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DYNAMIC MANUFACTURING INDIA

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Seenivasan Balasubramanian
CEO, IAMPL speaks about how the
company leveraged the unique
strengths and rich legacies of
Rolls-Royce and HAL to build a
world-class manufacturing force



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Advertorial | **GROB**

Journey of Grob Machine Tools India

We had a very successful decade long journey in Indian market GROB India started its operations in 2009 with one employee, continuous business growth that encouraged us to increase our highly skilled trained manpower to 35 as of now, we have plans to cross 100 employees in the next 3 years with our new upcoming plant. In the last 10 years we have installed more than 200 five axes machines at our esteemed Indian customers in different hi-technology oriented manufacturing sectors, in addition we have several projects in hand to deliver and install machines before April 2021. Thanks to GROB Group with more than 90 years of experience and expertise in delivering turnkey projects, for many of our customers we are sole turnkey partners for supplying complete manufacturing lines including automation, ancillary equipment and non cutting machines.

Key Highlight:

Thanks to GROB Group with more than 90 years of experience and expertise in delivering turnkey projects, for many of our customers we are sole turnkey partners for supplying complete manufacturing lines including automation, ancillary equipment and non cutting machines

We are delivering not only the machines but also with complete manufacturing process, our biggest strength is highly reliable machines and a very strong service, application support to our Indian customer to achieve faster cycle time, better & consistent accuracies.

To be future ready and to further increase our support & value addition to Indian customers we have acquired 20 acres of industrial land and started our new plant construction with first phase investment of 100 crores.

Quality & Processes

For all our machines and automation solutions engineering, R&D is done in Germany. We produce same machines in our plants worldwide

following the same technical standards and manufacturing processes. To ensure high quality and strict time lines except standard bought outs all the components of our machines are 100% manufactured, assembled and tested in house including motor spindles. Our special departments like CIP are continuously working on improving reliability, longer life time and lower energy consumption of our machines. We follow multilevel quality checking, tracking and approval for each element in our machine before it is released for next processes.

Managing Crisis

We have very little influence of pandemic situation in our machine manufacturing schedules as we manufacture all our machine parts in house. We did face some challenges with small delays in getting bought out parts from our suppliers but could largely manage with the emergency inventory that we always maintain. With quick decisions from our management and with immediate internal adjustments, in spite of the difficulties we could meet all our committed delivery time lines.

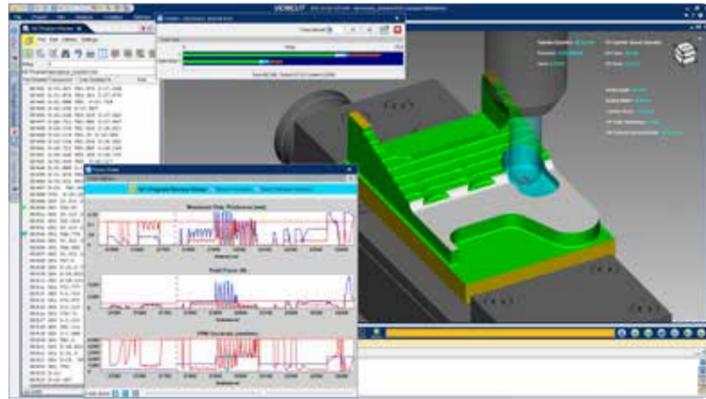
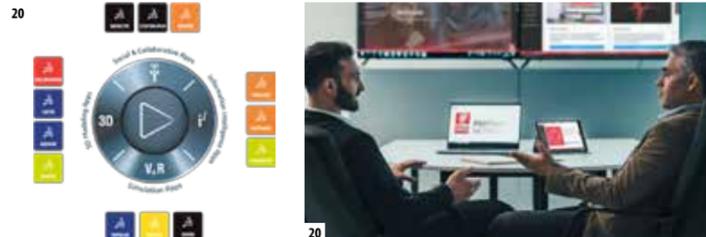
Road Ahead

GROB management considers India will be one of the biggest market for future already recognizing the future potential we have laid down our roadmap and structured our investment plans with the new plant. Closely following the automotive industry trend in 2012 we have started R&D and new product development in electro mobility sector, now we are already the market leaders. We provide turnkey solutions for battery cell manufacturing, cell to module and module to pack assembly lines, stator, rotor and final assembly lines for e-motor. We have also added new technologies like Spray bore machines for cylinder blocks and 3D metal printing machines for aerospace, medical and other sectors. In automotive sector in addition to supplying turnkey machining solution to power train parts in 2017 we have launched our F series machines for machining frame structure and chassis parts. We continue to strive and develop new technologies to remain as a global market leader in our business.



LJ Naidu
Managing Director
GROB Machine Tools India Private Limited

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Message | EDITOR'S NOTE

What It Takes

Last year, we, at Dynamic Manufacturing, did a good number of webinars. I would go as far as to say that we were the first magazine in the Indian manufacturing sector to have started doing them. We began doing our leadership webinar series in March 2020, that is, just around the time the countrywide lockdown restrictions came into force.

The idea of doing this was born out of a deep, uneasy sense of foreboding that had descended upon the industry in the early weeks of the pandemic. All of us in the industry were looking for answers; for any sort of clarity amid the Covid-19 gloom, and we turned to industry leaders for help through these webinars.

In December 2020, we concluded these leadership talks with a two-day conference, just in time for us to break into holidays and shut the door behind us on, what, in every sense of the term, was a dreadful year.

During these leadership discussions, the one theme that emerged time and again was the following: How can our manufacturing industry increase its share of GDP from the current 15-16 percent?

A whole host of ideas were discussed around this subject, which, if documented, would be enough to fill a bookshelf. But if I had to do the difficult task of sharing a quick summary of these ideas, I would choose to do it through a great perspective shared by Shailendra Goswami, the CMD of Pushkaraj Group.

During a discussion on the subject, Mr. Goswami said (from what I recollect) that if we look closely at the various models of industrial growth adopted in the postwar era by Japan, South Korea, and in recent years, China; two distinct models emerge. One is a low-tech, high-volume growth model and the second is high-tech, low-volume growth model.

These economies deployed a combination of these models depending on various factors, chief among them being the presence of a sizeable domestic market, inherent tech capabilities and talent, infrastructure, and their respective position on the learning curve. Typically, economies with a large domestic market employ the low-tech-high-volume model first and then move up the value curve to the high-tech-low-volume model. An example of this is China, which first created a local supplier ecosystem for mass manufacturing, and in recent years has come to play a major role in high-tech areas whether it is in 5G, artificial intelligence or electric vehicles.

India, he said, is in a unique position to make use of both the models at once: being home to the world's second largest market and having a vast supplier ecosystem give us the needed advantages to adopt the low-tech-high-volume model; and our skilled workforce and the rich legacies of world-class engineering organizations put us in the right position to pursue the high-tech-low-volume strategy.

That brings me to the point of this editorial. The best exemplar of the high-tech-low-volume model is India's aerospace and defence industry. Backed by world-class product design and development capabilities and the strong legacies of HAL and ISRO, India's A&D industry is fast developing into a global manufacturing hub.

In this issue, we have featured the journey of a company that best represents this vision. IAMPL (International Aerospace Manufacturing Pvt. Ltd.) – a JV between the British aerospace and defence major, Rolls-Royce, and India's iconic aerospace engineering company, HAL – has evolved into a category-leading supplier in the global A&D manufacturing space in just about a decade.

IAMPL's story of success and growth holds several important lessons for industry stakeholders, and the most important one is this: we have what it takes to be a global manufacturing force.

Stay safe. Stay resolute.



ANAND PANDEY
Editor DMI

Write to me at editorial@meshmixmedia.com



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Message | PUBLISHER'S NOTE

A Positive Turn

I take this opportunity to wish you a very Happy and Prosperous 2021. This month is momentous to us at Meshmix Media. Here with the Jan-Feb 2021 issue, Meshmix Media has successfully completed four years and started the fifth year of publishing.

The year 2020 had been a tough year for all of us. Thankfully the new year ushered in positive news like the commencement of the much-awaited Covid-19 vaccination drive and news of a demand rebound in many industries including electronics, FMCG and automotive.

Another encouraging news is that, in this year's Union Budget, the government has announced the inclusion of 13 more sectors into the ambit of the production-linked incentives scheme (PLI). In November 2020, the scope of PLI scheme was increased to cover 10 sectors that included advanced chemistry cell battery, auto components, pharma, electronics, and telecom products, among others.

The PLI scheme, which provides an incentive of 4-6 percent on incremental sales for goods manufactured in India, will go a long way to boost domestic manufacturing and take us closer to the national vision of Make-in-India.

Other encouraging news, announced by our Finance Minister during the Budget speech, was about the development of 7 textile parks and a plan to develop more economic corridors in the coming years. These initiatives have come at just the right time for our industry. I hope and pray that the coming months continue to bring us news of more such positive developments for the industry.

I want to reshare news about an initiative recently that we are very proud of: Industry Samurai Awards. Meshmix Media instituted this award last year to felicitate supply chain and manufacturing companies and stakeholders who responded boldly and bravely to the pandemic.

The award winners shared inspiring and heroic stories with us, which we will publish in our subsequent issues this year. Award-winning companies included Nocca Robotics, Alstom Transport India, Amace Solutions, M2NXT Solutions, IIT Kanpur, Moglix, the PDP Group, and IndoSpace. We will shortly announce the dates and other details of Industry Samurai Awards for this year.

The current issue you are flipping through is an Aerospace and Defence sector special. The cover story is about IAMPL that exemplifies how our engineers can collaborate with the best talents and companies in the world and create world-class products.

I thank you all for your valuable suggestions and unbiased feedback and look forward to your views on the current issue.

Please visit our website www.machineinsider.com for the e-copy of our magazine as well as the latest industry updates. Please write to me at preeti.m@meshmixmedia.com and meshmixmedia@gmail.com.

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PREETI MISHRA
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Message | NOTES FROM THE FIELD

A Show of Strength

The year 2021 has brought a new hope with the news that the first phase distribution of Covid-19 vaccines has begun. This is something that every person everywhere wanted to hear since the pandemic has taken a huge toll on people's health and livelihoods globally.

The manufacturing industry is showing signs of growth if the latest PMI (Purchasing managers Index) scores are any indication. I strongly believe that the next twelve months will see a recovery and strengthening of our sector.

Last month we concluded our Industry Samurai Awards after a two-day conference. This was the inaugural edition of the Awards. It surpassed our expectations in terms of industry participation and response. Various awards were announced for both the manufacturing as well as supply chain categories. Now we look forward to announcing the second edition which we will be hosting with new categories and a new theme for the 2021 conference.

The term the show must go on comes to my mind as it fits perfectly into what is happening around here and globally. Our industry's much-awaited show IMTEX Connect, organised by Indian Machine tool Manufacturer Association, took place this month which featured a digital trade show for machine tool manufacturers and users. The Meshmix Media team visited the trade show virtually. It was great to see a large number of visitors attending the virtual trade show.

Aero India 2021 is scheduled to take place from 3 to 5 February in Bengaluru. It is being organized in the traditional way i.e. as an in-person event, and it promises to be an exciting show this year with

all the top organizers expected to showcase their offerings and capabilities at the show. Our current issue is also focused on the sector – we have featured the journey of an organization that has achieved a great many milestones in its mission to become one of the leading global suppliers or aero-engine components.

Overall, by the looks of it, the popularity of our magazine continues to grow – I see that as a good sign not just for us, but also for the print publishing industry.

To everyone in the publishing and manufacturing industry – wish you a happy, healthy and prosperous 2021.

Happy Reading!

Sincerely,

Dinesh Mishra

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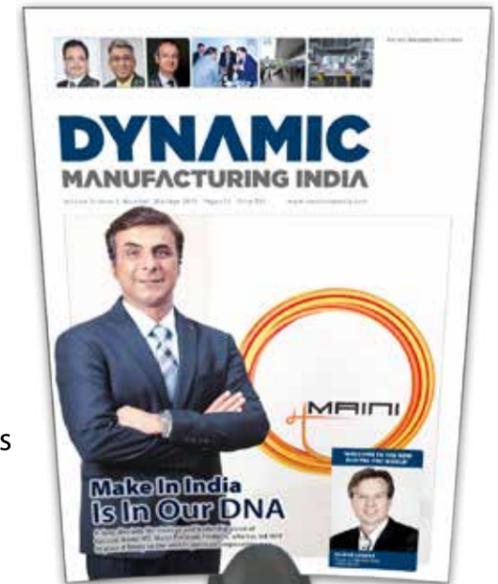
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MeshMix is B2B Trade media at MeshMix Media we aspire to offer end-to-end solutions in print and digital media markets tailored to meet exclusive needs of industry players.

