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The Official Magazine of



Indian Machine Tool
Manufacturers' Association

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OPED
Planning Next Steps

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MEDICAL MACHINING
Seizing Opportunities in Crisis



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RAJIV GANDHI
Senior Executive Director
Productions & Member of Executive Board
Maruti Suzuki India Ltd (MSIL)

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tachyon¹

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noun

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IMPRINT

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(IMTMA)

Dear Readers,

Industries have restarted their operations in a calibrated way with scaled-down staff to ensure business continuity while taking into consideration their health and safety against Covid-19. Over the centuries, human race has survived wars, pandemics, natural disasters, etc. and have emerged stronger. It, therefore, would not spring any surprise if it overcomes the current pandemic with the same resilience.

Business establishments are coming to terms with the after-effects of the lockdown as they resume their activities including focusing on completing existing orders and creating demand for new ones. Governance will take centre stage in steering the industry further as it is no longer about survival alone but of widening the horizons and offering new products to consumers over the long term.

The recent reforms announced by the Government of India has reaffirmed India's commitment to macro-economic stability, prudent fiscal management and indigenous manufacturing. The growth tonic to MSMEs, government support in provident funds to industries and workers, tax reductions, and releasing of bank guarantees are expected to ease cash flows.

Other measures such as disallowing of global tenders up to ₹200 Crore, push for agri-marketing reforms and infra, increasing of FDI in defence from 49 percent to 74 percent, etc. are expected to boost economy and manufacturing.

The sops will take some time to trickle down to end users, resulting in demand for goods and services. However, the momentum set by this economic package will enable industries to pick themselves up from the economic slowdown and coronavirus outbreak which have created many disruptions. The industry now needs to intensify its R&D initiatives and manufacture products that can find global acceptance.

Vibrant manufacturing is key for a country's growth and the measures announced in the economic package is expected to provide much-needed liquidity for industries, promote local manufacturing, spur demand and tide over the uncertainties. We are facing new norms, especially in health and safety, as we get back to everyday business, and this will be a reality until a vaccine is invented for Covid-19.

Although it's early to predict a near-accurate outcome, industries need to work towards favorable results by adapting, adopting, reshaping and transforming business through product and process innovations.

The Machine Tool industry, while continuing to work with Automobile and Auto Component industries, needs to expand its wings and explore opportunities in sunrise sectors such as Healthcare and Medical Equipment, Infrastructure, Aerospace, Defence, Food Processing, Agricultural Machinery and Equipment, Textile Machinery, Railways, Power, Electronics, etc.

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The industry needs to move ahead with motivation, innovation, courage, confidence and determination to write a glorious chapter. Leadership will play a vital role in ushering changes on shopfloors and steering the industry in the right direction.

Dear MMI Readers,

The Manufacturing industry is passing through one of its toughest phases in the recent history with prolonged economic slowdown, outbreak of coronavirus and lockdown imposed to contain it, affecting businesses adversely.

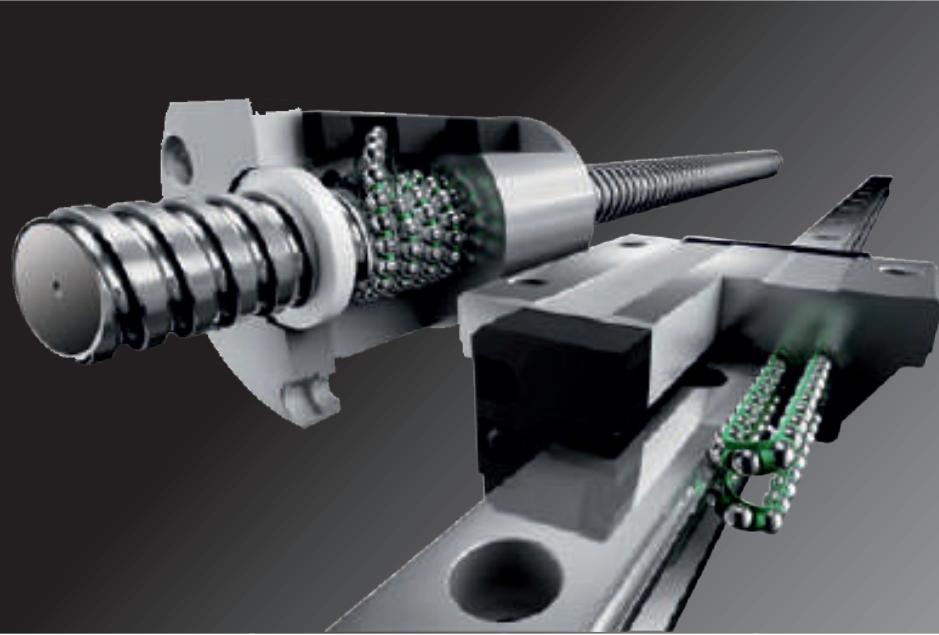
It's a new innings and a new approach for industrial units as they restart their operations in a measured way. The industry needs to move ahead with motivation, innovation, courage, confidence and determination to write a glorious chapter. Leadership will play a vital role in ushering changes on shopfloors and steering the industry in the right direction.

Modern Manufacturing India (MMI) magazine in its May 2020 edition is focusing on medical machining which is considered to be one of the sunrise sectors holding promise for the Indian machine tool industry.

Readers are invited to contribute articles with out-of-the-box concepts to help steer the industry forward in business and profits.

On behalf of Indian Machine Tool Manufacturers' Association (IMTMA), I thank you for your continued interest in the activities of the association and request for your feedback to help us comprehend your needs.

I hope that you enjoy the time you spend with MMI.



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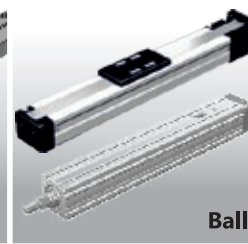
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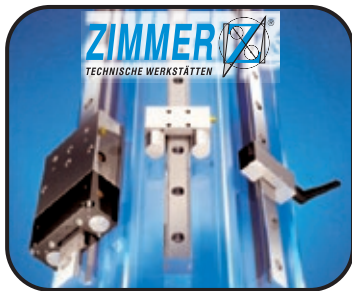
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Soumi Mitra

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FORERUNNER OF PROGRESS

To curb the spread of Covid-19, governments across the world have enforced regulations that were beyond imagination before the outbreak of this pandemic. It has compelled us to change our ways of working, communicating and socializing by setting new patterns. The 'New Normal Norms' have already percolated in our lives, reshaping the future.

Organizations that comprehend this new normalcy will have a plethora of opportunities for growth. There are long-term implications in the future of manufacturing after the advent of this pandemic. For the first time, the entire global manufacturing fraternity has witnessed disruptions in the supply chain, taskforce availability and market demand together. Hence, enterprises now need to be more resilient, agile, and responsive. The need of the hour for the businesses is to retool their manufacturing operations and ascertain how well-placed they are for future black swans.

MMI has always believed that every challenge presents a new opportunity to learn and evolve. Hence, we have sought views of industry stalwarts

*"Change what you can,
 manage what you can't."
 - Raymond McCauley*

to understand how the manufacturing landscape is changing in terms of the deployment of advanced technologies such as Artificial Intelligence, Augmented Reality, Virtual Reality, IIoT, Blockchain, 3D Printing and so on.

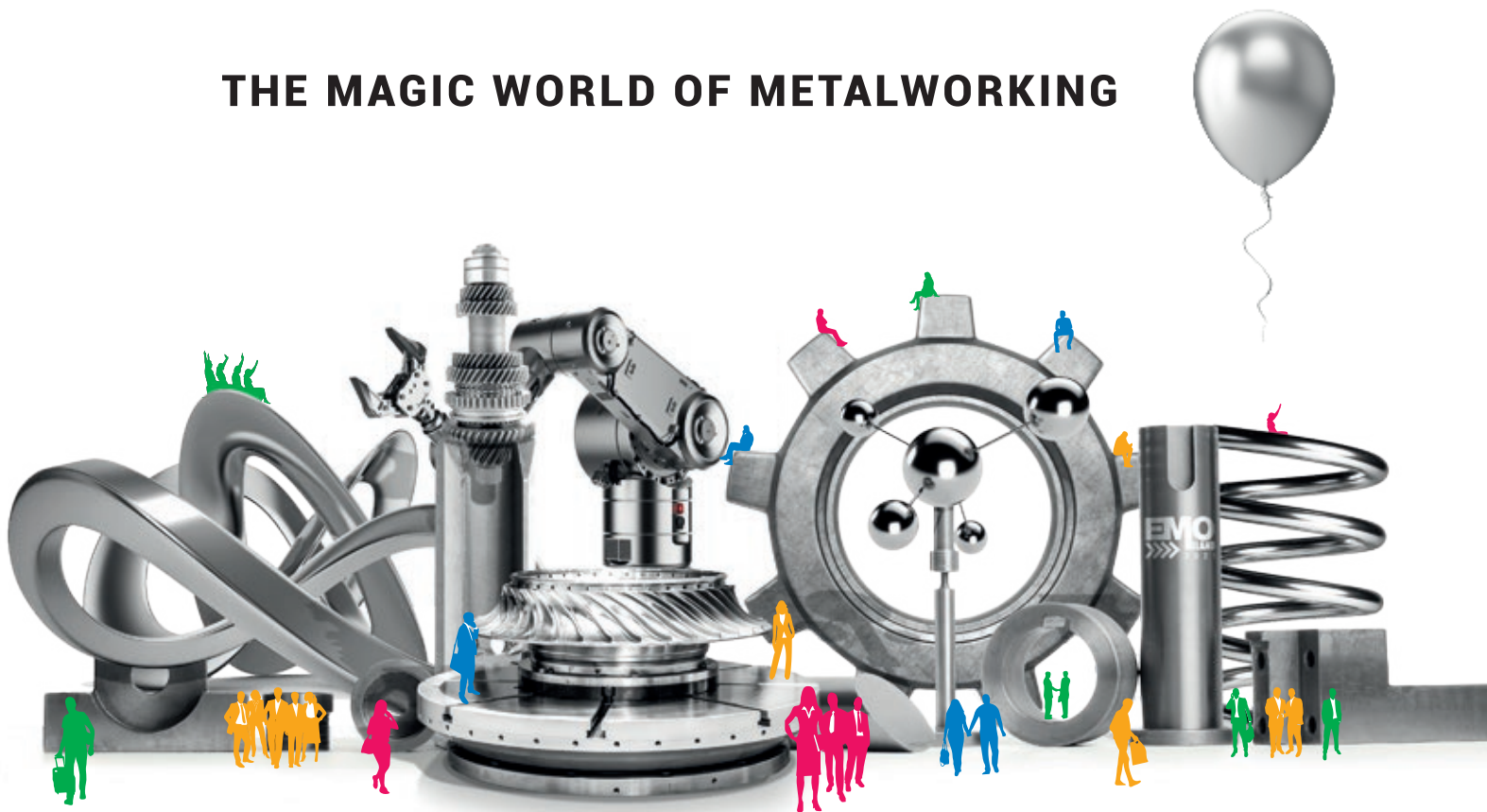
The present MMI issue is a compilation of curated content that aims to understand how Covid-19 is changing the world and paving a new way for the manufacturing world.

We solicit your feedback as always to keep up to your expectations and continue bringing forth content that is meaningful for our industry.

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WIDENING HORIZONS

With industries resuming their operations amidst the ongoing pandemic, the Machine Tool industry too is in a lookout for new opportunities the situation has created.



Source: Magic Wand Media

Industries have restarted their operations as they bid to regain a firm footing in business amid Covid-19 pandemic. The virus spread resulted in lockdown measures, hitting every industry sector including the Auto sector which was already reeling under a prolonged business slowdown. The sector is battling serious financial challenges, uncertainties in demand and orders, cash flow and pressure from workforce and distributors. It's imperative to ensure business continuity without compromising on the health and safety of people in our continued fight against Covid-19.

Companies have deferred their investments and capital expenditure for the near future with uncertainties engulfing capacity utilization, which is at an all-time low. Industry sources believe that people are slowly accepting to 'live and work with Covid' and the stalled economic cycle is gaining traction. With lockdown, fears of job losses and salary cuts looming large, public is spending less to conserve cash for emergency needs. Sensing this, companies are holding back their fresh investments and those which invested in the immediate past are hoping for sales and revenue returns.

Machine Tool industry exploring sunrise sectors

So, what does this mean for Machine Tool industry manufacturers, which until now were heavily reliant on demands from Auto Component and Automobile manufacturers? Well, the Machine Tool industry is the first industry to be affected in any kind of slowdown or downturn, and the last one to recover. In the current scenario, the silver lining is the thrust to localization and the series of stimulus measures for MSMEs announced by the Union Government to improve liquidity, cash flow and hopefully demand.

Industry outline

The Machine Tool industry is the first industry to be affected in any kind of slowdown or downturn, and the last one to recover. In the current scenario, the silver lining is the thrust to localization and the series of stimulus measures for MSMEs announced by the Union Government to improve liquidity, cash flow and hopefully demand.

Sectors such as Healthcare and Medical Equipment manufacturing, Agriculture Machinery, Infrastructure, Telecom, Power, Aerospace and Defence offer promise, and these sunrise sectors need to be explored keenly by the Machine Tool industry. Covid-19 has changed the way world used to function and manufacturers need to adapt to the changing order, keeping in mind the big picture as to what will pay in the medium- and long-term. Technology and R&D, leading to innovative product development, will be crucial to

stay ahead and meet customers' expectations from sunrise sectors, and Machine Tool industry needs to get geared up for this. Some prominent Machine Tool companies have entered the field and are manufacturing face shields, N-95 masks, ventilators, personal protective equipment, etc. in their factories. They have carried concept to product development in these trying times and, against all odds, are successful. They are supplying to the government, hospitals and in the commercial space. Companies have cleared the medical prerequisites,

obligations and procedures from regulatory authorities for their engineered equipment and released it to the commercial market successfully. These efforts are inspirational and Machine Tool manufacturers will carve out opportunities from new user sectors in the coming days or in the immediate future.

Localization is the answer

Industry leaders are exploring to localize their sourcing, developing products which until now were being imported, seeking collaborations, joint ventures, changing their product portfolio, and shifting from product selling to providing solutions and exploring opportunities in the export market. All these moves will help the Machine Tool industry develop and grow in the medium- to long-term. 

Some prominent Machine Tool companies have carried concept to product development in these trying times and, against all odds, are successful.

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Position: UI/UX Developer

Location: Bengaluru

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- Bachelor's degree in computer science or information technology;
- Mastery of C++, Java or other programming language;
- Design experience of 2-4 years in UX/UI. Candidates with experience in designing complex solutions will be preferred;
- Expertise in standard software such as Sketch, OmniGraffle, Axure, InVision, UXPin, Balsamiq, Framer, Adobe Creative Suite etc. Basic HTML5, CSS3, WPF and JavaScript skills are a plus.

