting new investments into green technologies including lithium-ion batteries. Still, the challenge is going to be in the natural resources required to make lithium-ion batteries, such as nickel, cobalt, lithium and graphite. India is not home to such materials. Hence, most of them must be imported. As such, good policies for robust collaboration with the nations that produce these materials is crucial. We have also seen that globally the reserves are good enough to address the demand for these kinds of materials. At the same time, to be sure, the mining of the rare earth materials used in batteries pose a risk to sustainability. Lithium production, for example, is of environmental concern as the demand for batteries soars. Australia and South America,



Source: Hexagon Manufacturing Intelligence, India



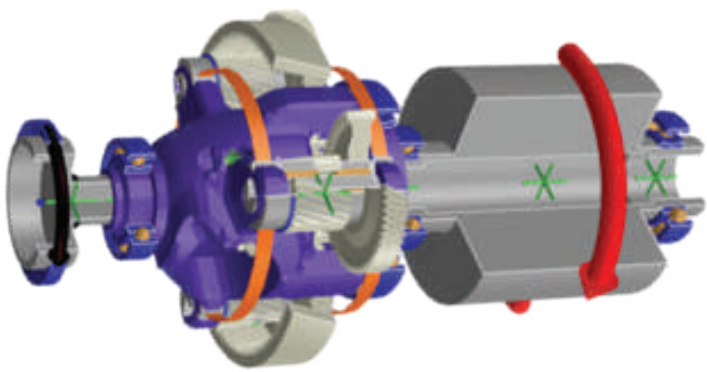
Source: Hexagon Manufacturing Intelligence, India

The initial cost to own an EV is much higher compared to ICE vehicles. Policies giving tax breaks to the people who want to purchase an EV would help bring the cost down. People, too, need to be educated that in the long run, the cost of an EV is far lower than an ICE vehicle.

in particular, what some call the 'lithium triangle' of Argentina, Chile and Bolivia, currently dominate 80-90 percent of lithium production. It is not without its controversies: indigenous people in the 'lithium triangle' worry that the high levels of water needed to produce lithium, which can reach as much as half a million gallons per tonne, could put immense pressure on their already-scarce water supply. These concerns have triggered protests against the exploitation of the resources by large companies.

However, we believe that technology will go a long way towards addressing these concerns. Canadian-based MGX Minerals, for example, is working to find accessible and underutilized lithium stores. Since 2016, the company has been testing a nano-filtration system that uses a set of highly specialized membranes to passively sift lithium from wastewater, which increases returns at a much-reduced time. Cost is also a barrier to many consumers. The initial cost to own an EV, without a doubt, is much higher compared to

ICE vehicles. There is still much to be done to bring this cost down, but for starters, policies giving tax breaks to the people who want to purchase an EV would help bring the cost down. People, too, need to be educated that in the long run, the cost of an EV is far lower than an ICE vehicle. The good news is: according to Bloomberg New Energy Finance, global battery-making capacity could double by 2021, while lithium-ion batteries are forecasted to be up to 43 percent cheaper by that same year. Charging infrastructure makes the next puzzle piece. Even as charging infrastructure continues to increase, range anxiety is still one of the key challenges. India is quite different from other countries. When we speak of EVs, we are not just talking about passenger vehicles, we are talking about two-wheelers, three-wheelers like auto-rickshaws, as well as commercial vehicles.



Source: Hexagon Manufacturing Intelligence, India

As more EVs find their way onto our roads, personal recommendations and experiences will soon overcome the concerns. Friends and families as well as the expected rise of commercial EVs, especially in India, will further reassure consumers to make the switch.

Yet, when we are faced with these challenges, we need to look for unconventional approaches; we look towards alternate methods like battery swapping or more mobile charging for example. To leapfrog technology to explore beyond the conventional charging infrastructure is the key here.

Of course, we cannot talk of EVs without considering that the move towards renewable energy is another crucial piece of the puzzle. The source of energy should not be, as it is now, from a non-renewable source. The good news, from India's policy point of view, is that there is a lot of push for this, especially the solar energy.

Undimmed potential

Even with these issues, the light for EVs is undimmed. Globally, EV sales have risen year-on-year, seeing a slight dip largely due to the ongoing pandemic. Rapid urbanization, consumer demand, commitments by nations for net zero emissions and an undeniably strong push towards environmental sustainability are indeed the driving factors for EVs.

In India, think-tanks like the NITI Aayog have pegged EV sales penetration in India at 70 percent for commercial cars, 30 percent for private cars, 40 percent for bus-



Source: Hexagon Manufacturing Intelligence, India

es, and 80 percent for two- and three-wheelers by 2030.

More crucially, these targets, if achieved, could see a reduction of 14 exajoules of energy and 846 million tonne of CO₂ emissions over the lifetime of the vehicle. Potentially, EVs sold from now till 2030 could save 474 million tonne of oil worth \$207.33 billion over its lifetime.


Shift in consumer behavior

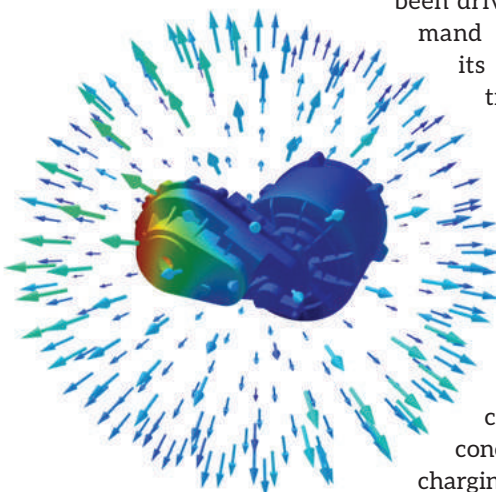
Moreover, consumer behaviors are changing quickly. The consumer demand has certainly increased. The younger generation is increasingly demanding for more sustainable solutions to transportation, and if their concerns are addressed, there is little to stop them from embracing EVs. Their growing awareness about climate change and the need for sustainability have been driving a spurt in the demand for EVs. Deloitte, in its report on EV vehicle trends, noted that from 2018 to 2020, there were some noticeable changes in consumer attitudes toward EVs.

Concerns over the cost/price premium have diminished as fewer consumers now cite driving range as a concern. While the lack of charging infrastructure has

become the top priority for most consumers, this is actually positive. It could mean that people are starting to see EVs as a realistic option and are considering the practicalities of ownership.

In its report, Deloitte expects to see some of the biggest barriers to EVs completely removed in the near future. Its report finds that EVs' driving range is already comparable to that of ICE vehicles and price has already reached parity, taking into consideration the subsidies in various markets and the total cost of ownership, and the number of models available is increasing.

As more EVs find their way onto our roads, personal recommendations and experiences will soon overcome the concerns. Friends and families as well as the expected rise of commercial EVs, especially in India, will further reassure consumers to make the switch. Ultimately, only when the puzzle pieces are in place are we able to see the full picture. The push towards EVs cannot be done in silos. The ecosystem for EVs needs to encompass everything from charging infrastructure to renewable energy to range concerns to cost. Only in this way, true transformation and the electrification of vehicles can be achieved and become the new normal for the future of transportation and mobility. 



Source: Hexagon Manufacturing Intelligence, India



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INNOVATIONS IN THE SKY

Parag Wadhawan, Managing Director & Site Lead, Collins Aerospace, in the following interview with Soumi Mitra, Editor-in-Chief, MMI talks about the company's technologically advanced and intelligent solutions for the global aerospace and defense industry, the crucial role it has played in shaping India as a major aerospace manufacturing hub, its roadmap to expand its presence in the civil aviation industry, and the innovations in the offing...



Source: Collins Aerospace

Our readers would want to know more about Collins Aerospace in India and your technologically advanced and intelligent solutions for the global Aerospace and Defense industry.

Parag Wadhawan: Collins Aerospace was established in 1997 with the inauguration of its manufacturing facility in Bangalore. Subsequently, Collins expanded its presence by opening engineering centers in Bangalore and Hyderabad. This

has enabled us to support local and international governments, aerospace Original Equipment Manufacturers (OEMs), and defense contractors with full-life-cycle capability (design to manufacturing) that can help them achieve a shorter time to market, at a lower program or project life-cycle cost, with innovative solutions.

We currently have 5,500 employees across four locations in India and are planning to open

a new location in Bengaluru's new Aerospace Park

Collins Aerospace's products and capabilities across strategic business units include aftermarket services, customer account management, engineering, technology, operations, quality and strategic development. Collins' sites in India serve a substantial customer base including international governments, aerospace OEMs, and defense contractors. Our Federal Avia-

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tion Administration (FAA) and the Directorate General of Civil Aviation (DGCA) partnership has enabled us to become one of the first Indian entities to ship a significant amount of products back to Collins in Europe and USA prior to getting shipped to our customers.

Some of the customers that we serve include Boeing, Airbus, Thales, Bombardier, Gulfstream, Sukhoi, Embraer, Rolls-Royce, and Pratt & Whitney.

Collins provides a vast array of solutions to the aerospace and defense industry. It goes beyond avionics and communication solutions to include Interior Systems, Mechanical Systems, Power & Controls, and Aerostructures for the commercial aviation space. In the defense space, we provide solutions such as large-area displays, ejection seats, and communications amongst others.

You are also known to have played a major role in shaping India as a major aerospace manufacturing hub. Please elaborate on the same.

