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ULTIMATE GUIDE TO PROFITABLE MANUFACTURING

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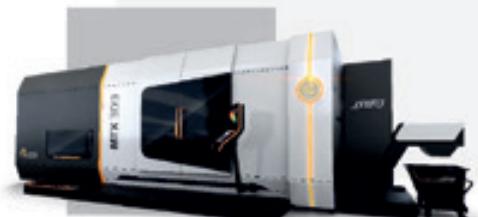
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## IS INDIA IMMUNE TO US RECESSION?

**T**he answer is, no. According to reports, India is not immune to the US' recession, and domestic growth in the past has slowed by ~1.5-2.5 per cent even in normal Fed-led recessions without domestic macro stability concerns.

In the base case, I assume that relatively stable domestic fundamentals in terms of the strong financial sector and non-financial sector balance sheets, high FX reserve and some amount of countercyclical fiscal policy ahead of elections in FY24 will limit the growth slowdown to 1.5 per cent. Assuming a mild US recession and GDP growth of 7.5 per cent in FY23, I believe that GDP growth could slow to 6 per cent in FY24. In a worst-case scenario, growth could slow to 5 per cent or below.

The US market share in India's merchandise exports declined from 22.8 per cent in FY2000 to 10.1 per cent in FY2011, which has since increased to 18.1 per cent in FY22. The rise of the US market share in India's export basket has increased India's vulnerability to the US recession. Moreover, other key export markets, particularly Europe is also likely to face recessionary conditions at the same time.

In FY21 and FY22, software exports recorded the fastest growth since FY11. In FY21, the US was the major destination for software exports, accounting for a 54.8 per cent share; Europe had a 30.1 per cent share, nearly half of which was contributed by the UK. The US recession is bound to have some adverse impact on India's software exports at the margin. The IT boom over FY21 and FY22 has supported domestic consumption and the residential real estate sector in India, which could see some adverse impacts if the US falls into a recession.

Past periods of recessions or significant growth slowdowns in the US have been usually countered by rate cuts from the Fed. Moreover, if a recession does fructify, some rate cuts cannot be ruled out in 2H2023, supported by easing inflationary pressures. On one occasion in the early 1980s, the Fed caused a double-dip recession when after cutting rates briefly, it resumed rate hikes to curb inflation, which ultimately resulted in a second recession. This time around, with inflation being a key concern, it is expected that the Fed refrain from rate cuts until there are clear signs of inflation coming closer to the 2 per cent target.

India's interest rate cycle has never moved in the opposite direction to that of the Fed. But, there have been periods of extended pauses in the 1970s and 1980s when the Fed had raised as well as cut rates. Similarly, in the early 1990s, when the Fed cut rates, the RBI maintained its pause. During 2010-2014, the RBI raised rates even as the Fed remained on pause. Therefore, there is a likelihood that the RBI could remain on an extended pause or not match rate cuts (if any) by the Fed in the event of a US recession if India's growth remains relatively resilient.

That said, any divergence between the US GDP growth and crude oil prices does not normally sustain. Therefore, a US growth slowdown will eventually lead to moderation in crude oil prices, the Achilles' heel for India's macroeconomic stability.

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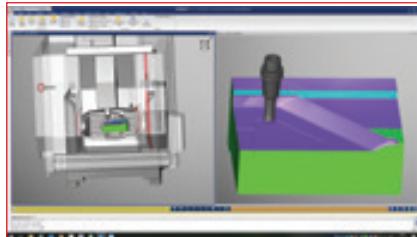
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**INDEXABLE DRILL**

# MVX

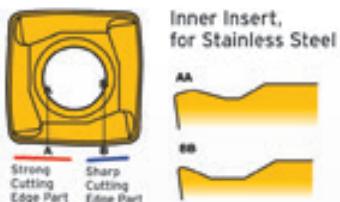
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## Delta Ships Over One Million EV Chargers Globally

**DELTA**, a global leader in power and thermal management solutions, has emerged as a major player in the e-mobility sector worldwide. Over the last few years, as one of the prominent leaders in electric vehicle (EV) charging solutions, it has set up EV charging stations in various parts of the world, including Asia, the USA, and Europe. The organisation has shipped over 1,000,000 EV chargers to consumers worldwide since 2011 to foster e-mobility transition across the globe. Currently, Delta provides powertrain and energy management systems to the world's leading EV automakers in Europe, the USA, and Asia.

With expertise in high-efficiency power technologies, Delta has been delivering energy-efficient EV charging solutions worldwide for over a decade. In 2020, Delta collaborated with Idemitsu



Kosan Co., Ltd., a Japanese energy company, to operate an EV charging station in Yokohama. Delta and Idemitsu renovated an old gas station into an EV charging station that has a cafe. The EV charging station operates under the theme 'Park and Charge' enabling a smart retail energy ecosystem that unifies Delta's energy storage, power conditioning system, EV chargers, DeltaGrid IoT energy management system, and Delta's

retail IoT solution.

In August 2022, Delta joined hands with EVgo, the largest public fast charging network for electric vehicles (EVs) in the USA, to supply 1000 fast chargers with up to 350kW power output. The organisation has successfully delivered over 6,000 EV chargers to consumers in India.

Benjamin Lin, Delta Electronics India's President

& GM, said, "We are at the forefront of building e-mobility across the globe. Delta strives to build a sustainable world that includes green energy infrastructure, smart factories, and e-mobility. We intend to increase the delivery of our EV chargers globally. We are immensely thankful to our local partners as we collaborate to build e-mobility. In India, we project to deliver more than 10,000 EV chargers by mid-2023".

## MG Motor India Elevates All-New ZS EV Experience In Exclusive Variant

**MG MOTOR INDIA** has introduced brand-new interior colour to its all-new ZS EV exclusive variant. The car will now be available in dual-tone iconic ivory interiors. The company also announced that the bookings of the new ZS EV Excite shall commence on October 3, 2022.

The ZS EV Excite offers customers a power-packed electric mobility experience with more than 75 connected features and the largest in-segment 50.3kWh battery with globally certified quality: ASIL-D, IP69K & UL2580. With 176 PS power, the all-new advanced technology battery offers a 461-km certified range on a single charge.

The car comes loaded with the largest-in-segment 25.7 cm HD touchscreen infotainment, along with a host of other segment-first features like a 360-degree all-around view camera and a digital key. The ZS EV Excite features a full digital cluster with the segment-best 17.78 cm embedded LCD screen and Hill Descent Control (HDC) for enhanced safety. To make drives smoother, the base variant also comes equipped with a Park+ Native app

for parking booking, the MapmyIndia Online Navigation System with live traffic, live weather, and AQI, and the integrated Discover app to locate restaurants and hotels nearby. The system also has Firmware Over-The-Air (FOTA) update capability.

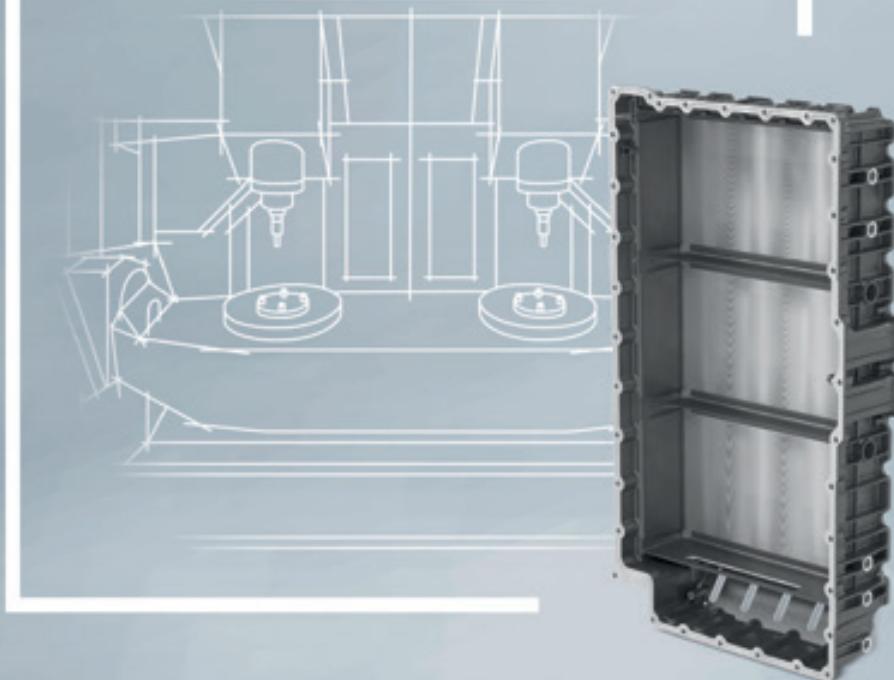
ZS EV is available in the United Kingdom, parts of Europe, Australia, Thailand, China, Peru, Chile, and India. The vehicle's EV platform has been consistently acknowledged among all others, reaffirming MG's position as a global leader in electric passenger vehicle manufacturing. The MG ZS EV continues to dominate key markets around the world. The demand for high-tech, high-performance EVs is increasing

at an alarming rate. The automaker sees this as an extremely promising segment.

MG Motor India is committed to strengthening the electric mobility ecosystem in India by raising the EV adoption rate in the country. To create a seamless EV experience for car owners, the carmaker has entered into strategic partnerships with key players such as Jio-bp, Castrol, and BPCL. The company is also promoting research and innovation in the EV space by collaborating with academic institutions. Recently, in association with RV College of Engineering, Bangalore, MG launched an EV certification course as a part of its skill development program, MG Nurture.



# AUTOMOTIVE



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## Igus Acquires Majority Stake In Commonplace Robotics

**IGUS AND COMMON PLACE ROBOTICS** have been cooperating intensively for six years and have, among other things, developed the igus Robot Control, which supplements igus' low cost kinematics made from high-performance plastics.

Dr. Christian Meyer, who worked at the Fraunhofer Institute for Production Engineering and Automation, founded the company Commonplace Robotics 11 years ago. The name says it all: make the integration and operation of robots so cost-effective and easy that they become 'commonplace' - meaning they can be used anywhere. The first products with control system and proprietary power electronics were robots for teaching. Meyer approached igus in 2016 because he found that igus robotic kinematics matched his vision of 'commonplace': Cost-effective, simple and suitable for the industry. Since then, the two companies have jointly developed products such as the iRC igus Robot Control, an actuator and the ReBeL cobot. Thanks to the high level of vertical integration of Commonplace Robotics - from firmware and software to switch cabinet construction and circuit board assembly

- new developments can be quickly implemented.

"Many customers are surprised that they can implement simple robot tasks in just 30 minutes without any programming knowledge," says Frank Bläse, CEO of igus GmbH. "We are very pleased that, following intensive collaboration over the last six years, an even more focused approach to low-cost automation is now possible." With this acquisition, Commonplace Robotics and igus are combining their innovative strengths. Dr. Christian Meyer: "We are looking forward to exciting technological projects with igus. The RBTX platform for low-cost robotics, which is operated by igus brings new requirements from customers from all areas of the industry to our laboratories every day. Much of this can be implemented quickly, especially as we are expanding with this investment." The latest product of the collaboration is the ReBeL cobot for €4,970 including the control system. The actuator, also available as an



individual component, combines igus' plastic know-how in the gearbox with the power electronics and software from Commonplace Robotics. With six axes, the ReBeL can handle a payload of up to two kilograms with a range of 664 millimetres - and all that with a net weight of just 8.2 kilograms. Requests and orders come from traditional areas of applications such as quality control and pick and place applications in mechanical engineering, however new areas of applications such as restaurant automation or urban farming are now becoming more frequent.

## Trina Solar Showcases Cutting Edge N-Type Module At REI Expo 2022

### TRINA SOLAR CO., LTD.

("TRINA SOLAR"), a leading global PV and smart energy total solution provider, today showcased the company's N-type solar technology at Renewable Energy India Expo 2022. Trina Solar's industry-leading N-type technology offers an alternative high power solar module for the next-generation of solar projects in India as the country mobilises to meet the ambitious renewable energy targets laid out by the government.

The N-type module showcased at the REI Expo is the NEG21C.20, the first 210 N-type solution designed for utility scenarios in India. The dual-glass bi-facial 210mm solar module offers 685W maximum power output and up to 22.1 percent module efficiency to deliver high customer value, reliability and energy yield at lower levelised costs of energy (LCOE) and balance of system



(BOS) costs. Trina Solar also exhibited the upgraded Vertex 19R series, which features the latest 210R rectangular silicon wafer technology to boost single-module power by up to 30W. It comes in horizontal packing and is compatible with most inverter models in the market and able to achieve higher DC/AC ratio at system level, making it an ideal choice for commercial and industrial rooftop projects.