Job Description:

- Translating concepts into user flows, wireframes, mockups, and prototypes that lead to intuitive user experiences;
- Providing customer-centric design, customer journey mapping, user experience design, market intelligence, user interface design, product usability etc.;
- Creating wireframes, UX/process flows and information architecture, high fidelity interactive prototypes and final design assets;
- Planning and conducting user research and competitor analysis.

Position: Software Development Engineer

Location: Bengaluru

Key Requirements:

- BE/MCA or equivalent;
- Sound knowledge of Dot Net, OOPS, VB.Net, ASP, ASP.Net, C#, C, C++, Javascript, JSON, J-Query, multimedia tools;
- Windows forms, Web Forms, Windows Services, Multi-threading, file handling and database programming using MS SQL;
- Exposure to mobile application development such as ANDROID / i-Phone will be a plus point.

Job Description:

- Studying and understanding unit level technical requirements to complete low-level technical design doc;
- Designing/developing GUI screens/interfaces (both windows forms and web forms); developing database procedures, database functions, database triggers and developing code using corporate technology platforms in use (VB.NET, ASP.NET C#, C, C++, SQL Server, multimedia software);
- Developing unit test plans and performing unit testing;
- Developing in-line documentation for every code module.



AceMicromatic Manufacturing Intelligence Technologies Pvt Ltd (AmiT)

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IR Transports SUVs in Unlock-1 Phase

Andhra Pradesh, India - Indian Railways has started transporting a wide variety of vehicles including Kia Seltos SUVs and tractors from one part of the country to another in the 'Unlock 1' phase. With lockdown restrictions easing, the railways is looking at capitalizing on the opportunity at hand, which could be mutually beneficial for OEMs, manufacturers, and automotive companies.

Korean carmaker Kia, with its production facility in Andhra Pradesh's Anantpur district, has restarted operations after weeks of work suspension. It sold 1,611 units of SUVs in May. The first batch of 100 SUVs was sent through rail from Penukonda, Andhra Pradesh to Farkhanagar, near Delhi.

The Covid-19 situation has hit the Automotive sector hard with the demand tumbling and supply chains affected. Indian Railways has emerged as a viable alternative for varied transportation options as the rail route often works out to be quicker and ensures timely delivery of the stock.



Source: Magic Wand Media

India Boosts Tyre Mfg, Restricts Imports

New Delhi, India - With the strategy to curb imports and boost domestic companies, the government has restricted imports of tyres including radial and tubeless, utilized for cars, buses, lorries, motorcycles, station wagons, racing cars, scooters, multi-cellular polyurethane tubeless tyres, and bicycles. Imports of tyres were worth approx. ₹19,880 crore in 2019-20, as against approx. ₹25,218 crore in 2018-19.

Prior to the arrangement and new rules notified by an amendment in the import policy of pneumatic tyres by the Directorate General of Foreign Trade (DGFT) under the Union Commerce Ministry, imports of tyres were permitted with no limitations. Any goods under the restricted category mean an importer would require a licence or permission from the DGFT for imports. Given the procedures and permissions, these measures have the effect to discourage imports.

The government's recent 'Aatmanirbhar Bharat' pitch and 'Go Vocal for Local' slogan, along with Indian tyre manufacturers demand for restrictions on imports from China and other destinations, aims to make India self-sufficient, boost domestic manufacturing, and enhance employment opportunities in the post-Covid phase.



Source: Magic Wand Media

HP's 3DP Technology for Covid-19

New Delhi, India - In its efforts to join the fight against the ongoing Covid-19 pandemic, HP Inc. is lending its support through 3D printing. The company has partnered with Redington 3D in India to produce 1,20,000 ventilator parts for AgVa Healthcare. Twelve categories of parts have been 3D printed to manufacture 10,000 ventilators.

The parts include inhale and exhale connectors, valve holders, oxygen nozzles and solenoid mounts among others. Since these components have complex designs and fine tolerances, it would have taken 4-5 months to manufacture these quantities using the conventional process. With HP 3D printing technology, these parts were printed in just 24 days.

To date, HP and partners have produced more than 2.3 million 3D printed parts. As part of this initiative, HP has ramped up



Source: HP Inc

its 3D printing team and global Digital Manufacturing Partner Network to design, validate and produce essential parts for medical responders and hospitals.

Lamiera now in March 2021

Milan, Italy - It has been announced that Lamiera 2021 is to be held from March 17 - 20, 2021 at fieramilano Rho. The event is recognized as one of the most qualified international exhibitions dedicated to machine tools and cutting technologies, sheet metal forming and processing, as well as to automation, robotics and connectivity solutions for the industry.

The 2021 edition of the event will be organized according to the now well-established model around the offering of metal forming machines and technologies. There will be dedicated Innovation Areas: Robot Planet, centred around industrial robots, integrators and machine-tending systems; FABBRICAFUTURA, dedicated to software and technologies for connectivity and data management; BOXCONSULTING, a space for consultants and trainers; Saldatech, focused on the welding sector; Fastener Industry, dedicated to screws, bolts, fastening and clamping systems; Ecocoatech, regarding the processes for sheet-metal painting and coating; and Blech Italy, reserved for subcontracting and services for the industry.

The event is recognized as one of the most qualified international exhibitions dedicated to machine tools and cutting technologies, sheet metal forming and processing, as well as to automation, robotics and connectivity solutions for the industry.



Source: www.lamiera.net

umati to Become the Global Production Language

Frankfurt, Germany - The VDMA (German Engineering Federation) and the VDW (German Machine Tool Builders' Association) are joining forces to promote the use and dissemination of OPC UA standards throughout the mechanical engineering sector under the umati label.

"Cross-industry and cross-technology marketing will take our customers a significant step forward," said Dr Wilfried Schäfer, Executive Director, the VDW, explaining the strategy at the associations' joint press conference in Frankfurt.

"Manufacturing companies not only have machine tools, but also their own individual mix of machines, equipment, robots and systems. If all these technologies can exist in a common ecosystem which is ideal for producing plug-and-play solutions, this will save end-users a lot of time and money," Schäfer continued. Hartmut Rauen, Deputy Executive Director, the VDMA, added, "Over 30 specialist groupings in more than 17 associations are working on technology-specific interfaces, the 'Companion Specifications'. This high level of collaboration forms the basis of true, open interoperability between machines and software systems, from the shop floor to the cloud."



(L-R): Dr Wilfried Schäfer, Executive Director, VDW; Hartmut Rauen, Deputy Executive Director, VDMA

An initiative to develop an open, standardized interface was presented back in 2017. A decision was taken in favor of OPC UA as the base technology. Just two years later, a showcase featuring 70 partners from ten countries demonstrated at EMO Hannover that it was possible to connect 110 machines to 28 software services distributed across the exhibition grounds in a system which functions to all intents and purposes on a 'plug and play' basis. In addition, the VDW launched the umati - universal machine tool interface label back in 2018, a brand aimed primarily at customers all over the world.

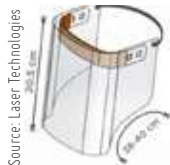
In the meantime, numerous other OPC UA Companion Specifications have been developed by the VDMA and its partner organizations. In order to give these specifications greater visibility and to increase their usage levels, umati is now being extended to cover the entire mechanical and plant engineering industry as a community for the use and marketing of OPC UA Companion Specifications.

The press conference held offered better clarity on the use of umati. "Membership of umati is not needed to use OPC UA standards. But then, it will not be possible to use the umati brand and label without being a member of the 'umati club'. Membership is required in order to be part of the community and reap benefits from marketing, showcases, publicity etc. For the moment, it is free. But umati is to be developed as a long-term, self-sustaining not-for-profit organization that will have to distribute the cost among its members," said the spokesperson.

When Soumi Mitra, Editor-in-Chief, MMI, asked regarding its adoption among Asian Machine Tool companies, it was informed that one company and CMTBA (China Machine Tool Builders' Association)/NC Link as consortium/association from China; 11 companies and Edgex Consortium from Japan; one Korean company, one Singaporean company; and four companies and two associations - TMBA (Taiwan Machine Tool & Accessory Builders' Association) and TAMI (Taiwan Association of Machinery Industry) from Taiwan have already adopted umati.

LTPL Joins Fight Against Covid-19

Navi Mumbai, India - In its efforts to fight against the ongoing Covid-19 pandemic, Laser Technologies Pvt Ltd (LTPL) has forayed into developing Face Shields, UV Sanitation Box Parts, Pressure Relievers, PPE Kits, Hand Gloves, Disinfectant Tunnels and Sanitizers. Its high-quality Face Shield has become its top selling product for which it has partnered with Divide by Zero. More than 1,30,000 Face Shields have already been supplied by the company and it has received about 500 more enquiries for about 7,00,000 Face Shields. LTPL has donated over 30,000 Face Shields to healthcare workers, police and first responders in this global pandemic.



SurfaceTechnology Dates Postponed

Hannover, Germany - The international SurfaceTechnology GERMANY trade show, which was to happen, like all trade fairs, in spring and summer 2020 has been postponed. The surface technology show is now happening from October 27-29, 2020 in Stuttgart.

"Corona was and is a severe blow to industry and business," says Olaf Daebler, Global Director - SurfaceTechnology, the Deutsche Messe AG team. "But it's important for all of us that we now actively exit the crisis. Trade fairs are indispensable marketplaces and growth drivers. That is why we are very much looking forward to when the events get underway again in the fall."

Current participation figures prove that companies want to start doing business again: approximately 220 exhibiting companies have booked roughly 7,000 sq m, which already accounts for three quarters of the target size. The German Surface Technology Association (ZVO) group exhibit, the VDMA Surface Technology Association's presentation, and the WoTech exhibit 'Innovation Platform for Surface Technology' make for the important features of the show.



Siemens' Workplace Distancing Solution

Mumbai, India - With Siemens' SIMATIC Real Time Locating Systems (RTLS), companies can continuously measure distances between workers, provide real-time visual feedback to employees regarding their spacing from others and create a log of all movements and interactions over time. Combining SIMATIC RTLS with a digital twin of the actual manufacturing environment permits companies to model and simulate how employees interact with the equipment and each other. To implement this solution, Siemens' SIMATIC RTLS transponders are embedded in badges which are worn as personal protective equipment by all employees. RTLS receivers placed throughout the operation can then continuously track and record workforce movement. When two employees are in a risk scenario (e.g., less than six feet apart), their badges will display a warning, alerting them to the situation. Such situations become easily actionable via the digital twin, which is provided by Siemens' Tecnomatix® Process Simulate and Plant Simulation software. Utilizing the collected data, new manufacturing layouts or workflows can be simulated until one is determined to provide the desired outcomes, which can then be implemented in the physical operation.



Source: Siemens

ReNew Power Acquires Climate Connect

Gurugram, India - India's leading renewable energy company, ReNew Power has signed a definitive agreement

ReNew
POWER

Source: www.renewpower.in

to acquire Regent Climate Connect Knowledge Solutions Pvt Ltd (Climate Connect), a digital-analytics, software development, artificial intelligence (AI), and machine learning (ML) company, specializing in the power markets domain in the country.

ReNew's acquisition of Climate Connect is expected to not only add to its digital capabilities, but also allow it to offer a suite of digital product offerings to customers across the energy value chain.

The latter will be operating as an independent subsidiary that continues to focus on building a global team, world-class data integrity and software development processes, as well as business development activities.

Sumant Sinha, CMD, ReNew Power, said, "As distribution companies look to tighten operations, find efficiencies, and reduce AT&C losses, digitalization will play a key role and Climate Connect is well-positioned to service this important market."

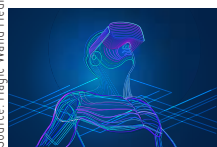
Nitin Tanwar, CEO & Co-founder, Climate Connect, said, "We believe that the company's acquisition by ReNew Power will help us create long-term value for our existing distribution utility and IPP customers and provide us the much-needed scale for the next leg of our journey."

Taiwan World's Second Largest Mask Supplier

Taiwan - With Covid-19 creating a havoc in the manufacturing world, most factories around the globe have either paused work or are slowly recovering. However, Taiwan has been able to maintain full staff levels in offices during this period owing to the massive increase in its mask production capacity, which has made the country the world's second largest mask supplier. The capacity expansion, which was estimated to take six months at first, took just 40 days to build up all the 92 sets of automated mask production lines with the support from the Machine Tool industry. The country's mask production, which was at 2 million and 240 thousand masks per day in January, has been increased fivefold within 40 days to 13 million in March. Now, 17 million masks are being produced per day.

To reduce the number of onsite workers required and solve manufacturing issues, remote control management (RCM) and other non-contact technologies such as augmented reality (AR) have been deployed. Several Taiwan machine tool brands like YCM, GOODWAY, CAMPRO are already seeing some good potential in furthering this manufacturing trend even after the virus situation calms.

Source: Magic Wand Media



Imaginarium India Forays into PPE

Mumbai, India - Imaginarium India Pvt Ltd has commenced manufacturing PPE (Personal Protective Equipment) for those battling the Covid-19 pandemic at the forefront. In response to the supply chain challenges for PPE availability, Imaginarium has come up with a unique concept of a Face Shield that provides complete coverage to the face, ears and neck. "With an ergonomic and lightweight design, it is a product designed for comfortable usage during long working hours. The Face Shield is the first in a line-up of products shortlisted by our team for design and manufacturing during this time," informed Kamlesh Parekh, Managing Director, Imaginarium. Till date the company has produced one lakh Face Shields. It has also been working on the development of Safety Goggles, Aerosol Intubation Boxes, Ventilator Components, and other critical supplies, with plans to deploy them in every part of the country. These products have been tested and approved by doctors, and manufactured with minimum human contact.



Source: Imaginarium India Pvt Ltd

ENABLING SURVIVAL

An insightful analysis of the business impact of COVID-19 on India and strategies that can enable companies to stay afloat...



Source: Frost & Sullivan

SARWANT SINGH
Managing Partner &
Regional Leader
Frost & Sullivan—
Middle East, Africa,
and South Asia



NAVOCH MOHANAYAK
Principal Consultant
Growth Implementation
Solutions Practice
Frost & Sullivan



Like other economies, India has been rendered vulnerable by the COVID-19 crisis. Wholesale and retail trade, transportation and storage, ICT, food and nutrition, and the financial and insurance sectors have all been affected.

A changed economic environment

Based on dynamic, real-time updates, Frost & Sullivan's research indicates that COVID-19 could play out in two ways. The first scenario of a severe pandemic will be marked by downturns in consumer demand, industrial production, and GDP growth. The outbreak will be mostly contained by the end of May, with the economy showing signs of industry

and economic rebound by Q2 FY20-21 and showing full recovery by Q1 FY21-22

If the pandemic is not contained to a large extent by the end of May, the second scenario of Global Emergency would ensue, marked by the uncontrolled spread of the pandemic with economies limping back to recovery from Q3 FY20-21, with a full recovery only after Q4 FY21-22.