From the time that Collins was established in India, we have been focused on introducing innovations to the market. We leverage our global expertise and Indian talent to come out with industry-first solutions to introduce greater functionality that is smarter and safer.

We have been building the Indian R&D ecosystem through the introduction of new technologies. Together the India team has produced over 235 patents that cover inventions across all Collins SBUs and disciplines. This includes the successful designing, developing, and qualifying of the power door opening system for Airbus and Bombardier C-series at the Bengaluru facility.

We have been working to ex-



Source: Collins Aerospace

“We have been working to expand the local supply base ecosystem as well. It started with simple parts and now we are manufacturing complex parts and testing systems that are designed and manufactured in India. We are working with the supply base to further expand the capabilities of special processing and investing in advanced manufacturing.”

**Parag Wadhawan
Managing Director & Site Lead
Collins Aerospace**

pand the local supply base ecosystem as well. It started with simple parts and now we are manufacturing complex parts and testing systems that are designed and manufactured in India. We are working with the supply base to further expand the capabilities of special processing and investing in advanced manufacturing.

In India, we currently work on a comprehensive set of solutions that include:

Assembly of flight safety-critical Line Replaceable Units (LRU) for commercial aircraft Interiors:

- Interiors
- Mechanical Systems
- Avionics
- Mission Systems.

Testing of flight safety-critical LRU for commercial aircraft:

- Expertise in technology transfers and product transitions

- Airworthiness certification issuing authority to ship products directly to OEM customer
- Federal Aviation Administration (FAA) Organization Designation Authorization (ODA)
- FAA Designated Manufacturing Inspection Representative (DMIR)
- Directorate General of Civil Aviation (DGCA) Civil Aviation Requirement (CAR) 21 production organization approval.

Tell us about your manufacturing facility in Bengaluru. What roles do the India Design Center in Hyderabad and the Global Engineering Center in Bengaluru play?

Our engineering centers are located in both Bangalore and Hyderabad and provide R&D that supports Avionics, Aerostructures, Power & Controls, Mechanical Systems, Mission Systems, and Interiors, while our manufacturing facility in Bangalore, which is over 6,50,000 sq ft, produces parts for Interiors, Mechanical Systems, Avionics, and Mission Systems.

Both these centers support the ‘Aathmanirbhar Bharat’ or the self-sufficient India campaign.

Collins is looking at expanding its presence in the Civil Aviation industry. How do you plan to do so?

Collins already has forayed into the Civil Aviation sector with our association with Delhi International Airport Limited (DIAL) and the local airlines. In 2009, DIAL turned to Collins Aerospace as they figured it is essential to implement new technologies that could offer significant benefits to its passengers. DIAL’s Terminal 1D was the first domestic terminal to implement Common Use Terminal Equipment (CUTE), in 2009. With this new technology (CUTE), airlines were able to use

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any workstation for their daily operations and not follow a set rotation schedule. This allowed the passengers for faster check-in to the aeroplane.

The implementation of Collins' solutions helped Indira Gandhi International Airport (IGIA), T1D handle its capacity issues, reducing processing time as well as decreasing passenger frustration and airport congestion. In addition, Collins' commitment to training, support, and collaboration across all relevant stakeholders made the implementation of the new systems seamless. The positive results led the two organizations to extend their collaboration to IGIA Terminal 3 (T3).

We also have a focus on touchless airports and have introduced several products that facilitate safe travel. Our ARINC SelfPass™ system provides passengers' contactless journeys through the use of a single token ID driven by secure biometrics. Check-in, immigration and security, lounge access, and boarding are some of the places where SelfPass can be used. Each step may be completed in a few seconds, and no traditional boarding and identification paperwork is required. Passengers merely go up to the camera and have their faces matched against the biometrics database, after that they can proceed.

“The Government of India has been focusing a lot on infrastructure development and we look forward to continued contribution to this growth. This includes areas such as the connected aviation ecosystem and the modern battlefield through collaborations and partnerships with local MSMEs.”

**Parag Wadhawan
Managing Director & Site Lead
Collins Aerospace**

You are among the first Indian entities to domestically produce and export an aviation product to the US. In addition, you have successfully designed, developed, and qualified the power door opening system for Airbus and Bombardier C-series at your Bengaluru facility. What other innovations are in the offing and what is your take on the government policies for the sector?

The Government of India has been focusing a lot on infrastructure development and we look forward to continued contribution to this growth. This includes areas such as the connected aviation ecosystem and the modern battlefield through collaborations and partnerships with local MSMEs.

We are also closely studying the new policies to seek out partnership opportunities to grow Collins Aerospace's businesses in India.



The year 2020 was an unprecedented phase in the Manufacturing industry worldwide. What are the challenges that you faced in the supply chain and what were the measures resorted to for maintaining a smooth flow?

Collins Aerospace, like several companies, not just in India but across the world has been affected by the pandemic. The commercial aviation business, which makes up a large part of our business in India has been



Source: Collins Aerospace



Source: Collins Aerospace

Collins Aerospace has an active environment, health, and safety (EH&S) strategy to ensure that its employees are well protected during this time. The company has conducted multiple vaccination drives in Hyderabad and Bengaluru for its employees and their family members to help protect its campus.

impacted the most. However, we have been committed to delivering on our projects in India and globally. In terms of the supply chain, we have added more time for transit and have been closely monitoring all shipments through various milestones on daily basis.

In addition, we have an active environment, health, and safety (EH&S) strategy to ensure that our employees are well protected during this time. We have conducted multiple vaccination drives in Hyderabad and Bengaluru for our employees and their family members to help protect our campus.

Recently, Raytheon Technologies (RTX), through its companies Collins Aerospace and Pratt & Whitney, donated four OxyTrucks to Indian Red Cross. The trucks can help to transport oxygen to remote locations. We are doing our best to support the country in this challenging situation.

Collins Aerospace’s CSR Initiative of sponsoring digital learning platform eBridgeNow to help aerospace and healthcare professionals upskill is laudable. How is that coming along?

eBridgeNow offers end-to-end lifecycle management of training online. Built on open source and cloud-first technologies, the platform enables corporates and educational institutions to seamlessly adapt to the changing needs of skill development.

Collins Aerospace sponsored the project that includes the development of a comprehensive digital platform and delivery of employment-based skilling programs in the Aerospace and the Healthcare sectors along with the creation of digital content. The project will provide scholarships to economically disadvantaged individuals to enroll in employment-based skilling programs to 50 candidates in the Aerospace and 320 candidates in the Healthcare sector.

Over the last two years, Collins Aerospace has completed 15

CSR projects related to education, skills development, rural development and environmental conservation.

One such recent initiative is the St. Theresa’s Grace Hospital project. In response to the humanitarian crisis, Collins Aerospace Corporate Social Responsibility (CSR) team, in partnership with United Way Bengaluru (NGO), has constructed the St. Theresa’s Grace Hospital. The hospital can accommodate 22 patients with all facilities including oxygen lines. It will provide free treatment to 1,000 to 1,200 destitute annually. We have also initiated the Integrated Rural Development (IRD) Project in Bengaluru. The project is aimed at the holistic development of communities around Collins Aerospace’s manufacturing unit in Devanahalli. Twenty villages will be supported with education, skill development, solar electrification, and watershed initiatives to positively impact 21,000 people from the locality. 

Disclaimer: The quality of images is hampered due to limitation in procuring high resolution images.

CELEBRATING PRECISION

Synonymous with CNC machining centers and turnkey solutions, CHIRON celebrates 100 years of success this year, a result of continued and collective commitment to its customers. Representing the Group's companies in India is CHIRON India Machine Tools that mirrors the Group's core values of having the courage to try new things and recognizing opportunities early on...



Source: CHIRON India Machine Tools Pvt Ltd

Bangalore-based CHIRON India Machine Tools has represented the companies of the CHIRON Group in India since 2011. The Group celebrates its 100th year of success coinciding with the 10th year of its India subsidiary and continues carving new paths.

Rajesh Ghashi, Managing Director, CHIRON India Machine Tools Pvt Ltd, briefs us on this historic occasion for the company, "Yes, it's been a decade now since we started CHIRON India, and we are proud to celebrate our success along with the 100th year celebration of

CHIRON. We thank all our patrons, customers, well-wishers, suppliers for all their support and acceptance they have provided us to serve them. We are really motivated and are looking forward to expand our operations in India to serve the market much better."

With offices in Bangalore, Chennai, Pune, and Gurugram, CHIRON India offers comprehensive consulting on the selection of the right CNC machining centers. Elaborating on the services extended to the customers in India, he shares, "CHIRON India is re-

sponsible for all the pre-sales and after-sales service support for all the CHIRON Group products sold in India. On the sales side, once we have acquired a potential customer, we discuss the specific requirements and offer them the best turnkey manufacturing solutions with the commitment of quality and quantity. On the service side, we carry out all the installation and commissioning of machines. We also offer maintenance training, annual maintenance packages, repair and retrofit services of machines to our customers."

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Well-received in Indian market

Even though CHIRON India is in the niche market space, the Indian market has been quite good for the company. "Today, we have more than 500 machines in the market and most of our customers have a multiple number of our machines. Secondly, more than 80 percent of our customers have multiple spindle machines. This only proves we are well accepted in the Indian market and see a lot more potential here," he says. Among the various industry sectors the company caters to, the Automotive sector has been a major revenue spinner for it in India. Its major Indian and international customers include Bosch, Sandvik, Sunbeam, and Turbo Energy. "The Auto sector is where we have supplied most of our turnkey machines," he adds.