Dynamic Manufacturing India magazine aspires to be at the heart of the manufacturing sector, targeted specifically to the managers, specialists, users and buyers of technology. It is being designed to provide rich information and knowledge in areas like automation, design, maintenance and production.

The magazine will be at the forefront of industry issues and developments and will act the default medium of choice to those seeking information and updates.



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Cover Feature | IAMPL

NOT JUST FAIR-WEATHER PARTNERS

Seenivasan Balasubramanian, CEO, IAMPL speaks about the how the company leveraged the unique strengths and rich legacies of Rolls-Royce and HAL to build a world-class manufacturing force



If there is any organization that best represents the orientation of India's A&D (Aerospace and Defence) sector's aspirations, it is IAMPL. A quick look at IAMPL's genesis reveals why. IAMPL (International Aerospace Manufacturing Pvt. Ltd.) is a joint venture between British aerospace and defence major, Rolls-Royce, and India's iconic aerospace engineering company, Hindustan Aeronautics Limited (HAL). Established ten years ago, IAMPL has achieved several important milestones and is now counted as a category-leading supplier in India's A&D manufacturing ecosystem.

Seenivasan Balasubramanian, Chief Executive officer, IAMPL spoke about the company's journey, its implementation of best-in-league manufacturing techniques, how it negotiated the challenges presented during 2020, and what it plans to showcase at Aero India 2021, with DMI editor Aanand Pandey. Excerpts.

Key Highlight:

"Rolls-Royce expects excellence in everything, whether it is in meeting the specifications or in not entertaining any concession on any part. Oftentimes, upon perceiving that a specification looks impossible to execute, we tend to ask for some sort of concession. That doesn't cut it with Rolls-Royce. They only want to know how you intend to make it possible. That is one of the prerequisites to be a Rolls-Royce supplier."

IAMPL was formed in the year 2010. How has it evolved over the years?

IAMPL has evolved over the years to become a fully accredited benchmarking facility within the Rolls-Royce global supply chain. We manufacture more than 160 different high precision machined, special processed components for technologically advanced civil and defense aero-engines and others. IAMPL has evolved into positioning itself as a competitive, front-ranking supply chain partner for the industry.



Seenivasan Balasubramanian, CEO, IAMPL



Can you share with us a snapshot of IAMPL's historical milestones?

In 2010, a Memorandum of Understanding (MoU) was signed between Rolls-Royce and HAL to establish IAMPL for supporting global and local aerospace and defense requirements. By 2012, we had a custom-built factory ready for operations and 2012-13 was dedicated to the training of people, with technical support from Rolls-Royce UK. In 2013, we began manufacturing and supply of parts.

Next, we won a large project for supply of parts for the Trent family of civil aero-engines that we subsequently started to manufacture and ship, and later we won additional parts for business aviation engines.

In 2020, we began working on programs with HAL for their defence supply requirements. Presently, having successfully achieved these milestones and gaining experience in the global quality and supply chain requirements, we are also open to exploring opportunities with other engine manufacturers in the industry.

What has been your experience of assimilating Rolls-Royce's work culture and legacy?

It has been a veritable shift in attitude from day one. Rolls-Royce expects excellence in everything, whether it is in meeting the specifications or in not entertaining any concession on any part. Oftentimes, upon perceiving that a specification looks impossible to execute, we tend to ask for some sort of concession. That doesn't cut it with

Rolls-Royce. They only want to know how you intend to make it possible. That is one of the prerequisites to be a Rolls-Royce supplier. This is a different, unique experience.

Over the last ten years, we have implemented that culture here at IAMPL, which in Rolls-Royce's parlance is called the Rolls-Royce production system. It is a step-by-step approach implemented right from the stage of process design up to the point of product shipment.

How does IAMPL leverage on the legacies and strengths of both Rolls-Royce and HAL?

We do this in three primary ways: first, implementing the global best practices and standards of quality for the aerospace and defence industry. Second, is implementing the digital production system. And third, our people receive training in industry-best practices and techniques from both Rolls-Royce and HAL.

Today, we have integrated machining technologies and special process capabilities under one roof, which makes us competitive in terms of delivering zero-defect parts faster and with greater cost-competitiveness.

Furthermore, we have developed a digital-twin based manufacturing execution system (MES) with an integrated inspection system in play for every operation. This is another aspect that sets IAMPL apart from the competition. We started implementing this digitally empowered MES from 2018-2019.

Let me share an example of how the digital-twin technology works. When one starts the production of a part, an authorized document – which informs the manufacturing team about the production parameters – called a work order is released. Thereupon it is transferred to the MES, where it waits for its turn based on a predetermined schedule.

As each part undergoes different processes, each step is automatically recorded in the MES. Sometimes an integrated inspection is undertaken as part of the process or to the CMM (Coordinate Measuring Machine) system as the process mandates. The CMM, on its part, sends the measurement data to the operator's machine.

These operations happen not just once – each part undergoes several operations before it is finally shipped to the customer. Now here comes the interesting bit – each part shipped to the customer has a digital twin stored in our system. This is so that if and when the customer wants to know anything about the manufacturing process of any part at any given point of time, that data can be retrieved and shared immediately. We can proudly say that, in our industry, we have pioneered the digital twin-based manufacturing execution system in terms of integrating it with the production system and using its data for further improvements.

Going forward, we aim to use our performance data for designing of processes. We are working on an AI-based system which can provide, from historical data, best-in-class design, production, and quality processes – including that of the selection of cutting tools – for future programs.

Apart from the digital tech benefitting the customers, in what ways has it helped internally?

It has helped us reduce, and wherever possible, eliminate manual errors and intervention. This is helping our engineers focus more on process improvement. We have completed a pilot project for developing a system-designed quality plan, where the alpha-level accuracy matches or betters the manual effort. This will help us pursue excellence further. We have to demonstrate our capabilities on these parameters because Rolls-Royce continuously evaluates the performance of a vendor, and rates vendor performance on quality, delivery, cost, and management initiatives, among others. A class-leading vendor needs to score 90 percent or more, and I feel proud to say that we are today a class-leading supplier in the Rolls-Royce global supply chain.

Key Highlight:

"We have developed a digital-twin based manufacturing execution system (MES) with an integrated inspection system in play for every operation. This is another aspect that sets IAMPL apart from the competition. We started implementing this digitally empowered MES from 2018-2019."

I share this to illustrate the point that if India has to become a global hub for aerospace and defense manufacturing, and foster a supplier ecosystem to cater to global players, our engineers have the ability and the vision to do it.

What are some of the key measures you have undertaken toward ensuring safety and sustainability?

We are a highly committed to ensuring environmental sustainability. We have zero-liquid discharge systems installed in our campus, which means we don't let any wastewater or any effluent out. We recycle wastewater to reuse it for our purpose, for instance, we use it in our chiller plant that helps us for air conditioning.

We use LEDs and have adopted IoT techniques for further savings of power. That is a part of our digital drive. We also use IoT-based devices for improving our efficiency in power consumption.

In what ways do these capabilities benefit HAL?

Our constantly evolving capabilities are a natural advantage shared with HAL in all our joint programs. At the same time, there are several other manufacturing techniques where we could and do learn from them. It's all cumulative. In a way, I see this as supporting our industry ecosystem where we can become class-leading vendors to the world.

Key Highlight:

"A class-leading vendor needs to score 90 percent or more, and I feel proud to say that we are today a class-leading supplier in the Rolls-Royce global supply chain."



These are some of the developments that are interesting given that today's technologies offer a lot of opportunity to think about and do things differently. A lot of things that we could only imagine about a few years ago have become a reality today.

The safety of our employees continues to be a top priority for us. We were among the first few operations in the industry to open after the lockdown. We restarted our operation as early as April 2020. Right from the start, we have been very careful and conscious about safety guidelines and have a zero-tolerance approach to any laxity around it. We redesigned our workspaces, rescheduled shift timings, and

implemented social-distancing practices from the very beginning which included designating marked spaces for people to stand six feet apart. These guidelines also covered the vehicles that pick up our employees. We have put in place touchless operations, temperature sensors and sanitizer dispensers at all the important points in our factory.

We will continue to educate our employees about COVID-19-related risks and have safeguards in place until everyone is out of the woods here and globally.

What are the solutions and technologies you are showcasing at the Aero India 2021 show?

We will showcase our integrated capabilities of machining, special processes and demonstrate how all that is coupled with our digital manufacturing execution system, all available under one roof.

The aerospace and defence sector operates at the leading edge of technology. How do you keep your processes and capabilities at pace with the technological developments and industry demands?

Our skills, driven by our imagination, have taken us to the next level. We must continue to imagine the future, about what, for instance, could be the next frontier for better analysis and delivery. Our ability to visualize the future has helped us develop an intelligent manufacturing system.

We have to be very aware that it's our own people who will shape and steer whatever processes we are putting in place; the only thing we can give them is technological advantage, a support system and expose them to newer

Key Highlight:

"We can proudly say that, in our industry, we have pioneered the digital twin-based manufacturing execution system in terms of integrating it with the production system and using its data for further improvements."



technologies like IOT or artificial intelligence. We continuously train our people, imparting new and multiple skills with the help of industry experts. These are the things we continuously need to do as a leader.

Technologies are evolving at a faster pace today. Ten years from now, the job description of our engineers will be very different from what it is today and we need to ensure they evolve with the times. We need to keep in view the benchmarks of excellence that are going to be in play in the future.

Civil aviation has been the worst hit sector in 2020. Major OEMs like Boeing and Airbus are trying to consolidate and insource a lot more in terms of their supplies. This has had a cascading impact on component manufacturers. From an industry perspective, how do you see these headwinds impacting the supplier ecosystem?

There is no doubt that times are tough, and it is during the times of crisis that it becomes even more important to tell customers that we stand with them, and that we are not just fair-weather partners, we are your partners in progress. And that is what we are continuously doing.

Secondly, we have made eliminating waste from our system a priority; we have declared a war on waste. We put a sharp focus on any operation that can be made leaner – whether it is inventory planning or freight cost or in determining the right batch sizes, or in reducing the setup or any type of rework on the shopfloor. We are focusing on becoming an even more agile partner to our customers. That is what I meant by



supporting our customers better than before in times of crisis.

Thirdly, we have set our sights on winning new projects in both the defence and civil aviation sectors. As you pointed out, the industry is witnessing a wave of rationalization. We see it not as a challenge but as an opportunity – an opportunity to use data and digital technologies to design our processes better, to further improve our speed-to-market, and deliver new products. We demonstrated this in 2020 when we delivered much greater number of parts than we did in 2019. And we will continue to demonstrate our ability to deliver excellence in 2021 and beyond.

Key Highlight:

“Technologies are evolving at a faster pace today. Ten years from now, the job description of our engineers will be very different from what it is today and we need to ensure they evolve with the times. We need to keep in view the benchmarks of excellence that are going to be in play in the future.”

IAMPL Supports Vision of Strong, Self-Reliant Indian Defence Sector

- Kishore Jayaraman, President, Rolls-Royce India & South Asia

“IAMPL is a great joint venture success of Rolls-Royce and HAL. It has been a phenomenal journey together to drive quality parameters and execution excellence to become one of the best suppliers to Rolls-Royce. All credit to the IAMPL team for their hard work and perseverance in achieving this success, and for completing ten glorious years as leaders in the high-precision component manufacturing sector. Rolls-Royce has been partnering the Indian armed forces for over 87 years, and today, over 750 Rolls-Royce engines across 10 engine types, power Indian military aircrafts. As India pursues its self-reliance ambitions and undertakes defence modernisation programmes, Rolls-Royce is committed to providing the best value and highest quality products possible. We recognize the evolving requirements of India’s defence sector and have been working to strengthen the ecosystem for Aerospace and Defence in the country. We believe that IAMPL is well-positioned in the manufacturing ecosystem to support the vision of a strong and self-reliant Indian defence sector.”