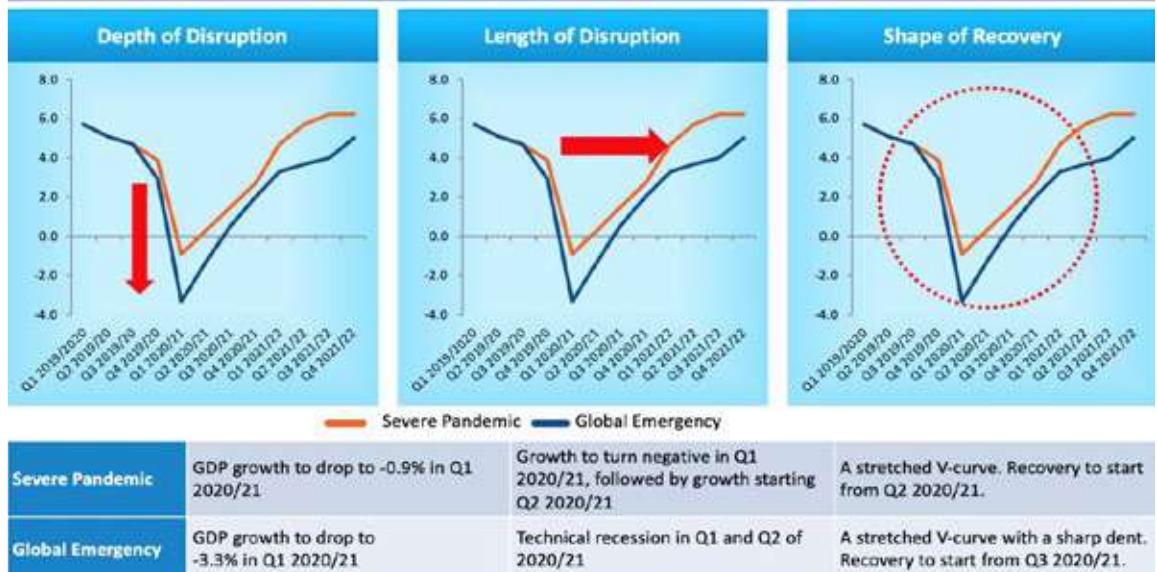
Impact and implications for eight key sectors in India

Notwithstanding pockets of growth in network implementation and management services, the ICT sector is likely to decline as a whole. The pandemic will, however, catalyze unprecedented growth in digital services and

technologies that enable digitalization. While most hardware segments will shrink, rising demand for workforce management, collaboration, security, remote access, and productivity tools will energize the enterprise software segment. Big Data, the digitalization of government services and healthcare services, and wider 5G use cases across industries will characterize the ICT sector in a post-COVID-19 period.

Travel restrictions and country-wide lockdowns have pummeled the Food & Nutrition sector. The total food market compound annual growth rate (CAGR) is expected to drop from 7.2 percent to 6.8 percent, with annual forecasted revenues dropping from \$75 billion to \$58 billion in 2020. Meanwhile,

Quarterly GDP Growth, India, 2019/20-2021/22



Source: Frost & Sullivan

Weak domestic demand for the metals sector is expected during 2020, with slow growth over 2021. This is primarily due to the likely slow revival of construction, infrastructure, and automotive sectors, which are facing raw material and component shortages along with a labor shortage.

quick-service restaurants (QSRs) and fast-food eateries have realigned operations to serve only delivery and takeaway orders. Food and nutrition retail is in flux with disrupted supply chains, consumers bulk-buying long-shelf-life food and nutrition products, and hoarding/panic buying, throwing traditional demand projections into disarray. The nascent e-commerce industry has received a fillip with new growth opportunities for primary packaging materials manufacture. Increased demand for immunity supplements is also expected. The Healthcare sector is expected to experience a short-term decline in revenues across all major sectors in 2020. This will be a result of reduced consumption caused by delays in elective surgery and lower purchases of medicines due to fewer prescriptions. During the pandemic, emergency visits are expected to drop 58 percent, outpatient and ambulatory care to drop 81 percent, in-patient admissions to drop 80 percent, and dental and cosmetics to drop 95 percent. Shortages in medical devices like

ventilators and test kits and operational issues, including the disruption of clinical trials and inadequate virtual care, will further exacerbate challenges. On the positive side, COVID-19 is poised to trigger double-digit growth in telemedicine and virtual care solutions, highlight the need for higher local production of essential drugs, and underpin the growing importance of online pharmacies. Ongoing uncertainties will have a sharp impact on the Mobility sector. Consumer traffic in physical showrooms is expected to dip with an up to 20 percent drop in new vehicle sales in 2020. Shared mobility has taken the largest hit, with a 50-55 percent drop in business. Demand for vehicle servicing and parts, short-term car rentals, and shared mobility services will wane steeply. Exasperating the situation is an already weakened consumer demand due to a drop in private investment and a banking crisis, making it difficult to access credit. Overall vehicle sales are expected to continue dropping in 2021, with the automotive industry ex-

pected to recover by 2022. The recent backlash against Chinese manufacturing could present an opportunity for India, especially as an alternative supply chain market for electronics manufacturing and auto components. Countries that have been hit hard by COVID-19 contributed nearly 50 percent of global trade in 2019, including 1.7 percent from India, which will impact its transport and logistics sector. Global trade is expected to decline by 15 percent, with the top 20 exporting economies currently under stress. More immediately, the sector will face challenges in the form of supply chain disruption, capacity constraints, and cost pressures. However, the crisis will motivate the building of shock-resilient supply chains in food and healthcare logistics while creating a greater impetus for supply chain digitization. Warehousing will gain greater operational efficiencies through the use of robotics, artificial intelligence, and augmented reality tools. The Industrial sector will embrace new paradigms—digitalized, decentralized, decarbonized, circular, and curative—in

the aftermath of COVID-19. Currently, disruptions in material supply and logistics and labor mobility are having a significant impact on the construction segment. Oil and gas revenue will drop by 9 percent with a recovery time of around nine months due to the twin shock of a global glut in oil supply and a domestic slump in demand. Water revenue will drop by 25.5 percent with a recovery time of around 6 to 12 months, with industrial and building segments being most impacted. Electronics will also have a large revenue drop of 30 percent with a recovery time of nine months. The impact on the power subsector will be relatively less severe with a revenue drop of 4.85 percent and recovery time is expected to be around four months due to its essential nature and long gestation associated with new capital investments. As the sector regroups, there will be newer and wider applications for automation and digitalization technologies. Additionally, autonomous operations in manufacturing, in-house manufacturing capabilities, supply-demand assessment, site inspection, and predictive maintenance will pick up the pace. The chemical sector is expected to

have a short but sharp impact in 2020. Demand for petrochemicals, including plastics, synthetic rubbers, and synthetic fibers, will be impacted, making feedstock production from Naphtha cracking profitable. The export of key drugs is banned by the government to ensure domestic availability. Identifying structural solutions that will aid the manufacturing of critical inputs in the country will be prioritized. Due to a surge in demand for immunity supplements, pharmaceutical and healthcare companies are expected to heavily spend on promoting dietary supplements. The chemical sector has been highly dependent on Chinese imports, so this is an opportunity for domestic capacity scale-up, developing alternative sources of supply and investment in backward integration. Weak domestic demand for the metals sector is expected during 2020, with slow growth over 2021. This is primarily due to the likely slow revival of construction, infrastructure, and automotive sectors, which are facing raw material and component shortages along with a labor shortage. Due to construction halts, the demand for aluminum extrusion is expected to decline. This situation creates an opportunity

to focus on utilizing hot metal for VAP (value-added products) and recycled aluminum scrap to make run-of-the-mill products, ensuring reduced dependency on bauxite/alumina. Mitigate risks by hedging the London Metal Exchange (LME) price index, since the LME cash Q1 volatility applies to both smelter and downstream industries.

Look ahead, anticipate and adjust

The duration and severity of COVID-19's impact on economies and sectors will undoubtedly vary. However, companies should set in motion a 'look ahead, anticipate and adjust' roadmap. Over the near term, companies should explore supply-chain diversification and leverage new opportunities arising from changing customer demands. Over the long term, product and service portfolio diversification will be critical to ensuring greater resilience. Externally, strengthening brand equity, and shifting sales channels online will be strategically important. Internally, adopting technologies that support workplace and operational continuity will enable companies to hit the ground running, following the COVID-19 crisis. 

Externally, strengthening brand equity, and shifting sales channels online will be strategically important. Internally, adopting technologies that support workplace and operational continuity will enable companies to hit the ground running, following the COVID-19 crisis.

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PLANNING NEXT STEPS

Manufacturing companies are already focused on preparing for a rapid recovery, drawing key learnings from the pandemic and its impact on their business. Here's knowing what the leaders of the Indian manufacturing industry plan to bounce back while embracing changes and adjusting to the new normal...



L. Krishnan
Managing Director
TaeguTec India Pvt Ltd
Past President, IMTMA

TaeguTec is busy with resuming activities in the post-Covid lockdown phase. In our factory as well as with our field personnel, we are taking several precautions, keeping the safety of our people as a top priority. On the factory side, we are fully geared up, and in fact, the layout of our factory lends itself most appropriate for social distancing. With added safety measures like temperature checks and frequent sanitation routines, we have gradually resumed operations over the last one month. It's been good going concerning our manufacturing activities.

Optimism amid concerns

However, the matter of greater concern is that of customer meetings and support. We are still waiting for the cloud to clear regarding domestic and local travel. Some of our customers are in containment zones. The restoration to absolute normalcy, therefore, is only expected in three to four months,

if not more. But physical movement apart, we see no great challenge in customer interactions considering TaeguTec has always led in matters of incorporating digital technologies for business. Over the last 10 weeks, we have been interacting with customers via myriad conferencing tools and, thus, have minimized the gap between personal and digital interaction.

In addition to these, the company is preparing to ensure we operate lean, and lower our breakeven levels and save cash to stay healthy in the long run. Our plans for upgradation and modernization meanwhile continue unabated. We remain optimistic about the opportunities to come in the times to come.

Automation and digital investments to up

We don't see any big change in long-term investment commitment. We continue to be committed, although some changes in the timelines due to low demands are inevitable. As the market recovers, investments will come back.

Of course, the industry's inclination to automation and digital investments are expected to increase in the times to come.

TaeguTec has always been at the forefront of any initiatives promoting automation and digital technologies for operations and safety in our two decades of existence. So, we don't see any significant change or impact on our strategy.



Ravi Raghavan
Managing Director
Bharat Fritz Werner
Vice President, IMTMA

We, at BFW, are not looking at a sharp recovery in the short run. Yes, we are optimistic for a fairly good recovery in the medium term. Hence, resilience and constant focus is warranted. We are focused inwards – on improving our efficiency and our offerings in terms of products and services. Keeping that in mind, we have not dropped any of the investments in the new product development.

Stress on advanced technologies

There will be a challenge on the availability of people and cost structure. And the adoption of advanced manufacturing will speed up. BFW has been investing significantly on Machining Solutions, Process Engineering, Automation & Robotics and Additive Printing. The latter part of Industry 4.0 Solutions offerings to customers is through our fully-owned subsidiary, M2NXT.

POONAM PEDNEKAR
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Reji Varghese
Managing Director
RV Forms & Gears LLP

We have been focused on Industrial AI and Industry 4.0 many months before the lockdown. Indian manufacturers are now beginning to start taking Industry 4.0 seriously. There's been

increased interest in predictive analytics that predicts trends in production, tool wear analytics, cost per component per tool, failure patterns and predictive maintenance of machines, fixtures and special equipment etc. What is interesting is that a large percentage of companies engaging with us right now are from the Tier 1 & 2 segments. We feel that in the next few years, the Automotive sector as a whole will be looking to enable IoT in plants and equipment across the board in a big way.

Economy to bounce back

We feel companies will be a bit cautious in investing a lot of money on advanced technologies for the next few months as no one knows how things are going to

pan out over the next few months. However, for cost-effective advanced solutions like Smartfix 4.0, which uses AI/ML etc. but is still very affordable for even small companies, we have seen a surge of interest and purchases recently. If both Agriculture and Infrastructure pick up, likely, the Commercial Vehicle segment will also revive.



Himanshu Shaparia
Vice President - Sales
Jyoti CNC Automation Ltd

Our first priority in the crisis response is focusing on health, safety, essential services, and virtualization of work. We are focusing on strategic review, stakeholder engagement, finance and funding, innovation and technology review, strong and supportive supply chain management, safe working process and workforce planning. The crisis has disrupted many lean supply chains with just-in-time inventory. We have to identify risks at external suppliers which may cause our supply chain to collapse. Another area we are concentrating on is the assessment of demand patterns and customer relationships. During this crisis, the shortage of life-saving ventilator is a huge threat. Under the visionary leadership of Parakramsinh Jadeja, Jyoti had accepted the



Umesh Pai
Managing Director
EPLAN Software & Services Pvt Ltd

The business world is expected to change beyond our current comprehension. We need to be innovative as well as creative in analyzing all the aspects. Due to a sudden and severe lockdown, there are multiple questions raised on the industries' reliability in the global value chain, be it in the back office, the supply chain or customer response. All these need to be radically looked into. That's what the Prime Minister meant when he talked about being 'self-reliant'.

When we are self-reliant that's when we can be relied upon. Therefore, we need to critically look at our preparedness, specifically about our systems, efficiencies and our ability to re-invent ourselves.

Focus on customers

For us, this is the time to be with our customers and to be of use to them in remodeling or reimagining their design processes. It's very critical for their survival, and with that, our survival. In this crisis lies the opportunity to help them be efficient and reliable by sharing with them the global best practices and processes. Before the Covid-19 onslaught, Industry 4.0, automation, etc. were considered aspirational. Now they are essential to survive. We see a tremendous requirement in the automation space be it factory automation, warehouse automation, or anywhere else.

challenge to design and develop the ventilator which could be an immediate aid in the Covid-19 treatment. This was a good example of flexibility in our manufacturing system where resources were well utilized to attain this goal successfully.

Any crisis plays out in three timeframes: Respond, Recover and Thrive. Currently, the second phase is where everyone is trying their best to recover and regain the pace. The most important will be the 'Thrive' phase where organizations prepare for and shape the 'next normal'. There would be a spike in

technological advancement and innovation post Covid-19. The world is witnessing a rapid shift to virtual and remote work with extraordinary levels of flexibility, teaming, and adaptability. A similar evolution is expected to happen in the adoption of advanced manufacturing technologies as organizations are grappling with the challenge to perform with a more dispersed workforce and other allied limitations. The shift would lead to embracing of automation, additive processes and manufacturing, and Industry 4.0.



Punit Gupta
Managing Director - West Asia
(India & SEA)
Blaser Swisslube India

We, at Blaser Swisslube, have always worked on building our business with strong fundamentals. They help us to increase our resilience over time. We have been a highly agile, evolving and efficient company. It will help us to adjust to a new normal fast. Globally, we work on a long-term strategy with long-term customers, business partners and employees who are committed to the same cause and create a strong chain. Looking at the situation all over the world, every company has to drive for higher competitiveness to survive and grow. Enhancing productivity and quality is the sustainable route to

achieve competitiveness on a global level. We will intensify our journey to work with our customers and help them achieve better competitiveness. This journey is long and involves change management.