When asked how is CHIRON coping with the rapid pace of digitalization and Industry 4.0 in the Manufacturing sector, Ghashi shares, "CHIRON is well prepared and we offer our smart line solutions which include various modules like Remote line for remote diagnoses, Data line for shop floor analysis, Protect & Touch line for machine pro-



Source: CHIRON India Machine Tools Pvt Ltd

"It has been a decade now since we started CHIRON India. We thank all our patrons, customers, well-wishers, and suppliers for all their support and acceptance they have provided us to serve them. We are really motivated and are looking forward to expand our operations in India to serve the market much better."

Rajesh Ghashi
Managing Director
CHIRON India Machine Tools Pvt Ltd


tection, Process line for support in simulation & programming, and Condition line for supporting maintenance."

The company has already geared up with its plans for the Indian market and in the fu-

ture will set up an Application Center along with localization. "We already have our component sourcing set-up in India and we would like this to grow. Since the pandemic broke in the end of 2019, we had to slow down a little but we will soon be ready to take the next steps."

The pandemic impact

The industry has been severely hit by the Covid-19 pandemic. Ghashi informs that CHIRON too has not been spared by its impact on the business. "The pandemic has surely hit the Manufacturing sector globally and has also affected our business in India as our major customers are in the Automotive sector," he shares.

"It's very hard to predict as to when the industry would recover to the pre-pandemic levels as a lot depends on how we are going to control the virus, vaccinate the masses and regain the customer confidence. Now that we have seen the second wave and are predicting the third wave, it's already the end of 2021. We hope the recovery should start somewhere in the 2nd - 3rd quarters of 2022," he concludes on an optimistic note. 

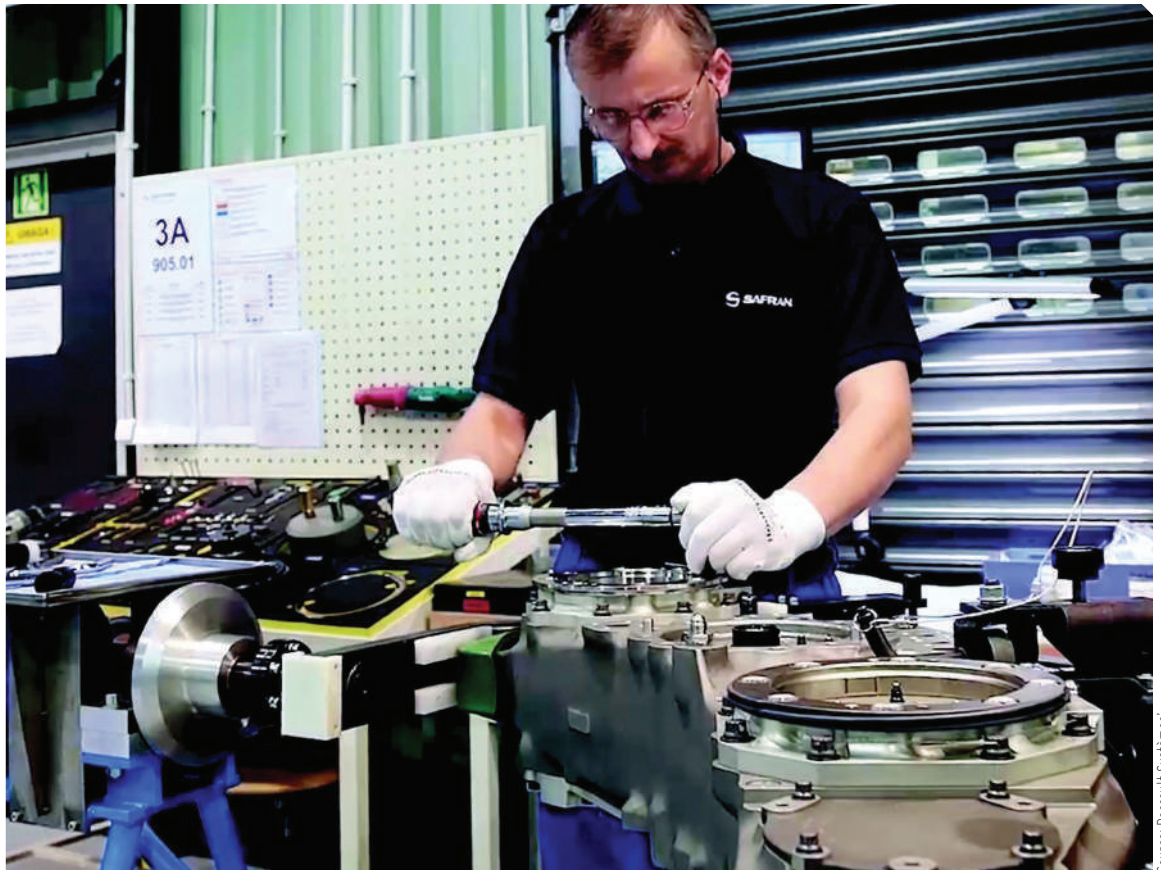
CHIRON offers its smart line solutions including modules like Remote line for remote diagnoses, Data line for shop floor analysis, Protect & Touch line for machine protection, Process line for support in simulation & programming, and Condition line for supporting maintenance.



Source: CHIRON India Machine Tools Pvt Ltd

CHASING EFFICIENCY

Safran Transmission Systems chose Dassault Systèmes' 3DEXPERIENCE platform including the Co-Design to Target industry solution experience to deliver digital continuity across all product-related departments. Here's what led to this decision and other benefits obtained...



Source: Dassault Systèmes

850 million. This is the number of hours Safran Transmission Systems' power transmission systems have operated worldwide. With facilities in France and Poland, and a joint venture with Rolls-Royce launched in 2015, the company aimed to increase the efficiency of its programs whose data was previously managed by disparate software. "The main challenge in our profession is to be able to ramp up production on new programs and to reach the level of performance our clients expect," Hélène Moreau-Leroy, CEO, Safran Transmission Systems, said.

Multi-site collaboration

The company's digital environment was a collection of heterogeneous and often incompatible software, which impeded data flow between divisions, subsidiaries and even with partners. Exchanging information was difficult, which slowed down the development process. "We are currently working on a number of development projects, for which different sites need to collaborate together," Jean-Philippe Salini, PLM Manager, Safran Transmission Systems, said. "Smooth and instantaneous exchange of information with

our partners, subcontractors and subsidiaries is an absolute necessity to meet project deadlines."

"The creation of Aero Gearbox International, our jointly-owned company with Rolls-Royce, has made it more essential than ever to streamline collaboration with a common toolset that facilitates access and use of intellectual property," Moreau-Leroy added.

Supporting reliable information access

A single source of information helps ensure that the technical, physical and functional characteristics of a product are linked and

Source: Dassault Systèmes

Challenge

Safran Transmission Systems sought to increase program efficiencies and reduce support of multiple software systems.

Solution

The company chose Dassault Systèmes' 3DEXPERIENCE platform including the Co-Design to Target industry solution experience to deliver digital continuity across all product-related departments.

taken into account by all project actors. "Developing a power transmission system requires managing a huge volume of data," Michel Dion, responsible for configuration management, said. "At the configuration management division, we are responsible for the airworthiness of our products. It is, therefore, our job to make sure that every project stakeholder works on a single product reference with reliable, up-to-date data that complies with the requirements of our external and internal customers," he said. Safran Transmission Systems selected the 3DEXPERIENCE® platform and its Co-Design to Target industry solution experience as the company's digital platform to manage all data and processes across its subsidiaries and with its partners. "With Co-Design to Target, we can coordinate all our activities with our suppliers and with the people working in methods, product development, and testing to trace their progress throughout a project," Laurent Raoul, CTO, Safran Transmission Systems, said. "Co-Design to Target provides our product development stakeholders with real-time access to the most up-to-date and compatible information enabling multi-disciplinary collaboration that improves the efficiency of our design and engineering programs," Salini added.



Source: Dassault Systèmes

"The 3DEXPERIENCE platform actively contributes to helping us work towards a goal we hold dear: zero defect design."

Hélène Moreau-Leroy
CEO
Safran Transmission Systems

Using the Accenture Product Lifecycle Services Agile Methodology, the combined team of Accenture and Dassault Systèmes' Industry Services working closely with Safran Transmission Systems ensured the timely and successful systems integration of the Co-Design to Target industry solution. "Their proactive support enabled a smooth and rapid deployment throughout the group," Salini said. "They not only implemented the solution but they also trained our engineers to use and to maintain the system."

To keep deployment costs and schedules in check, Safran Transmission Systems wanted to use the standard version of Co-Design to Target as much as possible. "From the beginning, we wanted to limit the number of specific developments to those that were absolutely necessary," Raoul said. "When we consulted our engineers to ask them what features they wanted to see installed, it turned out that most of their requirements were met by the out-of-the-box version of Co-Design to Target. The ratio we finally achieved is 16 percent specific developments and 84 percent standard, which illustrates that the solution is already well-suited to our industry."

Users found the application intuitive and easy to adopt. "They can rapidly find the information they need. We easily made only minor adjustments so that the interface reflects our internal processes and the way our engineers work," Dion said.

More than 400 users in France, Poland, Germany and England access the platform and use Co-Design to Target. "The 3DEXPERIENCE platform supports all our company processes," Salini said.