“We will showcase [at Aero India 2021] our integrated capabilities of machining, special processes and demonstrate how all that is coupled with our digital manufacturing execution system, all available under one roof.”



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Machine Insider is a dedicated portal designed to keep the manufacturing sector in full gear. The portal will carry elements that will announce innovation, stimulate change and help the sector move forward.

The portal will reflect upon the constant developments, issues, challenges and solutions experienced by the industry, better than anyone.

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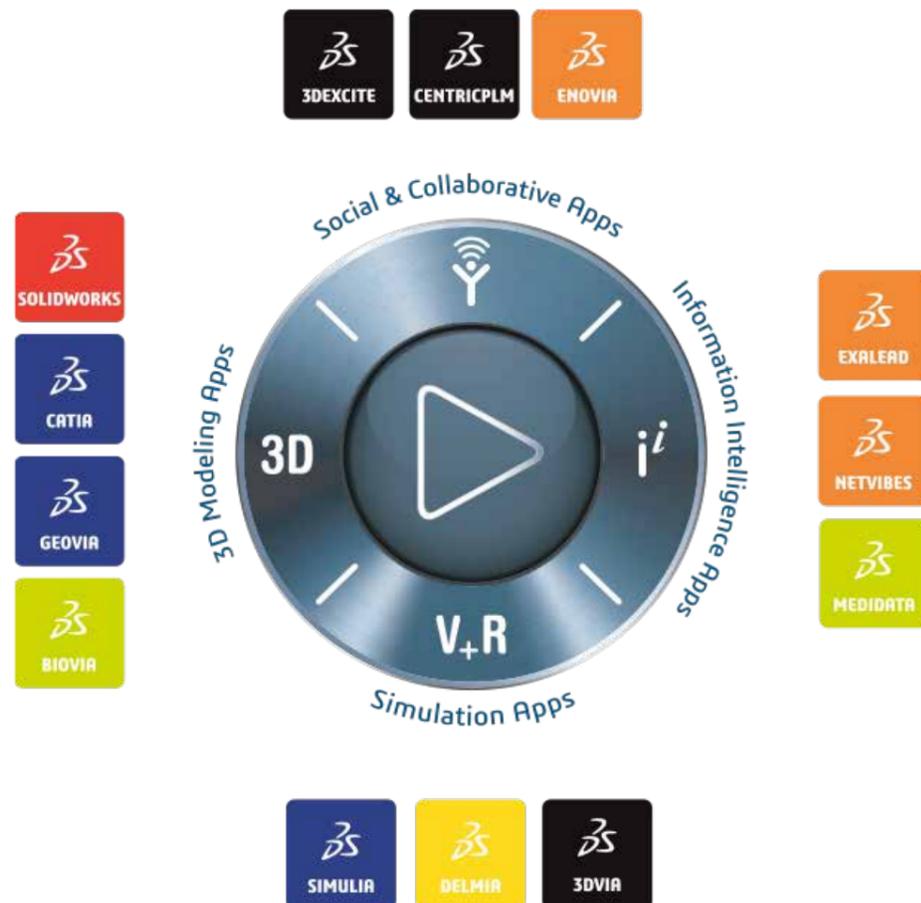
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- Information Intelligence Apps

And we serve 11 different industries with tailored Industry Solutions to address their specific challenges.



After almost a year of facing unprecedented disruptions and challenges with grit and resilience, the Aerospace and Defense (A&D) industry has started 2021 with the aim and ambition to revive and rejuvenate itself. OEMs and suppliers will need to accelerate innovation, drive efficiencies and move to the factory of the future to achieve greater agility and efficiency. This requires a new way to conceptualize, design, manufacture, test, certify and sustain new air and space vehicles. At Dassault Systèmes, we stand committed to help the industry with advanced 3D design and engineering solutions powered by our 3DEXPERIENCE platform.

- We are not only helping the Aerospace and Defense industry to design, simulate and manufacture the new generation of advanced aircrafts, but also helping them get ready for the future paradigms such as urban air mobility and vertical take-off/landings.
- We are fueling the transformation of the supply chain in the industry through effective digitalization via cloud, which enables our customers to collaborate and design in a better and faster way. A fully developed and evolved



RAVIKIRAN POTHUKUCHI
Director & Industry lead for Aerospace & Defense in India, Dassault Systèmes



supply chain ecosystem can help the industry break new grounds in its larger goal of Make in India. It means, the full utilization of the potential of virtual twins and application of model based systems engineering (MBSE) in the development of new aircrafts, new defense systems or next generation of commercial and defense ready drones.

- The growing focus of the Government of India on the space sector development will require intelligent use of cloud based 3D design and engineering tools to unleash the full innovation potential for developing the next generation of ingenious rockets and satellites. At Dassault Systemes, we are working closely with the Government to democratize 3D design and engineering tools through greater accessibility and availability of the technology for upcoming defense corridors, MSMEs and startups in India.
- Apart from the MSMEs, the startups in this industry are also a major drivers of innovation, especially in Drones or Unmanned Aerial Vehicles (UAVs). With the right support, mentoring and enablement, the current generation of startups can go toe-to-toe with the industry veterans and come up with such breakthrough ideas that fits the true definition of 'indigenous'.
- Upskilling and reskilling the Indian engineering talent will be crucial for the ecosystem's future trajectory. Dassault Systemes is working closely with various State Governments (Karnataka, Andhra Pradesh) to set up dedicated Center of Excellence that can provide the requisite training to the current and future generation of engineers, in the Aerospace and Defense industry.

As the leader in the sector for over three decades, we, at, Dassault Systèmes work with companies of every size and help them reinvent their operational models, product blueprints and delivery roadmap. At Aero India 2021, we were at booth number A6.6 & A6.8– where we showcased our technology and shared insights on how the Aerospace and Defense sector can thrive, revive and rejuvenate in the post-COVID word order.

Dassault Systemes at Aero India 2021:

The key Industrial Solutions Experience of Dassault Systemes for the Aerospace & Defense sector includes:

- **Build to Operate** industry solution experience based on the 3DEXPERIENCE® platform, accelerates meeting production targets and increases manufacturing capacity. The solution offers aerospace Original Equipment Manufacturers (OEMs) and suppliers the ability to implement lean practices, integrate new technologies and meet demand without sacrificing either quality or schedule.
- **Ready for Rate** enables flexible production while delivering products with first-time quality, on budget, and on schedule. Aerospace manufacturers can take advantage of the 3DEXPERIENCE® platform to implement lean practices that remove waste in critical areas of manufacturing. Planners can define and validate manufacturing processes down to individual work instructions virtually to eliminate potential issues and waste before they occur.
- **Engineered to Fly** allows small and medium suppliers to grow their business profitably from bid to delivery. By connecting the dots, the 3DEXPERIENCE® platform reduces complexity to develop new bids, collaborate during product development and facilitate manufacturing ramp-up.
- **Reinvent The Sky** supports startups, small and medium enterprises and OEMs in developing disruptive solutions: from small, light aircraft to electric vertical take-off and landing, as well as space launchers and satellite propulsion. Companies can accelerate the product lifecycle from concept to certification, and gain significant advantage by being the first on the market with their prototype.
- **Co-Design to Target** allows Original Equipment Manufacturers (OEMs) to integrate disparate tools, organizations and processes into a single stream to optimize form, fit and function in an integrated System Digital Mock-up (DMU). This System DMU can avoid many of the integration issues that significantly impact the cost and schedule of a program.

Please connect with us on
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3DS at Aero India 2021.

Industry News | INTECH ADDITIVE SOLUTIONS

Poeir Jets selects Intech To Make Parts for Heavy-Lift Drones

Intech Additive Solutions also launches its Large Format range of Metal 3D Printers - the iFusion LF series

Bengaluru, 18 January, 2021: Intech Additive Solutions Pvt Ltd.(Intech), the first Indian OEM successful in developing and supplying 3D metal printers based on laser powder bed fusion technology (LPBF) for industrial manufacturing, has announced the expansion of its range of Metal 3D printers with the launch of the 'iFusion LF series', its Large Format range of Metal 3D Printers with a high build rate for cost effective manufacturing.

The 'iFusion LF series', entirely developed and built at Intech's facility at Bengaluru, has a range that starts with a single 500W laser printer and is upgradeable to a quad laser configuration with 700W and 1000W lasers if required. The LF series of machines require the lowest initial investment to procure and install, compared to other similar-sized metal 3D printers, along with locally available spares and support.

This 'Made in India' product from Intech is a result of extensive research, development and innovation spread over the past almost 4 years. The 'iFusion LF series' large format 3D printers, tightly integrated with Intech's software suite for Metal Additive Manufacturing with a build volume of 450x450x450mm, aims to deliver robustness and productivity at a competitive MHR and lowest cost per part (CPP).

"Indian companies have a huge interest in 3D Printers that build parts larger than 400mm. All these machines must be imported and are prohibitively expensive. There are

other issues like long lead times for support and spares, making Indian companies ultimately settle for the less expensive mid-sized machines. The 'iFusion LF Series' amply fills this void." Said Pradeep Nair, Vice President -Hardware Sales, Intech."The system supports a wide range of materials like Aluminium, Titanium, Steel, Inconel and Cobalt

Chrome addressing the needs of industries such as Aerospace, Automotive, General Engineering, Tool & Die and Medical Market segments in India and abroad."

Intech has already signed a definite agreement with Bengaluru based Poeir Jets, the first company from India into the design, development, and manufacture of propulsion systems for unmanned aerial applications and micro-Jet engines for UAS (unmanned Aerial Solutions) and Heavy lift Drones, for supply of its LF series. With the success of the 3D printed parts from Intech, Poeir Jets have begun printing larger parts with an 'iFusion LF series' system for their production needs.

"The 3D printed parts from the iFusion series performed exceptionally well during the testing phases and proved to be of production quality. Intech's 3D printers helped us achieve the required scale for commercialising manufacturing and ensuring lower cost per part. We are now moving to printing parts on Intech's LF series of machines. The LF's larger build envelope suits our needs to print parts for our engine and Hybrid Drones.

This, coupled with the lower costs compared to imported systems, local spares and support availability among other things, make it an automatic choice for us" said K.S. Swami, Director, Poeir Jets.

"The Ministry of Electronics and Information Technology has identified Additive Manufacturing (AM) as a critical focus area. The Government plans to promote various AM sector verticals including machines, materials, software, and design methodologies to leverage new and untapped business opportunities. This initiative will prepare the Indian manufacturing sector for Industry 4.0 and evolve an integrated approach towards this emerging technology," said Sridhar Balaram, CEO of Intech." Intech's range of metal 3D printers is indigenously designed and manufactured for both the Indian and global markets. In this regard it is "Made in India, Built for the World" and captures the essence of the Aatmanirbhar initiative of the Indian Government. We have an excellent team in place and are confident of enhancing and growing the Indian AM ecosystem with our range of metal 3D printers, and end-to-end metal AM solutions."

Intech is a forerunner in the field of Metal 3D printing, providing leading-edge hardware, software, services, and solutions. It has the largest installation of commercially available metal 3D printers complemented by a sophisticated design studio for the development of fully functional components. With strategic investment from DMG Mori, Intech's objective is to power the development of an ecosystem for the industrialization of Additive Manufacturing.



Launching the Eplan Partner Network

The new partner network that EPLAN founded towards the end of 2020 pools the worldwide expertise of its cooperation partners to increase the benefits for customers.

The EPLAN Partner Network (EPN) defines common binding goals for boosting integration along the value chain. Users profit from this increase in continuity and integration, particularly in the areas of PLM, ERP and PLC as well as simulations. The in-depth interchange amongst the manufacturers makes it easier for customers to integrate the large number of systems used on the market.

At the turn of the year 2021, Eplan, the engineering solutions provider, started its Partner Network (EPN). It provides a framework for existing and new partnerships to jointly develop and market interfaces. The EPN partnership is based on common binding goals for enhancing and supporting interfaces. This commitment both increases customer benefits and enhances quality.