Going the right way

The industry will face a dilemma between investment Vs. expenditure post pandemic. This is the time to start preparing for robust businesses. Being focused and true to your objectives will be the primary key.

Being competitive with higher reliability will call for a paradigm shift in decision-making processes which will be based upon data and facts. Companies have to find ways to collect many data points in the manufacturing processes. The beauty of this change will be high transparency within the organization.

Investments in the right technologies and the right people will be the key to manage the future of the companies well. These are doable and every company can find a way ahead once they decide their clear approach. Fundamentals will improve and gain significance in time to come.



Vineet Seth
Managing Director -
South Asia & Middle East
Mastercam APAC

When we announced a work from home directive before the lockdown, most of our teams were already prepared for a remote working plan that spanned the last three months. We communicated both internally and externally about our events and action plans while ensuring work continuity for our customers who were involved in essential manufacturing.

Since our business supports CNC manufacturing, we are doing all we can for our customers to get back to normalcy as much and as soon as possible. We have supported them with free training and update programs in the past three months, and also assisted them during the lockdown with remote licenses to ensure that their CNC programmers could complete projects while working from home. Since we have permanent staff based out of eight locations across the country, we are well-prepared for site visits (if necessary, and with all the mandatory precautions) to help our customers with restarting their manufacturing.

Prioritizing human capital

It is natural that most organizations will restrict or postpone their capital investment decisions to ensure that they have sufficient liquidity for operational

expenditure. However, we believe that this will be only until cash flow returns to reasonable numbers. This could be a couple of weeks to a couple of months based on the overall market resilience. It is my opinion that organizations must prioritize human capital over long-term capital investments. That being said, all small- and medium-term capital investments must continue as per the plan. This way, companies will be able to better utilize

the current gap for quick learning and implementation of the short- and medium-term projects, while ensuring that they do not lose out on the human capital/knowledge pool as well as their medium-term profitability.

From our end, we are offering various options for manufacturing companies to purchase our software, without compromising on their current need for maintaining liquidity.



Yatendra Kumar
Business Head
MotulTech India



Maulik Patel
Executive Director
Sahajanand Laser Technology Ltd
(SLTL)

SLTL has always believed in innovating. Hence, although our research team could not resume its duties on the field during the lockdown, it was still able to provide customer support in every way possible. With the skills of our experts and constant support of our Chairman & Managing Director Dr Arvind Patel, we have developed an indigenous high-end ICU ventilator, which we call 'Pran Saiyam', to combat Covid-19. After the successful rollout of Pran Saiyam - version 1, which started on April 03 and completed on April 11, the engineers have started working on its upgrades. To ensure our team remains safe in this fight against the pandemic, we have been providing transportation to our people. Our managers are counselling them

and helping them adjust to the new normal. Every insight that we find on the current status of the demand and supply is shared with teammates transparently from time to time.

Challenges to be overcome

With the core purpose of innovating consistently, we have launched IoT as well as Smart Factory Solutions such as loading-unloading and opti-store for optimal utilization of resources. But despite the investments in tech products, challenges remain to be faced by the industry.

Before Covid-19, tech companies were investing heavily in advanced technologies such as automation, robotics, and artificial intelligence to reinvent how work is done. But post-pandemic if double down on investment is adopted to weather the coronavirus storm, it would not prove to be fruitful for the manufacturing firms because of a missing critical factor - the employee input. Although technology advances are seen as a solution to strengthen operational capabilities, companies will have to first ask their employees critical questions before new technologies are deployed. Investments in advanced manufacturing technologies will not do any good if employees are not prepared to utilize them.

Today, all manufacturing companies are focused on resuming their operations as soon as possible. However, everyone is facing internal as well as external challenges. When I connect with my customers, vendors, and friends across industries, I realize they are facing the same set of challenges including manpower, transportation and fund flow to name a few.

Reducing manufacturing cost

We have worked hard during the lockdown and made our team including distributors self-sufficient to tackle technical issues and commercial decisions so that we can focus on our new customers and new products in different/new segments. We and all our stakeholders are ready to not only survive, but also flourish in this environment. We have invested in advanced online and app-based tools like 'iCast EVO' to help our customers with the ways to generate money by reducing the manufacturing cost. In my view, this is the time to look for new technologies to reduce the overall cost of manufacturing and the total cost of ownership of the equipment.

PRACTICING STAGE TWO THINKING

Responsible decision-making requires thinking beyond the initial benefits to consider how a change ripples throughout the machine shop's operations and culture.



Source: Modern Machine Shop

In 'Applied Economics: Thinking Beyond Stage One,' the economist Thomas Sowell argues that 'stage one thinking' is when a decision-maker considers only the immediate result of an action without determining what happens next. An example of this might be a government's decision to raise taxes, assuming that the only result would be increased revenue. What it may fail to factor in is the subsequent effect on the business environment, possible relocations or expansions elsewhere, or negative payroll implications. The net result may actually be a loss in revenue over time.

On the shop floor, stage one thinking could encompass hiring decisions, capital equipment purchases or strategic initiatives. Here are five areas in which I personally failed to look past stage one when I decided to purchase a machine shop, and what stage two thinking would've involved in each scenario.

Existing customer base

Stage One Thinking: Since I was familiar with the current customer base, I made some basic assumptions regarding the shop's current workload. I thought the business had strong customer relationships, steady business and consistently profitable work.

Stage Two Thinking: If I had peeled the onion back one more layer, what would I have found? What market segments were these customers in? Were there long-term growth opportunities, or were these flash-in-the-pan moments we were taking advantage of? What was our average customer size? Was I working for large corporations with deep pockets and more work than I could provide, or was our customer base smaller, niche products that could rarely keep my machines busy? When looking at a customer network, be sure to ask what customers fit the business best. What is the business set up to handle, and who might those

customers be? Which customers don't fit into the company strategy you're trying to implement?

Workforce

Stage One Thinking: The business had several long-term employees and high retention rates, and most employees seemed happy with their jobs. There was a mix of older talent with the wisdom to train the younger employees.

Stage Two Thinking: Why were there so many long-term employees? Did they truly love their jobs, or had there been a lack of management that led to employee complacency? Were company policies and an employee handbook in place? Were all employees aware of them? Were company rules and expectations enforced when need be? What were the accepted norms at this company that might not be tolerated elsewhere?

When I purchased the business, I was impressed by several of the long-term employees, a few of them having been with the shop over 20 years. After taking ownership, I quickly realized that one of them should have been let go 20 years ago. I didn't realize the long-standing management issues I was handed.

Equipment

Stage One Thinking: Yes, there were several aged pieces of equipment, but they did their job dependably and held tolerance. Our newer equipment kept the shop competitive and added to its capabilities. The company was using the current equipment to deliver quality products to customer specs.

JESSE SCHELITZCHE
President
Imagineering
Machine Inc.
imagineeringmachine.com



Stage Two Thinking: How did changing technology affect our current equipment? How did the equipment handle our current mix of work? What maintenance should I expect in the coming years? Did I have the ability to grow with my current customer base with the same equipment? What impression did my shop floor give our customers?

In the ever-changing technology landscape, it is more important than ever to understand how your shop might look in five or 10 years. A decade-old machine tool may run all day, but if your machine memory and capabilities don't match the machining speeds and feeds you can output, you're only as good as your old equipment. Understand what investments may be necessary to stay competitive.

Process/Organization

Stage One Thinking: The business had an ERP system in place

with good shopfloor organization and sound flow and execution from start to finish.

Stage Two Thinking: Was the ERP system being used to its full capabilities? What company metrics were being tracked, and was the information accurate? What was the continuous improvement history and culture within the business? Were there constant fires to put out or was there a drive for improvement?

When evaluating the processes and organization of your shop or potential purchase, it's critical to understand what you are inheriting. From ERP reporting for better company communication to shopfloor metrics that drive employee performance, there may be great opportunities to improve quickly.

Technology


Stage One Thinking: The company was functioning as it should with limited internal issues. The business had a general

understanding of how technology benefits the company.

Stage Two Thinking: How was the company using existing technology to improve or grow? What opportunities were visible that could streamline process or replace unnecessary labor? What investments were needed to get the most from the technology available?

From the front office to the shop floor, technology has improved or replaced what previously required human hands and hours of labor. How can the business offer the most to your employees while staying productive and profitable?

Taking the next step

The first step is to get a 10,000-foot view of the company. Next, identify areas that function and flow well. Identify areas that need upgrades and attention. Next, do some stage two thinking within each area that needs improvement. Diagnose the most pressing issues and produce an action plan. 

A decade-old machine tool may run all day, but if your machine memory and capabilities don't match the machining speeds and feeds you can output, you're only as good as your old equipment.



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GETTING THROUGH A DIFFICULT SITUATION

These are tough times to be a person working in the field of sales or service. There are way too many pressures one has to handle from customers, business and family. The already difficult mix of target achievement, cost control, and customer satisfaction has gotten even more complex with the addition of hygiene maintenance, health precautions, and safe distancing.

Taking it easy

It is, therefore, highly important to not let yourself get overwhelmed and understand how the independent components work towards the final outcome. In case of servicing a machine or giving a demonstration of a machine, there would arise a need for a physical presence, which would then require travel. How can one commit to that in these times? It is hence critical to look at the issue holistically and weigh the associated risks and rewards. It is important to bring in the understanding that there are people on both sides, and a mix of logic and feelings will only get you to take the best decisions in the given circumstances. The escalation of these decisions should be done only as a final resort if a resolution is not possible.

An already complex situation needs to be sorted out. Adding more processes and procedures often make solutions worse than the problem itself. The need is to seek multiple perspectives and see the big picture before you start testing solutions. Hence, nurture an environment of feedback, experimentation and open mindedness.

Interaction helps

Approach any interaction as a learning opportunity. Ask, “What do I have to learn here?” This mind-set shifts how you perceive others and the questions you ask. This will have the same effect on the other person’s mind-set and their perception of you, turning the interaction into an enriching experience.

Remember whatever you may know, no matter how right it feels, it always is just a part of the truth. Ask other people for facts and evidence. Get them to say how they feel about the issue, and ask them to describe its impact on them. You may have good information but you still have to learn from it by listening intently. The secret to effective listening is to shift from thinking about what people’s words mean to you and considering what their words mean to them. Learning to listen attentively – not while planning what you’ll say next – takes conscious effort and time.

In volatile and challenging times, to get to solutions that are not known, your direction and priorities must be clear. This will make way for action and resolution in an experimental way, teaching you and the others with you, as you seek your destination, things that must be learnt.

The need is to seek multiple perspectives and see the big picture before you start testing solutions. Hence, nurture an environment of feedback, experimentation and open mindedness.

T K RAMESH
Managing Director and CEO
Micromatic Machine Tools Pvt Ltd

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

HARNESSING AR CAPABILITIES



A report exploring the robust and increasingly complex opportunities presented by the Industrial Augmented Reality (AR) market, and also shedding light on the actionable trends and insights across the entire AR ecosystem...

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Augmented Reality (AR) has lately been recognized nearly universally as a top business imperative by the leading analyst firms, and for enterprises undergoing digital transformation, making the time right to integrate AR into the technology

roadmap. Moving quickly from pilot to production, industrial enterprises are quickly recognizing optimization of their workforce as AR reduces training time and costs to bridge the growing worker skill gap through knowledge transfer and improves quality and first-

time success rates to drive operational efficiencies. This edition of our State of Industrial Augmented Reality series examines the market trends for enterprises across industrial verticals for their own internal use to improve workforce productivity.

Facing increasingly complex and digital processes and products, coupled with an acute skilled labor shortage, industrial enterprises are bridging the gap with the help of AR technology.

Our key findings include:

- Industrial enterprises are the highest adopters of AR, focusing efforts on improving worker performance and solving the skilled labor shortage they are experiencing.
- Use cases for worker productivity focus on delivering instructions and guidance primarily within manufacturing, service, and training environments.
- Companies piloting AR initiatives are experiencing dramatic gains in worker efficiency and quality, while reducing the cost of training by more effectively transferring knowledge to new workers.
- Successful pilot programs are being moved to production at higher rates year-over-year to capitalize on the early mover competitive advantage

Methodology

The insights contained in this edition of the State of Industrial Augmented Reality report series have been developed through primary and secondary market research conducted. The primary research includes exclusive data related to one of the largest sets of industrial enterprises pursuing AR in the market—companies testing PTC Vuforia software.

These enterprises include a global sample representative of multiple verticals with a focus on industrial settings. We supplement this proprietary data with market projections and case studies from dozens of analyst firms and consultancies in the broader market. The State of Industrial Augmented Reality distills this vast set of knowledge and provides a

BAE Systems

Take BAE, the multi-national aerospace and defence company, for example. BAE has piloted operator and assembly work instructions to improve the speed and accuracy of assembly procedures, and more quickly and inexpensively roll out new information to workers. Using AR, the company is able to create work instructions to deliver to workers 'in hours, at a tenth of the cost' of previous methods. And according to one BAE Operations Associate, AR has enabled them to cut their assembly time in half. Leveraging these instructions for training, BAE has been able to train new employees '30-40 percent more efficiently'. With these kinds of staggering improvements to worker productivity, it comes as no surprise that BAE views AR as 'the next step in the evolution of high-tech manufacturing'.

comprehensive view of the current state of the market. In this update, we'll focus on findings from our cumulative three years of research data and provide insight into industrial enterprises capitalizing on the opportunity presented by industrial AR to optimize their workforce.