Digital continuity drives efficiency

Safran Transmission Systems is undergoing a digital transformation and the first step is to rationalize its information systems. 3DEXPERIENCE plays a major role in this transformation. "The platform is not simply another system in our IT environment," Charles Manin, CIO, Safran Transmission Systems, said. "It enables us to replace a number of outdated or independent applications that operated in silos with an integrated system that provides us with a global, unified view of our group's activities. For example, in the past we had CATIA on one side and our old PLM system on the other. Today, our CATIA V5 data is naturally linked to, and managed by, ENOVIA V6, thanks to this unified platform. The 3DEXPERIENCE platform gives us the digital continuity we need to be more efficient and productive. This digital continuity greatly reduces maintenance costs by limiting extensive customization or additional developments to bridge independent software together or to convert data back and forth, which not only complicates development but proves complex and costly to maintain over time."

"Until now," Jean-Philippe Salini added, "we had the digital mock-up in a separate system, but with the 3DEXPERIENCE platform, the digital mock-up is linked to

Safran Transmission Systems has recorded 30% productivity gains on configuration control tasks using the 3DEXPERIENCE platform.

Data security is another benefit of Co-Design to Target. This industry solution experience allows the company to manage and secure its intellectual property by allowing external partners access only to the information they need.

the product configuration. Our users find the dashboards available within Co-Design to Target very useful because they display program milestones and key performance indicators in real time, helping teams to rapidly assess risks and speed decision-making," Salini said.

"The 3DEXPERIENCE platform provides our engineers with a leaner approach to their activity. "For example, it normally takes anywhere from three to 18 months to carry out a design change, depending on its complexity. Thanks to easy and rapid access to accurate information on the 3DEXPERIENCE platform, we can reduce this time by up to 30 percent on configuration control tasks," said Dion.

Design challenges and data security

"With Co-Design to Target, all of our engineering and manufacturing processes are available on one common platform, which enables us to better synchronize the activities of the different actors throughout the development process. Moreover, it helps to ensure the reliability and traceability of all product information," Raoul said.

Data security is another benefit of Co-Design to Target. "This industry solution experience allows us to manage and secure our intellectual property by allowing external partners access



Source: Dassault Systèmes

only to the information they need," Salini said. "This enables us to base all our projects on one platform. Every project stakeholder is declared in the system, which saves time when searching for information or when interacting with a colleague or partner on a design."

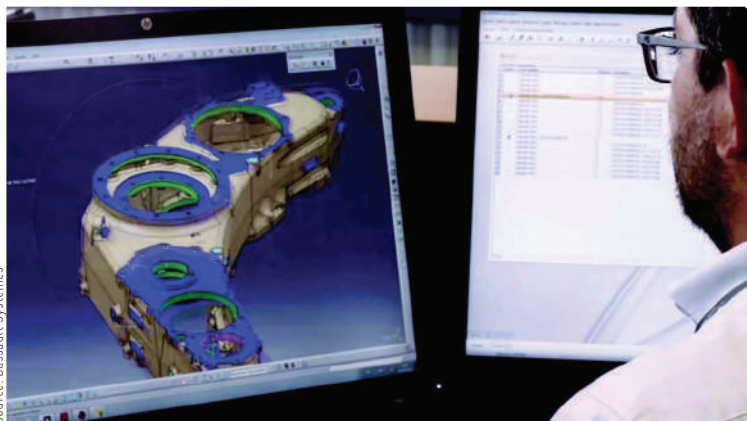
Materials compliance management

With Co-Design to Target, Safran Transmission Systems can manage and maintain the composition of the materials used in its products and assess materials compliance with REACH (Registration, Evaluation, Authorization and Restriction of Chemicals) requirements. "We can easily check material content information from the earliest stages of product development to verify REACH compliance and to make the appropriate design

changes if needed," Raoul said. "We must be precise in the way we handle our materials over the long term as they have a lifecycle that can easily exceed 30 years. This traceability is possible with Co-Design to Target."

Zero defect design

"To keep pace with advances in engine design, we also must innovate and introduce new power transmission systems concepts," Moreau-Leroy said. "This evolution is only possible if we master the required technologies and advance the way our products are manufactured. The 3DEXPERIENCE platform helps us to efficiently and productively deliver on this dual objective by allowing all actors and functions to collaborate in real time using compatible tools on a single platform and by providing project traceability from the earliest design stages. As a result, Co-Design to Target helps elevate the precision of our work and consequently, of our products. With the market demanding an accelerated rate of new product introductions, Co-Design to Target helps us to respond in a positive way by shortening our development cycle time. The 3DEXPERIENCE platform actively contributes to helping us work towards a goal we hold dear: zero defect design," she concluded. 



Source: Dassault Systèmes



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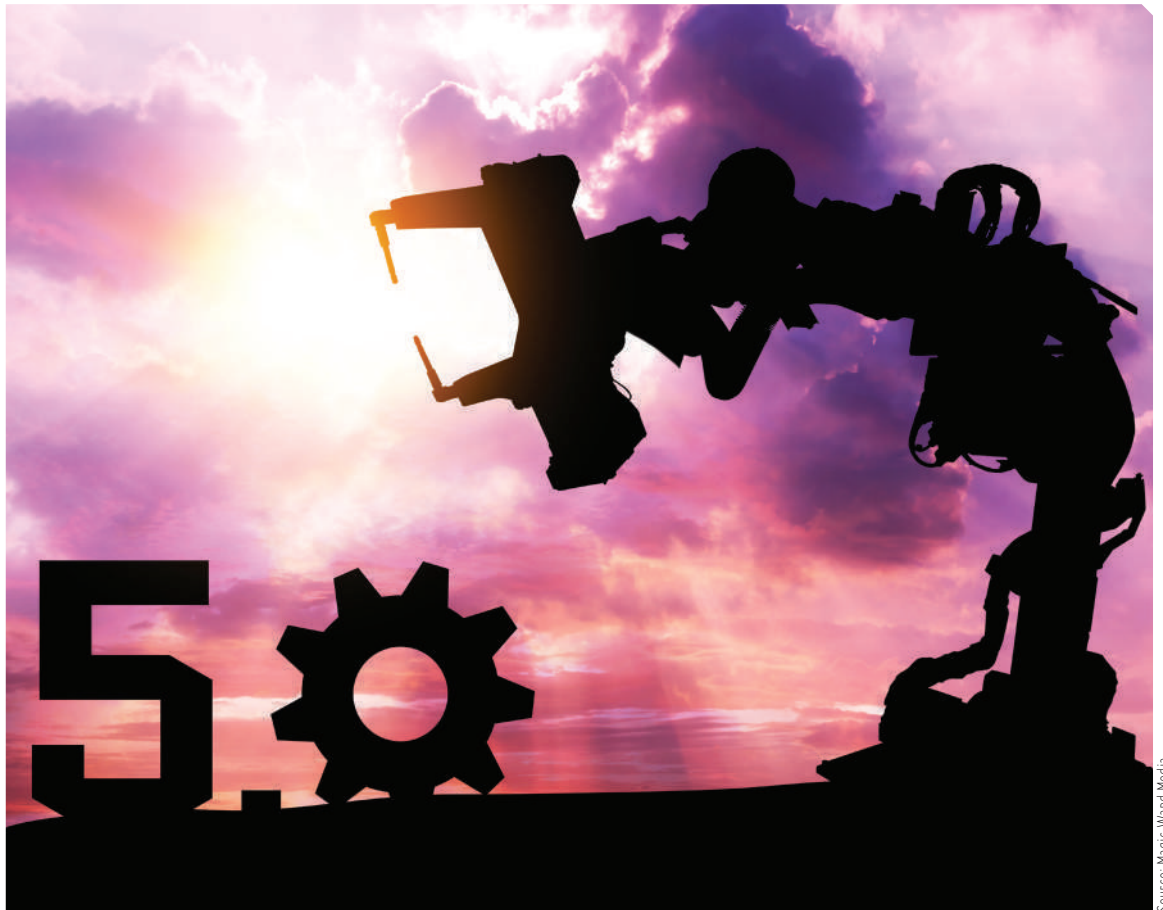
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LEADING MANUFACTURING MODERNIZATION

Industrial robots are the future of Indian manufacturing, where factories will have zero labor fatigue, zero accidents, and improved quality and productivity with the help of an efficient synchronization between man and machine.



Source: Magic Wand Media

Robots have revolutionized the way people used to look at their processes. In the 20th century, robots were big machines with automation. Now they are being used in varied applications in sectors ranging from Healthcare to Outer Space. Industrial robot technology is gaining momentum like never before and has evolved to new concepts of man and machine co-existence.

For achieving maximum efficiency, safety, and competitive advantage in the market, robot-driven automated manu-

facturing is becoming a norm. These industrial robots help in doing hazardous and repetitive tasks which ensures that the manpower on shopfloors is safe and can operate and synchronize with machines, thereby delivering precise, consistent, and efficient output.

Robots and applications

There are numerous ways in which a robot can be used for industrialization purposes. Categorized differently according to industries and applications, these robots vary in volume,

process, accuracy, and flexibility. They have real solutions to help people with more complex tasks like welding, painting, lifting, moving heavy items, and high-precision pick-and-place applications. The first phase of this revolution brought electric machines that performed repetitive tasks without fatigue. These robots were used in the Automobile industry and other similar applications. The second phase brought industrial robots that besides performing basic tasks also absorbed data to evolve and become better.