"The demand for power continues to grow in India and solar energy will play

an important role as the country strives to keep power generated from fossil fuels under 50 per cent. Of the current 58GW installed solar energy capacity in India, more than 8GW is generated by Trina Solar's modules. We look forward to deepening our relationships with our partners in India, providing them with the high performance and reliable solar modules they need to create a greener future for the country," says Gaurav Mathur, India director for Trina Solar.

The company's solutions have recently been deployed at scale in the floating solar farm located in Kayamkulam, one of the largest floating solar projects in India to date with a power capacity of over 100MW. Bi-facial dual-glass monocrystalline Vertex modules are widely known that they are resistant to harsh environments such as high humidity areas, making it a reliable choice to power the expansive floating farm.



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## IMTMA Appoints Jibak Dasgupta As Director General & CEO

**INDIAN MACHINE TOOL MANUFACTURERS' ASSOCIATION (IMTMA)**, the apex body for machine tool industry in India, has appointed Jibak Dasgupta as its Director General & CEO. Dasgupta is a seasoned professional in knowledge ecosystem building, formulation of industrial policy, promotion of R&D and technology, and development of industrial capacity in manufacturing, innovation and entrepreneurship.

Earlier, he headed CII Naoroji Godrej Centre of Manufacturing Excellence, Mumbai, CII's Technology Innovation and Entrepreneurship Department, Delhi and CII Maharashtra State Office, Mumbai. Dasgupta's work has enabled to successfully establish an enterprise innovation maturity framework to implement structured innovation processes within firms. This framework has been key to the establishment of CII Industrial Innovation Awards which annually recognises top innovation driven Indian enterprises in manufacturing and services domain.

From 2011 to 2017, Dasgupta was associated with Global Innovation Index (GII), co-authoring various chapters



in GII reports which were published by WIPO, INSEAD, and Cornell University. He also worked closely with the Planning Commission (NITI Aayog) for their innovation cluster development program under the aegis of National Innovation Council.

Dasgupta has been an active member of various public and private policy advocacy groups like National Council of Science Museums (NCSM), Ministry of Culture for creating innovation hubs across India, Technical Advisory Committee (TAC) under Department of Scientific and Industrial Research (DSIR), National

Science Technology Entrepreneurship Development Board (NSTEDB) to review Technology Business Incubators (TBIs), All India Council for Technical Education (AICTE) for Innovation & Entrepreneurship Capacity Building, Department of Science and Technology (DST) committee on R&D and Innovation Indicators in National S&T System and Policy Implications, DST National Panel for the formulation of the Technology – led Innovation Policy (2017-2018), Governing Council of Indian National Academy of Engineers (INAE) (2016-2018), Member of the Maharashtra State Innovation Society (MSInS), and member of the Hub Governing Body (HGB) of Technology Innovation Hub at IIT Bombay.

An instrumentation engineer, Dasgupta holds a master's degree in Management and Economics of Innovation from Chalmers University of Technology, Gothenburg, Sweden. Speaking about his appointment, Dasgupta said, "I am elated to have joined a vision-oriented association and keenly look forward to providing a strategic direction to IMTMA and support the Indian machine tool industry capitalise on market opportunities."

## Komaki To Add Venice Eco Scooters To Its High-Speed Fleet

**TO FURTHER INCREASE** the fervor of the festive season, Komaki has planned to launch Venice Eco, a scooter with third generation TFT screen, during Navratri. The high-speed advanced electric vehicle, Venice Eco will be launched with a third generation TFT screen for better navigation and stress-free ride. Equipped with fire-resistant Lithium Ferro Phosphate (LiPO4) battery and real-time lithium battery analyser, the sleek and trendy Venice Eco will be available in seven different colour options.

"Komaki has earned its reputation in the green and clean mobility domain by manufacturing products which are of high quality, high performance, excellent strength, rigid design, low maintenance, and long life. I am optimistic that Venice Eco will further bolster our customers' trust in the brand Komaki and soon it will become synonymous with electric vehicles," said Gunjan Malhotra,

Director, Komaki Electric Division.

Fully loaded with cutting-edge features and stylish look, Komaki Venice Eco is going to be the most visible bike on Indian roads. 6-inch x 4-inch TFT screen, onboard navigation, and mesmerising music keep Venice Eco ahead of other players in the race.

Besides, fire-resistant LFP technology accompanied by advanced BMS/Multiple thermal sensors/app-based connectivity with 2000+ cycles make Komaki Venice a completely safe bike and it is priced at Rs 79,999 (ex-showroom) in Delhi and NCR.

The brand has unveiled the picture of the TFT screen and will shortly unveil the full picture on all important digital channels.

One of the fastest growing electric manufacturers in the country, Komaki, in just four years of existence, has established a strong network of 300+



dealership stores in pan-India. Komaki has the widest range of electric 2 wheelers, with 11 CMVR exempt models and 6 high-speed registration models.



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## Glencore & Lohum Partner To Produce Lithium For Battery Manufacturing

**LOHUM**, India's largest lithium-ion battery lifecycle management firm and Glencore, one of the world's largest globally diversified natural resource company, announced a strategic partnership to advance circularity in the Li-ion battery supply chain. Under the alliance, Lohum will supply Glencore with 10,000 MT of speciality chemicals for the battery supply chain over the next five years, including cathodes, sulphates, carbonates, and oxides of various metals extracted from spent batteries and other sources.

Lohum and Glencore share a vision to further the energy transition and recognise the need to sustainably address the growing commodities demand for Li-ion batteries. The global partnership will allow both companies to deepen their recycling expertise and support the advancement of a circular economy by



supplying raw materials back into the battery supply chain.

An expanding focus on Li-ion battery recycling is inevitable to meet the burgeoning raw material demand, especially in view of growing EV adoption. The multi-million-dollar association between Glencore and Lohum is in complete alignment with the government's vision of scaling up the sector.

By reimagining how the lithium-ion industry would be indigenous in India, Lohum seeks to establish an ecosystem. This partnership will lessen India's reliance on other countries, which will eventually result in lower battery prices,

allowing the entire country to quickly transition to sustainable energy storage.

Jyothish George, Co-Head of Marketing Zinc and Copper (Metal), Glencore, commented, "We are excited to partner with a key player of India's green economy. Our focus on a greener future is aligned and supports Glencore's ambition to reach net-zero carbon emissions by 2050. Part of our approach is to seamlessly combine primary as well as recycled feed streams to provide the critical metals needed for the transition to a low-carbon future. Our partnership with Lohum fully complements these goals."

As part of its mission to expand its recycling footprint, Lohum will procure spent batteries and recycle them at its plant in the National Capital Region, India.

## TVS Motor launches all new 2022 TVS Apache RTR 160 & RTR 180

**BUILDING ON 40 YEARS** racing pedigree and 4.8 million TVS Apache customer base, TVS Motor Company, a reputed manufacturer of two-wheelers and three-wheelers in the world, launched the all new 2022 TVS Apache RTR 180 and TVS Apache RTR 160 motorcycles today. They now come packaged with new exciting styling and feature updates for an uncompromised ride experience. The power increase coupled with weight reduction of 2 kgs in Apache RTR 160 and 1 kg in Apache RTR 180 has resulted in an enhanced power-to-weight ratio for both motorcycles, offering an unravelling riding experience.

The TVS Apache Series have always

been at the forefront of technology & innovation since their launch in 2005, and continue to set a benchmark in the performance segment. The vehicles under the stable of TVS Apache have offered multiple first-in-segment & best-in-class features & technology to the customers, starting from Fuel injection, ABS, Dual Channel ABS, Slipper Clutch, to the most recent SmartXonnectTM, Ride Modes, LED headlamp.

Commenting on the launch, Vimal Sumbly, Head Business - Premium, TVS Motor Company, said, "The TVS Apache series has been built on the racing heritage of TVS Racing to bring superior products into the market that connect with our customers and racing enthusiasts. The introduction of the 2022 range of TVS Apache RTR 160 and TVS Apache RTR 180 is a testament to our commitment towards delighting the Apache community and loyalists globally, with a true racing experience.

These motorcycles will continue their legacy of offering class leading race technologies to transform performance

biking, and further strengthening our premiumisation journey."

Designed as 'The All-New Racer's Choice', the new 2022 TVS Apache RTR 160 and 2022 TVS Apache RTR 180 are updated with striking style elements and new attractive graphics that are in line with its racing DNA. The two motorcycles also get segment leading features like an all-new LED headlamp, offering superior range and light penetration, as well as an all-new LED tail lamp.

Stepping up the convenience quotient for the riders, the 2022 TVS Apache RTR 160 and TVS Apache RTR 180 will come equipped with an advanced Bluetooth enabled fully digital instrument cluster and SmartXonnectTM technology with Voice Assist, to further enhance their ride experience. As a segment first, these motorcycles get three ride modes namely - Rain, Urban and Sport, showcasing their adaptability to different conditions.

These motorcycles also get a X-ring chain, wider 120mm rear tyre, gear position indicator and TVS Connect App with new a UI/UX. The 2022 TVS Apache RTR 180 series is available in two stunning colours – Black and White; while the 2022 TVS Apache RTR 160 series is available in 5 colours namely Black, White, Red, Blue and T-Grey.



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## “WHILE MACHINE DOES NOT CHANGE, IT’S ALL ABOUT PRECISE & RELIABLE PERFORMANCE”

In conversation with **TK Ramesh**, Director & CEO, Micromatic Machine Tools, wherein he elaborates on the Indian machine tools industry, its stand on business with the influx of EVs and more. Excerpts...



**The global machine tools industry is set to grow into a \$73.5 billion market by 2027. How can India be an effective contributor to this market?**

This is a question that's been topmost & foremost and also plaguing and troubling, companies as well as the industry association. I believe that the scope is huge. Currently, the Indian manufactured machine tools are not even 1 per cent of the global consumption, and post-COVID, Eurasia war, etc. shift is expected. The initial part of globalisation was to make somewhere sell everywhere, think global act local, etc. Now, it is going to be the era of regionalisation of markets and manufacturing. Currently, there is a lot of need for an interaction to happen between components and the machine tool manufacturers and some realignment through the industry. We have the language, education, people, judiciary, intellectual property, etc., giving India a fair chance of growing in the global market. In the coming 5-10 years, I believe we will see a good CAGR of 10 to 12 per cent growth and contribution from the machine tool sector.

“

What the government should really do, which they are doing, but not fast enough, is strongly focus on infrastructure and ease of exporting. While the Indian market is fairly okay with delivery time in weeks, and project institutional funding to buy machine tools, the global market works on sales from stocks and more creative market funding for machines.

**How much has Aatmanirbhar Bharat helped the machine tools sector? How is Ace Micromatic contributing to the movement?**

At this point in time, looking at all the IPPs and the incentives that the government is giving, there's nothing that directly benefits the machine tool or the cutting tool sector. Although the automotive industry (which drives the machine tools sector) being included in Aatmanirbhar Bharat has certainly helped. There's also a huge thrust on exports that the government is looking at to make in India for the world where the machine tools or capital equipment/capital sector is focused on. So, at this point, the support is indirect. What the government should really do, which they are doing, but not fast enough, is strongly focus on infrastructure and ease of exporting. While the Indian market is fairly okay with delivery time in weeks, and project institutional funding to buy machine tools, the



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To become a global manufacturing hub, scale and agility are two key requirements. In phase one, we will need to augment skills competencies in manufacturing & make investments for infrastructure in logistics & supply chain. The government should lead the way along with the private enterprise with committed investments which will enable the flow of technology. The next phase will be about scaling and optimisation.

global market works on sales from stocks and more creative market funding for machines. Hence, the government needs to look at offering single window clearances, better ports, cheaper funding, etc., to enhance India's focus on Aatmanirbhar Bharat for machine tools. We are probably the only machine tool company that has been looking at exports for the last 15-18 years in a very focused manner. I am also happy to mention that while our top line is growing, our percentage of export has also been steadily growing. Currently, nearly 9 per cent of our turnover comes from exports. We are now targeting to reach a 15 per cent mark in the next 3-5 years.

**As you said, the automotive sector is one of the biggest contributors to the machine tools sector. Given the trend of rapid electrification of vehicles and reducing ICE vehicles, how is it going to affect your industry? Further, how are you preparing to be a part of the EV market?**

The electrification of vehicles will certainly have an effect on the machine tools sector, and there is no question about it. There's enough research that's done, where from the sheer number of transmission parts, the engine parts that are required – the prime mover – are completely gone from an ICE to EV. Currently, nearly 50-53 per cent of the parts in an ICE vehicle comes from the metal cast, which is machined and made. So, this is the hard part. However, over the last five years, if you take the Indian machine tools industry as a whole, the percentage of dependence on machine tools for the automotive industry in the 80s was over 85-90 per cent. Today, the dependence has come down to less than 60 per cent. So, there has already been a conscious shift from the automotive industry. Further, while EVs are going to grow, there are several other infrastructures that are set to grow, which are far more in number compared to cars. Additionally, the aerospace and defence sectors will continue to need high-accuracy machined parts. So, it is important to analyse how the companies look at it and start the diversification. While fundamentally the machine does not change, it is more about precise and reliable performance, measurements, and how

to use it and get a better output while using different materials.