Demographics, drivers, and beneficiaries

With a majority of survey respondents falling into the industrial category, AR has found its greatest value in verticals bearing heavy physical product or process components. It should come as no surprise that 26 percent of responses are representative of industrial products with an additional 29 percent from industrial verticals such as Automotive, Electronics and High Tech, and Aerospace and Defense. Facing increasingly complex and digital processes and products, coupled with an acute skilled labor shortage, industrial enterprises are bridging the gap with the help of AR technology. Prediction is that this concentration of deployments in industrial environments will continue to consolidate, as AR moves from hype to reality and real-world deployments prove themselves

Figure 1: Industry Vertical

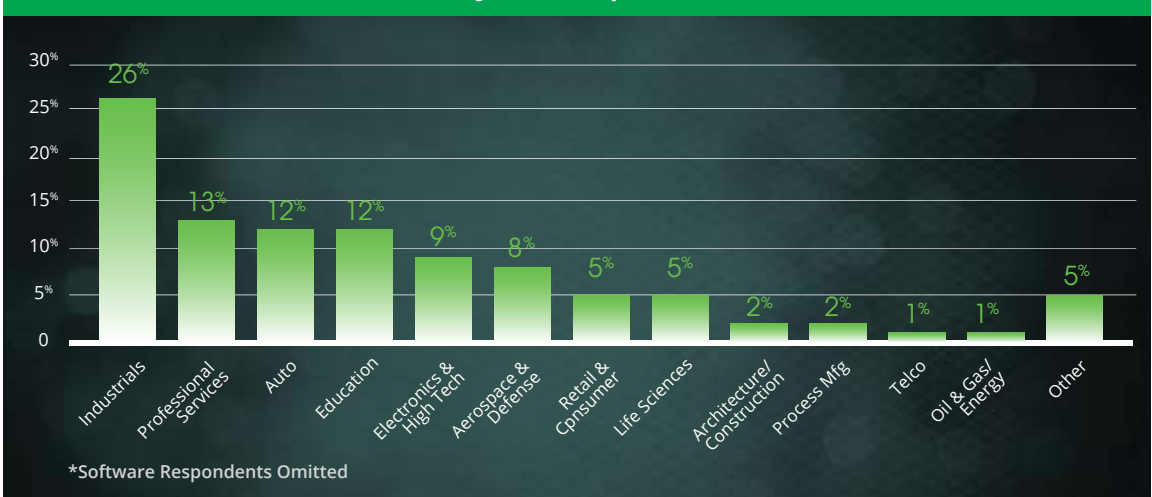
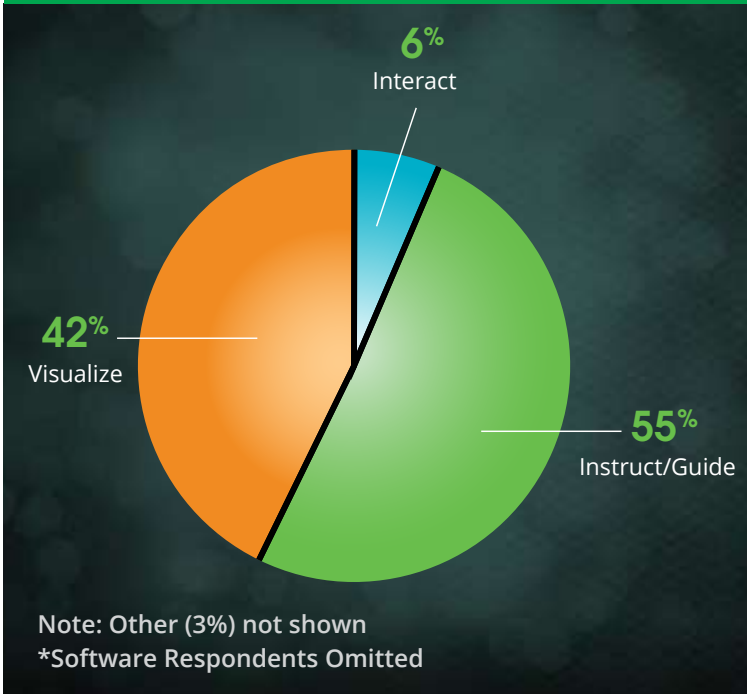


Figure 2: AR Capabilities Being Utilized



Source: PTC

to create the greatest value in these domains. Trending in line with our previous research, most enterprises today are adopting AR for their internal use and benefit, marking improvements in 'Operational Efficiency' or 'Lower Costs' as main value drivers according to our data. To achieve these ben-

efits, use cases being developed are leveraging AR to provide instruction or guidance. Interacting or using AR to manipulate digital graphics or interface with a smart, connected product is an emerging capability that will grow as AR becomes integrated with more business and product control systems. Whether

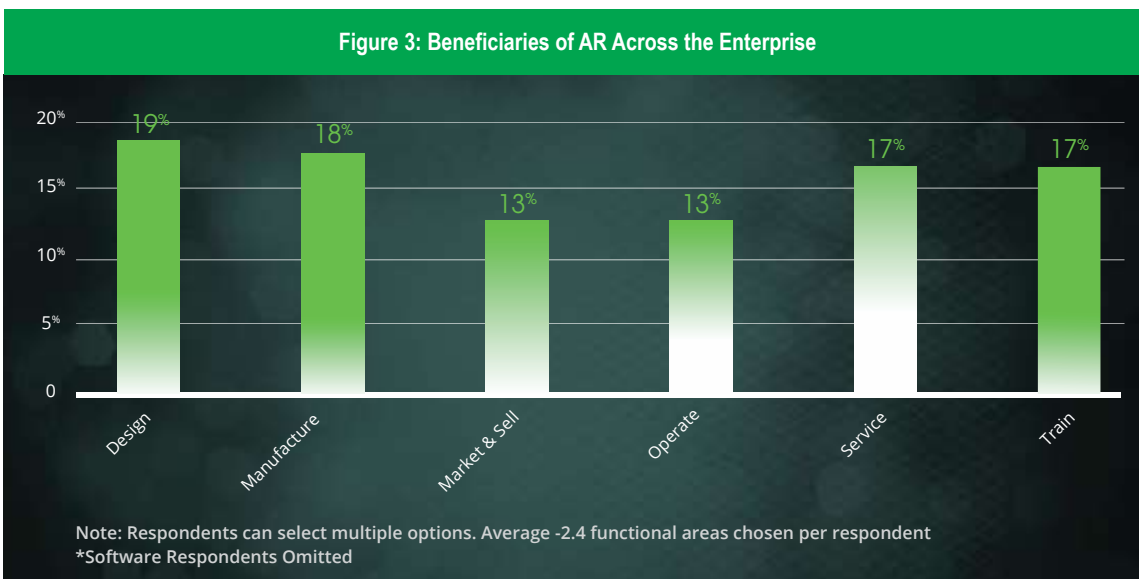
the aim is to centralize and scale expertise to achieve cost savings in travel and logistics, or reduce workers' ramp time to learn new tasks, worker distribution and development is receiving a welcome overhaul thanks to the new capabilities AR provides. This is in contrast to use cases focused on visualization, which are mainly being used as new methods for customers to engage with products and brands.

Opportunities to leverage these capabilities across the value chain are diverse, with heaviest concentrations in design, manufacturing, service, and training. Design use cases typically drive value through 'design for manufacturability' or 'design for service' value propositions, where designers visualizing products at scale can engineer based on manufacturing and service efficiencies or ergonomics. In this way, downstream productivity is gained by a reduction in design iterations, and by working those downstream efficiencies into the design requirements more efficiently.

For manufacturing, service, and training-centric beneficiaries, use cases are most often utilizing step by step instructions to

Most enterprises today are adopting AR for their internal use and benefit, marking improvements in 'Operational Efficiency' or 'Lower Costs' as main value drivers.

Figure 3: Beneficiaries of AR Across the Enterprise



Source: PTC

speed the completion of tasks and improve work quality and collaboration among workers. As consumer expectations rise, these types of initiatives yield not only internal workforce benefits, but ultimately improve relationships with customers and supply chain partners, providing competitive advantages as well.

Top AR use cases and examples of workforce optimization

Industrial enterprises are focusing on harnessing the new AR

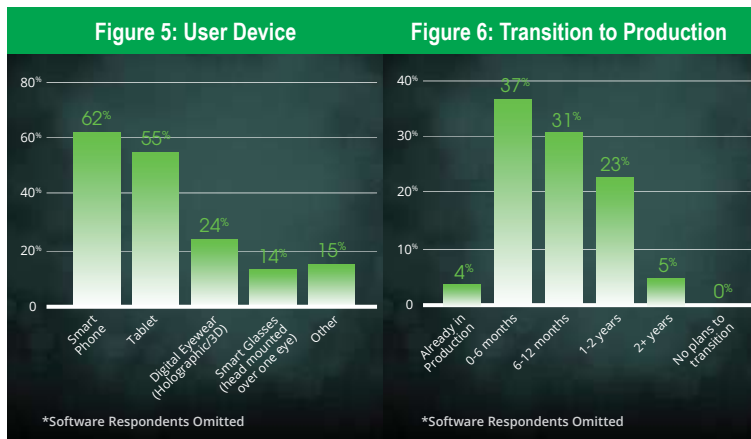
capabilities across their value chains. Many early AR deployments have showcased the exciting new potential of AR through product and brand experiences. The launch of Porsche and other major brands 'digital showrooms' is proof of the transformative potential of AR to impact marketing and sales. AR can certainly shorten the sales cycle and improve close rates, but as the technology matures, industrial companies are turning their focus to embedding AR within their critical processes to optimize their workforce.

For industrial enterprises offering AR experiences to enhance their workforce, a staggering 69 percent of use cases are focused on benefitting their internal workers in engineering, manufacturing, service, and training. This trend is in line with broader market observations, and step-by-step instructions have quickly become the default starting point for anyone experimenting with AR. The way in which information has been documented, maintained, and shared has historically been slow and costly.

The launch of Porsche and other major brands 'digital showrooms' is proof of the transformative potential of AR to impact marketing and sales.

Figure 4: Augmented Reality Use Case Adoption





Source: PTC

More importantly, for the worker accessing it, the abstract context of a drawing or text-based instruction, and even out-of-context video, creates significant cognitive burden and slows work processes significantly while opening them up to errors. According to a recent Manufacturing Workforce Training Survey conducted by Informa, 75 percent of manufacturers view 'on the floor pairing' or shadowing as the most effective way to train workers, followed by a paltry 15 percent for classroom methods. Indeed, the power of context cannot be overstated when dealing with complex and variable tasks in ever-changing environments characteristic of industrial jobs. Yet 1:1 expert training is costly and inefficient, requiring more time from seasoned workers than enterprises can afford, and producing logistical challenges that do not scale. With AR, these challenges are significantly reduced and industrial enterprises are welcoming its new capabilities in a much-needed overhaul of knowledge transfer and workforce development at a time when the skill gap and retirement of the previous workforce has caused an acute bottleneck. These types of results are becoming increasingly common as more industrial enterprises make the commitment to pilot this promis-

ing new technology. One unique and necessary evolution in the way industrial enterprises conduct their operations is the need for agile, real-time worker development and learning without sacrificing time and productivity. The re-use of pre-work training content for in-situ work instruction is producing cost savings not only in the development and delivery of training materials, but it's also reducing the unproductive time spent by workers to consume it. The prediction is that over time the need for out-of-context learning and development will be limited to regulated certifications and necessary safety training, while standard work instructions and job training will happen in-situ thanks to AR.

Deployment methods and timeline

When most people think of AR, they picture a head-mounted display like the Microsoft HoloLens. According to PTC data, 24 percent of enterprises experimenting with AR have done so with the aid of these futuristic devices. Indeed, for industrial workers performing complex tasks with both hands, the need for a hands-free experience is paramount. But considering 62 percent and 55 percent of respondents who are making experiences available on smartphones or tablets, there

is a clear opportunity to develop platform-agnostic AR experiences today that will be accessible to HMDs as they become available. With the announcement of HoloLens 2 at Mobile World Congress in February 2019, one becomes sure of a significant progress toward the hands-free AR of the future. We, therefore, predict this trend of smartphone-led AR pilots to begin to shift, favoring more sophisticated hands-free devices. With regard to the timeline that enterprises foresee advancing their pilots, an impressive 68 percent feel confident that they will move their AR initiatives to production within 12 months. While the number of enterprises in production with AR at scale today remains low, with the level of value being reported by trailblazers like BAE, there is no doubt these timelines will continue to shorten. This is particularly true considering the growth in ready-to-deploy solutions becoming available in the market, driven by the clear strategic focus areas of enterprises that have been testing this technology in recent years.

The bigger picture

Our research and analysis show that industrial enterprises are exiting the awareness phase and are working quickly to integrate AR into their digital transformation strategy to optimize their workforce and beyond. Market analysts' and PTC's forecasts predict that industrial augmented reality has the potential to create significant economic disruption and impact. To capitalize on this opportunity, industrial enterprises should seek partners and technology providers that have solutions ready to deliver value and build, integrate, and deploy AR experiences as quickly and easily as possible. 

While the number of enterprises in production with AR at scale today remains low, with the level of value being reported by trailblazers like BAE, there is no doubt these timelines will continue to shorten.

SEEING THE BIG PICTURE

In this free-wheeling interview with MMI's Editor-in-Chief Soumi Mitra, Rajiv Gandhi, Senior Executive Director, Productions & Member of Executive Board, Maruti Suzuki India Ltd (MSIL), offers his expert take on the impact of Covid-19 on the Auto sector, the expected changes in the EV plan, supply chain dependencies, and shares the experience of producing ventilators and the challenges encountered amid the lockdown...



Rajiv Gandhi, Senior Executive Director, Productions & Member of Executive Board, Maruti Suzuki India Ltd (MSIL)

Source: MSIL

Mitra: It is slated that the first-time car buyers in India which are 40 percent at present would go up by 10-15 percent Post Covid-19 as people would focus on owning personal transport due to hygiene consciousness and social distancing. At the same time, job losses and salary cuts would dampen the purchasing sentiment. How do you perceive the growth of the Indian Auto sector in this backdrop? Will there be more consumption of small cars in comparison to sedans and SUVs?

Gandhi: The Covid-19 fallout is unprecedented. With more than half of the world's population forced into lockdown and countries struggling to get a grip on the fast-evolving health crisis, the economic implications of the pandemic have started emerging in the form of muted growth projections and unemployment levels unheard of. No one could have imagined that we will be at a standstill due to a pandemic. This was the risk never thought of and never prepared for, and hence, has left us all unguard-

ed with manufacturing activity across the world and in India at a standstill. Until we, which means India and the world, are at a stable state with declining cases and a cure in sight, we need to take this uncertainty as the only reality. The economy is a delicate balance of demand and supply. For people to come out and buy, they should have safety and financial security at the back of their minds. Having said that, at Maruti Suzuki we have started operations at our plants and opened our showrooms and workshops in a graded

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manner as per approvals from the state Government guidance.

On the supply side, we may face issues on the availability of factors of production and we will be adjusting our operations to the 'new normal'.

Though it's too early to predict an increase in demand for automobiles, but looking at some learnings from other nations and adherence of social distancing will keep people away from car pools and public modes of transport including aggregators. Hence, there may be an increase in demand for affordable cars. The number of first-time buyers may go up. But demand is not just driven by need; there are crucial factors such as affordability, general sentiments income of the buyers.

Positive things in this situation have been prompt actions by the Government. There seems to be a conscious effort to restart, run, and sustain businesses with special schemes, waivers, tax rebates, etc. There are a few exemptions and relaxations also provided to boost exports as well.

I am sure, with incentives and stimulus packages being rolled out from the Government, we will see a positive sentiment soon. We need to wait and see how businesses leverage these opportunities and how these stimuli boost the demand.

Additionally, one important factor that can drive automobile sales at this point would be the availability of loans and affordable rate of interest. This will also give thrust to first-time buyers.

The Electric Vehicle (EV) plan envisages 30 percent EVs on India's roads by 2030. With an existing vehicular population of more than 210 million and swelling, it's hard to see how this transformation will happen in about a decade. What are your thoughts on it?