ATUL PATIL
Asst. General Manager
Marketing Department &
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Busting myths

There are a lot of myths revolving around industrial robots. One among them is that with the penetration of robots in industries, humans will tend to lose their jobs. People need to understand the fact that they can never become completely redundant as these robots may be highly efficient but are still limited in numerous ways. While these machines are getting smarter, manpower is still needed to work around them to operate, monitor, and synchronize many processes. We humans need to spend more productive time in planning and doing smart work, while the robots can continue to work on repetitive and fatigue jobs.

Cobots are workspace partners

Nowadays, with the technology getting upgraded day by day, we have a new industrial robot, a game-changer in this space - Collaborative Robot, popularly known as 'Cobot'. Simpler, easier, and flexible to use, Cobots are designed to be workspace partners. They are safe, require minimal or no programming, and allow hassle-free connectivity which makes them an excellent option for a wide range

of applications.


Collaborative robots like MELFA ASSISTA have a wide range of uses including handling components, doing assembly jobs offering a variety of finishes, applying sealant or glue, and a lot more. They are used in load building (at a production line's end where they assemble a pallet load of products), quality control (inspecting and testing procedure involving deployment of robots for repetitive work), transportation (load pallets before shipping), and warehousing (for carrying out the removal of received products from pallets and then routing them to a facility's storage location). In addition to this, they are also widely used in Food and Pharma industries for handling pick-and-place jobs.

MELFA FR series industrial robots come with a Robot control, which is a combination of all the technologies required to control an industrial robot's electromechanical system. A Programmable Automation Controller (PAC), Programmable Logic Controller (PLC), Embedded Controller, PC, Industrial PC (IPC), or Motion Controller can be used for robot control. The industrial robot allows various benefits including

gentle product handling, accuracy, quiet operation, improved efficiency, and flexibility.

Easy to train

Some robots may need programming while others do not require any programming at all. For instance, MELFA ASSISTA can be programmed using a tablet with simple point teaching. One just needs to teach the moving points to ASSISTA and consider the work done. The user can simulate the movement before actually transferring it to the Cobot for confirmations. Alternately, he can hand guide ASSISTA to the points and can directly teach with a teaching panel available on the Cobot arm, eliminating the need for any complex programming and software.

Industrial robots are the future of Indian manufacturing, where factories will have zero labor fatigue, zero accidents, and improved quality and productivity with the help of an efficient synchronization between man and machine. If used correctly with complete shop-floor data integration, this technology can put India on the world map of manufacturing and establish India as a manufacturing hub for the world. 

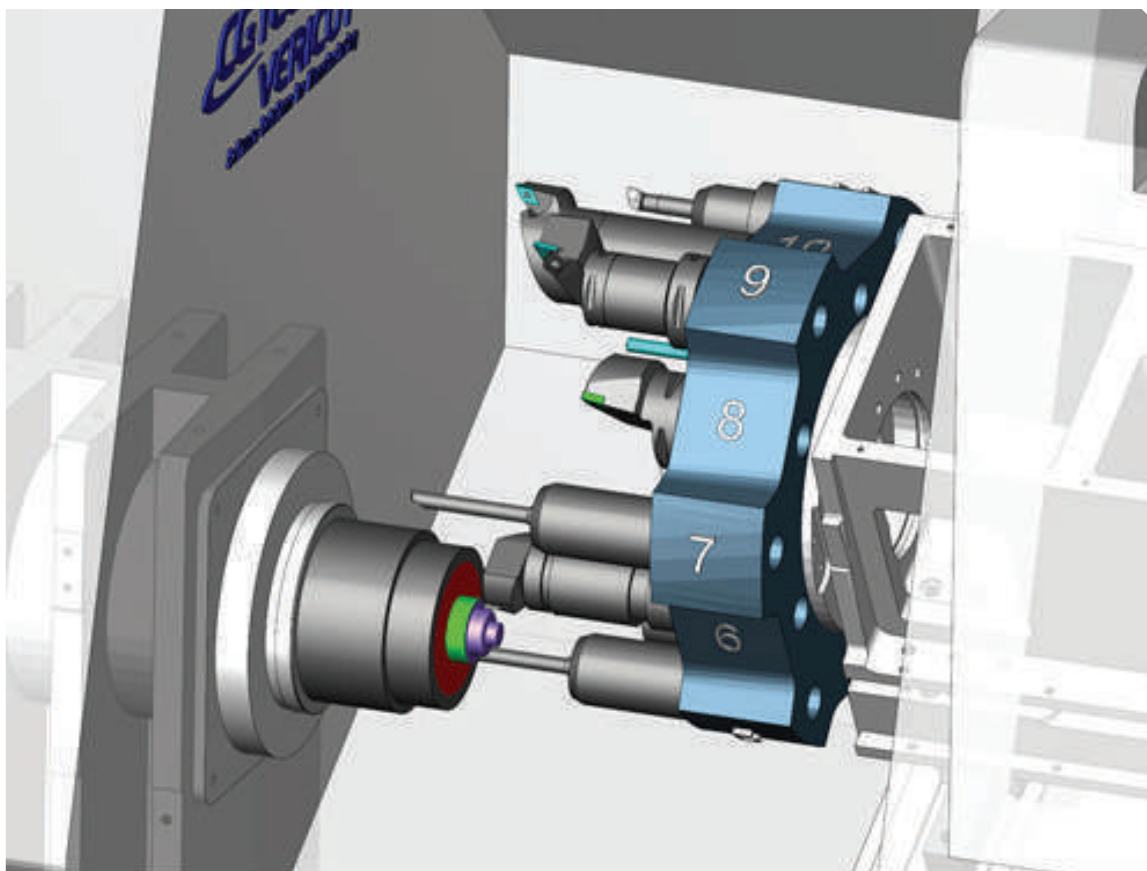
Simpler, easier, and flexible to use, Collaborative Robots or Cobots are designed to be workspace partners. They are safe, require minimal or no programming, and allow hassle-free connectivity which makes them an excellent option for a wide range of applications.



Source: Magic Wand Media

CHECK BEFORE YOU CUT

Everyone involved with CNC machining understands the importance of checking and verifying the machining process before applying a cutting tool to the raw material. Below are reasons why independent G-Code verification software such as VERICUT from CGTech makes for an ideal choice.



Source: CGTech

With so much at stake, including the value of the raw or partially completed material, the cutting tools and workholding systems, as well as the structural integrity of the machine tool itself, any NC programming errors will always prove to be costly. Alongside the potential damage to your production capacity there is the prospect of negatively harming the reputation of your business.

While everyone involved with CNC machining understands the importance of checking and verifying the machining process be-

fore applying a cutting tool to the raw material, you should consider what are you really checking? More importantly what are you missing?

With multiple lines of code NC, program errors are a common cause of machine crashes, and the two main sources of errors are programmer mistakes (we are only human) and errors introduced by the CAM system's post-processor.

For programmers and machinists, the task of manually proving out a process can be slow - checking line by line, block by

block to make sure there are no errors in the program. The machine is held up, production time is occupied and the chances of missing an error that could ultimately result in a very costly crash are extremely high, especially on complex multi-axis machining systems.

An alternative to the manual prove-out is to apply CAM simulation and verification software. Many CAM packages will accurately simulate machine motion and are often used to give feedback about the overall machining process. However, despite

Source: CGTech

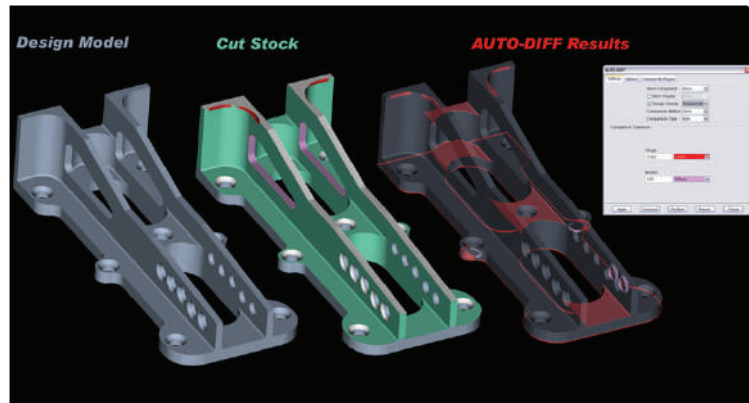
advances made within the CAM systems they are still limited when compared to independent third-party simulation systems, such as VERICUT.

Limitations of CAM verification

CAM systems offer varying levels of verification based on CL data, that has been post-processed into machine specific G-Code. In reality, this means the CAM system is simulating something different to what the machine will actually run. This is, of course, one of the main hurdles for CAM simulation and verification.

Any simulation that runs on CL data cannot be fully trusted. It is not running the exact same thing that the actual machine is running so there will be differences. In essence, it is guessing and projecting what the machine will do as opposed to representing what it will actually do.

In addition, getting true parameters from the machine such as rotary behavior, shortest distance and so on, is problem-



Source: CGTech

atic. While machine reference locations such as 'going home', where is 'home', how does it get there, as well as tool change locations including where does it need to go and how does it get there, are another major limitation of internal CAM verification systems.