**Ace Micromatic, not too long ago, introduced a metal 3D Printing system – STLR-400. Can you elaborate on the product? What sets it apart from other metal 3D printers in the market?**

The AMACE STLR 400 is a large format, high productivity, industrial grade metal 3D printer, which employs the most advanced and technologically mature process in metal 3D printing, called Laser Powder Bed Fusion (L-PBF). It is designed and developed to suit serial production applications, allowing for multiple parts to be nested within it or for larger-sized parts to be printed. The team at AMACE, through rigorous R&D over the years, have proved out multiple materials like stainless steels, aluminium alloys, tool steels, Inconel, titanium alloys and many more. What we believe sets it apart is its innovative, multi-blade recoating system designed to enhance the productivity of printing, especially during production-related activities. Further, its smart power management system, an in-situ inspection of part dimensions, automatic filtration system, user-friendly digital cockpit format for data display on the Graphical User Interface (GUI) and the remote monitoring & control of the machine are some of the many features that make the machine a smart one and most suited for a production environment.

**With the growing digitalisation and competition, how can India become a global hub for manufacturing? In what ways can the government help the sector?**

India has in its own way made some presence in global manufacturing in the automotive, especially in the two-wheeler & small passenger car segments. To become a global manufacturing hub, scale and agility are two key requirements. In phase one, we will need to augment skills competencies in manufacturing & make investments for infrastructure in logistics & supply chain. The government should lead the way along with the private enterprise with committed investments which will enable the flow of technology. The next phase will be about scaling and optimisation.

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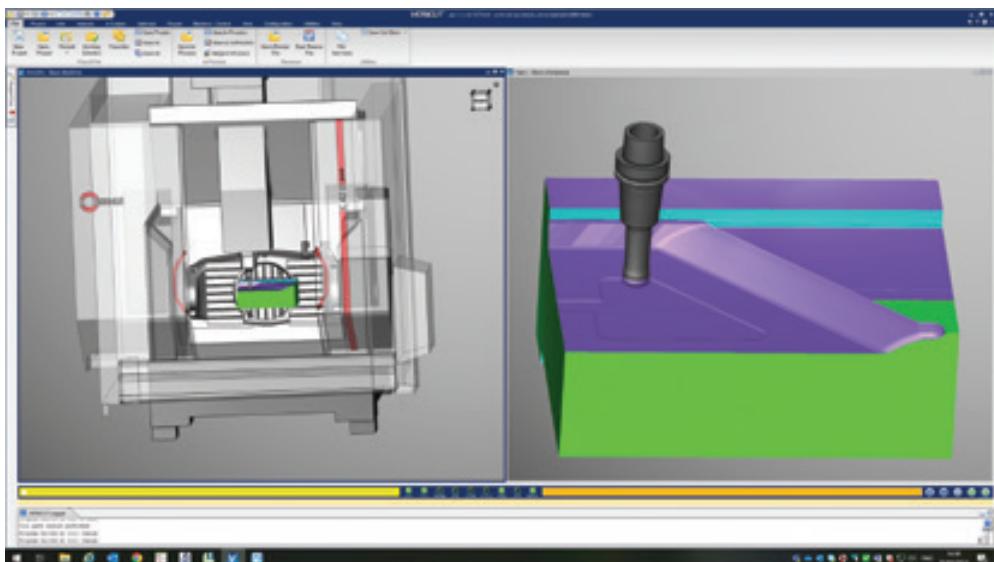
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## MULTI-NATIONAL OEM RELIES ON VERICUT FOR MOULD TOOL MACHINING

The case study elaborates on how CGTech's VERICUT helped Plasson, a flow solution, livestock equipment systems, and products for bathrooms and kitchen manufacturing company, optimise production and increase efficiency in real-time.



Plasson, a NIS 1.3 billion (£285 million) turnover multi-national manufacturing business headquartered in Israel, relies on VERICUT CNC machine simulation, verification and optimisation software from Plasson1 CGTech to ensure high-quality, reliable and highly productive mould tool machining operations. Enhancing the manufacture of the company's injection mould tools and associated parts, VERICUT is today embedded into machining procedures at this progressive OEM after more than two decades of continuous use.

As a global leader in the design and production of flow solutions (fittings and valves), livestock equipment systems, and products for bathrooms and kitchens, Plasson maintains a tradition of over 50 years of excellence and innovation. Formed in 1963, quality is the key concept in all of Plasson's processes, from development and design through production, assembly, packaging, distribution, delivery and aftersales services. The company has a strong global presence, operating

in more than 100 international markets, with approximately 2,000 employees and over 25 subsidiaries worldwide, including one in the UK at Burgess Hill.

### MATCHING THE EVOLVING CUSTOMER NEEDS

Plasson constantly aims to develop added value and stand at the forefront of technology in the development of innovative products and solutions that suit the ever-evolving needs of its customers. Such a philosophy relies heavily on the company's in-house mould tool machining capabilities, which is where the capabilities of VERICUT come to the fore.

"We've been using VERICUT for over 20 years," states Itamar Minerbo, Mould Department Manager at Plasson. "It was originally introduced because we didn't feel that we could fully trust the post-processor. We were finding some differences between the CAM software simulation and the G-code files, where the software simulation didn't show any problems. In contrast,

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running a VERICUT simulation shows very clearly whenever the tool follows a different path according to the G-code. For sure we've protected many mould tools against damage since installing VERICUT."

The importance of protecting both components and expensive machine tool assets at Plasson should not be underestimated. Although the company only ran two four-axis CNC milling machines when it first introduced VERICUT more than 20 years ago, today Plasson has two Hermle five-axis CNC machining centres on-site and a brand-new multi-axis Nakamura turn-mill machine.

"Since we produce injection mould parts, there's almost no serial production," explains Minerbo.

#### GROWING BENEFITS TO CONSUMERS

Plasson machines injection moulds, slides and electrodes measuring up to 300 x 300 x 300 mm in size. Materials include high-specification tool steels specifically for plastic injection moulds, as well as copper for the electrodes. These metals are typically expensive, even more so in the current inflationary environment for raw materials.

To help protect its workpieces and prevent costly rework or scrap, the company relies on VERICUT for all of its machining simulation, verification and optimisation tasks. Supplied by Z-CODE, a VERICUT reseller in Israel, Plasson leverages the benefits of VERICUT base modules that include verification (detects program mistakes and verifies part accuracy), CNC machine simulation (detects collisions and near misses between all components in the machining zone) and multi-axis (simulates multi-axis milling, turning and mill-turn operations).

"For every simultaneous four- or five-axis milling

move we use the multi-axis module," says Minerbo. "Due to the type of jobs, we're processing, we rely on this module quite often."

Minerbo adds, "The overall benefit of using VERICUT is the option to send the program to the machine with the certainty that it will run smoothly without collision. Of course, to ensure reliable results we always make sure that the tools, fixtures and workpieces are the same in the machine as in the simulation. That's why we've standardized all the tools on both of our five-axis machining centres. For example, a 4 mm diameter ball-nose cutter will have the same length and same tool holder on both machines."

Plasson also takes advantage of the AUTO-DIFF™ module, which compares a CAD design model with a VERICUT simulation to detect differences, weaknesses or mistakes in the design and reduce the time needed to cut the first production-worthy part. AUTO-DIFF™ also reduces the time it takes to prepare an NC tool path. Programmers can check for gouges or excess material while working on the program, Plasson4 with problems identified and corrected before machining.

"We use AUTO-DIFF™ on all of our jobs," reveals Minerbo. "This module helps us to make sure we've covered every feature on the part by running the excess analysis function. If we've failed to program a specific feature, it shows up and we can fix it right away. AUTO-DIFF™ also helps to determine where the tool has removed more material than needed and, of course, any collision between the tool, tool holder, workpiece and fixture."

To make the deployment of VERICUT even easier, further modules at Plasson include the PTC-Creo Parametric interface and Esprit to VERICUT interface. "We find that VERICUT is easy to use on a day-to-day basis. The software is very user-friendly and even those new to VERICUT get up to speed in a relatively short space of time," concludes Minerbo.

#### EFFICIENCY & OPTIMISATION

For more than 180 years, WaldrichSiegen has known that continuous innovation is needed to create industry-leading trends. Currently, the company is showing great interest in using the FORCE module. Waldrich-Siegen wants to optimize the processing times of its clients' complex projects. FORCE is a physics-based NC program optimisation software module that analyses and optimises cutting conditions throughout the NC program. It provides the most efficient NC program based on material, cutting tool and machining conditions. This results in considerable time savings and improved cutting tool life. 

Courtesy: CGTech



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By Raj Darji, CEO & Founder, Aarav Solutions

## AI & ML THE KEY TO UNLOCK SMART POWER SOLUTIONS

The article elaborates on how technology solutions such as artificial intelligence and machine learning can help improve efficiency and profitability for utilities.

The utilities' space is rapidly transforming today. It's shifting from a conventional and highly regulated environment to a tech-driven market at a fast clip. Collating data and optimising manpower are a constant struggle. The smarter optimisation of infrastructure has increased monumentally with the outbreak of the pandemic, and also the dependency on technology. There is an urgent need to balance the supply and demand for which artificial intelligence (AI) and machine learning (ML) can come into play.

Data Science, aided by AI and ML, has been leading to several positive developments in the utility space. Digitalisation can increase the profitability of utilities by significant percentages by utilising smart meters for grids, digital productivity tools and automating back-office processes. According to a study, firms can increase their profitability from 20 per cent to 30 per cent. Digital measures rewire organisations to do better through a fundamental reboot of how work gets done.

### CUSTOMER SERVICE & AI

According to a Gartner report, most AI investments by



Raj Darji

utilities most often go into customer service solutions. Nearly 86 per cent of the utilities studied used AI in their digital marketing, towards call centre support and customer application. This is testimony to the investments in AI and ML that can deliver a high ROI by improving speed and efficiency, thus enhancing customer experience. The AI that's customer-facing is a low-risk investment as customer enquiries are often repetitive, such as billing enquiries, payments, new connections etc. AI can deliver tangible results for businesses on the customer service front.

### AUTOMATIC METERS FOR ENERGY CONSERVATION

As the manual entry and billing systems are not only time-consuming but also susceptible to errors and expensive too, the Automatic Meter Reading (AMR) System has made a breakthrough. The AMR enables large infrastructure setups to collect data easily and also analyse the cost centres and the opportunities for improving the efficiencies of natural gas, electric, water sectors and more. It offers real-time billing information for budgeting. It has the advantage of being precise compared to manual entry. Additionally, it is able to store data at distribution points within the networks of the utility. This can be easily accessed over a network using devices like mobile and handhelds. Energy consumption can be tracked to aid conservation and end energy theft.

### PREDICTIVE ANALYTICS ENABLE SMART GRID OPTIONS

By leveraging new-age technologies, utilities can benefit immensely. These technologies in the energy sector help in building smart power grids. The energy sector heavily relies on a complex infrastructure that can face multiple issues as a result of maintenance issues, weather conditions, failure of the system or equipment, de-

“

The AMR enables large infrastructure setups to collect data easily and also analyse the cost centres and the opportunities for improving the efficiencies of natural gas, electric, water sectors and more. It offers real-time billing information for budgeting. It has the advantage of being precise compared to manual entry.

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mand surges and misallocation of resources. Overloading and congestion lead to a lot of energy being wasted. The grids produce humongous data which help with risk mitigation when properly utilised. With the large volume of data that continuously passes over the grid, it can be challenging to collect and aggregate it. The operators could miss these insights which could lead to malfunction or outages. With the help of ML algorithms, insights can be obtained for the smooth functioning of the grids. Automated data management can help maintain the data accurately. With the help of predictive analytics, the operators can predict grid failures before the customers are affected and also create greater customer satisfaction and mitigate any financial loss.

#### EFFICIENT AND SUSTAINABLE ENERGY CONSUMPTION

These allow for better allocation of energy for consumption as it would be based on demand and can save resources and help in load management and forecasting. AI can also deal with issues pertaining to vegetation by analysing operational data or statistics. This can help to proactively deal with wildfires. Thus, it can become a sustainable and efficient system. To overcome issues pertaining to weather-related maintenance, automation helps receive signals and prioritise the areas that need attention to save money and cut down downtime. To achieve this, the sector adopts ML capabilities as they need to be able to access automation fast and easily.