Vehicle Electrification is one of the key approaches being followed



Source: MSIL

“The Manufacturing sector needs to be self-reliant in many ways. We are still dependent on many countries to source critical parts, specifically electronic components. We need to encourage local manufacturers, foster collaborations to make in India to be self-reliant and emerge as a strong global manufacturing hub. The Future of businesses will rely on two important concepts — Digitalization and Localization.”

Rajiv Gandhi
Senior Executive Director
Productions & Member of
Executive Board
Maruti Suzuki India Ltd (MSIL)

globally for meeting national objectives of Carbon emission and fuel consumption reduction. Eighty-five percent of crude oil is imported in India accounting for 20 percent of total import bill. With growing mobility, India's crude consumption is likely to increase year on year, thus requiring a comprehensive approach to reduce the fuel consumption and oil import bill.

It is estimated that India will have 70 million Car parc. by 2030 at 8 percent CAGR. If we consider 20-30 percent annual EV penetration by 2030, ICE Vehicles will be 83 percent and EVs will have 17 percent share of total parc. Therefore, a comprehensive approach, with simultaneous focus on electrification of ICE powertrains, and promotion of alternate fuels (CNG, Ethanol, and Methanol) along with battery electric vehicles (BEVs) is required to have a significant impact on reductions in oil imports. The same has been conveyed by us under the 'Mission Green Million'.

BEVs currently have a challenge related to high acquisition cost and infrastructure, thereby impacting the customer pull from the market. However, other electrified powertrains such as hybrids, and alternate fuel vehicles may have easier adoption, as they offer good fuel efficiency at a relatively lesser cost, and may not require any external charging infrastructure. To further enhance the adoption of fuel saving technologies, we need to localize HEV and EV technology to reduce cost through 'Make in India' and generate consumer pull for natural adoption.

The Government is primarily supporting BEVs right now, whereas equivalent support to other xEV technologies (strong hybrid and plug in hybrid) is missing. Moreover, the Auto industry has worked for three decades to establish ICE-based ecosystem in India, because of which we have been able to achieve very affordable cost levels as compared to the global benchmarks. Going forward, similar level of efforts from the Government and the industry will be required for BEV adoption to increase. Government support is required in making long-term policies, which can propel the development of an ecosystem, R&D and supplier base, similar to the ICE vehicles, and provide fiscal and non-fiscal incentives to generate consumer demand for adoption. Right measures in this direction will help India to produce electrified vehicles and components not only for India, but for the world.

Maruti Suzuki is looking at all aspects of an xEV ecosystem in the Indian context. Learning and capability building from demonstration projects, real-life prototype evaluation, localization of critical child parts to end-of-life processing are some of the critical aspects we have been focusing on.

Positive things in this situation have been prompt actions by the government. There seems to be an effort to restart, run, and sustain businesses with special schemes, waivers, tax rebates, etc. There is a string of exemptions and relaxations provided to boost exports as well.

We have always worked towards reducing our dependency on imports by focusing on Local Vendor development. Localization not only helps in reducing the cost of the product, but it also hedges us from global uncertainties.

Last year, Maruti Suzuki initiated a nation-wide field testing of over 40 prototype EVs. The extensive real-life usage of the vehicles in multiple terrains and climatic conditions has helped the company to get valuable insights and gather critical inputs based on actual consumer usage. It will help it to develop a reliable and suitable EV for the Indian market.

MSIL, along with AgVa Healthcare, is also gearing up to meet the target of manufacturing 10,000 ventilators by this month's end. What were your challenges in terms of the supply chain to source the components from different vendors in the lockdown period? Is there any supply chain emergency plan in place to meet the requirements of the industry?

The production of ventilators was a challenging task. Hence, we partnered with the setup which was already into this business.

We did not have any knowledge of the product and were unaware of the supply chain. Most importantly, we were up looking to scale up the production from a mere four units per day to 400 per day, for which we leveraged our expertise in assembly operations. We had to break the tasks into operations, sequencing, work distribution, and a lot of standardization. These were the controllable factors. The biggest challenge was to establish the supply chain for the ramp-up of the production. We had to work extensively to create a pool of vendors who can supply the increased quantity of the parts. Imported supplies were limited; many local vendors were in the red zone or not operating. A lot of fabricated parts were needed as well. So, we hunted for the local sources or standard manufacturers having stocks. We

“Industry 4.0 is gradually making our manufacturing smart. Decisions that used to be driven, either by experience or gut and were extensively dependent on instinct can now be made accurately based on actual parameters obtained from the data collected from these technologies. It's a transition from gut to logic.”

**Rajiv Gandhi
Senior Executive Director
Productions & Member of
Executive Board
Maruti Suzuki India Ltd (MSIL)**

also engaged our component manufacturers to provide electronic parts, sensors, and fabricated products. Leveraging our existing supply chain helped us in providing the technical partner with the requisite components. This was a great learning experience for the team.

Do you foresee the impact of post-pandemic in following the Just-in-Time production model? What are your plans for working with your suppliers and vendors to re-ascertain supply chain dependencies?

Definitely, the availability of factors of production seems to be a challenge currently. This pandemic has highlighted very clearly the points where we need to work extensively to be self-sufficient. Necessary corrections in our infrastructure both physical and digital are highly crucial. There is a need to develop local sourcing units and adopt alternative strategies for reducing dependency on single sources of import. These will bolster the Government's call to Make in India and develop the country into a market with a strong export network as well.

The Just-In-Time model is making sure the right material is available in the right quantity at the right place. Due to this pandemic, logistics and sup-

ply chain have been hard hit. However, we have digitally enabled systems in place to ensure we have strong communication with our vendors to ensure material availability. This is a challenging time for vendors as well. We all have to ensure each other's safety and yet ensure the businesses survive. I believe once we have a cure or vaccine in sight, things will rapidly improve.

Hon'ble Prime Minister Shri Narendra Modi has announced the 'Atmanirbhar Bharat Abhiyan' which primarily focuses on self-reliance. How does MSIL plan to reduce its dependencies on imports of components, especially from China, post Covid-19?

This reminds me of a quote - 'An obstacle is often a stepping stone'. The ongoing pandemic situation has added to the complexity of the term 'disruption'. Almost every manufacturer has experienced supply chain disruptions due to Covid-19.

Our company's direct import content is very less, especially from China, but some of our component suppliers source a few child parts like LCDs, Sensors, and PCBs, etc. from the country. During the initial phase of the pandemic, when its outbreak was limited primarily to China, the supply chain of these child parts was severely impacted. We took this problem as an opportunity and worked with our vendor partners to set up alternate channels of sourcing to ensure business continuity.

Our commitment towards this goal already reflects in our Vision statement - 'To be a leader in the Indian Automobile industry creating customer delight and shareholder wealth, a pride of India'. Customer delight is

achieved when a customer gets extra value for his money. And we believe that it is difficult to create that extra value with high import content. Hence, we have always worked towards reducing our dependency on imports by focusing on Local Vendor development. Localization not only helps in reducing the cost of the product, but it also hedges us from global uncertainties.

The Manufacturing sector needs to be self-reliant in many ways. We are still dependent on many countries to source critical parts, specifically electronic components. We need to encourage local manufacturers, foster collaborations to make in India to be self-reliant and emerge as a strong global manufacturing hub. The Future of businesses will rely on two important concepts – Digitalization and Localization.

A lot of initiatives are being taken by the Government of India in this direction. What is needed is supporting each other to make our country self-sufficient.

What are your views on the increase in the deployment of advanced automation, manufacturing technologies, robotics, and digitization such as Artificial Intelligence, AR, VR, machine learning, etc., in the Auto sector post Covid-19?

“India is a land of opportunities for all automobile manufacturers considering the population of India, most of which comprises the younger generation. Owing to the ongoing pandemic and other regulatory changes in the recent past, the demand has been low but once we come out of it, we expect that the demand will surge. We are working hard to be ready to meet that.”

Rajiv Gandhi
Senior Executive Director
Productions & Member of
Executive Board
Maruti Suzuki India Ltd (MSIL)


The process of transformation towards Industry 4.0 has already begun with Indian manufacturers showing eagerness to adapt to this change to be globally competitive.

Industry 4.0 is gradually making our manufacturing smart. Decisions that used to be driven, either by experience or gut and were extensively dependent on instinct can now be made accurately based on actual parameters obtained from these technologies. It's a transition from gut to logic.

The game-changing tools around data analytics, artificial intelligence (AI), advanced robotics, augmented reality and others promise great benefits when they are combined with the connective power of the Internet of Things (IoT). Data-driven

decision making is finding its way into the manufacturing processes. It is a journey that can drive growth to levels not achievable under conventional business models and strategies, and I am sure that this is going to be an exciting and challenging journey.

Each industrial revolution has touched and changed the way people work in manufacturing. The degree of difficulty of jobs has seen a transition. With the advent of automation, we have been able to delegate physically taxing jobs to our machines and mechanisms and create new opportunities for our workforce.

Automation has changed the way we work. At Maruti, we are using automation based on 3D's – Dirty, Dangerous, and Difficult. For the past five years, our focus has been to eliminate jobs that involve bending, heavy load picking, awkward body postures wherein approachability is tough, exposure to heat, sparks, or other such risks. Automation has been a boon. The talent and creativity of our people have been the biggest contributor in this area. Indian manufacturing has done a lot of progress in the field of low-cost automation. The journey of automating the processes will continue after the pandemic as well. 

Leveraging our existing supply chain helped us in providing the technical partner with the requisite components. This was a great learning experience for the team.



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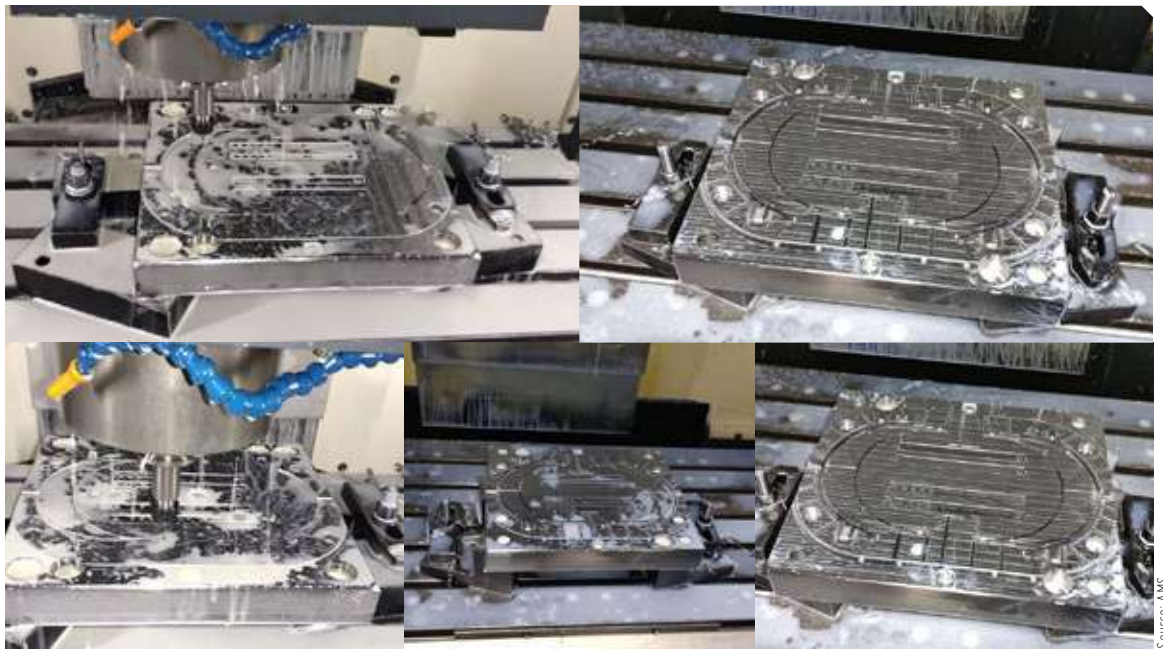
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SEIZING OPPORTUNITIES IN CRISIS

A compelling account of how TTB Tooling, a customer of Ace Manufacturing Systems Ltd (AMS), has applied its capabilities to making face shield dies in order to adapt to the current situation and thrive, and the latter's support in this endeavor.



In today's times of grave uncertainty, enterprises are searching for new growth paths to thrive and do their bit to save thousands of lives. They are racing against time to leverage the opportunity Covid-19 has presented by getting into products and services required in the current times.

Going with the flow

Pune-based TTB Tooling is one of the companies that has remained unfazed and decided to take charge despite the challenges the lockdown had brought forth. The visionary leaders, Muralidhar Kadam, Aditya Mishra and Satwant Singh, each supporting as Joint Managing Director of

the company, were on the same page when the need arose to think of a new strategy to keep their business intact.

"We make injection moulds for Automotive, Household, White Goods, Furniture and Material handling. At the time of lockdown, we struck on the idea of making face shield dies, and immediately took the decision and designed the same," shares Kadam.

Working out of a facility of 40,000 sq ft, the company is proud to have major Indian and international players as its customers including OEMs like Mahindra & Mahindra, International Tractors, TVS Motors, Maruti Suzuki, MG Motors, Tata Motors, Bajaj Electricals, AO Smith, Godrej & Boyce etc.

Leveraging opportunities

It took TTB Tooling around 2 days for producing moulds with the aid of 850V/1060V machines from AMS, which in the words of LS Umesh, Director & CEO, Ace Manufacturing Systems Ltd (AMS), are compact, rigid and designed to achieve high accuracy in Die & Mould, Tooling, Medical, Aerospace applications to name a few.

"AMS machines are universal, capable of machining any components irrespective of industry. We have sold around three hundred 850V machines and around two hundred 1060V machines so far," he informs. With Covid-19 disrupting human life, the need for PPE (Personal Protective Equipment) has become imperative to save

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Requirement

To cater to the demands of the current times, TTB Tooling struck on the idea of making face shield dies.

Solution

With the aid of AMS' 850V/1060V machines, which TTB Tooling already had, it could produce the dies in mere 2 days.

one's life. With imminent need for PPE type products, AMS' customers including TTB Tooling have been using its machine models 850V and 1060V to produce face shield masks cavity plates. "Another of our valued customer RPM Manufacturing Solutions, Mysore, has forayed into producing Covid-19 safety kits using our 1060V machines," shares Umesh.

On whether AMS is able to fulfil the sudden demand of the machines, he states, "Clearly, it's an opportunity for AMS as we have the requisite capability matrix; we can produce over 3,500 machines per year."

The very DNA of AMS is to closely engage and connect with the customer. "With empathetic listening to customer needs, we advocate 3Rs of customer-centricity - Reflect, Resonate and Radiate. Our powerful in-house R&D and Design team work in tandem with the Marketing team to develop NPDs (New Product Developments) and PEs (Product Enhancements) that reflect market requirements. Our MD, P Ramadas' expertise and more than four decades of machine tool experience give credence to our products that match global accreditation standards like Certified European (CE) Standards, adds Umesh.