The post-processor itself can also introduce errors that could damage the part or the machine. Most CAM verification will use component software for machine simulation, an outsourced generically integrated third-party plugin to the software and it is mainly just for

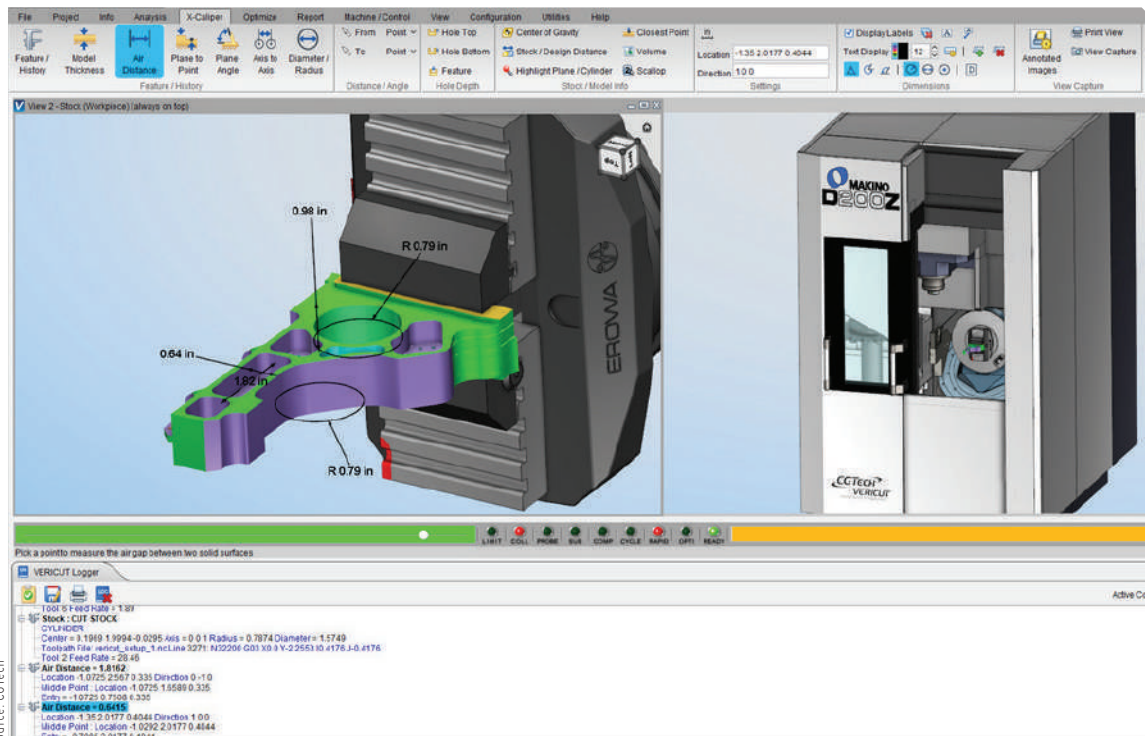
material removal and not actually simulating the actual machine motion.

There are some verification systems out there that state "we're simulating the actual G-Code". What they are actually doing is posting it and simulating it at the same time and they are projecting what their post is supposed to be doing. So, how can you trust a post-processor driven simulation? Who checks the validity of the post-processor?

Independent G-Code verification is the only way

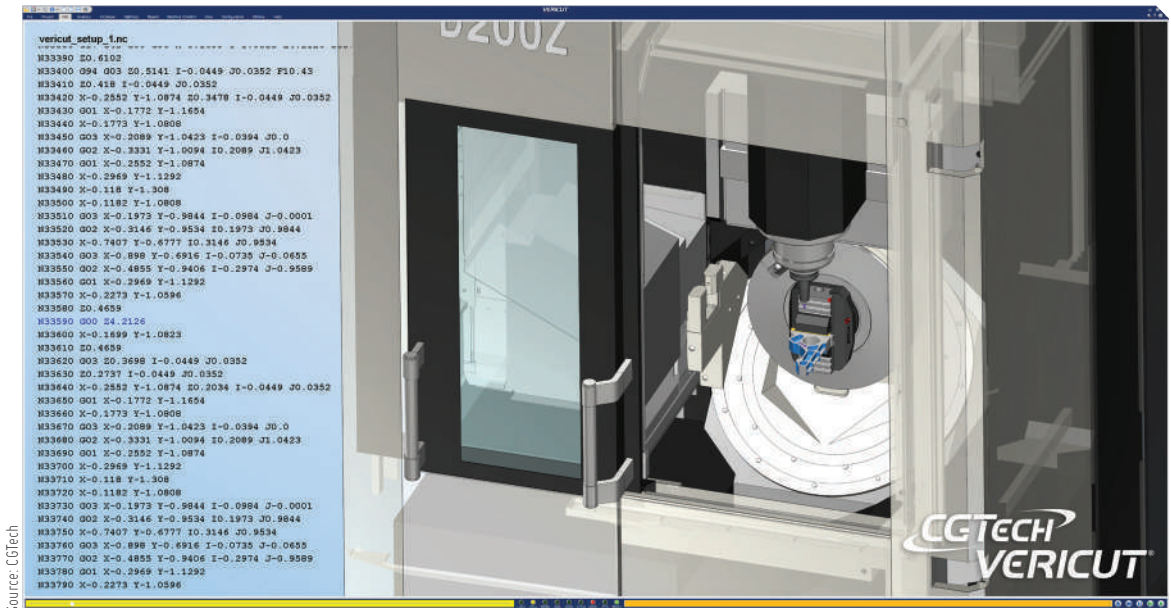
Independent G-Code verifica-

VERICUT not only simulates and verifies the accuracy of the machining process, it also optimizes the G-Code by adjusting the feed rates for each cut to make the process safer, faster, and more efficient.



Source: CGTech

Simulating, verifying, and optimizing the machining process with independent G-Code verification software, such as VERICUT, eliminates any fear of a new NC program and reduces set-up time.



Source: CGTech

tion software, such as VERICUT, verifies post-processed G-Code instead of the CL data. This is the exact same G-Code that runs within the NC system of the machine, so the software is able to carry out a comprehensive machine simulation based on the same data that will operate the machine.

Unlike CAM verification, the machine features, components, fixtures, and stock are identical to the physical process, and it offers accurate feature-rich models, cylinders, cones and so on. Multiple set-ups are supported as cut stock is automatically transferred between set-ups in the proper orientation. All cut history is maintained from the first set-up to the second set-up and so on. This allows the user to identify prob-

lems quickly and easily, with a click of the mouse.

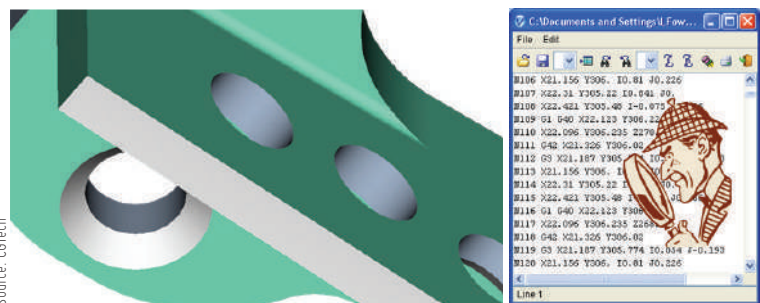
Measurement and inspection tools allow the user to check and verify the dimensional accuracy of cut models, something most CAM verification systems cannot do. With in-process measuring, known as X-Caliper in VERICUT, cut stock can be measured at any time, including hole depths, volume removal, model thickness, air distance, diameter/radius, center of gravity and many more. While the AUTO-DIFF feature compares the CAD design model to the simulation to detect differences, gouges, or excess material. This way the user can be certain that the final component precisely reflects the design intent. VERICUT not only simulates

and verifies the accuracy of the machining process, it also optimizes the G-Code by adjusting the feed rates for each cut to make the process safer, faster, and more efficient. It drastically reduces cycle times so inadvertently you get faster turnaround, less out-sourcing, reduced tool breakage and longer tool life.

The advantages of using independent G-Code verification

Simulating, verifying, and optimizing the machining process with independent G-Code verification software, such as VERICUT, eliminates any fear of a new NC program and reduces set-up time. The checking is done during production planning before any real machining starts. So, you never waste valuable machining time, and you will be confident that the process will deliver accurate parts with no machine crashes, while adjusting feed rates to optimize machining time and prevent broken cutters.

Given the advantages of using an independent verification system you have to ask, 'is your internal CAM simulation good enough?'



Source: CGTech

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SAVING TOMORROW

Innovation Filter System, with its innovative filtration and separation solutions, has created a benchmark in the industry. To ensure balance in the ecosystem with reduced pollutants and waste, it is helping companies take a step towards green manufacturing, and build a safer, healthier, and sustainable future for all.



Source: Innovation Filter System Pvt Ltd

The team behind Innovation Filter System (IFS) Pvt Ltd began its journey in 1999 with the idea to develop indigenous engineering solutions for Indian manufacturers. Its first assignment was the development of a 'Mineral bed filtration system' for wire cut EDM. The project included engineering a suitable, cost-effective system with regenerative filter media and provided the same filtration efficiency as a consumable cartridge filter.

"We collaborated with our customer's engineering and management team and developed a first-of-its-kind system, wholly designed and manufactured in

India," shares Ajinkya A Kelkar, Director, IFS.

"This success inspired us to start IFS in Pune, India. Over time, we developed our other products like the oil-water separator called 'Coalescer', edge filtration system called 'Micropure', solid-liquid separator called 'Centrifuge', etc. Now, along with our specially designed products, we offer a full range of filtration and separation products to serve not only the Indian market but also the global market," he adds.

"We are blessed to have partners like Transor, Friess, and KMU Loft through this journey - all German companies with whom

we have a long and highly profitable relation," he adds further. With Transor, GmbH, Innovation Filter System has a joint venture since 2015 resulting in Transor India Pvt Ltd.