"The effective interaction of various applications is particularly important for our customers. As part of the EPN, we will therefore be focusing on joint development of integrations as well as quality assurance and support," says Eplan CEO Sebastian Seitz.

Maximum advantage via perfect interaction

Sebastian adds, "Aside from using Eplan software, our customers also use a variety of other software applications from various manufacturers in the ERP, PLM, PLC and simulation environments

to name just a few. The effective interaction of these various applications is especially important to them. As part of the EPN, we will therefore be focusing on joint development of integrations as well as quality assurance and support."

Integration is everything

Asked about the motivation to found the new EPLAN Partner Network, the company's Senior Vice President Strategy & Corporate Program Marco Litto says: "The professionalization of our network systematically increases the benefits for end users." As Litto explains, the goals are ambitious: "The connectors between our systems should be planned, developed, tested, supported and marketed with at least the same rigour and soundness that we are accustomed to with our own solutions. Together with our EPN partners, it will allow us to achieve a completely new level of customer focus." Open interfaces and modern integrations will create a wide range of opportunities that users of the various software solutions will benefit from, not to mention the partner companies themselves.

Prestigious companies on board

Global key players of automation including Bosch Rexroth, B&R, Endress+Hauser, Festo, ifm electronic, Mitsubishi Electric, Phoenix Contact, Pilz, Rittal and Rockwell Automation are already

Key Highlight:

The entire group employs 12,100 people and generated revenues of around €2,6 billion in 2019. For the twelfth time in succession, the family business has won the accolade 'Top German Employer' in 2020.



The Eplan Partner Network (EPN) pools the expertise between cooperation partners with defined development goals.



Eplan CEO Sebastian Seitz



Senior Vice President Strategy & Corporate Program Marco Litto

taking part in the initiative. Software partners – for example configit, Contact Software, encoway, Gain, ISD, ISG, keytech, machineering, Procad, Quanos and SAE – are also participating in the new network. Both German and international companies are being approached to participate too, and Eplan is currently in talks with many of them. For instance, UDMTEK in Korea was the first Asian company to seal the membership deal – others are certain to follow.

The best of all worlds

Rockwell Automation USA Vice President Global Business Development Tom O'Reilly says: "A digital thread of data within and across organizations is one of the key requirements to bringing the Connected Enterprise to life. Together with Eplan, we support companies through their digital transformation by enabling data consistency, improving efficiency of engineering processes and shortening time-to-market."

Also Bosch Rexroth got involved right at the network's start. As the company's Vice President of Sales Steffen Winkler explains, "Configuration of automation solutions and the dynamic provision of exact device data are essential with regards to Industry 4.0. The Bosch Rexroth ctrlX Configurator enables easy configuration of complete ctrlX AUTOMATION solutions. By directly integrating our configurator into the Eplan Platform, users will receive all device data of the configured system topology including detailed product lists and CAD data at the touch of a button. This integration ensures full data consistency and reuse of product data throughout the entire digital design phase."

In Korea, UDMTEK CEO Gi Nam Wang also has good reasons for joining, saying: "We have decided to partner with Eplan through EPN to leverage our industry-leading offerings and combine them with Eplan's best-in-class engineering platform. We are excited to partner with a world-class company as we embark on our next phase of growth and innovation."

Eplan is making it easy for users and

companies alike. A partner area on the website provides particulars for companies involved in the Eplan Partner Network, information about integrations, contact persons and current news.

In the era of the digital transformation, when cloud solutions are playing an increasingly crucial role, it's becoming more and more important for providers to coordinate integrations across companies. Eplan CEO Seitz says, "With the EPN, we're maximizing the overall benefits of our own solutions and those of our partners in the ecosystem of industrial automation for shared customers. Together we're creating a win-win situation for both customers and partners."

EPLAN provides software and service solutions in the fields of electrical, automation and mechatronic engineering. The company develops one of the world's leading design software solutions for machine and panel builders. EPLAN is also the ideal partner to streamline challenging engineering processes.

Both standardized as well as customized interfaces to ERP and PLM/PDM systems ensure data consistency along the whole value chain. Working with EPLAN means boundless communication across all engineering disciplines. No matter whether small or large enterprises: Customers can apply their expertise more efficiently. EPLAN wants to grow further with customers and partners and pushes integration and automation in engineering forward. Worldwide, EPLAN supports over 58,000 customers.

EPLAN was founded in 1984 and is part of the owner-operated Friedhelm Loh Group. The Friedhelm Loh Group operates worldwide with 12 production sites and 96 international subsidiaries. The entire group employs 12,100 people and generated revenues of around €2,6 billion in 2019. For the twelfth time in succession, the family business has won the accolade 'Top German Employer' in 2020. In addition Friedhelm Loh Group was recognized as 'Top vocational trainer' according to a study of Deutschland Test and Focus Money.

Key Highlight:

The professionalization of our network systematically increases the benefits for end users.

Q&A | INDOSPACE

Supply Chain's Resilience Samurai Begins 2021 On A High Note

IndoSpace, the winner of our Resilience Samurai award in supply chain, leveraged digital tech to ensure employee safety and business continuity in 2020. The industrial real-estate major is prepared to make the best of 2021 and beyond.

IndoSpace is a leading investor, developer and manager of Grade A industrial and logistics real estate in India. Promoted by Everstone Group, GLP and Realterm, IndoSpace continues to develop new facilities to cater to the needs of its clients.

IndoSpace won DMI's Resilience Samurai Award in the Supply Chain category this year.

Presenting, a Q&A with Rajesh Jaggi, Vice Chairman - Real Estate, The Everstone Group.

Can you give us an idea of the range and the scale of your operations in India?

IndoSpace is the pioneer and largest investor, developer and manager of Grade A industrial and logistics real estate in India and has taken total commitment to India to above US\$ 3.2 billion. We currently have 38 industrial and logistics parks, spread over 40 million square feet in India. These facilities are in and around major industrial corridors and consumption hubs — the Delhi NCR, Mumbai, Pune, Bengaluru, Chennai, Ahmedabad, Coimbatore, Anantapur, Rajpura – and are well connected through rail, road, air, and sea.

Thirty-eight percent of our customer portfolio comprises Fortune 500 companies from across diverse sectors such as automotive, auto components, engineering, 3PL, Consumer Durables, Retail, and Ecommerce. 30 percent of our leased portfolio

comprises of companies undertaking industrial and light manufacturing, and out of this 30 percent, engineering and automobile sector contribute more than 80 percent.

The recent couple of years – particularly 2020 – have been harsh for India's industrial economy. As being among the largest players in the industrial warehousing space in India, how did that impact you and how have you coped with it? How have you helped your customers and vendors cope with these challenging times?

The year 2020 has been full of trials and tribulations across the globe and our sector was no exception as far as the impact of the pandemic is concerned. However, as the warehousing sector is categorized under essential services, our logistics parks were operational during the periods of successive lockdowns in India.

Taking a cue from our international partners, IndoSpace had taken proactive measures to prevent the spread of the virus, in February 2020 itself. We started periodic communication, which continues till today, about protocols of international standards that we had set in motion and assured our tenants about the preventive measures in place. We activated our business continuity plan in the middle of March for continuing the growth, ensuring service excellence and safety; and normalizing business as soon as possible.

We prepared, circulated and implemented new standard operating procedures (SOPs) in the times of COVID for smooth operations of our customers. IndoSpace partnered with CBRE, Deloitte and Microsoft for these protocols and our SOPs are one the best in the industry which helped us bounce back faster and in an efficient way. We continue to monitor and strictly adhere to the set safety protocols. We also ramped up digitization across functions and processes in the company for seamless operations. In the early months of the lockdown, IndoSpace also launched the Tenant Communication App for easier and faster communication with our customers and for responding quickly to their queries and requests.

This apart, employee health and morale became even more critical during the lockdown and as we slowly resume office operations. Several communication, engagement and health measures were taken up, including tie-ups with a health support company, enlisting online doctor support, Covid-19 testing at home, personal coaching and counselling, and employee helpdesk and emergency numbers.

This year you won the Resilience Samurai Award, an award given by MeshMix Media, our publisher, for leadership in business continuity. Can you share with us an overview of the business continuity practices and implementation that you did this year?

Our early response to the pandemic ensured business continuity for all our tenant partners, enabling them to lead in the new normal. As mentioned above, we provided value added solutions in our parks and adopted international best practices owing to our global partnership.

All IndoSpace parks were operational during the lockdown, and we followed all government protocols to ensure safe and infection free workplace.

A 'Crisis Management Plan in response to Covid-19' was immediately drawn up and is being implemented at IndoSpace offices and parks. The plan specifically details out all protocols to be followed by IndoSpace as well as by the tenant employees such as temperature checks for all, hand washing facilities, sanitizing the areas, isolation facilities for those who develop symptoms while at work, etc.

In a challenging year like 2020, our land bank exceeded 1,600 acres, completed portfolio reached 17.6 million sq. ft and leased portfolio crossed 100 customers.

What have been the key learnings for you from this year's challenges?

Warehousing providers should have the ability to quickly scale up or down based on the demand and supply fluctuations. Going forward, the focus will be now to maintain the highest degree of hygiene and safety standards in the warehouses, therefore organized national level players will have an edge over the unorganized sector. Safety measures should remain high priority so that unforeseen situations in future don't impact manufacturing and logistics operations.

Warehouses need to constantly upgrade themselves in terms of technology, safety, sustainability and network.

This year we have introduced many technology-led solutions at our parks to enable accessibility for all stakeholders, and to make operations contactless, more efficient, and data-driven. We are also working on our Smart Parks initiative which includes gate management, truck time management for reducing TAT, smart water and electricity meters, drone based construction and operations management, facility management through online apps, etc. These breakthrough solutions will be based on IoT.

Now as the industrial stakeholders have started to learn to operate more in alignment with the new normal, how do you see the year 2021 and beyond in terms of customer offerings, new innovations, launches, and investments?

The warehousing and logistics sector is poised for further growth this year and could play a major role in rebuilding India's economy post Covid-19.

With the pandemic, we see a need more than ever for a shift towards Grade A warehouses.

National players will have to step up and make sure that for efficient last mile deliveries, there is substantial presence of superior infrastructure and warehouses in tier II and III cities as well in addition to the eight top regional hubs of Guwahati, Lucknow, Jaipur, Indore, Nagpur, Hosur and Coimbatore as mentioned by in JLL report. At IndoSpace, Tier II cities such as Rajpura, Coimbatore and Anantapur are seeing upward movement in the development and absorption of Grade A warehousing.

Cold storage facilities and temperature-controlled warehouses, especially in the pharmaceuticals and agriculture space, are a key requirement today. With India's role expected to expand further in manufacturing and global distribution of pharma products, the country requires associated infrastructure to support a cold supply chain. Keeping this in mind, IndoSpace is proud to have ventured into this space through a partnership with Kool-EX, a leading pharma cold chain logistics service provider. We will build customized, GDP/GWP-compliant, temperature-controlled pharma distribution centers across the country. Kool-EX and IndoSpace will jointly design and set up three warehouses in the first phase close to Mumbai, Delhi and Bangalore. With 36,000 pallet positions in each warehouse, they will be the largest standalone cold chain facilities in India.

Another focus, as I have already mentioned, will be to maintain the highest degree of hygiene and safety standards in the warehouses, therefore organized players will have an edge over the unorganized sector.

We are confident about India's growing economy as it is one of the largest consumption markets in the world. With consumption, the requirement for storage and warehousing is expected to spike up, and we are well positioned to provide world class warehousing and industrial parks infrastructure in India due to our decade long experience, global best practices and environmentally sustainable operations.

Key Highlight:

IndoSpace, Tier II cities such as Rajpura, Coimbatore and Anantapur are seeing upward movement in the development and absorption of Grade A warehousing.



Rajesh Jaggi, Vice Chairman - Real Estate, The Everstone Group

Industry News | KBL

KBL's submersible pump-sets get renewed BIS Certification and BEE Star Rating

Renewal certification from BIS and BE Estar rating for 320 and 45 KBL pump models, respectively

Mumbai, 11th January, 2020: Kirloskar Brothers Limited (KBL), the leading pump manufacturing company in India, has recently received renewed certification from the Bureau of Indian Standards (BIS) and Bureau of Energy Efficiency (BEE) Star Rating for 320 and 45 models of its submersible pump-sets, respectively. These water and oil-filled bore-well submersible pump-sets are mainly used in the agriculture and domestic user segments.