The construction sector is also a major beneficiary of the solutions. Building codes and architecture are often humongous challenges that take a long time to meet. But some solutions help the builders and devel-

opers test these applications seamlessly without any system interruptions. By integrating AI and ML in the data management platforms, the developers enable the data-science teams to spend enough time innovating and much less time on maintenance. With the rise in computational power and accessibility to the Cloud, deep learning algorithms are able to train faster while their cost is optimised. AI and ML are able to impact different aspects of a business. AI can enhance the quality of human jobs by facilitating remote working. They can help in data collection and analysis and also provide actionable inputs. Data analytics platforms can throw light on the areas of inefficiency and help the providers keep costs down.

Though digital transformation might appear intimidating, its opportunities are much more than the cost and risk associated. Gradually, all utilities will undergo a digital transformation as it has begun to take root in the industrial sectors. This AI-led transformation will improve productivity and revenue gains, make networks more reliable and safer, accelerate customer acquisition, and facilitate entry into new areas of business. Globally, the digital utility market is growing at a CAGR of 11.7 per cent for the period 2019 to 2027. In 2018, the revenue generated globally for the digital utility market was 141.41 Bn and is expected to reach \$381.38 billion by 2027 according to a study by ResearchAndMarkets.com. As the sector evolves, the advantages of AI and ML will come into play and lead to smarter grids, efficient operations and higher customer satisfaction. The companies that are in a position to take advantage of this opportunity will be ready for the future challenges that could emerge in the market.

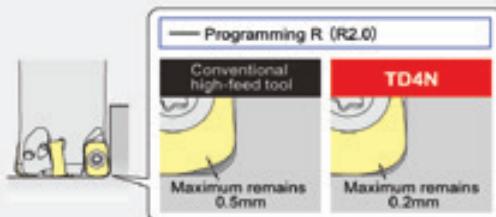
# TD4N

Radius mill TD4N



#### Reduces uncut remnants on work pieces

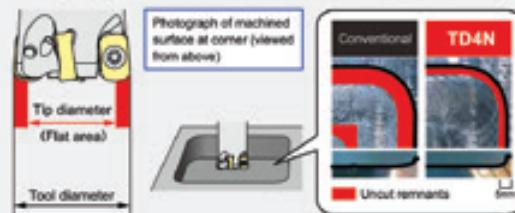
The cutting edge shape was reviewed for TD4N so that uncut remnants are reduced. This enables the load on the next process to be reduced by up to 40% compared to conventional products.



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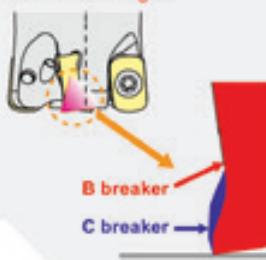


#### Excellent chip discharge characteristics

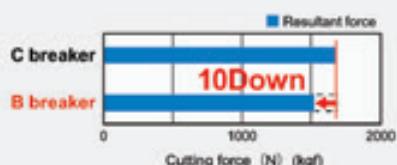


#### Magnified view of cutting edge cross section

Positive rake angle



#### Comparison of cutting force



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By Dr Shubhrangshu Barman Roy, Senior Principal Consultant & Business Head, BMGI India

## DE-SKILLING: THE FASTEST WAY TO RAISE PRODUCTIVITY

The article elaborates on why de-skilling is the new-age way of running a business and how it contributes to productivity growth.

In 1976, Dr G Venkataswamy (Dr V) decided to eliminate 'needless blindness' and started an 11-bed hospital staffed by four medical officers called Aravind Eye Care. But he soon realised that to achieve his vision, the current way of working would not be enough to serve large volumes of people and making patients wait was something he did not want. So, he decides to bring in the unique assembly line approach, which improved his productivity tenfold. Today, Aravind Eye hospital is the world's largest eye care provider (4.5 L procedures in a year) and to top it all, it does not charge 50 per cent of its patients.

So, what does de-skilling have to do with this? A lot, provided the principles are understood before implementing the practices. How and what could an eye hospital learn from an assembly line and implement it to get ten-fold gains?

Let's change our perspective and see what McDonald's has done to maintain the same standards globally, considering people working in any outlet are not 'cooks or chefs'. So, how is it that the french-fries are the same irrespective of the outlet you go to? Well, that's



**Dr Shubhrangshu Barman Roy**

the practice of deskilling at work. So, what did they de-skill? And why?

### SEGREGATING STYLE & STANDARD

Both the entities above essentially did two things – first, they managed to segregate the 'style' of work and 'standard' of work, and second, they separated the 'physical work' from the 'thinking work'. Once these two were done, the process steps were standardised (either by digitisation/mechanisation or automation) to such an extent that they could squeeze the 'variability' out of the process to the maximum. A consistent, sustainable, repeatable & continuous process remains when you do all that. So, when Aravind Hospital placed two patient beds side by side and asked the doctor to make the 'cut' to finish the operation on one bed as the other patient was getting prepared on the bed right behind them, it was an example of separating the physical work of 'setting up' the patient and 'thinking work' of the doctor. Hence, the doctor was only doing what they were supposed to and not fatiguing out doing ancillary work. In parallel, the physical work was divided into small standard actions and standardised to the extent that even a fresher or semi-trained nurse could set up the bed with minimal training. Bingo! De-skilling at work. An additional benefit was the reduction in training time and easy replacement and/or easy job rotation.

A simple way to look at standardisation is to remember the principle of 'adjustments to settings' - i.e., you don't tell people 'how to' do it but rather 'what to' do. For instance, in earlier days, when you went to fill petrol, the person used to fine-tune the counter to the last paisa or millilitre and hence had to stand there all along to ensure that, but now he sets it to the amount you want and goes out filling some other car (unless you are getting your tank full). He is more productive now as he does more work simultaneously with less fatigue.



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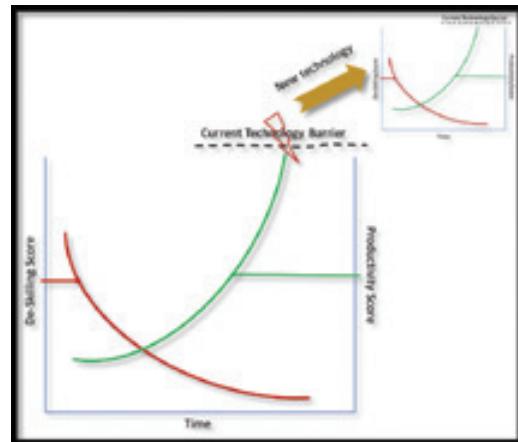
### BENEFITS OF DE-SKILLING

Similarly, suppose you spend time absorbing the work of any McDonald's outlet. In that case, you will realise a few things: for instance, the alarm goes off when french fries are done (no one needs to monitor it), and the movements of each member are limited and standardised to reduce fatigue and wasteful movements. The dispensers are click-type and dispense precisely the same amount of salt/cream every time; ever notice the burger pack, it is designed to work in parallel while making the burger, so information sharing is de-coupled. Screens are used to transmit info (no dependency/collaboration required), the pack has an easy lock and so many other examples of de-skilled work.

So how does de-skilling help? Well, here are a few benefits:

- It helps get supervisory control over the process; in other words, it allows you to decide the rhythm of the process rather than leave it to different people's different skills to run the operation. So, if you control the process, you also control the result.
- It enables you to identify different solutions for manual and thinking work (digitisation/AI) to simplify the process further.
- It helps you to reduce training time for any process and reduces the chances of error substantially.
- Enables you to disperse your value adders across processes, sites, etc.
- You get to ensure that 'adjustments' do not become 'skills' and that style and standards are well segregated.
- It increases capacity creation by doing away with ancillary and incidental activities and saves time. Ancillary and incidental activities tend to increase fatigue and hence reduce productivity.
- It sets your direction towards a consistent, sustainable, and capable process.
- It helps you identify a new set of value-added skill requirements and upgrade your process rather than just managing and maintaining the ageing process.

Deskilling is often seen as a negative trend in the workplace, but there are some benefits to it. For ex-



As you get onto your deskilling journey, you will eventually hit your current technology barrier; that's the time to move to new technology and start this process again to continue your productivity journey (refer to the chart above).

ample, de-skilling can allow companies to reduce their labour costs and increase profits. It also improves efficiency and simplifies processes. The term de-skilling is often used to describe how technology has automated tasks humans previously carried out. For example, automation might replace a worker in an assembly line. This means they will no longer need to perform the task but may still be required to maintain and operate the automation equipment that requires a higher level of skill.

So, as you get onto your deskilling journey, you will eventually hit your current technology barrier; that's the time to move to new technology and start this process again to continue your productivity journey (refer to the chart above). As the deskilling score reduces (lower the score, faster the learning), the red curve, and productivity increase (the green curve). However, the productivity increase will create a barrier concerning the current technology being used; hence, once that barrier is hit, new technology should be contemplated. Having said that, technology selection is highly dependent on the variability (product & process) it has to manage. Therefore, a tradeoff must be worked out while crossing the current barrier and selecting the next.

It's a never-ending journey, and now with technology driven by AI/ML, the challenges are increasing for selecting the right one and exploiting it to your advantage.

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By Anvita Pillai

## FLYING HIGH & AHEAD

In an exclusive interaction with **William Blair, Vice President & Chief Executive, Lockheed Martin India**, he discusses the company's India success, the lags in the Indian ecosystem, their fighter jets for Indian A&D space, entry into the newly opened space sector, and more. Excerpts....

**Lockheed Martin has had a successful presence in India for over three decades. What have been the key drivers of your success? Can you highlight some of your key achievements during this period?**

Lockheed Martin's association with India began in the 1940s when we supplied our Constellation aircraft to India's national airline and the Indian Air Force (IAF). Since then, we have been a committed member of the Indian aerospace and defence industry for over three decades. The company has a strong history of partnership with India and is working to support India's vision of achieving greater self-reliance in defence.

**"The current and future state of warfare is and will be around gathering and sharing information across multiple domains to make effective warfighting decisions as quickly as possible"**

For more than a decade, Lockheed Martin has had two state-of-the-art manufacturing Joint Venture (JV) in India with Tata. The partnership exemplifies the government's 'Make in India' initiative and supports the growth of India's aerospace and defence ecosystem by manufacturing advanced components for transport, fighter, and rotary-wing aircraft – for meeting India's requirements and for export.

We have supported the requirements of the Indian Armed Forces extensively over the last three decades through several programs and platforms such as the C-130J Super Hercules, MH-60R Romeo helicopter and indigenous Light Specialist Vehicle.

The C-130J program represents a strong legacy of partnership between the US and India. IAF's C-130Js have been used to support a variety of missions over the past few years including humanitarian efforts in the wake of COVID-19, and transportation of relief materials, equipment and personnel in the areas affected during the Assam floods. The IAF has even made history by landing a C-130J at the world's highest landing strip in the Himalayan Mountains (Daulat Beg



**"More than \$600 million worth of exports have been generated by our JVs and produced over \$200 million in Indian industry revenues"**

Oldi), making headlines around the world for achieving such a daunting feat.

MH-60R is the largest program for Lockheed Martin in India in support of the United States Government's foreign military sales. The US Navy has already delivered the first three aircraft to the Indian Navy in 2021, a record 14 months from contract signing, and these aircraft are being utilised to train Indian pilots and crew members in California. In July-August 2022, the US Navy transported to India another three helicopters, which will be initially based at Naval Air Station INS Garuda in Kochi. A total of 24 MH-60Rs will be delivered in the country over the next few years.

Lockheed Martin has also worked with Ashok Leyland to develop the next-generation military vehicle for India and the global market. The vehicle has been field evaluated in various environmental conditions by the Indian customers, and the first lot has been delivered to the IAF. Lockheed Martin's engineering support and the cooperative working relationship with Ashok Leyland were instrumental for the success of the development and production of indigenous equipment – another great example of the 'Make in India' concept.

**Lockheed Martin, in 2020, offered the F-21 for India's exclusive use. Can you give us an update on the**

**F-21 partnership with India? How does it enhance India's defence capabilities?**

We are confident that F-21 is the best solution to meet/exceed the IAF's capability needs, provide Make in India industrial opportunities and accelerate India-US cooperation on advanced technologies, including but not limited to fighter aircraft. F-21 integrates India into the world's largest and most successful fighter aircraft ecosystem – a \$165 billion market.

Currently, we have on offer the F-21 aircraft for the Indian Air Force's 114 fighter-jet procurement program. This is the most advanced fourth-generation fighter we have ever offered. The F-21 would serve as a force multiplier for the Indian Air Force (IAF) with an unmatched capability-to-cost ratio compared to the competition. In addition, the F-21 is equipped with state-of-the-art systems and sensors that would allow the IAF to detect, track and engage multiple targets in a contested environment.