Source: AMS

"Covid-19 is the biggest disruption in the history of humankind. In these tough times, knowing our machines are being used to produce protective/safety gears has been highly encouraging for Ace Manufacturing Systems and Ace Micromatic Group. We are extremely proud of our customers and our machines for rising to the occasion and contributing to the needs of the situation."

LS Umesh
Director & CEO
Ace Manufacturing Systems Ltd

Designing, developing the die

The idea for making face shield dies was basically derived from the news that relayed the need for masks and face shields, shares Singh. The team of TTB Tooling then started off with the process of referring to existing designs of masks. "We wanted to make effective masks which were also economically affordable. Hence, we had to design the product with considerable inputs from our design engineers and also referring to masks used worldwide. Once the product design was finalized in a day, we started working parallelly on mould design," he adds.

The team was able to produce the first piece OTS (Off Tool Sample) with 99.90 percent pre-

cision. "It took us a few hours to put the mould in production after fine tuning. WhatsApp and other digital media used for advertisement and then mouth to mouth advertisement were a considerable help in getting us known. The people who bought from us also helped others to approach us. We were aired by All India Radio too. We distributed masks to many of the Corona warriors like the Police department, Medical staff, Medical institutions etc.," Singh informs.

Coping with crisis

TTB Tooling is thankful to the AMS team for their continuous support and guidance to run the machines and produce during the lockdown that brought in innumerable challenges for both the companies including an immense disruption in the supply chain.

"It was very difficult to source even standard parts so we had to manufacture them in-house although there was also a shortage of manpower due to the lockdown. We had to request our suppliers to stretch themselves and supply us the parts. We also used some parts of existing and scrapped moulds to fulfill the requirement," shares Mishra.

Revealing his share of struggles, Umesh says, "The lockdown announced from the end of March 2020 affected our operations to a great extent. We had to close

With empathetic listening to its customer needs, AMS advocates 3Rs of customer-centricity - Reflect, Resonate and Radiate.



It was very difficult to source even standard parts due to the lockdown so TTB Tooling had to manufacture them in-house although there was also a shortage of manpower.



Source: TTB Tooling

TTB Tooling is extremely thankful to the AMS team for their continuous support and guidance in running the machines and producing during the lockdown that brought in innumerable challenges including a disruption in the supply chain.


Muralidhar Kadam, Joint Managing Director; Aditya Mishra, Joint Managing Director; Satwant Singh, Joint Managing Director, TTB Tooling

down our operations and pay full salary to our employees on roll, contractual employ-

ees, vendors, and suppliers on time, as per our values. This has resulted in an enormous pres-

sure on our cashflow with zero sales in April 2020. Even after partial opening, customers other than medical equipment manufacturers have either postponed or cancelled their orders, leading to an increase in our inventory levels."

"With the forced lockdown, labor force at our vendors have also moved to their hometown. They may return when they feel safe to do so. As of now, there is a pressure on supply chains and supplies are getting affected up to 50 percent of our capacities," he shares.

The above account is a reflection that in the face of unsurmountable hurdles, what wins is the human spirit to disrupt one's business to cater to the current market situation and the iron will to turn adversity into opportunity. 



Source: TTB Tooling

ETCHING AN INDELIBLE MARK

One of the most popular tooling partners in the Indian industry, Tungaloy India Pvt Ltd has had an eventful journey since its inception. Here's knowing how the Indian subsidiary of Tungaloy Japan performed the formidable task of not just finding a strong foothold in the country but become one of the leaders, and its strategies to cope with the current unprecedented times.



Tungaloy India Team

Source: Tungaloy India Pvt Ltd

Prior to the establishment of Tungaloy India, Tungaloy Singapore would oversee and cater to the Indian market. "One of the biggest challenges then was that we were only known for our Turning Tools. Timing of Tungaloy's merger with the IMC Group in 2009 and inception of Tungaloy India in 2010 worked in our favor as a launch pad. Infusion of extremely innovative products for Milling, Drilling, Grooving as well as Turning, during our inception, helped us reach out to customers confidently. Today, it has made us one of the most

popular tooling partners in the industry," shares Jay Shah, Managing Director, Tungaloy India Pvt Ltd.

The company has not only increased its market share in all segments with new products, but also reduced its Turning dependability from 98 percent to 58 percent now.

Worthwhile challenges

Shah lists out additional barriers the company had to smash to gain entry in the Indian arena. "With already quite a few strong names in the Cutting Tool industry we had our work cut out. As a new entrant, our goal

was not only to find a strong foothold, but also become one of the leaders, which was a formidable task. It has been an eventful journey till now. We started with a team of ten with a yearly turnover of ₹8 Crore to a team of 102 and a turnover of ₹200 Crore in 2018, all in just 8 short years. Finding the right Channel Partners was key, along with putting together a dynamic team, with strong communication, core values and work ethics," he adds. The hard work has paid off with the company achieving ₹172 Crore in 2019 with a target of ₹220 Crore for 2021.

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Synergy of Tungaloy's metallurgy and R&D of IMC has helped the company deliver the most innovative and consistent products. Every year, it launches over 25 new products, which is one of the biggest contributors to its growth.

Highly receptive Indian market

India being one of the world's fastest growing economies has an unparalleled potential, Shah believes. "Our globally hit products are very well received by the Indian consumers. They not only welcome faster, better and the most cutting-edge tools and technology, but also demand for them. Such is India's zeal to grow and be in the forefront of the Machining world," he points out.

Recognizing this, Tungaloy Japan has included India as one of the five subsidiaries responsible for New Product Development during a yearly conference where the feedback and the new product requirements of Indian customers are taken into account for future planning of product ranges, which are then horizontally deployed throughout the world.

Synergy of Tungaloy's metallurgy and R&D of IMC has helped the company deliver the most innovative and consistent products. Every year, it launches over 25 new products, which is one of the biggest contributors to its growth. Indian customers are the first to test Tungaloy's new products and implement them. The company's products including Deep Tri Drill for deep hole drilling on machining centers, TungForceRec for small



Source: Tungaloy India Pvt Ltd

"In the past few years, we have successfully formed a special Project team, which has executed multiple tooling up projects with various machine tool builders. It is an amazing experience when we win a customer working along with a Machine Tool partner. Thanks to these partners, we have matured faster in this industry."

Jay Shah
Managing Director
Tungaloy India Pvt Ltd

pocketing applications, the new T9200 series turning inserts for high-speed turning of steels, advanced Multi Nano layer PVD coated AH8000 series inserts for high temp alloys, and Easy Multi Cut grooving solution for deep grooving, have been found exceptional in solving customers' key problem areas.

One of Tungaloy's biggest business generating segments are the Two wheelers and the Passenger vehicle sectors followed by Commercial Vehicles. Apart from Automotive, it is well received by Aerospace, Oil & Gas, Rail Component Machining, Defence Components and General Engineering.

Standard vs. customized solutions

Shah shares that the company does not believe in offering too complicated tools, which sharply increases investment and maintenance costs. "We try to offer simple special solutions developed around our standard inserts program," he adds.

Seventy five percent of its sale is from standard products. "Most of our special tool development

happens for projects we do with our machine tool partners and we are glad, we have had very good acceptance from both our partners and our customers. We also develop special tools for re-engineering projects we do with our customers, for process improvement," he further shares.

Meeting demands post Covid-19

The Cutting Tools industry was getting ready to meet the new demands owing the emergence of EVs and the future sunshine sectors. Shah offers his view when asked regarding the change in the scenario with the appearance of Covid-19. "Currently our biggest challenge is to come out of the pandemic post which the demand will see a gradual rise. Though the Automotive industry is ready to launch newer models of EVs, Covid-19 has given them a chance to relook into improving their offering, working on cost reduction and look at overall optimization of their concept EV. However, the 2W and 3W are already being sold and would steadily increase, post Covid-19. 4W EVs' sale would take at least another couple of years to see a steady rise," he notes.

The Automotive industry, he believes, will still be the major tooling buyer, though an increase in popularity of Hybrid and EV cars will have an effect on tooling consumption. "Increase in the use of composites in aero structures can lead to lower consumption of tooling as it will have mostly end milling and drilling applications and not much of other operations. Tungaloy is geared up to meet newer challenges. Post covid-19, we see a huge opportunity coming India's way which will surely bring in newer horizons to explore for the Cutting Tools industry," he adds.



Ream Meister

Source: Tungaloy India Pvt Ltd

To this end, the company has invested in newer technologies. Tungspeed Mill for high-speed precision machining of aluminum parts; Ream Meister for high-speed hole finishing; a new range of indexable threadmills; and new geometries of router endmills for machining composites; are few of the examples.

Ready to strike back

Tungaloy has chalked strategies for meeting a fresh surge in demand of its products once the things are back on track for the manufacturing industry. "Our ERP system does not allow hoarding of stock by any particular subsidiary. We keep the fast-moving inserts of the Indian market in our warehouse at Mumbai for supplying to our customers in the smoothest and fastest mode possible," Shah shares.

Challenges are to teach

The pandemic lockdown has brought about an unprecedented set of challenges in the day to day operations of companies that have stopped them in their tracks. Shah throws light on the hurdles that have emerged in the supply chain management of the company, "As of now, one major hurdle we have is in getting the shipments from Japan and delivering to some places in India. Due to many shipments in queue, and stoppage of passenger air movement, we have to wait for our turn to get the shipment." The company can ship to its customers only three days a week. Hence, efforts are on to optimize the systems and manage the warehouse team's time to serve the customers efficiently.

"Every situation teaches us to view things differently and come up with unique solutions. Our current situation calls for better inventory management and



Deep Tri Drill

Source: Tungaloy India Pvt Ltd

efficient warehousing. We have a range of Industry 4.0 compliant tool management solutions to enable customers to get a range of reports for monitoring and efficiently manage their tool inventory and manufacturing costs. This can be accessed remotely and can integrate the functions of warehouse and purchase with least human interaction. Our direct customers now have an option of selecting and placing orders directly with Tungaloy, through our website," he informs.

Optimism for India

As per the estimates done a few months ago, the global metal Cutting Tools market was to grow at a CAGR of 8.8 percent to reach \$38.3 billion by 2024 from \$22.2 billion in 2018. However, owing to Covid-19, economy of every country has shrunk drastically. Shah is of the view that the tooling market globally may not grow at the pace at which it has been forecasted. However, for India, he sees a hope for faster recovery.


He informs that the company has already started receiving enquiries from customers for components which are being manufactured in other countries, and is looking at a possibility to manufacture the same in India. "This will help the manufacturing sector to register a decent growth rate for the next 2-3 years. Post Covid-19, we may see many new projects and investments being shifted to India which would be

a great opportunity to the entire industry," he notes

Motivating teams during Covid-19

Shah tells us about the initiatives the company is undertaking to manage stress of the task force and boost their morale. "Under a lockdown, it's an uneasy scenario for a salesman. Travelling and meeting people is part of his daily work routine, which can be very rattling. The anxiety of one's livelihood and well-being of loved ones can be very strenuous. Hence, it has been our focus to keep the team motivated and upbeat. We have focused on online training on every new product and its application for the last 8 weeks. It also included fun team building elements. By doing so, we could also hone our presenting skills to a virtual audience. We now have a formidable team of presenters who can handle digital presentations with ease," he informs.

"We have also organized interactions where participants had a chance to showcase their talents in singing, acting, delivering dialogues, showcasing their travelogue through photos, and training them on how to take care of their personal finances. We have realized that the team and their families also need to be relieved of stress and hence we have regularly organized some fun indoor family activities, clue related puzzles, and Bollywood quizzes so the entire family can participate and take their minds off the current stress," he adds.

"Making the best of a situation by finding growth opportunities, and having a new and positive outlook even in the midst of a crisis will definitely be a new skill we all will need to learn," he concludes with a point to ponder on. 

"Making the best of a situation and finding growth opportunities, and having a new and positive outlook even in the midst of a crisis will definitely be a new skill we all will need to learn."

PREPARING FOR THE FUTURE

A compelling account on how the SmartFix 4.0 team has been working through this lockdown to analyze data collected to come up with a robust Lockdown Recovery Plan.

As the pandemic of Covid-19 continues to impact our daily lives, we must continue to hope for a brighter future. To achieve that, we must utilize the present to prepare for it. The manufacturing industry, in particular, has had no choice but to close down factory floors for the safety of the employees. But soon there will be a day when the doors open again and they have to face the challenge of catching up and bringing things back to normal. Fortunately, Industry 4.0 has enabled companies to get a head start on this journey to normalcy. The (Forms & Gears/ASM) SmartFix 4.0 team has been working through this lockdown to analyze data collected to come up with a Lockdown Recovery Plan. Through the sensors on SmartFix 4.0, they are now able to determine the daily number of components manufactured by combining the clamp and unclamp data from pressure sensors along with operation data from vibration sensors. The benefit of this exercise is that it has allowed ASM to calculate the total machine time as well as the total idle time.

Case in point

In a particular case of one customer, it was observed that there was more idle time than machine time on a daily basis. Hence, the first analysis done was to see how many additional components could be manufactured if the idle time was utilized.



Source: RV Forms & Gears Pvt Ltd

Now, it is not realistic to replace every minute of idle time with machine time so various models were generated to show how many additional components could be manufactured based on different idle times.

The next layer of analysis was to see total amount of idle time per shift. Data patterns show that there was a gradual increase in idle time per shift as the day went by. This granular layer of analysis can help a customer take measures to utilize specific shifts over the others and be more predictive.

The implementation of SmartFix 4.0 for this customer had three

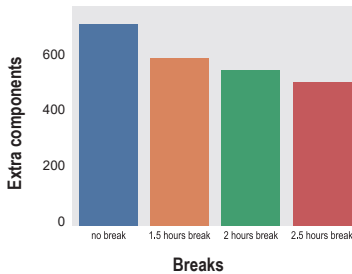
vibration sensors, one pressure sensor and one proximity sensor. The proximity sensor, as the name suggests, logs the presence of the component on the fixture. The pressure sensor collects pressure applied during the clamping and de-clamping of the component. The vibration sensors (we use three to capture data across every axis) are used to record the vibration values caused by the impact of the tool on the component. When these values breach a certain threshold, we can detect issues with the component being manufactured as well as detect tool wear.