The BIS certification is a true indicator of KBL's trusted and assured superior product and service quality. Meanwhile, the BEE star rated pumps result in power and energy bill savings, and the certification truly underlines KBL's continued commitment towards providing value to its customers through its energy-efficient pumping solutions. The submersible pump-sets are suitable for bore-wells ranging 4-8 inches in size.

BIS is a central body responsible for standardization, marking and quality certifications of goods. The Product Certification Schemes of BIS are aimed at providing third party assurance of quality, safety and reliability of products to the customer. On the other hand, BEE ratings are issued by the Bureau of Energy Efficiency (BEE), an Indian government agency under the Ministry of Power. The BEE star ratings help consumers understand the level of energy efficiency of the appliances.

KBL is a world-class pump manufacturing company with expertise in engineering and manufacture of systems for fluid management. KBL has been at the forefront of manufacturing energy-efficient, low maintenance and easy-to-operate pump-sets in the market with key focus on sustainability.

KBL is the flagship company of the \$2.1 billion Kirloskar Group. The company was established as Kirloskar Brothers in 1888 from which various group companies emerged later. Kirloskar Brothers was officially registered as a legal entity into Kirloskar Brothers Limited on January 15, 1920. KBL, a global conglomerate, provides complete fluid management solutions for large infrastructure projects in the areas of water supply, power plants, building & construction, process industries, irrigation, oil & gas and marine & defence. It engineers and manufactures industrial, agricultural, and domestic pumps, valves and hydro turbines. It is also India's largest centrifugal pump manufacturer with eight manufacturing facilities in India along with other international subsidiaries and operations in the Netherlands, South Africa, Thailand, the United Kingdom and the United States of America. KBL has 12,700 channel partners in India and 80 overseas and is supported by the best-in-class PAN-India network of authorized service and refurbishment centers.

All manufacturing plants of KBL have the necessary Quality, Environment, Occupational Health & Safety and Energy standard certifications under the Integrated Management System (ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 and ISO 50001:2018). The company's Kirloskarvadi plant is a state-of-the-art integrated manufacturing facility, which houses Asia's largest hydraulic research centre with a testing facility of up to 5000 kW and 50,000 m³/hr.

KBL is the only pump manufacturing company in India and the 9th in the world to be accredited with the N and NPT certification by the American Society of Mechanical Engineers (ASME).



Key Highlight:

The BIS certification is a true indicator of KBL's trusted and assured superior product and service quality.

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Industry News | KHS

Strong Presence

KHS provides world-class quality and training in the growth region of Africa and the Middle East, say Markus Auinger, EVP Sales, KHS MEA, and Jörg Thomas, MD, KHS South Africa

KH S provides quality made in Germany and local service teams on the African continent and in the Middle East. In doing so, the Dortmund systems supplier scores both with global key accounts and small and medium-sized companies and startups. Presenting, excerpts of a talk with Markus Auinger, executive vice-president for Market Zone Middle East/Africa, and Jörg Thomas, managing director of KHS South Africa.

What significance does the market zone of Africa and the Middle East hold for KHS?

Auinger: This market zone makes up 15% of KHS' total sales. The region is the most important market for us as regards PET lines in particular thanks to the strong growth in this segment. Unlike empty cans, PET is readily available throughout the whole of Africa – and PET systems require much less capital than glass lines as the sum of investment is lower. Small and medium-sized startups thus focus on PET, allowing them to generate turnover very

quickly. The glass segment is firmly in the hands of our financially strong global key accounts, among them AB InBev, Heineken, Coca-Cola, Diageo, Pepsi and Groupe Castel, that have been present and established in Africa and the Middle East for decades.

How has KHS' business in Africa and the Middle East developed over the years?

Thomas: KHS enjoys an excellent reputation here for good reason. After all, we were the first engineering company to sell filling systems on this continent. We opened our own branch office in South Africa as early as in 1971. Some machines have been in operation for over 30 years – and are still running round the clock six days a week. On average our installed base is about 17 years old. The machines are serviced by KHS engineers and we can supply the necessary spare parts, regardless of how old the machines are.

Which particular challenges does the region pose?

Auinger: In order to understand the challenges presented by our market zone, you have to bear in mind that on the one hand – take the Emirates, Saudi Arabia and Mauritius, for instance – it includes some of the richest countries in the world. On the other, it also has most of the world's poor and poorest nations. There's thus a big economic divide. There're a lot of underlying problems that have to be dealt with here, too. These include incalculable climatic, economic and political risks, wars, terrorism and famine but also import restrictions and the sugar tax, to name but a few examples. We have to constantly adapt to changing situations and come up with new ideas. It's therefore all the more important that we're always accessible for our customers at a local level and able to give them the support they need at all times.

In which countries is KHS particularly strongly represented and why is this so?

Auinger: A few years ago there were still a large number of regions we hadn't yet covered. Our systems and solutions are now installed in every single country in our sales region and looked

after by our engineers. We're extremely successful where our branch offices are. However, we also have very good business relations with customers in Cameroon, Tanzania, Mozambique, Iraq, Afghanistan, Pakistan and other countries with a turbulent history. At the moment, we've a lot to do in the Maghreb states thanks to the strong market growth there. In relation to the entire region, the overall market growth is less strong that you might imagine, however. This is due to the fact that on the one hand you always have countries that are booming. These are juxtaposed by nations on the other that suffer a setback following a very positive development. One example is Angola that for a long time underwent a very good development. But for four years now there's been more or less nothing doing. Saudi Arabia is investing little at the moment, too.

Which types of machine are in particular demand in Africa and the Middle East? What kinds of beverage are KHS systems used for?

Thomas: In our market zone we do about 95% of our business in turnkey lines – unlike in sales regions such as the USA where up to 50% is attributable to single machines.

Auinger: While non-alcoholic soft drinks in cans and PET bottles are chiefly consumed in the Middle East, on the African continent returnable glass bottles for carbonated beverages have a long tradition. This is clearly changing: in North Africa and the Middle East, for us we see a rapidly growing market for still water in PET bottles. Combined with the increasing demand for soft drinks in the Sub-Saharan, the PET container segment here now has a market share of about 80%.

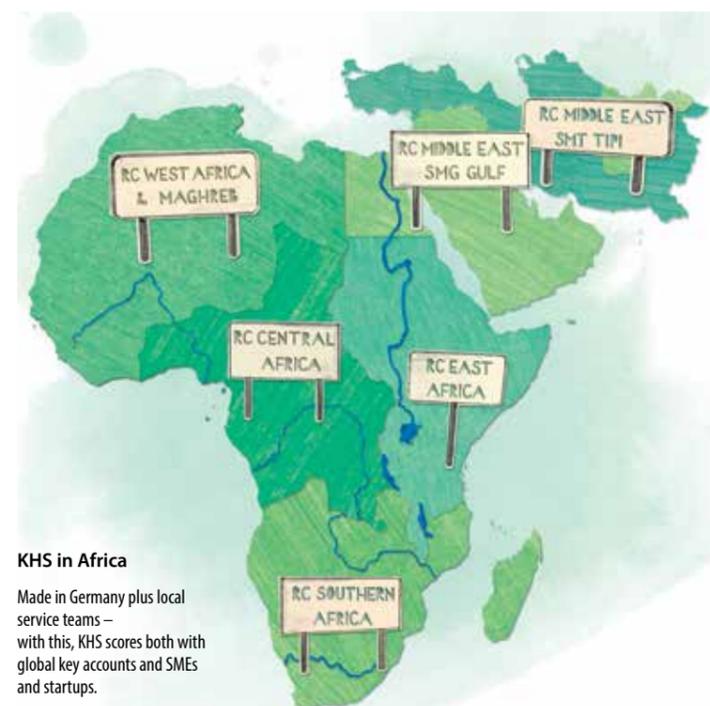
How do the requirements of bottlers here differ from those in other regions?

Auinger: Our customers need more advice on project planning and implementation. In Africa and the Middle East we're seen as a guarantee for the success of the beverage producer. This explains why turnkey lines are procured instead of single machines: with these, the responsibility for the functioning of the technology lies with a single source. Our customers value the stability and high efficiency of our machinery and reward this quality with great loyalty. Our customers also require much more support with the maintenance of their plant technology. In Central and East Africa especially we thus conclude extremely highly devised service level agreements, in which we define a certain level of efficiency for our systems over a period of many years.

Which strategy has KHS adopted in this market zone?

Auinger: In 2013 the decision was made to strengthen our sales regions and build up technical expertise and capacity on a local scale. In the same year we founded our own regional center in Kenya. Since then we've been continuously checking where branch offices or service hubs would be prudent in line with our market development and then establishing them. In 2016 we split the market zone into six clusters, each of which is managed by a regional center (RC). West Africa and the Maghreb states have been supported from Europe to date but here, too, we're soon to show local presence by setting up a separate branch office for this region.

Thomas: The aim of these regional hubs – apart from sales organization – is to transfer our local service knowledge to the KHS Group's entire product



KHS in Africa

Made in Germany plus local service teams – with this, KHS scores both with global key accounts and SMEs and startups.

Source: KHS Group

Key Highlight:

In 2013 the decision was made to strengthen our sales regions and build up technical expertise and capacity on a local scale. In the same year we founded our own regional center in Kenya.



Jörg Thomas, Managing director of KHS South Africa



Markus Auinger, Executive vice-president of Market Zone Middle East / Africa

KHS Group

The KHS Group is one of the leading manufacturers of filling and packaging systems for the beverage and liquid food industries. The KHS Group includes the following companies: parent company KHS GmbH, KHS Corpoplast GmbH and numerous subsidiaries outside Germany, located in Ahmedabad (India), Sarasota and Waukesha (USA), Zinacantepec (Mexico), São Paulo (Brazil) and Suzhou (China).

KHS manufactures modern filling and packaging systems for the high-capacity range at its headquarters in Dortmund, Germany, and at its factories in Bad Kreuznach, Kleve, Worms and Hamburg, where the group's PET expertise is pooled. The KHS Group is a wholly owned subsidiary of the SDAX-listed Salzgitter AG corporation. In 2019 the KHS Group and its 5,149 employees achieved a turnover of around €1.260 billion.

portfolio. This allows us to provide proximity to the customer and establish a level of expertise in the region which enables local teams to also install and commission our machinery besides just servicing it. Part of our strategy of regionalization is training, this offered not just to our own employees but also to many local customers. We've already opened a KHS training center in South Africa to this end. East and Central Africa are to follow, so that by 2022 we'll have a training structure in place that covers the entire continent.

Auinger: We've also set up a uniform SAP system. This not only facilitates administration and controlling but also functions as a platform for communication to coordinate work locally between the various KHS subsidiaries. Because we've identified regionalization as the key to our success, our endeavors have by no means stagnated but instead continue to be permanently further developed and optimized.

What role do employees play in your strategy of regionalization?

Auinger: Up until ten years ago engineers had to be sent out from Europe; we now employ over 250 people throughout the entire region. This number has more than tripled in the last five years. Ninety-five percent of our workforce is comprised of local specialists. There are lots of people here with ambition who have great potential. We're always nurturing our local personnel by inviting them to Germany for a few weeks each year to take part in training courses, for instance.

What role do the prevention of waste and protection of the climate play on your markets?

Thomas: In Africa people are used to working with returnable bottles in the glass segment. In the fast-growing PET segment it's often not possible to set up a closed-loop system. More action needs to be taken here. Our big customers practice sustainability only if costs remain neutral for them. The willingness to make improvements is limited as long as governments don't intervene. That's why

international politics needs to bring pressure to bear on the countries of Africa. There are a number of positive examples, however. In Kenya, for instance, the production, import and use of plastic bags have been prohibited since August 2017. The recycling rate for PET bottles is over 70% in South Africa, with much of the recycled material going to the clothing industry.