The current and future state of warfare is and will be around gathering and sharing information across multiple domains (air, space, land, sea and cyber) to make effective warfighting decisions as quickly as possible. The F-21 will be able to integrate across these domains and across Indian services to provide current and future relevance. Our F-21 offer is also 'Made in India', which addresses the goals of 'Atmanirbhar Bharat' while providing India with an improved security cooperation relationship with the United States. Furthermore, the F-21's industrial offering will put India at the epicentre of the world's largest fighter production and sustainment market creating thousands of new jobs in India.

**Between Rafale and Tejas, how does the F-21 fit in? Further, there were some concerns about the F-21 being a refurbished model of the F-16V back then. What are the key differences between the two aircraft?**

The F-21 is the perfect complement to India's current fleet in terms of operational performance. The F-21 offered to the Indian Air Force provides a single engine, low life cycle cost platform at a Max Take-Off Weight (MTOW).

Lockheed Martin is leveraging technologies across our entire fighter portfolio – not just backwards (i.e., fifth to the fourth generation) but forward as well (fourth to the fifth generation). In terms of fifth-generation technologies being inserted into the F-21, our advanced active electronically scanned array radar is one example. There are many shared technologies on this radar which have been derived from both the F-22, as well as the F-35. Compared to previous mechanically scanned array radars, the F-21's AESA radar has detection ranges nearly double that of legacy versions. Furthermore, we are offering an advanced cockpit on the F-21 with a Large Area Display. This avionics suite is leveraging both hardware and software

from our fifth-generation fighters and will greatly enhance pilots' situational awareness. Additionally, our Automatic Ground Collision Avoidance System, which was developed and fielded on our F-16, is also included in our F-21 offering and has recently been fielded on the F-35 for which Lockheed Martin received the prestigious Collier Trophy. This game-changing technology detects when the pilot(s) are disoriented or are at risk of losing control and automatically takes control of the aircraft. To date, auto-GCAS has saved 11 pilot lives.

**Drones are being extensively promoted in India's defence sector. Does Lockheed plan on entering the domain for India?**

Lockheed Martin's unmanned technologies can play a predominant role in modern-day warfare situations. Our portfolio of sophisticated unmanned systems is currently being used for a variety of lifesaving military and commercial applications, and the demand for these capabilities is growing.

In addition, advancements that support autonomous and optionally piloted operations, like Sikorsky's MATRIX™ technology, will change the ways aviators and aircrews execute their missions, assisting when flying with a reduced crew or limited visibility. Matrix is like a virtual second pilot that will help operators fly safely and confidently in dangerous and complex missions. It can leverage full authority flight control inputs for autonomous flight – including take-off, route planning, obstacle avoidance, site selection and landing. The Matrix technology will enable operators to fly more manned missions in adverse

weather or restricted visibility, fly missions more effectively in complex and obstacle-rich environments, eliminate sources of pilot and operator error and reduce operating costs.

The technology has been integrated and extensively flight tested on various aircraft, including the S-76B and Black Hawk. The team recently achieved a significant milestone, flying an uncrewed S-70 Black Hawk autonomously for 30 minutes.

**Keeping in mind the 30-year-long partnership, what have been some of the key challenges encountered by Lockheed Martin in the Indian market? What kind of support from the government could make the journey ahead smoother, in your opinion?**

While the overall trend with respect to reform of the Government's defence policies has been encouraging, there is still work that needs to be done to increase the speed of the implementation of these policies for manufacturing world-class A&D products in India at globally competitive costs and quality. Some of the suggestions for further refinements include:

- Enhancing the project approval process, efficiency and period of discharge of offset obligations
- Making skill development eligible for defence offset credits
- Incentivising the industry by giving higher multipliers on capital and equity investments.
- Allowing tier-1 suppliers to discharge offset obligations on behalf of the foreign OEM for all offset contracts currently under execution
- Allowing group companies or subsidiaries to discharge offset on behalf of the OEMs





- Rationalisation of levy of penalties
- Formulating a pragmatic definition of 'India Value Addition'

**With India's space sector opening up, where does Lockheed Martin fit in? Are there any partnerships with ISRO in the pipeline?**

We see a tremendous opportunity to help India realise its space goals. India is a key contributor to the success of the global space community. Lockheed Martin is excited about the developments surrounding India Space, and its willingness to open its facilities to support future cooperation and collaborative efforts within the space domain. We are also expecting closer collaborations with state governments and the creation of working groups with industry to build talent and capability for the country. For us, growth prospects from India are vibrant and multi-dimensional.

**Start-ups are turning out to be a very important part of the Indian A&D ecosystem. How is Lockheed working on creating a synergy with the start-ups in India for a much stronger A&D sector?**

As a part of our larger commitment to enhancing the growth and development of India's innovation, Lockheed Martin has sponsored and supported the India Innovation Growth Program (IIGP) since 2007. Aimed at developing entrepreneurship in India, IIGP 2.0 is the only public-private partnership of its kind in India that spawns indigenous innovation by training budding innovators in world-class strategies, promoting and providing incubation and acceleration

support, and assisting in business development. The program is designed to accelerate the launch of early-stage Indian technologies into the global marketplace. To date, the program has generated over 400 business agreements and \$1 billion in revenue for Indian start-ups and entrepreneurs.

**Do you think that Make-in-India in defence production is very crucial and not just an option? Subsequently, what factors can make Indian defence manufacturers more competitive considering our geopolitical position?**

Among the world's major nations, India stands out for its commitment and ambition to build an indigenous industrial base for defence and aerospace. Prime Minister Modi's call for increasing defence exports to \$5 billion in five years is a testament to this commitment and ambition. Much of this will have to happen through the 'Make in India' vision and 'Atmanirbhar Bharat' abhiyaan for defence, which is both progressive and visionary.

To fulfil the government's vision of making India a defence manufacturing hub, there is a massive opportunity for partnerships between Indian organisations including micro, small & medium enterprises (MSMEs) and start-ups and foreign OEMs. Integrating MSMEs can help India build a strong and viable indigenous defence industrial capability and reduce dependence on imports. For foreign OEMs, MSMEs are ideal partners for strengthening India's defence ecosystem, increasing aerospace & defence exports and for the cost-effective discharge of offset liabilities.

Foreign OEMs, with their global expertise and capabilities, can provide much-needed support to MSMEs as they look to break into the world of defence manufacturing. This support can extend from sharing technology, access to global supply chains, guidance with manufacturing, among others. The final goal is to go beyond just providing a workshare to building a capable ecosystem on par with global standards – an ecosystem that has MSMEs empowered to execute complex and demanding contracts.

Foreign OEMs, with their global operations, also open a world of opportunities by integrating MSMEs into their supply chains. This provides future business opportunities to MSMEs to benefit not just from the OEM but also from their global networks, building vital capabilities and experience. There is another aspect to the OEM-MSME partnership because of the association with foreign OEMs, MSMEs are upheld to global standards and are required to comply with benchmarks and certifications for which they are constantly counselled and trained. This makes them attractive to the global defence community.

**Aatmanirbhar Bharat has been picking up pace in India. Since the import of defence systems has fallen considerably, how is the A&D sector coping with the need to create indigenised systems in India? Where does Lockheed Martin place itself on this journey?**

India presents a tremendous opportunity for Lockheed Martin to build on our foundation here and expand in multiple domains to meet the customers' needs. India provides us with opportunities to not just partner with the government, public and private sector in modernising the country's armed forces but to also contribute to the country's society and economy.

Through various business programs over the last decade, Lockheed Martin has had the opportunity to work with Indian companies and develop long-term business relationships. The JVs and partners we have established over the last decade have generated value and flowed down to Indian tier 1/2/3 large, MSMEs and start-ups supporting a foundation for the defence and aerospace ecosystem in India. We are fully committed to supporting the Prime Minister's vision of self-reliance through supporting the growth of an indigenous defence manufacturing ecosystem, advancing the aerospace and start-up ecosystem, and strengthening India's strategic security and industrial capabilities.

Our JV with Tata – Tata Lockheed Martin Aerostructures Limited (TLMAL) – in Hyderabad established over a decade ago produces major aerostructure components for the C-130J Super Hercules transport aircraft. This is the sole supplier of these components to Lockheed Martin and is an integral part of our global supply chain.

Our other JV, Tata Sikorsky Aerospace Limited (TSAL), also established over a decade ago,

manufactures aerospace components for commercial helicopters & aircraft and has expanded to include aircraft engine components for aerospace industry companies as well. It is also fully integrated into the global supply chain.

To date, TLMAL has manufactured and delivered more than 180 C-130J empennages and TSAL has delivered 157 S-92 cabins with over 87 per cent indigenous content.

As a show of commitment that exists in our relationships with our partners in India, Lockheed Martin last year qualified TLMAL to build one of the most technologically complex aerostructures – a fuel-carrying 9G, 12,000 hours, interchangeable/replaceable fighter wing with >70 per cent detail parts indigenously produced.

More than 500 suppliers including over 140 MSMEs feed into these two JVs and have benefited from the vision of Lockheed Martin and Tata working together. At present, more than 70 Indian suppliers have been integrated into Lockheed Martin's global supply chain.

More than \$600 million worth of exports have been generated by these JVs and produced over \$200 million in Indian industry revenues. Lockheed Martin has invested over \$100 million in manufacturing equipment, tooling and IP at these JVs.

**What lies in the pipeline for Lockheed Martin for the short and long-term future?**

The IAF is currently facing a fighter squadron deficit required to meet its regional security needs. Lockheed Martin has proposed the F-21 as the ideal solution to meet India's capability, force structure, affordability, Make in India and Skill India requirements. Lockheed Martin has an unmatched track record of establishing robust partnerships and defence industrial capabilities across multiple fighter platforms and countries worldwide.

We have been investing in building capability in the country in advance of the fighter jet competition and as a show of confidence in the Indian industry signed MoUs with Hindustan Aeronautics Limited (HAL) and Bharat Electronics Limited (BEL) to explore industrial opportunities to generate jobs and economic benefits in support of 'Make in India' and 'Start-Up India' initiatives, as well as in support of India's air power mission.

Additionally, we are leveraging decades of experience to develop scalable directed energy solutions for military aircraft. Our integrated systems complement kinetic solutions to protect warfighters in the air and on the ground.

Besides this, we are also working on investing in the future of India through educational and skilling efforts that aim to inspire future generations of scientists, technologists and innovators in India and develop the country's workforce. 

By Sriram Shankaranarayana, Managing Director - Digital and Technology Advisory Services, Alvarez and Marsal India  
Prangya Mishra, Director – Industry 4.0 Advisory Services, Alvarez and Marsal India

## APPROACH TOWARDS ACCELERATING DIGITAL TRANSFORMATION AND INDUSTRY 4.0

The article elaborates on the general trends of the adoption of digital and Industry 4.0 in manufacturing companies.

**M**anufacturing companies, globally as well as in India, have been embracing and adopting Industry 4.0 and digital transformation steadily. As per a report by industry body NASSCOM, dated February 2022, on Industry 4.0 adoption:

- Global manufacturing technology spending has risen 2.4x in the last decade, to \$509 billion now. Particularly, Industry 4.0 investments by manufacturing companies, now at \$102 billion, comprise 20 per cent of all manufacturing technology spending.
- Industry 4.0 is at an inflection point in the Indian manufacturing sector which has started pivoting to Digitalisation with more than two-thirds of Indian manufacturers embracing the digital transformation by 2025, thereby contributing to the goal of raising India's manufacturing GDP to 25 per cent.
- 50 per cent of the technology spent by Indian manufacturers is on Industry 4.0 technologies.
- 50 per cent of the Industry 4.0 spend is on foundational technologies – Cloud and IoT. But 35-40 per cent of the companies are still at the Proof of Concept (PoC) stage and will need a rapid PoC-to-Production transition.
- 75 per cent of the Industry 4.0 spend is by leading discrete manufacturers in auto, electricals and electronics, while chemicals and pharma lead in the process manufacturing segment.

- In the next 18-24 months, companies plan to ramp up investments in emerging network tech, big data analytics, central and remote-controlled monitoring, and automation.

### KEY BENEFITS ACCRUED BY SUCCESSFUL ADOPTION OF INDUSTRY 4.0

Industry 4.0 brings structural changes to the way companies manufacture, improve and distribute their products. Manufacturers are integrating new technologies, including the Internet of Things (IoT), computer vision, cloud computing, analytics, artificial intelligence and machine learning into their production facilities - throughout their operations and across their value chains.

Industry 4.0 adoption can help manufacturers derive key business values such as:

- Increasing enterprise growth
- Improving business processes
- Reducing enterprise costs / Improving EBITDA
- Driving operational efficiencies
- Improving profitability and margin
- Creating new products and services
- Expanding into new markets and geographies
- Attracting and retaining customers
- Driving enterprise innovation
- Improving staff advocacy score

As per the NASSCOM report, digital transformation projects across the sector have witnessed a >25 per cent reduction in timelines, from PoC to adoption to RoI with a strong focus on supplier de-risking strategies, coupled with traceability needs, will push for value chain digitalisation.