Wide range of products

Under the IFS brand, the company makes conventional coolant filtration systems like magnetic separators, paper band filters, compact band filters, and conveyors. However, it is more popular for providing customized filtration and tramp oil separation solutions. Some of the unique products that IFS manufactures cater to the following applications and industries -

POONAM PEDNEKAR
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Magic Wand Media Inc
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Mineral Bed Filter System - For wire EDM application;
Eco-coalescer - For eliminating tramp oil on machining coolant;
Coalescer - For removing tramp oil from component washing machines;
Mega Coalescer - For removing tramp oil from paint pre-treatment baths;
CoolBot - A machine tool sump cleaner that removes burrs, fines settled in the machine tank along with tramp oil and anti-bacterial treatment. It does all these functions while the machine is running;
Phosphate Sludge Separation System - That eliminates the costly, time-consuming, and labor-intensive manual process of phosphate tank cleaning.

These solutions find their applications in industries including Die & Mould, Automotive, Auto Ancillaries, General Engineering, Aerospace, Bearings, Painting and Surface Coating. Under Transor India, IFS provides neat oil filtration solutions for single machines, islands of machines, and centralized systems. The applications for which it provides solutions include tool and cutter grinding, honing, EDM, and superfinishing in the Cutting Tools and Aerospace industries.



Source: Innovation Filter System Pvt Ltd

“Being an SME, we always thought that brand is something big corporates build. However, we have realized that big corporates get big because of their efforts to build a successful brand. Hence, we have now concentrated our efforts on setting up a marketing infrastructure within the organization. It has been a steep learning curve, and the task is not yet complete.”

Ajinkya A Kelkar
Director
Innovation Filter System Pvt Ltd

With such a comprehensive range of products, the company has, therefore, awe-inspiring names in the list of its customers. Sandvik Asia, Bajaj Auto, SKF India, Electronica HiTech Machines, LMT Tools India, Ind-Sphinx Precision, Guhring India, and Carbide Cutting Tools make for IFS's Indian customers. The global list comprises OSG (Thailand), OSG (Indonesia), Lomas (UAE), Transor (Germany), Piaggio (Vietnam), and HPMT Industries (Malaysia).

Gaining customer confidence

IFS's products are regularly exported to various countries such as Germany, Italy, the UAE, Thailand, Malaysia, Vietnam, and Indonesia. In India, most of its sale is through machine builders who source the filtration or oil separation equipment from the company and install them along with their machines or systems.

Kelkar shares another of IFS's revenue streams which is the customized solutions that it provides to its customers, “Typically, we engage with customers who have requirements of super-fine filtration or need filtration solutions for not-so-common applications like filtering water-based emulsion coolant used in grinding tungsten carbide or silicon carbide.” “What we have learned from our German partners over the years is that we prove our solutions to the customers rather than asking them to invest blindly. Hence, we ask our customers to send us their dirty fluid samples. We run them through our test rigs and then provide reports from accredited labs before and after filtration results. This process means much R&D and longer sales cycles for us, but we gain our customers' confidence as effective solution providers in the end,” he adds.

Together to grow

Throwing light on IFS's association of 15 years with Transor Germany, Kelkar says that from Transor India, the company provides neat grinding oil filtration solutions for cutting tool manufacturers. “The beauty of Transor systems is that the filter elements are capable of excellent filtration (down to 3 microns). In doing so, we warranty these elements for one

IFS's products get regularly exported to various countries such as Germany, Italy, the UAE, Thailand, Malaysia, Vietnam, and Indonesia. Its list of global customers includes OSG (Thailand), OSG (Indonesia), Lomas (UAE), Transor (Germany), Piaggio (Vietnam), and HPMT Industries (Malaysia).



Source: Innovation Filter System Pvt Ltd



Source: Innovation Filter System Pvt Ltd

The main reasons for IFS's successful partnership with Transor, according to Kelkar, are cutting-edge technology, unwavering customer focus, and ethical and transparent business relations.

year from the date of installation. However, we have some customers who have not replaced their elements for close to seven years," he adds.

"In a short span of six years, Transor India has installations with significant cutting tool manufacturers in India, the Middle East, and Southeast Asia. Transor India systems are currently filtering close to 20,000 lt of grinding oil per minute. Globally, Transor systems are filtering close to 6 million lt of oil per minute," he shares.

The main reasons for IFS's successful partnership with Transor, according to Kelkar, are cutting-edge technology, unwavering customer focus, and ethical and transparent business relations.

Positive outlook

Last year during the lockdown, IFS underwent an absolute freeze in its functioning, Kelkar shares the changes in the wake of the second wave of the pandemic. Many of IFS's orders got canceled since it could not deliver its systems on time; many customers delayed their investment plans stating they

would think about it when things returned to normal. In some cases, the company had to hold on to the finished inventory since the customers were going through a challenging situation and could not accept the deliveries.

"However, some positives came out of this as well - it gave us time to rethink our business and reassess our plans. The phase confirmed for us the advantages of having good financial planning and sound financial management practices in place. But, most importantly, it showed us the trust our employees, suppliers, and partners have in us and are ready to stand by us in times of crisis," he adds.

Another breakthrough that IFS achieved during these times is to focus its attention on building its brand. "Being an SME, we always thought that brand is something big corporates build. However, we have realized that big corporates get big because of their efforts to build a successful brand. Hence, we have now concentrated our efforts on setting up a marketing infrastructure within the or-

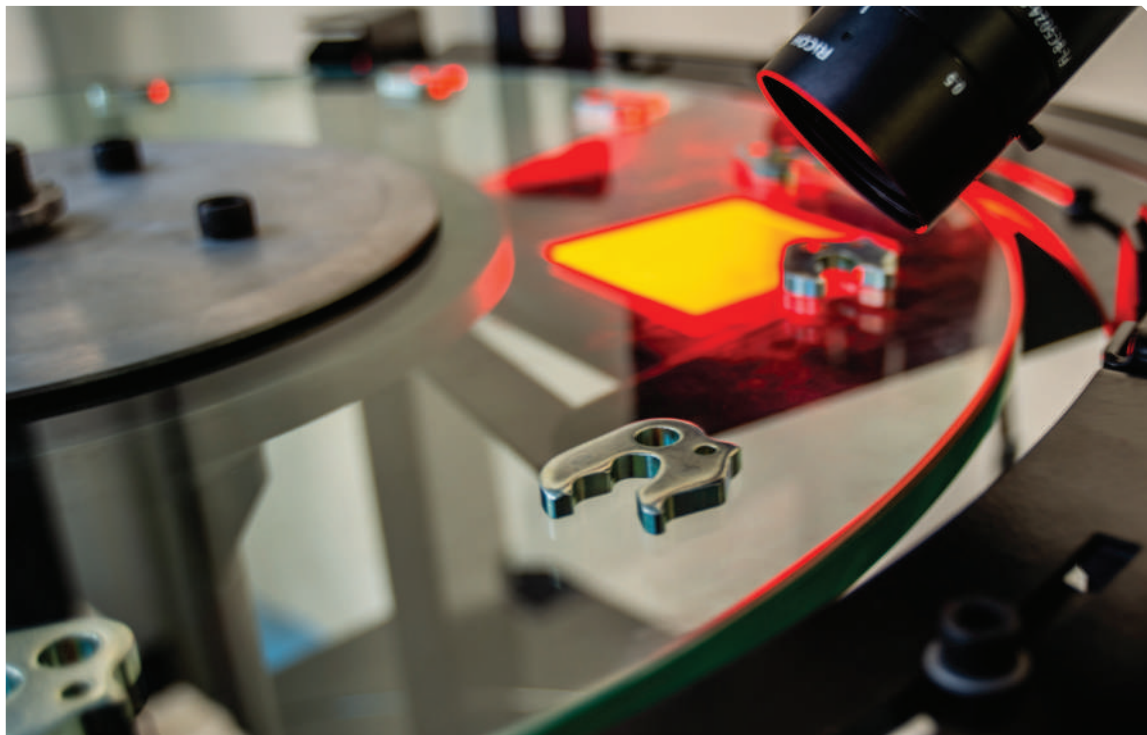
ganization. It has been a steep learning curve, and the task is not yet complete; however, we are certainly better placed than five years back," he shares.

Self-reliance is key

To attain the goal of 'Atmanirbhar Bharat', the Government of India is looking up to MSMEs for turning the coronavirus crisis into an opportunity through sustained focus on making the Indian economy globally competitive. Kelkar lauds the initiative as it has brought attention to India being a viable manufacturing hub. "We certainly have the capability of competing on the world stage with great and diverse human resources. However, there needs to be a systemic, focused change in the entire manufacturing ecosystem. Governments and authorities will keep on changing, and the policies they implement may or may not always favor every MSME in each sector. Hence, it is up to the individual entrepreneur or business owner to chart a course of action for their organizations based on their ambition," he sums up with a highly valid point. 

ADVOCATING INTELLIGENT AUTOMATION

Chennai-based next-gen startup Jidoka Technologies is in the field of automated cognitive inspection, delivering AI-powered defect detection systems for mitigating pain points experienced by the manufacturing industry. Read on to know about the founders' path-breaking automated QC solutions and their plans for a smart tomorrow...



Source: Jidoka Technologies

Coming from a Manufacturing background, Sekar Udayamurthy, Dr Krishna Iyengar and Vinodh Venkatesan recognized a huge opportunity for automated QC solutions that would help to increase the efficiency of the manufacturing processes across industry verticals.