Auinger: Our influence as machine manufacturers is limited to the provision of suitable technologies. We're actively forging ahead with reductions in bottle weight and packaging materials, for example. And the high efficiency and low consumption of our KHS systems also actively contribute to the protection of the climate.

How is the corona crisis affecting Africa and the Middle East in particular and what does this mean for KHS' business?

Thomas: The wave of infection hit our regions later than Europe. Despite this, very extensive measures were adopted early on in some places, such as in South Africa. This not only introduced one of the world's strictest lockdowns but also prohibited alcohol and tobacco – not only for consumption but also in production.

Auinger: The corona crisis has hit us hard in our market zone. While our global key accounts have suspended their investments for the time being, our more regional private customers are continuing to invest. We're also affected by travel restrictions. We're therefore left to our own local devices much more than before. We can have greater confidence in ourselves and simply get on with the job using our local teams. Our service engineers in Nigeria have thus installed complex machinery and passed the acceptance tests without any outside help. In Saudi Arabia and Mozambique customer employees have completed the commissioning process on their own with the help of our remote support unit. We feel confirmed in our strategy of regionalization adopted over the past few years. It enables us to provide equipment and support to our customers locally despite the current situation.

Key Highlight:

The corona crisis has hit us hard in our market zone. While our global key accounts have suspended their investments for the time being, our more regional private customers are continuing to invest.

Industry News | FPT INDUSTRIAL

FPT Industrial Powers Sustainable Tractor Of The Year

Even more, out of 18 candidates for the Tractor of Year 2021 awards, seven were powered by FPT Industrial engines

FPT Industrial powers the 'Sustainable Tractor of the Year 2021', the CLAAS AXION 960 CEMOS. The winning tractor is fitted with the latest generation of FPT's Cursor 9 Stage V engine. This 6-cylinder engine delivers maximum power of 327 kW/460 hp at 1,800 rpm and maximum torque of 1,860 Nm at 1,400 rpm.

It's also worth remembering that out of 18 candidates for the Tractor of Year 2021 awards, seven were powered by FPT Industrial engines: Class Axion 960 CEMOS - Cursor 9, CASE IH Quadtrac 620 - Cursor 13, Landini Serie 7 V Shift - N67, New Holland T6.160 - N67, STEYR 6240 Absolut CVT - N67, CASE IH Vestrum 130 CVX Drive - N45, Valtra F105 - F34. This is the second time the 'Sustainable Tractor of the Year' has been awarded, and it is intended to honor tractors that stand out for their particularly sustainable technology. The first edition of this category awarded the New Holland Methane Power tractor concept powered by the FPT Industrial N67 Natural Gas.

"With the Claas AXION 960, and thanks to the CEMOS system, a big step towards more sustainable farming has been achieved. All the technology available on this tractor is easier

to use than ever. The optimization of all the technology and all the electronics, including the optimization of tyre pressures, allows to this tractor to achieve remarkable fuel savings and a much more efficient in-field performance in all working condition", explained the international jury of 26 specialist journalists.

Normally, the winners are awarded every year at either the EIMA or Agritechnica tradeshows. This year, due to the COVID-19 pandemic, for the first time the award ceremony took place virtually and was streamed as a live broadcast.

"We are extremely proud to be an integral part of this great achievement," says Marco Zanelli, Head of Market Segment Off-Road. »Cursor 9's DNA, in terms of high performance in a compact layout, top class transient response and low fuel consumption, robustness and reliability in all working conditions, proved, once again, to be the best solution for all off-road vehicle manufacturers aiming to reach top performance and true economic and ecological sustainability.

The Cursor 9 is a member of FPT Industrial's flagship engine family for off-road applications, designed to provide high performance for applications with highly intensive missions, ensuring low operating costs and maximum productivity. Key features include: top class performance with up to +9% power density vs. the market average in the nine liter.

range; fast load response and maximum in-field productivity thanks to high torque availability and an eVGT; high system efficiency and low fluid consumption with EGR-free combustion and second-generation Common Rail; low running costs with FPT's exclusive, maintenance-free Hi-SCR2 after-treatment solution; and proven system reliability thanks to robust and lean design and EGR-free combustion.



The Eplan Partner Network (EPN) pools the expertise between cooperation partners with defined development goals.

Industry News | **NORD**

Drive Solutions For F&B

NORD brings forth several solutions for the food and beverage industry

Thousands of installed drive systems are making NORD DRIVESYSTEMS one of the world's leading suppliers of drive solutions across all branches of the food and beverage industry. Based on their extensive knowledge of applications and the versatile modular system, NORD drive experts are providing complete drive solutions for all branches of the industry from a single source.

Reliable drive solutions are an essential requirement for the entire value creation chain throughout the food and beverage industry. From storing, conveying and processing of raw materials to process engineering and filling right up to packaging and logistics - drive systems tailored to the specific application are required. They need to balance hygiene requirements, technological requirements and energy efficiency with product protection and demanding environmental conditions such as heat, cold or moisture in an economical way. In order to meet these requirements, NORD DRIVESYSTEMS designs reliable and high-quality complete systems consisting of geared motors, frequency inverters and intelligent software.

Gentle and powerful pumping

Amongst others, NORD DRIVESYSTEMS supplies pump drives with special functions tailored to the pumping medium such as high starting torques or soft start. Wall or motor-mounted frequency inverters facilitate decentralised automation concepts and mobile pumps with intelligent control concepts. In combination with the nsd tupH surface treatment, smooth surface motors and two-stage bevel gear unit-based drives are created that combine light weight and high efficiency in a large number of variants with corrosion protection and hygienic smooth surfaces that are easy to clean. Even without a fan, they are achieving a considerably better heat dissipation than stainless steel drives while still featuring a similar corrosion protection. These properties are also required for drives in machines and systems for cutting and dosing as well as in CIP and SIP areas. Whether it comes to heating, cooling or freezing - NORD drive solutions are at home in all temperature zones and can be designed for extreme application conditions in cooking and baking lines or deep-freeze systems.

Agitating in all sizes

For processing steps such as agitating, mixing or kneading, NORD is building high-performance gear motors in all sizes with especially resilient output shaft bearings for high loads. For this application area, MAXXDRIIVE® industrial gear units with output torques from 15 to 282 kNm are especially suitable. They can now also be equipped with the new SAFOMI adapter: a flange with an integrated



For processing steps such as agitating, mixing or kneading, NORD builds high-performance gear motors in all sizes with especially resilient output shaft bearings.



The nsd tupH surface treatment provides outstanding corrosion protection for drive components in wash-down-optimised cast aluminium housings for the food and beverage industry.

oil expansion tank, increasing operational reliability and requiring fewer wearing parts. NORD DRIVESYSTEMS offers application-specific equipment options that combine high performance and efficiency, specifically designed for pumps, agitators and mixers with high process-related radial and axial bearing loads.

Perfect conveying, filling and packaging

Synchronous motors with frequency inverter and encoder feedback via absolute or incremental encoders enable highly economic and precise positioning applications and dynamic movement of small and large packaging units. NORD implements versatile solutions for horizontal, vertical and inclined conveyors as well as palletising systems, as well as customised drives for filling systems. With the intelligent NORD frequency inverters, soft start, braking ramp, braking and STO functions can be implemented. Multi-encoder operation, during which a frequency inverter can control up to four motors with encoders, is also possible. For intralogistic systems, NORD also offers the LogiDrive concept: a modular system for individual, economical drive concepts that achieve an optimal balance between energy efficiency and reduction of variants.

With more than 4,000 employees, NORD DRIVESYSTEMS has developed, produced and sold drive technology for over 50 years, and is one of the leading global full-service providers in the industry. In addition to standard drives, NORD delivers application-specific concepts and solutions for special requirements such as energy-saving drives or explosion-protected systems. In the 2018 financial year, annual sales amounted to € 700 million NORD now has subsidiaries and sales partners in 98 countries worldwide.

Industry News | **OPENTEXT**

OpenText's Five Predictions for 2021

Tom Leeson, Senior Industry Strategist, Manufacturing & Supply Chain, OpenText points out five trends that he sees emerging or amplifying in 2021

Adaptability and resilience are watchwords for the new supply chain

COVID-19 exposed the risk for manufacturers in their current supply chains. Manufacturers – and especially those with complex, global supply chains, must be able to quickly adapt to handle major disruption. This will accelerate the trend towards the adoption of cloud-based supply chain platforms that enable flexible and scalable ways to trade, collaborate and grow digital partner ecosystems. These platforms also provide benefits for companies looking to ensure their ethical and sustainability goals are met vis-à-vis the supply chain.

Accelerating digital transformation puts more focus on data

In response to the pandemic, manufacturers that were previously faced with a tidal wave of data are being challenged to accelerate their digital transformation initiatives even quicker. COVID-19 has further emphasized the importance of understanding demand signals and addressing customer concerns in order to assess unmet needs. In turn, transformative activities like using multiple sources of customer data will be imperative to understanding new challenges consumers are looking to solve moving into an unprecedented and/or unpredictable 2021.

Changing work practices place focus on automation

Industry skill gaps have been a topic of conversation for many years, and commitments made by these industries towards narrowing those gaps show promise in future proofing the workforce. However, the rapid introduction of new workplace measures in recent months, like socially distanced production lines, puts added pressure on companies to adapt quickly to new work requirements. Automation is the key to meeting the rapidly changing landscape requirements and quickly enable employees to augment their roles in order to meet consumer demands and new industry regulations.

Innovation and agility point to the digital twin

The digital twin – virtual replicas of a physical product, equipment, process or the supply chain – help to monitor, simulate and optimize performance. However, they're rapidly becoming an even more critical tool for organizations looking to anticipate stress points, enable more efficient model adaptations and more quickly

rework its processes in today's uncertain climate. Perhaps most importantly, the digital twin provides a fast and cost-effective method to continue focusing on innovation when in many cases funds are being diverted to recovering revenue generation for the foreseeable future.



Tom Leeson, Senior Industry Strategist, Manufacturing & Supply Chain, OpenText

The autonomous world may be further down the road

2020 has pushed forward a turning point for disruptive technologies and market demands that will transform operations, undoubtedly. Manufacturers are getting smarter and those with a digital foundation are enabling the connected, intelligent and trusted supply chain to increase resilience and ensure continuity of their business operations. Within any industry, however, unpredictability can play a factor in progress, and the events of COVID-19 have pressed companies to re-evaluate investing in developing areas of their business and focus on liquidity above all else. Autonomous ecosystems are the best opportunity there is when looking to mitigate future risk, predicting disasters and enabling an agile workforce, and organizations will continue to exploit AI-assisted analytics to deliver value into all aspects of production and product development.

About the Writer

Thomas (Tom) Leeson is Senior Industry Marketing Strategist for the Manufacturing sector at OpenText. OpenText Corporation develops and sells enterprise information management (EIM) software.

Tom is an Engineer by trade, a Mathematician by education. He has nearly 40 years of experience working in the manufacturing sector. First within Aerospace, Automotive and Discrete Manufacturing companies introducing computational techniques before moving into the Engineering and Manufacturing IT sector. The last 22 years Tom has fulfilled various senior roles with manufacturing software specialists Dassault Systemes, SmarTeam PLM, Computervision, PTC and the Artificial Intelligence Company Aion Corp.

Tom is passionate about engineering and manufacturing and began his career with a traditional engineering apprenticeship as a Precision Engineer servicing the Oil and Gas, Mining, and Automotive industries in Scotland before moving on to design analysis careers with British Aerospace (BAe) and Jaguar Cars. With BAe he studied a master's degree in Computation Mathematics relating to Computer Aided Engineering.

Industry News | PANASONIC

India Has A Huge Opportunity To Be A Growth Leader

Masafumi Himeno, Divisional Managing Director, Panasonic Smart Factory Solutions India affirms his company's commitment to grow with India

Leveraging its legacy of producing cutting-edge technologies for over a century, Panasonic established Panasonic Smart Factory Solutions India – integrating its welding business and SMT (Surface Mount Technology) equipment business in early-2019 – to offer the best of Japanese technologies to India's manufacturers. **Masafumi Himeno, Divisional Managing Director, PSFSIN** speaks about the company's offerings and focus sectors in an interaction with DMI.

How has been the journey in India over the last eight years?