### KEY CHALLENGES IN INDUSTRY 4.0 ADOPTION

At the very core, Industry 4.0 is the transformation of a manufacturing/production facility across the value chain of sourcing, operations, sales and services - enabled by technologies resulting in greener, safer, and profitable manufacturing. It is a journey of setting direction, embedding capabilities, and scaling them - im-



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pacting three pillars of operational efficiency - people, process and technology.

However, certain crucial factors inhibit digital adoption in manufacturing companies that need to be addressed.

- **Technology Barrier** – Vertical system integration is a fundamental requirement to kick-start the Industry 4.0 journey. Many manufacturing organisations are still struggling with legacy industrial control systems, islands of automation and non-converged IT/OT layers. Without a proper vertically-integrated approach that connects the ‘shop floor to the top floor’, it’s nearly impossible to set course on Industry 4.0 journey.
- **Organisation Culture** – Leaders at the top often want to increase control by using digital technologies. Their goal is to have continuous, real-time performance measurements. Organisational resistance is often seen in both lower-level employees and mid-level managers. Employees may be frightened of losing their jobs with increasing digitisation, and real-time performance measurement induced by Industry 4.0. Over time, the scope of activities of middle managers will also be completely transformed and their role will change to include some new tasks that may need more expertise. The fear and the need to continuously upgrade skills lead to resistance to ‘change’ and is one of the major barriers to Industry 4.0 implementation.
- **Skill & Resource Scarcity** – Digitalisation and Industry 4.0 increase the importance of new technical skills specifically in the areas of operational and mechanical activities in the areas of production, quality, maintenance, stores, purchasing and logistics. New process-dependent systems making greater use of technology sometimes prove to be a major challenge for the existing generation of employees. In many cases, employees require training to make full use of the Industry 4.0 ap-

plications and technologies. Longer lead-time requirements for training the staff are often seen as one of the barriers to implementing manufacturing digitalisation.

- **Fear Of Failure** – Increasing digitisation of production processes provides several financial benefits, including a significant reduction in the cost of human resources, inventory management and operations. However, the introduction of Industry 4.0 technologies also requires a significant number of financial resources, which may hinder companies. Many companies are still concerned and not fully convinced about the return on investment in new technologies as well as changing or upgrading existing technologies required to start Industry 4.0 journey.

## KEY LEVERS FOR ACCELERATING ADOPTION

While there are challenges to the digitalisation of manufacturing and implementing Industry 4.0, a thoughtfully designed framework involving people, processes and technologies can help in improving and accelerating the adoption.

- **Overcoming The Technology Barrier** – Manufacturing organisations must follow a series of steps in digitally transforming the factories rather than following a big-bang approach of transforming everything in one go. Sensorisation and local integration of sensors should be the first step towards Industry 4.0 followed by vertical integration of systems and applications including industrial automation refresh if required. Horizontal or value chain integration considering IT/OT cyber security follows the next. The next step of evolution would be creating consumer-grade application interfaces for employees, suppliers, and customers.
- **Reimagining Organisation Culture** - To drive the needed cultural change, companies need commit-

ment and ongoing efforts from most of the senior leaders. Besides that, it also needs to be driven at multiple levels of the organisation: The executive team, human resources and digital leaders. Everyone needs to be aligned in the transformation journey of Industry 4.0.

- For the executive team, it is important to have a called-out vision and they must create a mission-driven transformation, breaking down the organisational hierarchy to enable idea generation and a fail-fast mindset.
- The human resources team must focus on creating a team of middle management with a diversity of thoughts and backgrounds. They must concentrate their efforts on engaging factory stakeholders by creating a 'hero' culture, encouraging them to be pioneers who take pride in being at the forefront of the transformation.
- The digital leaders must work as evangelists of manufacturing digitalisation and clearly define what digital means to different stakeholders across various levels within the organisation. They must leverage 'design thinking', new technology platforms and functionalities as well as the 'Open Innovation' approach - leveraging the ecosystem of providers of technology products and services – including innovative start-ups and demonstrate improvement in the KPIs to tell a positive story to prove the point and reiterate that digital is a means to an end and be pioneers for open and transparent communication across the organisation to help drive employee engagement.

#### OVERCOMING RESOURCE SCARCITY

Foundational skills such as digital literacy and continuous learning are key indicators of an individual's ability (and willingness) to upskill, gaining the knowledge and expertise they need to excel in a job. Companies willing

to venture into Industry 4.0 must ensure investment in such foundational skills at all levels within the organisation to have an Industry 4.0 or digital-ready workforce.

- **Emphasis On Soft Skills:** As departments and organisations become more interconnected, professionals will gain exposure to a wider range of challenges, situations, and non-homogenous co-workers. Skills such as creative problem solving, communication, leadership and teamwork are all necessary to embrace this dynamic environment that Industry 4.0 has created. Proper training, leveraging internal and external resources, must be planned to improve the soft skills at various job levels within the organisation.
- **Future-Ready Technical Skills:** Industry 4.0 is expected to make manufacturing jobs more specific and technical. Professionals must navigate the highly digital manufacturing environment, acquiring the capabilities to perform these specialised tasks. Organisations must ensure learning and development programs across the board to impart the comfort of working with various new digital tools for the industrial workforce.

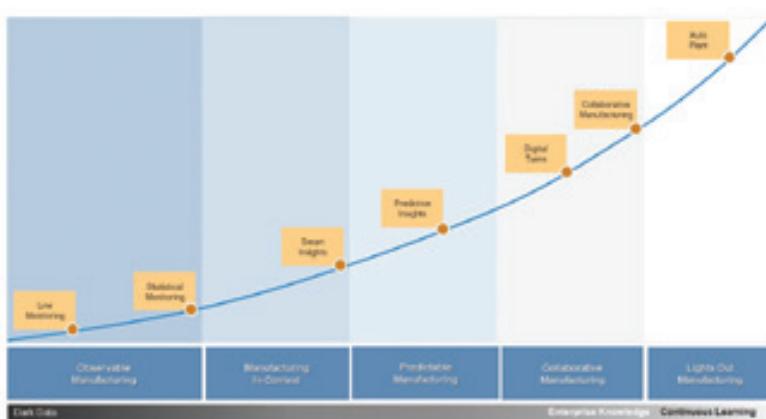
#### OVERCOMING THE FEAR OF FAILURE

One of the fundamentally inhibiting factors for digital transformation is unclear and uncertain ROI, given ROI is a function of technology as well as human and organisational factors in a typical Industry 4.0 implementation. One of the ways organisations are tackling this is by following two approaches:

- **Failing Fast, Failing Smart:** Identifying the key KPIs and use cases for Industry 4.0 initiatives based on current baseline data, running one or more pilots for testing the hypothesis around the envisaged value out of the use cases and expecting them to fail fast with minimal investment leveraging the technological advances in cloud and IoT technologies, SaaS model etc. Complementing this process is the

notion of "failing smart" - failing fast but learning from the experience and using the experience as part of the continuous improvement strategy.

- **Learning From Others:** There are certain Industry 4.0 use cases which are fundamental to operations and have matured over time - these were once considered unproven a few years ago. Predictive maintenance and digi-





tal twins among others are now largely proven and have even become standard capabilities for many manufacturing organisations. Failing to build these tools/capabilities can mean leaving the opportunity untapped. Organisations fearing financial failure can choose from many successful and real-world use cases from industry peers to learn and build a convincing investment case and then build their organisation or department-specific use cases.

### ENSURING THE MOMENTUM IS NOT SLOWED DOWN OR LOST

Post defining the organisation changes, breaking the technology barriers, overcoming the fear of failure, and having a plan for making skill upgradation as required for Industry 4.0, organisations need to ensure the momentum for digital transformation is not slowed down or lost over the implementation period and beyond.

Industry 4.0 journey could be very complex, and it demands a lot of enthusiasm, continuous engagement, and a shared common vision across functional groups for successful implementation and sustaining the results.

Top 5 levers for ensuring the momentum are not slowed down or lost over time:

1. **Cross-Functional Collaboration:** Organisations need to ensure there is support for sharing work, initiating projects in group settings, and effectively connecting with additional project groups to form cross-functional teams.
2. **Embrace Adaptability:** Free flow of information needs to be ensured across all project groups irrespective of job roles and hierarchy; individuals can make decisions and respond to changing conditions & experimentation and learning are encouraged.
3. **Ensuring Inclusivity:** Established channels for providing feedback or learning about projects and

activities; leaders and project teams actively solicit diverse perspectives; there are processes for collective or collaborative decision-making.

**4. Transparency Across Board:** Individuals and teams must regularly disclose their plans, projects/products, or processes to multiple stakeholders; decision-makers share data

and resources.

5. **Encouraging Community:** Shared values guide decision-making, so rather than relying solely on top-down directives, organisations mobilise expertise from people closest to challenges or opportunities to promote agility, quicker decisions, and better ideas.

### THE TECHNOLOGY ADOPTION CURVE

Implementing Industry 4.0 is highly technology intensive involving a very complex integration of a variety of technologies from several suppliers into a single, tailored framework relevant for individual manufacturing organisations and factories. The technology building blocks must be tightly aligned to the new digital capabilities promised by Industry 4.0 following a progressive journey.

### INDUSTRY 4.0 ACCELERATING VALUE

Organisations looking for accelerating the manufacturing digitalisation and Industry 4.0 journey must ensure the readiness of technology and human factors besides ensuring the fear of failure is well taken care of while designing the journey itself. Technology readiness must be approached in a phased manner while up-skilling of the workforce must follow a medium to long-term learning and development strategy across the board. The technology adoption must be sequenced aligning to the newer digital-led capabilities the organisation is willing to onboard over time. While envisaging the journey, it is also important to have a management vision around Industry 4.0 value generation and re-imagining the company culture by breaking down the organisational hierarchy to enable idea generation and a fail-fast mindset. It is equally important to maintain the momentum going during the journey of Industry 4.0 over time by developing a framework for engaging the cross-functional and cross-organisational group of stakeholders.



FEBRUARY 2023 | DELHI, INDIA

# LET'S CELEBRATE INDIA'S MANUFACTURING EXCELLENCE



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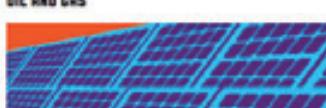
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By Maneck Behramkamdin, AVP & Business Head, Godrej Aerospace

## PUBLIC-PRIVATE PARTNERSHIP: SPACE & AIRCRAFT GROWTH STORY OF INDIA

With India's civil aviation and space sectors opening doors to the private sector, immense growth is anticipated. The article throws light on how PPPs will now be a core reason for the sectors' growth.

**I**ndia's civil aviation sector has emerged as one of the fastest-growing industries in the past three years. India has risen to the third-largest domestic aviation market in the world, and by 2024, it is predicted to surpass the UK to assume that position. A big boost to the Make in India initiative has been given by the government's decision to create a task group for developing a roadmap in response to the aspiration of having indigenously built civil aircraft in India.

### CIVIL AIRCRAFT MANUFACTURING

Airbus, Boeing, Bombardier, Embraer, and Tupolev make up the present oligopoly of companies that manufacture civilian aircraft worldwide. Of the five participants, Airbus and Boeing own the majority of the market. The number of companies in the aircraft manufacturing business is naturally small due to the significant investments needed in this sector. A passenger aircraft's production is also a difficult, risky and drawn-out procedure. It has taken 15 years for technologically sophisticated regions like the US and Europe to develop their learning curves in this area. As far as Indian capabilities go, the country currently imports the majority of its needs for civil aircraft. However, it is predicted that India can develop sizable capacities in aircraft production in the following 10-15 years due to its capacity for technology absorption. Indian operators now have authority over a fleet of about 450 aircraft. The present operators must, however, increase capacity given the anticipated growth in passenger demand over the next years. In order to meet the increased demand, domestic players will need about 816 additional aircraft. Domestic airlines have placed significant orders with global giants like Boeing, Airbus, and Bombardier due to the absence of Indian manufacturers.