The trio identified several pain points faced by manufacturers on the shop floor with manually driven QC processes. This is mostly in the area of visual quality checks done on the products manufactured - either in-process or as final inspection before they are shipped to the customer. Due to human subjectivity, decision-making varies based on the experience and expertise in addition to fatigue setting in. The accuracy

rate of human inspection to detect defects is generally not more than 90 percent. Moreover, in high-volume production lines where visual inspection is not deployed 24x7, there remain backlogs that create bottlenecks.

Being equipped with expertise and the know-how in manufacturing and digital technologies, they then identified a gap in the market to be filled. Hence, in 2018 they came up with Jidoka Technologies, a venture to serve the fast-expanding manufacturing market with their AI-Powered Defect Detection Systems to consistently enable 100 percent visual inspection.

“Due to the pandemic, where manpower for manufacturing has become scare, leveraging our QC solutions is ensuring business

continuity to manufacturers. Also, with increase in exports of manufacturing goods, we foresee a huge demand for our solutions from the industry,” reveals Sekar Udayamurthy, Co-founder & CEO, Jidoka Technologies. This is the reason the startup, with a current turnover of ₹33 lakh has a target for the ongoing fiscal year as ₹4 crore for the Indian market and ₹3 crore as exports. Its clients include Nexteer Automotive, Indo Schottle, MIM - to name a few.

Automation with a human touch

Jidoka QC solutions help to automate the process of visual quality, increasing consistency and accuracy at high speed by leveraging AI (Artificial Intelligence) / ML

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Jidoka stands for a principle that advocates 'intelligent automation' or 'automation with a human touch' in Japanese. Currently operating in India, the startup serves Automobile, Pharma, General Manufacturing, Electronics and Printing industries.

(Machine Learning), Deep Learning and Analytics. Jidoka stands for a principle that advocates 'intelligent automation' or 'automation with a human touch' in Japanese. Currently operating in India, the startup serves industry verticals including Automobile, Pharma, General Manufacturing, Electronics and Printing.

"We leverage Deep Learning, a subset of Machine Learning in AI, which teaches machines to learn by example. This technology can recognize features that distinguish trends and make intelligent predictions and decisions. It scales the intelligence of human visual inspection with the reliability, consistency and speed of a computerized system," explains Udayamurthy.

"We use a combination of Supervised and Unsupervised Computer Vision AI algorithms. In the low data regime, we use our patented Anomaly detection algorithm along with clustering," he adds.

Image Data augmentation aids Supervised AI algorithms like Image Classification, Object Detection and with regression algorithms, model testing, monitoring and MLOps are done.

"We deliver customized dashboards for the Management, Quality Assurance, Supervisors and Operators so that the right information is presented to the right people at the right time. Users can analyze data on various products, types of defects, severity, occurrence and generate reports," he informs further.

How Jidoka solutions matter

Jidoka's state-of-the-art automated cognitive QC solutions combine the power of AI with automation and computer vision in defect detection, delivering 98 percent or higher accuracy in the QC process, claims Udayamurthy. The QC solution has both hardware and software components.



Source: Jidoka Technologies

"We were self-funded while building the core of our product and getting our first customer. We have recently received a seed funding of \$340,000 from a leading technology entrepreneur who is our mentor too and Jidoka is currently valued at \$3 million."

Sekar Udayamurthy
Co-founder & CEO
Jidoka Technologies

The hardware platform has three trademarked structural shells that the company uses to customize the right solution for different products: Huron for large-volume complex products; Tigris for flat and lightweight products; and Miyake for manual load and unload with selective checking.

"We also integrate our software with a third-party radiography equipment to identify defects in X-ray images, Bubble Test (wet

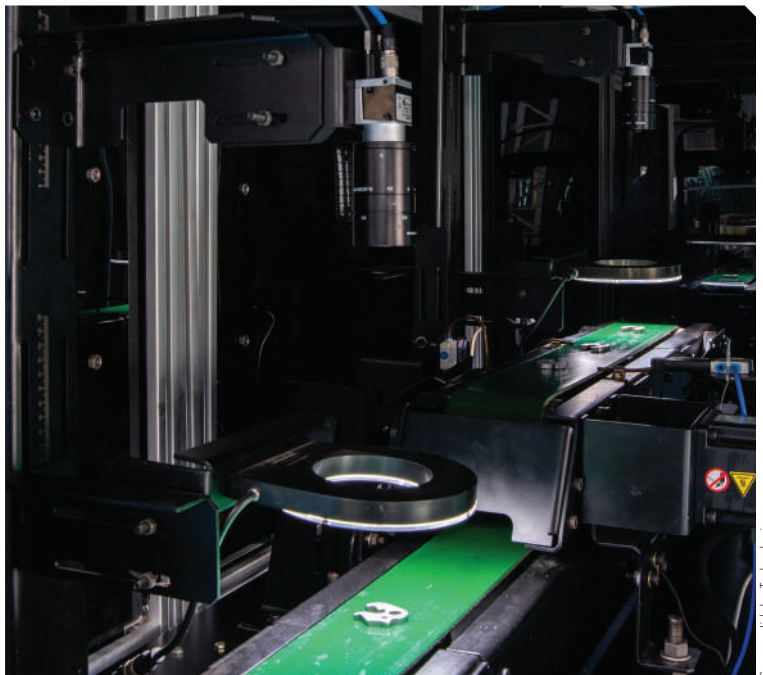
leak) systems to identify cracks in castings. Other hardware designs can be specially built depending on the component requirement. Solutions that integrate with robot is also in progress," he reveals.

The software platform Kompass marries real-time decision-making to the state-of-the-art AI to create an end-to-end system for visual defect system. The software provides a turnkey solution that fits seamlessly into the production line of different manufacturers. The system uses a digital twin created by the hardware and maps it to the AI to deliver up to 1200 decisions per minute.

"We are an E2E solution provider with proven implementation experience and not merely a software platform," he states.

When asked how different are the company's solutions from others available in the market and their tangible benefits, Udayamurthy states that their customers will be able to recover their RoI on what they have invested in the Jidoka system in as less as 12-15 months.

He enlists the tangible benefits along with the estimation of cost savings per year:



Source: Jidoka Technologies

“*Regarding quality inspection, human biases will be eliminated, leading to 30 to 40 percent reduction in false rejections. With 5 to 8 percent improvement in detection, there will be a higher level of customer satisfaction adding at least 1 percent to new revenues.

*In the QA process, Corrective and Prevention Actions (CAPA) can be implemented to eliminate non-conformities with effective analysis. With manual inspection or with conventional machine vision installations, the analytics is not available for the user to take action on the defects.

*A 20 percent increase in the speed of inspection can be achieved in the Product Control aspect with inspection as a bottleneck getting eliminated and increase in throughput by 33 percent.

*We provide an E2E solution that delivers committed output backed by a commercial model.”

Smart minds behind the venture

Along with Udayamurthy, the other two Co-founders Dr Krishna Iyengar and Vinodh Ven-

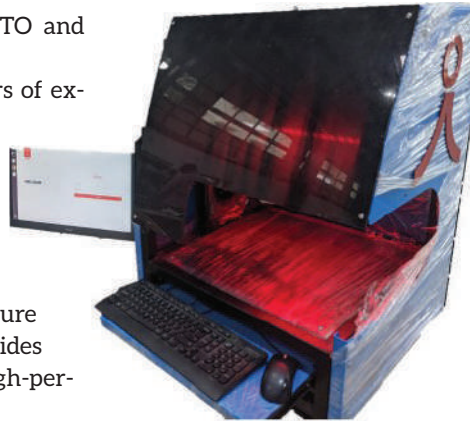
katesan are company CTO and COO, respectively.

With more than 25 years of experience in building Product and Digital platforms in North America and passion for technology, Udayamurthy oversees the platform architecture and performance, besides building effective and high-performing teams.

Dr Iyengar is a technical innovator and leads the product development and data science divisions. With a rich experience in manufacturing and previous startup experience, Venkatesan heads the marketing, sales and operations functions at Jidoka Technologies.

Teething issues and future plans

Talking about initial pain points, Udayamurthy shares, “On the technical side, we had to streamline our MLOPs to ease the delivery of models. Scaling of cameras and working with the vendors to iron out technical issues were part of the process. We also had



Source: Jidoka Technologies


to streamline our implementation process to ensure adequate check and balance to deliver the committed outputs.”

“Getting the right talent was another challenge so we hired the talent that was versatile. We provided them in-house training to make them productive in a very short span of time,” he adds further.

The team is looking at furthering the company’s product development in two areas:

The first step, shares Udayamurthy, is to move to a KPI-driven triaging of quality for organizations i.e., managing economic, quality and production constraints and bringing in an incremental change in quality.

“Secondly, we are looking at the need of customers to have data to ensure higher levels of accuracy, which is done by various features for data augmentation and experience-driven inferencing. For this, we will leverage the cutting-edge work done in AI/ Machine vision such as Anomaly detection, 3D image generation, etc., and to this effect we are productionizing some of the concepts while patenting them as well. We continue to evolve in the hardware platforms as well,” he states.

By 2025, the company aims to expand its services across the global market of the US, the UK, Europe, Southeast Asia besides serving in the Indian sub-continent. 

By 2025, Jidoka Technologies aims to expand its services across the global market of the US, the UK, Europe, Southeast Asia besides serving in the Indian sub-continent.



Source: Jidoka Technologies

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