Committed to grow with India, we are well on track. The Panasonic Smart Factory Solutions India (PSFSIN) facility at Jhajjar, Haryana is

strategically aligned with the Government of India's Make-In-India and Skill India initiatives. PSFSIN was established to cater to the needs of India's manufacturing industry offering the best of Japanese technologies to manufacture Welding Machines, Digital Solutions, and Robotic Welding thus, driving the nation towards self-reliance. Similarly, we have trained over thousands of students, leading auto professionals and leading industry bodies on usage on welding machines, upping the ante on Skill India drive.

We started with a focus on Automotive industry over the years, we have expanded to cater to the Infrastructure Industry, the Power sector, Agriculture equipment (like Tractor and Other Agricultural Equipment's) and Oil & Gas sector. Also, today we are proud to state that the PSFSIN division



Mr Masafumi Himeno Div Managing Director PSFSIN Panasonic India

at Panasonic India's manufacturing facility is now among the largest producer of manual welding equipment in India. We have manufactured and sold thousands of welding machines since the inception catering to the industrial demand arising from automobiles, infrastructure, and oil & refinery sectors.

What are the solutions that Panasonic Smart Factory Solutions India is offering?

PSFSIN is among the largest producer of manual welding equipment in India. The business entails manufacturing and selling of Digital Controlled welding machine, SMT (Surface Mount Technology), and Robotic production line to cater to the demand of diverse sectors. The facility also offers smart manufacturing solutions propelled by the adoption of the Internet of Things (IoT), industrial robots, and process automation in the manufacturing plants.

PSFSIN offers a competitive advantage in form of Quality, Durability, and Performance enabled by the legacy of Japanese technology. For instance, we offer digitally controlled welding machine to ensure High Quality weld. We provide 3 Tier 4 Cabinet Dustproof technology to ensure longer life of Electronic components. And, all our products are "RoHS-2" compliant as per Global Standards to make sure there's minimized presence of harmful substances like Lead, Cadmium, etc.

Which manufacturing sectors are you focusing on?

We are one of the largest suppliers of welding machines for the Indian automobile sector. In fact, PSFSIN is the preferred supplier for India's leading two wheeler and four wheeler companies. We also, have significant market share in the Infrastructure Original Equipment Manufacturer (OEM) sector. Catering to new-age technology needs, PSFSIN offers smart manufacturing solutions propelled by the adoption of the Internet of Things (IoT), industrial robots, and process automation in the manufacturing plants.

As part of a globally diversified technology company, PSFSIN is significantly focusing to increase its market share in the non-auto sector, including infrastructure, oil and refinery, power, agriculture OEMs, etc. Further, we are committed to

developing advanced manufacturing capabilities to help grow our customers' businesses.

How does Panasonic look at the Indian market and its growth potential for its business?

India is a strategic market for Panasonic. The country plays a crucial role in the ISAMEA (India, South Asia, Middle East and Africa) region and has a huge opportunity to be a growth leader. Aligned to Panasonic India's vision, we are working towards making India a global manufacturing hub and thus, driving the nation towards self-reliance. Infact our welding unit is a great example of backward integration as we manufacture components and finished machines in the same facility. Panasonic India's largest manufacturing facility – TechnoPark – situated at Jhajjar (Haryana) demonstrates our commitment towards India market. Besides manufacturing PSFSIN solutions, Technopark has a manufacturing capacity of over 4,50,000 units of air conditioners, 3,00,000 sets of washing machines, 5,00,000 refrigerators amongst other products and solutions. At PSFSIN, we are committed to offer made-in-India Welding solutions that ensures durability, quality and safety to our consumer. Further, we are not only serving customers in India itself, but are also exporting the machines to Sri-Lanka, Bangladesh, Vietnam, South East Asian, and Middle East countries.

With the adoption of digitization in the manufacturing sector in India, how is Panasonic adding value to its customers?

Recently, the country has witnessed a rapid adoption of digitization. The pandemic has been one of the key drivers for the adoption of the Industry 4.0 concept. Additionally, with the advent of new-age technologies such as 5G, IoT, AI to name a few, we can expect more investment towards this technology to meet the growing industrial demands of India. PSFSIN is heralding the implementation of digitization, which also scales up the welding process to the next level. We have an integrated welding and SMT (Surface Mount Technology) equipment business that offers end-to-end integrated smart manufacturing solutions to our partners by seamlessly consolidating software and hardware capabilities. A significant step towards advancing manufacturing to the digital frontier.

Industry Events | CGTECH

Optimization, Module Tackles, Tough Materials.

Tool path verification and optimization are two of the best ways you can dramatically improve your manufacturing operation and save money

Most anyone who's worked in a machine shop for any length of time has at some point attended a trade show or machine tool distributor's open house. There they see canned demonstrations of CNC machines busily carving up chunks of brass, mild steel, or aluminum into business card holders and tic-tac-toe games. While these giveaways are fun stuff, wouldn't it be refreshing to see some real parts being machined, preferably from a difficult-to-machine material?

That's what took place at the Okuma Winter Showcase, an annual event the machine builder hosts for 600+ attendees. At the event, attendees were treated to more than two-dozen CNC machine tools under power, most of them making chips. These included an MU-8000V LASER EX super multitasker with laser metal deposition and the GENOS M460V-5AX, a trunnion-style, five-axis vertical machining center offering high productivity, a small footprint, and a surprisingly low-price tag.

There was also an LB3000 EX-II lathe with barfed vibration detection, a MULTUS B300II turn-mill center with collaborative robot part handling,

MA-500HII horizontal and MCR-A5CII double-column machining centers, and a MULTUS U3000 multitasking machine.

An impressive lineup, to be sure, but there was one demo that had a large number of show attendees talking, even those responsible for setting it up. "It was pretty cool to see, especially when you consider that we were cutting titanium, a very hard and difficult-to-machine material," says Okuma Applications Engineer Lee Johnston.

He's talking about CGTech's Force, a physics-based NC program optimization module that works within the company's flagship VERICUT toolpath simulation software. Working with representatives from CGTech and Sandvik Coromant, Johnston programmed a Ti-6Al-4V titanium bracket being made for an aerospace customer, then optimized its toolpaths with VERICUT Force.

"We had the same demo on two vises and ran them side-by-side, one with the standard program and one that was optimized," said Johnston. "We reduced cycle time from an hour to just under 40 minutes, and you could also hear and see the

difference in how the tools were cutting and tell that the optimized program was easier on the machine. This is probably the best thing to happen to programming since trochoidal toolpaths."

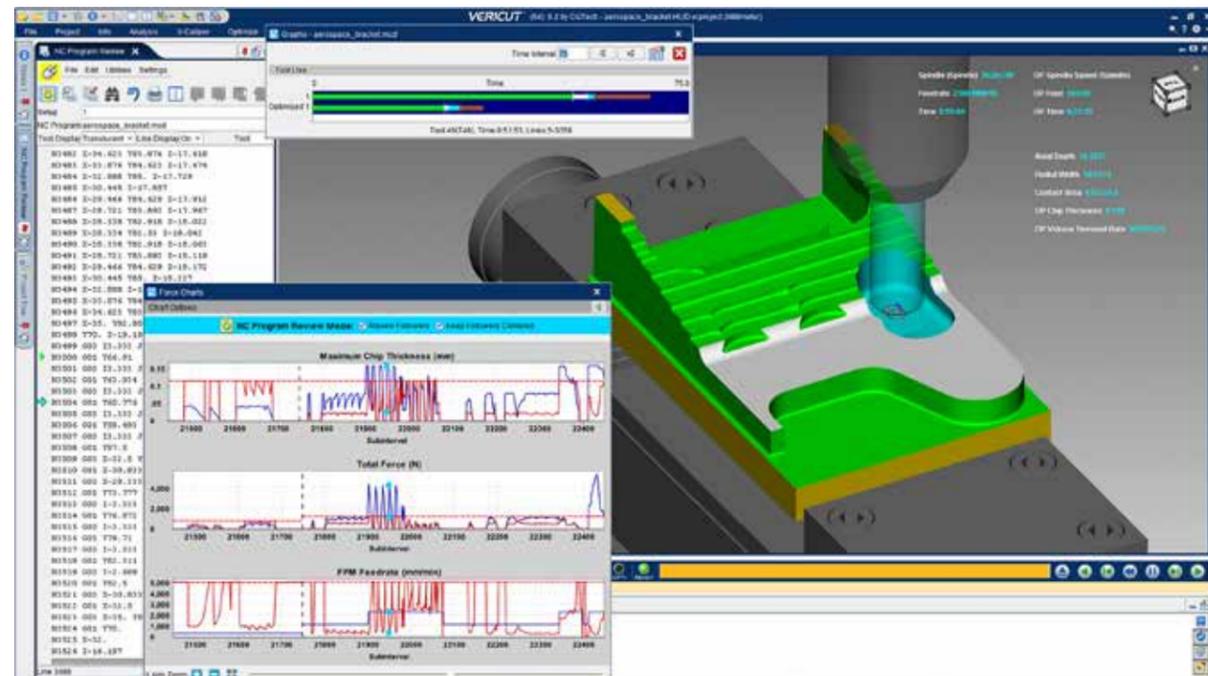
VERICUT Product Specialist Pete Haas explained that Force works by analyzing the NC toolpath, evaluating the changing cutting conditions, and increasing or decreasing the feed rate to achieve the ideal chip thickness for any given material. Compared to CAM systems and online machining calculators, which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

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

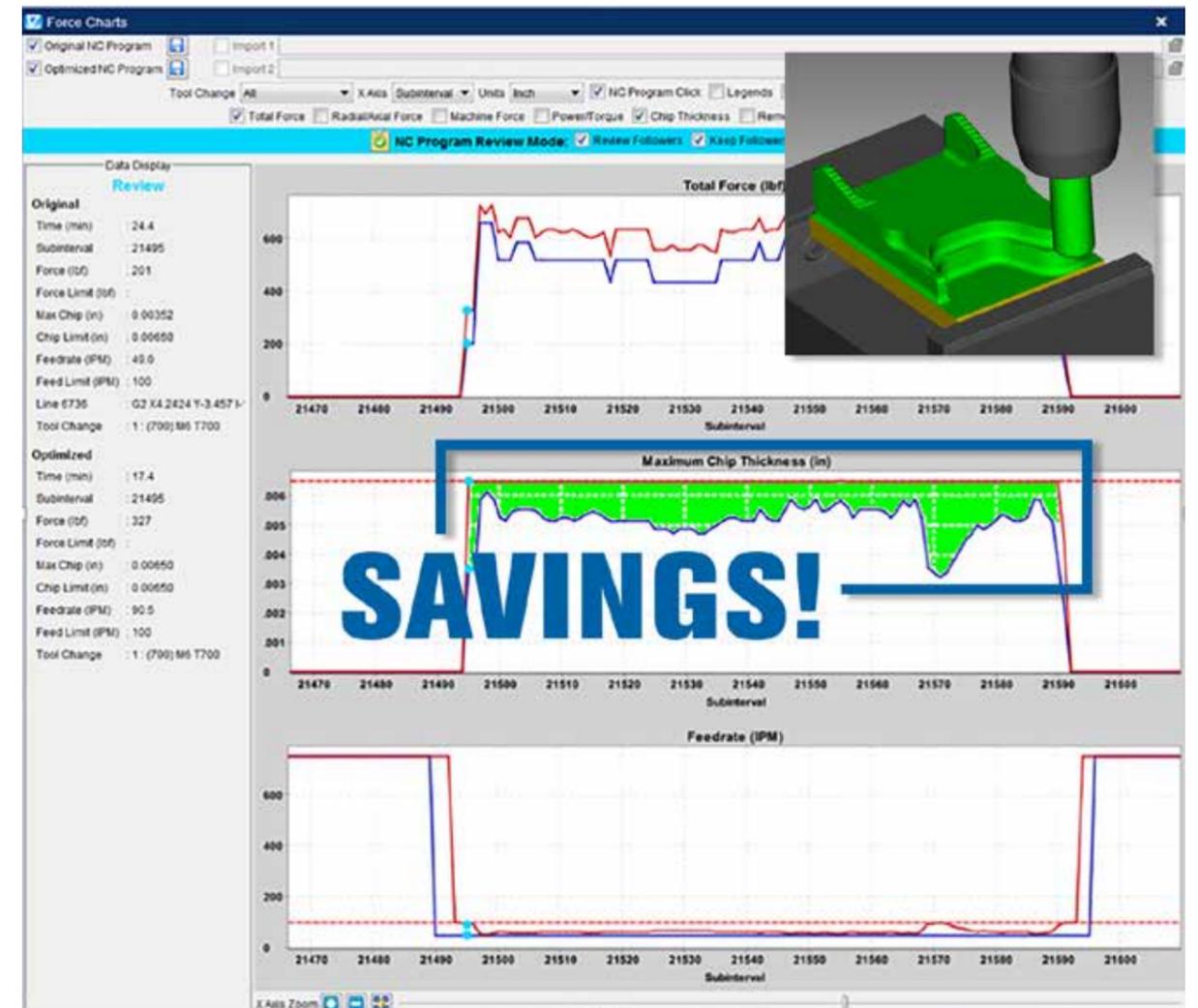
too aggressive on tight turns and too slow on the straightaways. Force, on the other hand, uses physics to calculate cut-by-cut throughout the changing conditions and determine the optimal feed rates."