Maneck Behramkamdin

### INDIA'S ROLE IN INDIGENOUS AEROSPACE COMPONENT MANUFACTURING

India has made various attempts to strengthen its skills in fields with strategic or broader-national significance. For instance, the Government of India has established defence public sector organisations to form alliances with large international aerospace and defence companies in order to develop capabilities in the manufacturing component of the defence industry – aeroplanes, helicopters, and missiles. This has been accomplished in some instances through the licenced production of trainer aircraft and in others through the production of helicopter and fighter aircraft subsystems, parts and spares. Domestic companies have made a significant contribution, increasingly steepening their learning curves. Due to this, the nation has developed skills in crucial areas including the production of fourth-generation fighter aircraft, cutting-edge helicopters (Dhruv and Light Combat Helicopter), and best-in-class missiles (BrahMos). This year in May, the 250th set of stealth universal supersonic cruise missile airframe assemblies were handed over virtually to BrahMos in the presence of the mentors and leaders from Godrej & Boyce, BrahMos Aerospace Pvt. Ltd, Missile Sys-

**6<sup>TH</sup> EDITION**

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tems Quality Assurance Agency (MSQAA) and Defence Research & Development Laboratory (DRDL) a lab under DRDO. 250th BrahMos airframe on 4th May 2022. By using more domestic components in these supersonic missiles, the nation's security will be strengthened through self-reliance. In the civil sector, when pooling requirements of domestic players can be carefully handled, a similar strategy is advised. Other high-tech complementary industries, including defence, space, IT, etc., where India has had some recent success, are also projected to provide significant support for this industry. Such actions would not only expand the market for large and medium-sized businesses but also help the economy save a significant amount of foreign currency.

India has made admirable efforts to produce its own aircraft by making significant expenditures on finance, infrastructure and skill-building. For instance, the multipurpose light transport aircraft known as the Dornier 228 has been produced in mass quantities by the state-owned Hindustan Aeronautics Limited (HAL) in India. In 1983, HAL acquired the right to manufacture this aircraft from the German company Dormer GmbH. Defence forces are actively using the 19-seater aircraft. The Directorate General of Civil Aviation (DGCA) has granted this aircraft a 'certificate of airworthiness,' opening the path for its civil usage. Under the ambitious UDAN plan, the aircraft is expected to play a significant role in improving regional connections.

While Airbus has joined forces with Tata Advance System to replace the Indian Air Force's AVRO aircraft

with the Airbus C295, Hindustan Aeronautics Limited (HAL) has taken very important steps in aircraft manufacturing, including the production of the Hindustan-228, the Indian version of the Dornier-228.

The public-private partnership was a positive start, and it was necessary to provide the ISRO and private sector authority. While doing so, we must exercise sound judgement on permissible use, assure operational safety, and take into account environmental and sustainability concerns. In India, space has three functions: it facilitates operations via digitalisation and improves connection via communication satellites in geostationary orbit, which is a purely commercial use of the space application. The next step is remote sensing, primarily in LOE, which is beneficial for military use, the production of strategic data, as well as for mini and microsatellites. Although it is simple to deploy, the majority of the apps are strategic and need strong controls. The third is the research and development of satellites and interplanetary missions. Huge financial commitments and regulatory compliance are necessary for this. This can be grouped with the development of codes and standards, simulators, and basic testing & qualifying facilities. GEO will be approved right away, but LOE and interplanetary missions will have a calibrated approach and will be allowed instantly but gradually.

#### PUBLIC-PRIVATE PARTNERSHIP IN AEROSPACE BOOSTING ATMANIRBHAR BHARAT

Public enterprises like Ordnance factories, PSUs and R&D labs have excellent infrastructure, expert teams





of scientists and engineers and a large fleet of operators, but they lack project management and the push for productivity. The private industry players, however, bring agility and the ability to scale up quickly. The government's decision on banning 780 items from the import list is a clear push for making Atmanirbhara Bharat a success. It has also helped in bringing clarity to the business opportunities that lie herein.

In the PPP model, we did not have access to technology and the only option was engaging in a TOT with foreign OEMs. This has now been made possible by DRDO announcing 108 technologies that it is ready to share and also providing support in testing and certification. This will now force us to re-look at the PPP model and make it successful as we may not get a second chance.

The customer will continue to judge the aerospace component manufacturer's performance on quality, cost and delivery (QCD). In India, we have been using well-established platforms imported from global OEMs. Our maiden attempts to design, manufacture and supply will naturally be compared, and the same standards are required to be maintained. As we start afresh, our volumes are going to be limited with sourcing and manufacturing costs likely to be on the higher side. Also, the global situation and that at the borders will shorten the timelines for production. So even though we see a huge business opportunity, there are a lot of challenges like risk management, supply chain management and technology development with sustainability. So, unless and until one is ready to invest heavily in infrastructure, manpower and test facilities with or

without current OEMs, it is going to fall short of one of the three parameters of QCD.

A solution that most of the countries figured out in their initial stage was the formation of clusters and sharing of risks and resources. We can address such a time-tested model in India as PPP and should start implementing rather than debating it further and learn how we can perfect it in the coming days.

It is clear that for over seven decades, a serious concern regarding domestic manufacturing capabilities in both the civil aviation and defence aerospace industry persisted until the early 1990s. The sector has made significant development since being exposed to the private sector in the 1990s post-liberalisation era. There are indications that things are improving after Prime Minister Narendra Modi's Make in India initiative was announced. The country's aircraft industry is at a turning point, much like the telecom and auto industries were two or three decades ago. Therefore, it requires ongoing government assistance to establish the critical mass, expertise, and R&D needed to realise its full potential.

Adding academia to this model is also essential to make it complete. While we are focusing on the final product, we cannot neglect fundamental research which is best done with students and professors also helping them with Masters and PhD candidature. Moreover, start-ups and MSMEs are contributing immensely to the segment at lightning speed. With all this coming together, we will be able to generate IP with India and further modifications and servicing of our own products over the complete life cycle of the product. 

By Shivanand Pandit, Independent Writer

## WILL GOODS IN INDIA MOVE LIKE A CHEETAH?

With the National Logistics Policy being instilled, it is expected to make a positive impact on the goods and logistics sector. The article analyses the policy's impact & benefits for the Indian logistics sector.

India ultimately has a National Logistics Policy (NLP). Although the \$200 billion logistics business sector has been weeping for a robust policy for several years got the policy now, a vital factor is the speedy implementation of the various proposals declared.

Logistics includes planning, coordinating, storing and moving resources such as people, raw materials, inventory, equipment, etc., from one place to another, from manufacturing locations to consumption, distribution, or other manufacturing locations. India's logistics sector is complex with more than 20 specialist establishments, 37 export elevation bodies, 500 certifications and 10,000



Shivanand Pandit

commodities. The sector also involves 200 transport entities, 36 logistics organisations, 129 inland container depots, 168 container freight stations, 50 IT ecosystems, and banks and insurance coverage companies. Additionally, 81 authorities and 500 certificates are needed for exports and imports (EXIM).

The necessity for the NLP was felt since the logistics cost in India is greater than the remaining advanced economies in the world. A decrease in the logistics cost expands productivity cutting across several sectors of the economy while uplifting value addition and enterprise. Presently, India spends nearly 14 to 18 per cent of its Gross Domestic





Product on logistics costs, which is much higher than the global average. According to the 2018 World Bank Logistics Index, India is ranked 44th in logistics costs. India is behind developed countries like the US and China, which were ranked 14th and 26th position, respectively.

#### CONCRETING THE ROAD

The NLP targets to elevate the smooth movement of goods throughout the country, while also developing the competitiveness of Indian goods in both local and global markets. It also targets to augment economic progress and surge employment opportunities. The policy targets to accomplish, among others, rapid last-mile delivery, end transport-linked confronts, save time and money for producers and curb wastage of agro-produces.

Additionally, the policy has many other transformational targets. Firstly, it aims to lessen the cost of logistics to a global best rate of 8 per cent by 2030. Nations like the US, Japan, Germany, South Korea, Singapore and certain European nations have such a low logistics cost-to-GDP ratio. Secondly, it attempts to enrich the

nation's Logistics Performance Index (LPI) ranking to be among the top 25 countries by 2030. Thirdly, it aims to construct data-driven decision support systems (DSS) to support a capable logistics ecosystem.

The most valuable building block is the Unified Logistics Interface Platform (ULIP), which intends to fold all logistics and transport sector digital services into a single portal, thus liberating producers and exporters from the current cruelty of lengthy and burdensome procedures. The second building block is Ease of Logistics Services (E-Logs), a new digital platform. The platform will permit the industry to take up operational matters quickly and directly with government agencies for an immediate solution. The third building block is the Comprehensive Logistics Action Plan encompassing unified digital logistics systems, standardisation of physical assets, benchmarking service standards, human resource development, capacity building, development of logistics parks, etc.

#### SHARP CURVE AHEAD

Although the NLP has several transformational targets and robust building blocks, it faces a few key challeng-

es. Firstly, substantial dependence on road transport. Around 65 per cent of India's consignment movement is by road, where fuel overheads are very high. For nations that handle as much consignment as India, the maximum of the consignment is transferred via high-speed railway networks that are inexpensive and quicker than roadways. However, the railways do not provide door-to-door delivery service. The railway sector suffers from numerous operational deficits such as low speed of freight trains, fewer wagons, etc. have to be removed quickly if logistics overheads have to plunge to global standards.

Secondly, the absence of appropriate logistics infrastructures like warehousing and cold chains is a key challenge. India's cold chain from the farmhouse to the seaport or airport is faulty. During the novel pandemic, many hospitals experienced a shortage of medicines because of logistical hindrances. According to the data of the National Agricultural Cooperative Marketing Federation (NAFED), in India annually, 40 per cent of the food grain produced, amounting to Rs 88,800 crores, goes to waste due to a deficiency of storage amenities. Most of this wastage is due to a decline in the quality of food grain in the course of transport and storage.

Thirdly, the formation of an integrated logistics interface platform and the adoption of digital infrastructure in the logistics sector is another great challenge. The assimilation of various e-platforms will be a challenge because there are many e-platforms and all of them should be combined without a glitch into one platform, which will be a massive task. Finally, the creation of a harmless and protected database to store sensitive and complex data is critical. India has had a history of many cyber-attacks. To create a safe and secure platform, the government must invest considerable time and know-how.

### MILES TO GO

India's infrastructure insufficiency is every so often considered one of the major restraints in rapid economic growth. The absence of suitable infrastructure enhances the complete cost of production and disturbs the competitiveness of Indian businesses. The government has been working in this space and invested a considerable volume of resources in recent years. However, along with development in infrastructure, its effectual use is important to control costs. Therefore, recently introduced the NLP should aid Indian businesses to increase competence.

India's logistics sector is enormously disjointed, which contributes to the cost of doing business. As mentioned earlier the sector comprises many government agencies and the sector also involves a host of documentation. Healthier harmonisation between dif-

ferent government agencies will smoothen the transfer of cargo and reduce the turnaround time. An improvement in total efficacy will lift overall activity and help generate employment even in the logistics sector, which supports the livelihood of over 22 million people.

The government has been working in this space for a while and the policy was in the creation for many years. The Union government shaped the Logistics Division in the Department of Commerce in 2017 to support the integrated growth of the sector. A draft logistics policy was published in 2019, but the implementation was postponed. The delay in the execution of vital policies is highly injurious to the economic health of any country.

Although the NLP attempts to enrich India's LPI to be among the top 25 nations by 2030, this is not impressive enough. If India has to march quickly to be among the three largest economies and join the group of advanced countries, it has to target to be among the top 10 in the LPI by 2030. It has to match the speed of South Korea. Also, the government should insist on asset monetisation. The private sector must be stimulated to partake in the digital drive and develop the presentation layer that will perform as an interface with the end consumer. A harmonised structure for interoperability should be developed.

Moreover, although few State governments have designed their logistics policy, many are still in the process of doing so. Significantly, the Union and all state governments work together to tackle ineptitudes in the logistics sector. Lesser logistics costs will make Indian businesses more viable and support push-up exports, which can become an imperative driver of growth and employment generation over the medium term. For instance, a 10 per cent decrease in logistics costs is projected to increase exports by between 5 per cent to 8 per cent. Nevertheless, the whole purpose of lessening logistics costs will also depend on constant investment in the infrastructure sector. Enlargement in the general government budget deficit and public debt because of the pandemic may disturb expenditure in the sector over the coming years.

As a final point, reinforcing the logistics sector will not only make it stress-free to do business but also create substantial employment and guarantee improvement in wages and working conditions. The government should make sincere efforts to execute the policy effectively concentrating on the various challenges that lie ahead. Then the NLP, in combination with the Gati Shakti Programme, the Sagarmala, and Bharatmala (waterways and roadways) schemes, the Dedicated Freight Corridors, etc., can be transformational. Therefore, need 'cheetah' speed execution of measures announced in the National Logistics Policy. 

Date - 24<sup>th</sup> Nov 2022  
Location - Pune

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## ISCAR'S 'LOGIQAL' EXTENSION

Iscar has introduced NEOLOGIQ, a logical extension to the previous campaign comprising an entire range of advanced products and technological solutions for metal cutting tools - a quantum leap in the field.

Iscar believes that NEOLOGIQ provides the answers to typical questions that modern metalworking faces today due to the latest changes in technology. Today, we are witnessing serious upheaval with far-reaching effects on manufacturing.

High feed milling (HFM), also referred to as fast-feed milling, is considered a commonly used effective method for rough machining both complex and plane surfaces. Iscar has an extremely wide range of HFM products to meet the requirements of a customer. However, even in this niche of products, there is room for new innovations.

LOGIQ4FEED, a family of HFM cutters carrying specific bone-shaped inserts, was enriched by new tools with greater insert sizes. These new tools have several features that substantially improve performance in HFM, especially when machining big cavities and pockets in steel parts.

Another HFM product that provides the customer with a reasonable cost-saving solution is NEOFEED, a family of mills with square, double-sided inserts. This insert has 8 indexable cutting edges to use on cemented carbide and a dovetail-shaped insert pocket that ensures reliable mounting to withstand heavy loads to enable higher cutting data and increased productivity.

The progress in 5-axis machining and CAD/CAM systems opens new horizons for machining 3D surfaces using barrel-shaped endmills. Although such endmills are still not common in the metalworking industry, advanced accurate metal shaping methods will dramatically increase the demand for these barrel-shaped endmills. Therefore, the development of effective 'cutting barrels' is one of Iscar's highest priorities. In the NEOLOGIQ product range, the barrel-shaped endmills are represented by two configurations: a solid carbide design and a Multi-Master head. Combining Multi-Master advantages with the precise barrel profile of a cutting-edge will result in a cost-effective and sustainable solution for finishing complex-shape surfaces by milling with minimum machining stock.

The Multi-Master family has expanded the boundaries of its product range by introducing a new threaded connection size, T21, which enables increasing the nominal diameter of an exchangeable endmill head to 32 mm (1.25").

### INTELLIGENT TURNING

In internal turning, a boring bar is the main factor of tool rigidity. A large bar overhang to diameter ratio leads to the tool deflection and vibrations; and is the bane of



machining accuracy and surface finish. WHISPERLINE, a family of anti-vibration boring bars, was developed to exceed the ratio bounds. These bars have a specially designed built-in absorber and a vibration-dampening mechanism that enables stable cutting with an overhang of up to 14 diameters.

WHISPERLINE bars are important elements of the new versatile modular system NEOMODU, providing a rich variety of assembly options for turning tools. A combination of different system units such as shanks, anti-vibration capsules, and interchangeable heads with indexable carbide inserts result in a tool assembly, which is maximally customized to a specific application. The shanks may be cylindrical, square, or with a polygon taper interface in accordance with ISO 26623 standard.

Speaking of new turning products, one cannot pass the XNMG insert. It is a beneficial combination of two famous ISO rhombic insert shapes: CNMG and DNMG insert with 80° and 55° including angles. This intelligent integration resulted in the XNMG 70° angle insert that features improved clearance and ramping angles, when compared to the CNMG, and strengthened cutting corners against DNMG. The advantages of the new insert are visible in

efficient multi-directional turning applications. The cartridges carrying insert XNMG, which are intended for mounting on NEOMODU units, are available as well.

### COMPETENT PARTING

Iscar began its leadership with just parting tools. That is why every company's innovation in parting gains special interest.

Adapters and holders occupy a prominent place among Iscar's NEOLOGIQ parting products. The concept of the LOGIQF-GRIP family is based on a 4-pocket adapter that is clamped in a reinforced tool block. The high rigidity of such an assembly in combination with an inner high-pressure coolant supply (HPC) option facilitates productive cutting with extremely high feed rates.

In parting, one of the secrets to success is well-directed high-pressure cooling. If an adaptor has no HPC channels, mounting a specially designed crown-shaped accessory pushes the boundaries of application limits and enables effective pinpointed coolant flow to the active cutting edge of an insert.

The growing capabilities of modern multitasking machines and turning centres pushed the common boundaries of cutting strategies. Particularly, they brought the method of efficient turning along the Y-axis. In quite a few cases, it is a worthy alternative to traditional X-axis machining. In Y-axis turning, the dissipation of cutting force components is more favourable, and the main load is directed to a holder. The cutting process becomes more stable, and this facilitates increasing cutting data to improve productivity. Therefore, providing appropriate cutting tools for turning operations along the Y-axis is one of the central points of NEOLOGIQ.

LOGIQYGRIP, a new Y-axis parting modular system enables

vibration-free machining with high efficiency. A wide range of exchangeable TAGPAD-T adapters for inserts ensures the exceptional versatility of the system.

#### EFFICIENT HOLEMAKING

One of the more impressive product lines introduced in the LOGIQ campaign is LOGIQCHAM, a family of drills with replaceable carbide heads and three cutting edges, providing an effective tool for significantly increasing productivity for drilling depths up to five drill diameters.

A new design of the three-flute drill body is

based on a variable flute helix angle. Such a concept considerably improves the dynamic behaviour of the drill and results in expanding the drilling depth boundaries: the maximum depth can now reach eight diameters.

The metalworking community faces new challenges and must find the shortest way to get out of the maze. Iscar believes that new innovative solutions, which take machining to a whole new level, can become the new "Ariadne's thread". NEOLOGIQ, a logic of development for a new range of tools, has expanded the boundaries of intelligent machining.

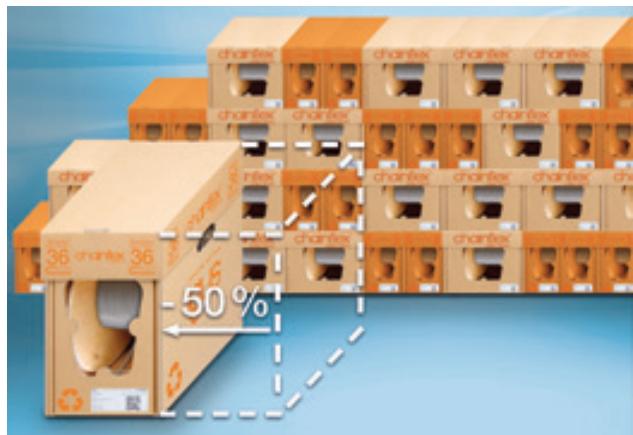
## IGUS CHAINFLEX CABLE DRUM CASE

In order to be able to store and transport as much as possible in a small space, better and better logistics solutions are being sought for cable drums. Thanks to the new chainflex CASE S from igus, the lack of space in the warehouse is a thing of the past. The cable box is an addition to the larger CASE M, and also allows easy unwinding of cables directly from the box - even while on the move. With the smaller CASE S, storage and transport are now easier still. After all, customers save 50 per cent of storage space while retaining 100 per cent of the benefits.

With the CASE M, motion plastics specialist igus developed a special logistics solution for its chainflex cables as early as 2020, so that users can save both shipping and storage costs. The chainflex CASE is a cardboard box made from 100 per cent recyclable materials, which allows drum shipping without a pallet. The goods can therefore be sent by a parcel deliverer. At the same time, the CASE serves as a storage system for cable drums. The chainflex cables can be unwound directly from the box and cut to the desired length. Setting up a space-saving, cost-effective storage system for drum goods is now even easier thanks to the new chainflex CASE S. "We have noticed that there is an additional need in the market for a more compact solution for the storage and transport of cables sold by the metre. Examples are thin cables or shorter cable lengths," explains Andreas Muckes, Head of Product Management chainflex Cables at igus.

#### EASY HANDLING – EVEN ON THE MOVE

With chainflex CASE M and S, customers do not need any kind of shelving system to hang up their cable drums. Since both sizes are compatible with each other, customers can easily stack the cable boxes on top of each other and thus set up flexible storage facilities. With the smaller CASE S, storage space can now be used even more effectively. In addition, users also save costs with shorter cable lengths compared to the chainflex CASE M with a maximum filling of 200 metres. The compact size also pays off when you're on the move. The chainflex storage system is portable and, thanks to its smaller installation size, can now be transported even more



easily in the car. It can also, for example, be used directly at construction sites. The chainflex CASE is already a popular logistics solution, especially among service technicians and in the service area of factories. In contrast to cable laying with a ring, the mounted drum enables twist-free cable filling of the energy chain, which is the basis for long service life in the e-chain.

#### RE-ORDER VIA QR CODE

If the goods sold by the metre are used up at some point, customers can re-order their cables online with their smartphones in just a few seconds - simply via an individual QR code on the shipping box. This not only saves customers' shipping and storage costs but also processing charges. A total of over 850 cables can be delivered in the chainflex CASE. With the chainflex range, customers receive flexible and robust cables that are suitable for various applications with enormous speeds and accelerations, long travels and the most adverse environmental influences. In numerous tests in our own 3,800 sqm test laboratory, the cables continuously prove their long service life. Based on this data, their service life can also be precisely calculated - in just a few clicks using an online tool. "Thanks to the results of our extensive tests and our more than 30 years of experience, we can also give our customers a guarantee of up to 36 months or 10 million double strokes on our cables in good conscience. We were the first German company to have this promise validated by the world-renowned testing agency 'Underwriters Laboratories' (UL)," adds Muckes.

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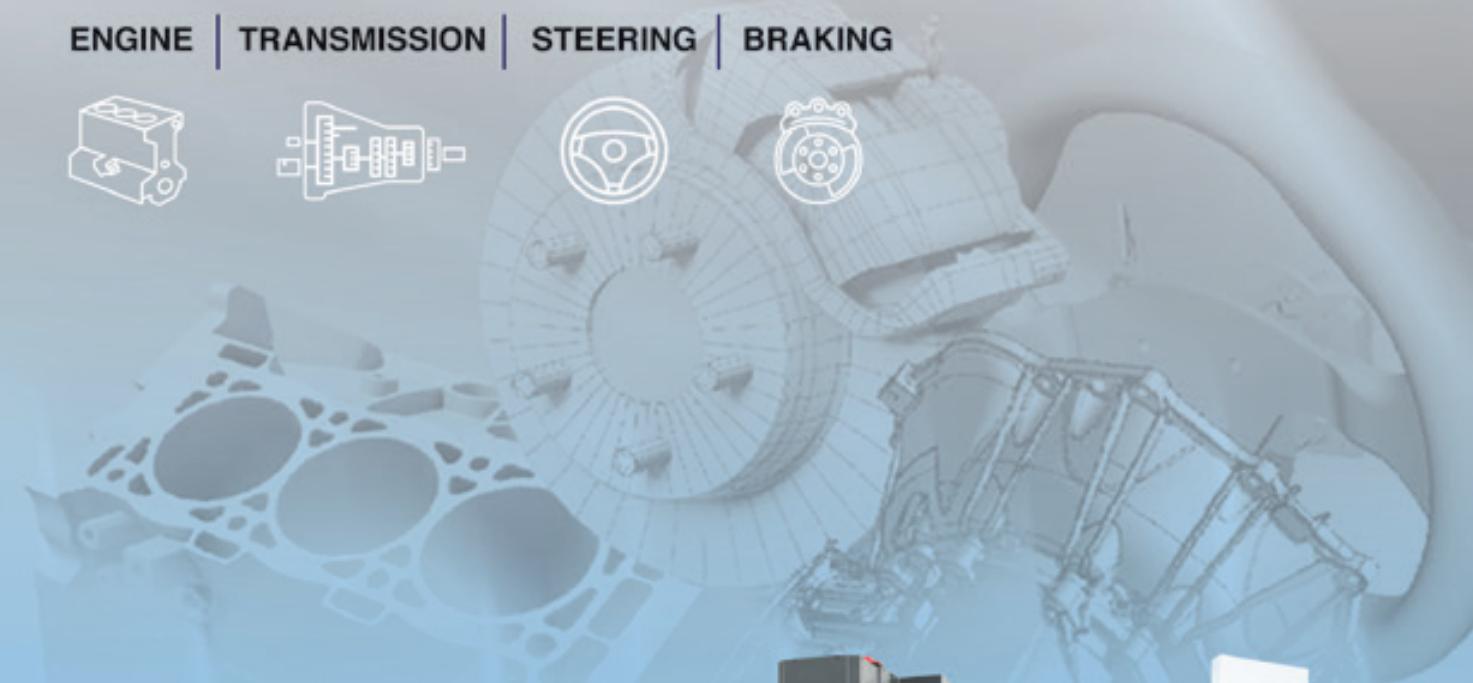
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— TURNING — MILLING — TURNMILL —

# COMPLETE MACHINE LIFE CYCLE SOLUTION

ANNUAL MAINTENANCE  
CONTRACT

PRODUCT KITS  
& SPARES

MACHINE UPGRADES  
RECONDITIONING &  
RETRO-FITMENT

AUTOMATION

MACHINE CALIBRATION

IIOT SOLUTION & VALUE  
ADDED SERVICE

AMG VALUE