The result, according to Haas, is greatly reduced cycle time, improved tool life, better part quality, and less wear and tear on CNC machine tools. It works on any material and any machine, and can even be used on legacy programs.

Johnston wasn't the only one surprised by Force's capabilities. Even CGTech Technical Support Engineer Chris Davala—someone with 20 years of experience as a machinist and programmer who now works with VERICUT customers across the country—said the demo was an eye opener. "To be honest, I was a little skeptical," he said. "This was my first hands-on experience with the product, and it's not that I didn't have faith in the people who developed it, but there were some bold claims made about the potential gains. I can truly say that, after seeing Force in action, it's made a believer out of me."



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





In the Okuma demonstration, the VERICUT Force Optimized finished part on the left was produced more than 20% faster than the original programmed part on the right.

That's an easy thing to say for someone employed by the product's developer. But Sandvik Coromant MTS specialist Richard Howard, who worked alongside Davala and Johnston setting up the demo, backs it up. He supplied the cutting tools and toolholders used for the demo and specified the initial machining parameters.

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

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

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

Its optimization capabilities are proactive, not reactive, so everyone knows what to expect before



pushing the cycle start button.

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

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

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

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

Okuma's Lee Johnston agreed. "At the event we were cutting titanium and saw significant improvement, but I think Force is just as suitable for machining easier materials like aluminum, and for other general purpose work. I look forward to using it on future projects."

MAKERS & MOVERS

Dynamic Manufacturing India Editor Launches Makers and Movers, a Web-series.

Aanand Pandey, Editor, Dynamic Manufacturing India, has launched **Makers and Movers**, a YouTube channel about people, ideas and organizations that make and move things, that is, the stakeholders of India's industrial sector. In Episode 01, he has talked about 3 Critical Focus Areas for Mission Make in India 2.0 and explores:

- What India must do to create quality jobs.
- How India can leverage the US-China trade war.
- What stops India from becoming a global industrial powerhouse.

And many more.

In the coming episodes, **Makers and Movers** will cover many relevant and burning industry issues. Let us know if you want your ideas, your success stories or your brand to feature in the series.

Watch the Video



Opinion | RAMA IYER

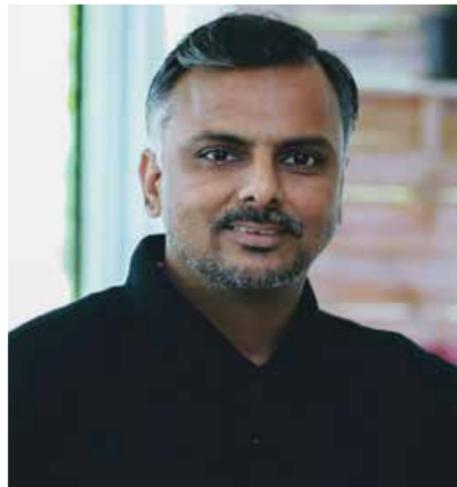
Attaining Digital Transformation with Smart Manufacturing

Rama Iyer, Chief Innovation Officer, T-Hub unbundles important concepts and drivers around smart manufacturing – the key enabling technologies, the different levels of a smart factory, and the future of manufacturing

New technologies, such as industrial robotics, drones, IoT, 3D printing, and artificial intelligence (AI) are revolutionising manufacturing today. Reports forecast the market for AI in manufacturing is expected to hit USD 16.7 billion by 2026. Most U.S. manufacturers, around 71 percent in a recent PwC study, have also adopted 3D printing in some way, while others, approximately 25 percent, are expected to adopt it in future. Clearly, the growth of emerging technologies has increasingly becoming mainstream.

Today, even as the pandemic slows down manufacturing across the world and disrupts global supply chains, it has also accelerated the adoption of smart manufacturing. Digital workflows and automation are no longer aspirational, but essential for every business in the new normal. ISG even predicts the market for smart manufacturing will rebound aggressively to hit US\$ 384 billion by 2025.

But ISG also predicts the top challenge for smart manufacturing will remain the difficulty in attracting new talent. With manufacturing jobs becoming increasingly high-tech, these demand more advanced skills, and as a result the talent shortage is expected to worsen in the coming



Rama Iyer, Chief Innovation Officer, T-Hub

years. However, development in technology and innovation, along with an increase in skilled jobs resulting in higher wages, is expected in a more globally competitive industry with a robust economy. In this environment, a PwC study indicates most companies are looking at employee reskilling as a solution to the current talent crisis. Here, advanced manufacturing is emerging a job creator, not a job killer.

India has also begun early steps in this direction with the country's first smart factory being launched in Bengaluru by Indian Institute of Science (IISc) using seed funding from Bosch. So, while developments in this area may still be at a nascent stage, the country's journey into the future of manufacturing has already begun. It is expected to only grow in the coming years with IBEF predicting India will emerge as the fifth largest manufacturing country in the world.

Technologies of Industry 4.0 in smart factories

The manufacturing practice adopted by smart factories — smart manufacturing — is the most optimised application of technologies in the fourth industrial revolution, known as Industry 4.0.

Smart factories do not simply deploy one software across the shop floor and witness immediate improvements in the production process. Instead, a combination of Industry 4.0 technologies contributes to the optimisation of smart manufacturing. Let us discuss five such enabling technologies.

1. Industrial IoT (IIoT) is enabling operational efficiency

IIoT refers to interconnected devices, machines, and/or processes linked by data communication systems to facilitate the exchange of data between people and machines. Typically, these instruments have sensors to collect meaningful data points on a cloud or offline database, where it is possible to identify ways to improve the manufacturing process. IIoT enables operational efficiency, control, and visibility in key areas. IDC estimates operations

optimisation led by IIoT could generate a value of US\$ 470 billion annually by 2025.

2. Sensors are increasingly integral to the manufacturing process

Sensors attached to devices and machines collect distinct data points at specific stages of the manufacturing process, providing instant visibility into every layer of the shop floor. For example, temperature sensors in a cleanroom can track and detect the climate in a lab and share that data through an IoT gateway. Data can then be used to self-correct with AI or alert relevant team members for review. An EY study estimates the introduction of such sensor technology will improve profit margins by up to 30 percent across sectors by 2030.

3. Cloud computing is enabling decision making

Cloud computing allows smart factories to store, process and share data with greater flexibility at a lower cost as compared to traditional on-premise alternatives. Interconnected devices and machines on the shop floor benefit from being able to upload large amounts of data quickly, which is distilled to provide feedback and make real-time decisions.

4. Big data analytics is optimizing production processes

The accumulation of data over time can provide insights into how efficient the production process is, which key metrics to focus on, and what systems are underperforming. The sheer size of big data makes it possible to spot error patterns and run predictive quality assurance with high accuracy. The presentation and the timing of big data analytics —delivering the right information at the right time — enables shop floors to improve optimally and quickly.

5. AI is empowering smart manufacturing

While predictive analytics is making it possible for business to analyse large volumes of data, AI leverages this information to eliminate the human layer in decision making and automate the manufacturing process. A 2020 PwC study found 50 percent of companies surveyed were already using smart algorithms to automate decisions. This use of AI in manufacturing enhances performance, controls cost, optimizes processes and shortens product cycles. The market for AI in manufacturing is expected to grow by a CAGR of 39.7 percent between 2019 and 2027 to hit US\$27 billion by 2027.

Benefits of smart factories

Smart factories optimise efficiency and productivity by extending the capabilities of both

manufacturing devices and people. By focusing on creating an agile, iterative production process through data collection, smart factories can aid decision making.

By continuously improving the productivity of manufacturing processes, smart factories can lower costs, reduce downtime, and minimise waste. Identifying and reducing misplaced or underused production capacities mean opportunities for growth without investing in additional monetary and/or physical resources.

Smart levels: Four levels of a smart factory

These four data structure levels will help you evaluate your progress in becoming a smart factory and point to the steps you need to take to make advancements to the next level.

Level One: Available data

In all probability, this is the current status in most factories. Data is available, but not accessible. Sorting and analysing of data is manual and time-consuming, adding inefficiencies to the production improvement process.

Level Two: Accessible data

At this stage, data is presented in a more digestible form. It is structurally organised and sorted in one location with additional systems to help visualise data and display dashboards. The factory can perform proactive analysis, though this may require time and effort.

Level Three: Active data

Proactive analysis is performed on such data using machine learning and artificial intelligence to generate insights, without human supervision. The system can pin key issues and anomalies to predict failures with high accuracy and inform the relevant decision makers with valuable insights at the right time.

Level Four: Action-oriented data

At this stage, machine learning can generate actionable solutions to problems identified in earlier stages. The manufacturing machines and devices connected to this system execute those changes with no human intervention. Collecting data, identifying problems, and generating solutions happen in sequence with minimal human input.

Building a smart factory

Approaching Industry 4.0 and the move to a smart factory as a journey rather than a single project allows you to realise value faster. Building a strong foundation with the right data infrastructure and data acquisition processes allows you to scale

your industrial IoT initiatives more rapidly. Jumping straight into advanced analytics, while still having siloed data, results in data variability, which quickly becomes mired in complexity.

Predictive and prescriptive analytics, along with AI-driven automation, require both live and historical data to make accurate predictions. Additionally, machine learning technologies operate in a continuous loop as people, processes and data change. A step-by-step approach allows manufacturers to progress through a process of natural evolution.

As you progress, you'll begin to amass the datasets needed to enable machine learning and artificial intelligence applications. Enabling predictive and prescriptive analytics then allows you to identify and execute production-process improvements based on data. With this methodical approach, manufacturers will build a smart factory more quickly and with less frustration.

The future of manufacturing

The future of manufacturing lies within intelligent automation. In fact, IDC predicts 20% of G2000 manufacturers will have transitioned to intelligent manufacturing by 2021, reducing execution times by up to 25%. As a result, these manufacturers will continually experience annual efficiency improvements allowing them to lower costs and improve margins.

Becoming a smart factory is a journey, which will not happen overnight. It's important to begin taking steps towards digital transformation, if you haven't already started. Smart manufacturing is the future of manufacturing as it provides numerous benefits including increased productivity and better throughput without sacrificing product quality. The benefits are clear and the many resources available to provide insight and guidance make it easier and more accessible to start and continue your journey.

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Rama Iyer is Chief Innovation Officer at T-Hub, which leads India's pioneering innovation ecosystem that powers next-generation products and new business models. He was part of the founding team at T-Hub and played a crucial role in building its corporate innovation business. A senior advisor to the State of Assam's innovation ecosystem and the ICRISAT ihub incubator, Rama is a seasoned business leader in India's innovation ecosystem and seeks to establish the country as a trailblazer in the innovation paradigm. In the past, he has also worked with brands such as Cisco, Polycom, Ericsson, Nortel and TCS. He is also a startup evangelist/advisor, business and technology leader with over 20 years of experience including building incubators, open innovation and accelerator programs, advising venture funds and startups, product/project management, Go-To-Market.

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- Quick turnaround time : sanction within 4 days of submitting complete information



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