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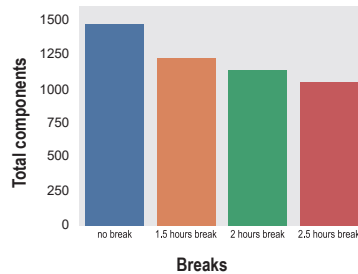


RECOVERY ANALYSIS (DAY WISE)

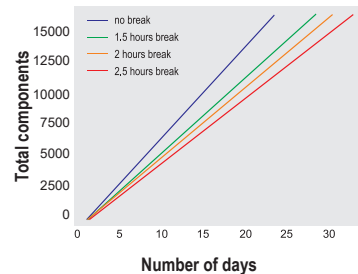
Average number of extra components per day with different break schedules



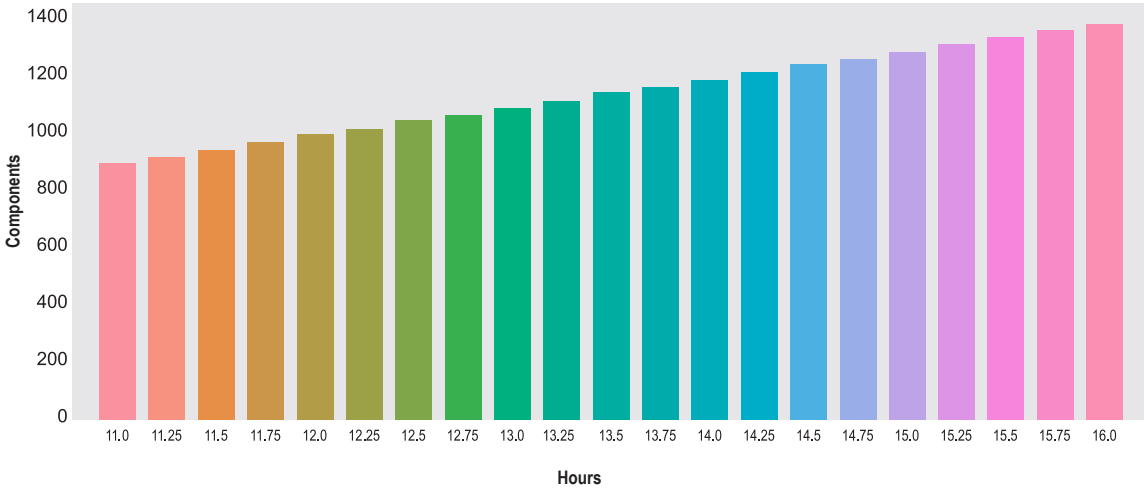
Average number of extra components per day with different break schedules



Days to recover production halt w.r.t breaks taken



Distribution of production count per day w.r.t clamp hours



One might wonder with shorter shifts being planned by government and industrial bodies, will it be possible to recover the shortage of shifts with the utilization of idle time. The short answer is 'Yes'.

Extra and Total components per day utilizing unclamp hours

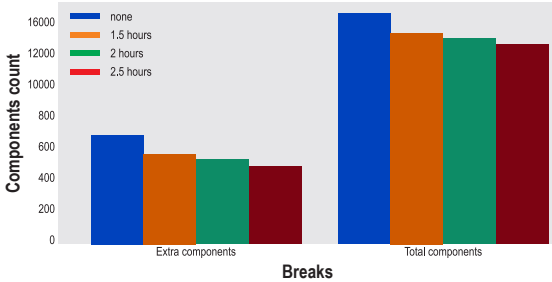


Fig 1 Dispute distribution of number of extra and total components produced during unclamped hours given 4 break plans

Days to recover production halt w.r.t breaks taken

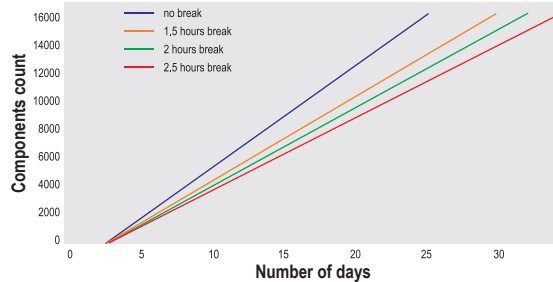


Fig 2 The projected number of days to recover 21 days production halt with different break plans

Distribution of production count per day w.r.t clamp hours

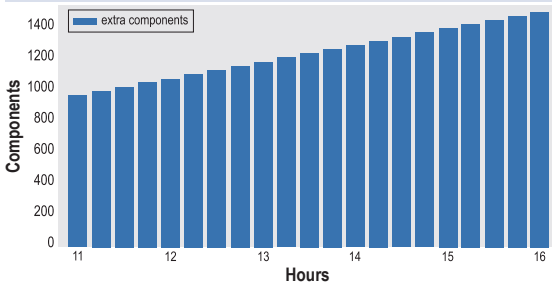
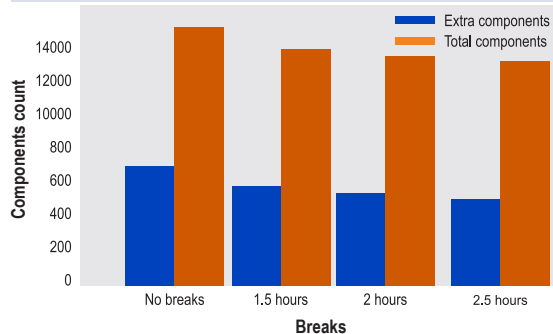


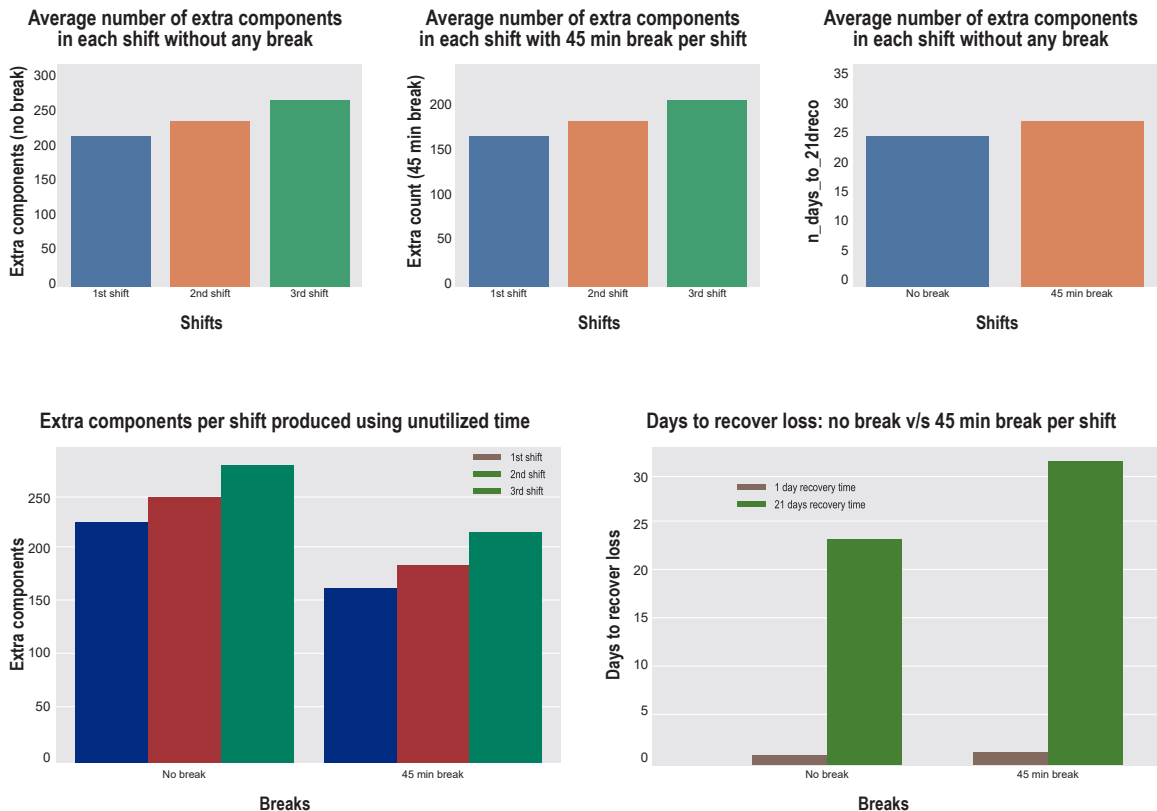
Fig 3 The trend of number of components with respect to total clamp hours throughout the day

Extra and Total components per day utilizing unclamp hours



Source: RV Forms & Gears Pvt Ltd

RECOVERY ANALYSIS (SHIFT WISE)



The data captured by SmartFix 4.0 allows the customer to not only see how much idle time exists, but also pin point the exact moment when the idle time began to increase.

Being as efficient as possible

In order to achieve the highest efficiency during this lockdown recovery process, we have utilized machine learning techniques to give us different work models. The work models primarily are divided on the basis of two factors: one 24-hour day analysis and three 8-hour shifts analysis.

24-hour analysis: This analysis is based on data compilation of continuous 24 hours including breaks. Within these 24 hours, we have clamped and unclamped hours. The unclamped hours include both planned and unplanned breaks. Efficiency of the production plan, upon segregating the unplanned, breaks into 4 types: no break, 1.5-hour break, 2-hour break and 2.5-hour break.

8-hour shifts analysis: Three 8-hour shifts comprise a working day on the shop floor. This

analysis gives different efficiency enhancing models. Based on break distribution within each shift, the efficiency curves differ. Projection on the number of components produced is done utilizing the present unclamped hours. Shift wise efficiency models are divided as two types: No break in any shift and 45 minutes break per shift.

One might wonder with shorter shifts being planned by government and industrial bodies, will it be possible to recover the shortage of shifts with the utilization of idle time. The short answer is 'Yes'. The data captured by SmartFix 4.0 allows the customer to not only see how much idle time exists, but also pin point the exact moment when the idle time begins to increase. It is for each company to find ways to utilize as much of this idle time as possible

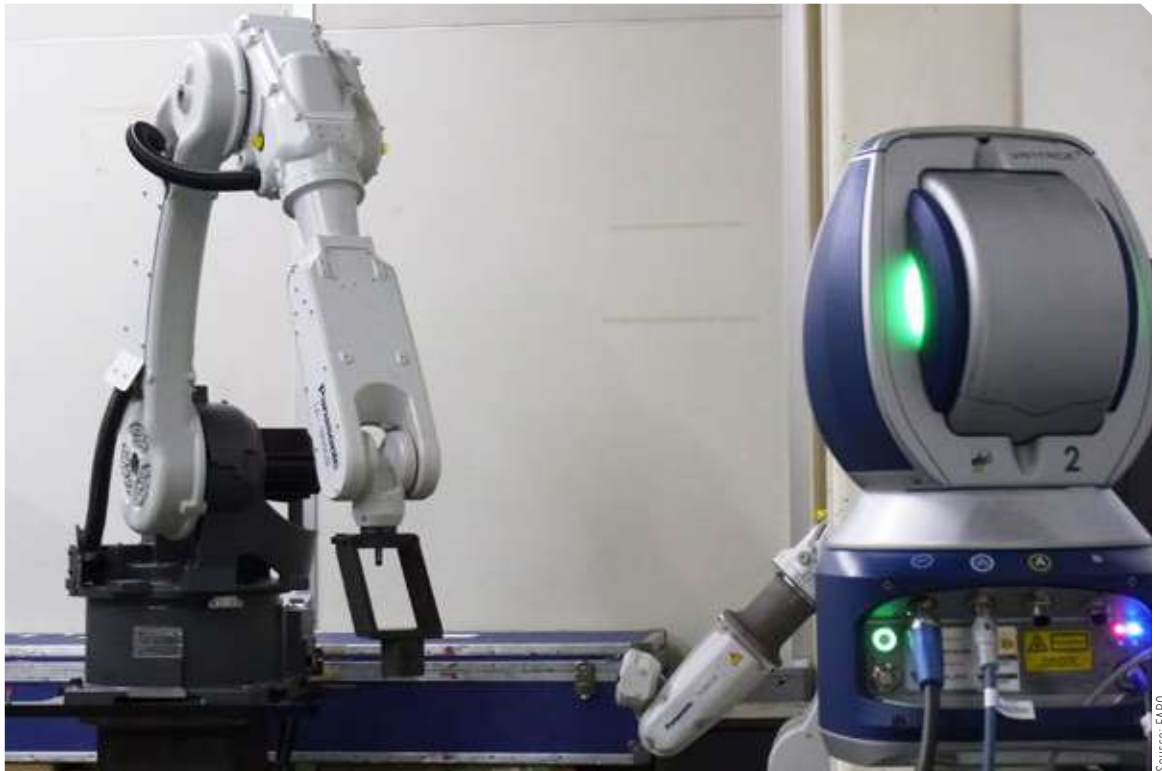
and varied resources available will determine their ability. The situation the world is facing has forced us to innovate in order to stay relevant as well as the lack of data on this granular level. We are only scraping the surface with whatever insights and outcomes can be accomplished with the power of data that will usher the fourth revolution to the industry.

The impact of Covid-19 has tossed up a bunch of changes. The demand for different commodities has changed and, hence, each industry will have to plan accordingly. With the use of real-time data captured by SmartFix 4.0, management teams can employ a robust and dynamic approach that will help them take action to tackle all the unknown challenges that are yet to come. The timeframes will vary based on the demand dictated by the industry. 

Source: RV Forms & Gears Pvt Ltd

FOR MORE ACCURATE MEASUREMENTS

Panasonic Smart Factory Solutions could significantly reduce operation time and improve robot accuracy through a unique measurement method by FARO.



Source: FARO

Panasonic Smart Factory Solutions Co., Ltd (Located at Toyonaka, Osaka, Japan) caters to electronic component mounting and welding machines for various manufacturers including those in the Automotive industry. One of its main products in the thermal processing business is the laser welding/cutting robot system equipped with the industry-first Direct Diode Laser (DDL) specification, where laser processing head and oscillator, controllers and robots are all developed and manufactured by the company itself. Currently, its thermal processing business has mainly 6-Axis articulated arc welding robot,

TAWERS and remote laser welding/laser cutting robot system, LAPRISS. The company has developed its business targeting a wide range of Manufacturing industries. It is FARO's 3D measurement devices and software that support its R&D.

Collecting 1,000 data per second

Panasonic Smart Factory Solutions first showed interest in FARO products in April 2016. Finally, in June 2018, it adopted a portable 3D measurement device FARO Vantage Laser Tracker as well as inspection software FARO BuildIT Metrology. The company's thermal processing business is engaged in the

development of element components relating to the basic performance of robots. One of the important tasks is to measure the accuracy of the robot arm's trajectory. Panasonic Smart Factory Solutions had earlier used other products before FARO solution but faced the disadvantage of limited measurement points due to constraint in the operation range caused by mechanical issues. This happened especially when the clients requested for a bigger or higher performance robot where there were some points which were difficult to measure, thus obstructing the workflow. Also, the measurement tasks

Source: FARO

Challenge

Panasonic Smart Factory Solutions' thermal processing business needed a reliable system to measure the accuracy of the robot arm's trajectory.

Solution

FARO's portable 3D measurement device FARO Vantage Laser Tracker and inspection software FARO BuildIT Metrology – was employed that brought in benefits including:

- Time saving by automatic measurement
- Support for the measurement of large-sized robots
- Easy to use software for data analysis

FARO's solution, consisting of FARO Vantage Laser Tracker and FARO BuildIT Metrology, is now utilized 24 hours and it is not uncommon to operate it for 10 days in a row.

are normally repetitive and simple if conducted in a traditional way. So, the company needed to accelerate the automation of such tasks to improve its production efficiency. The team had tried various automation methods but software or signal problems relating to information communication made it difficult to achieve that.

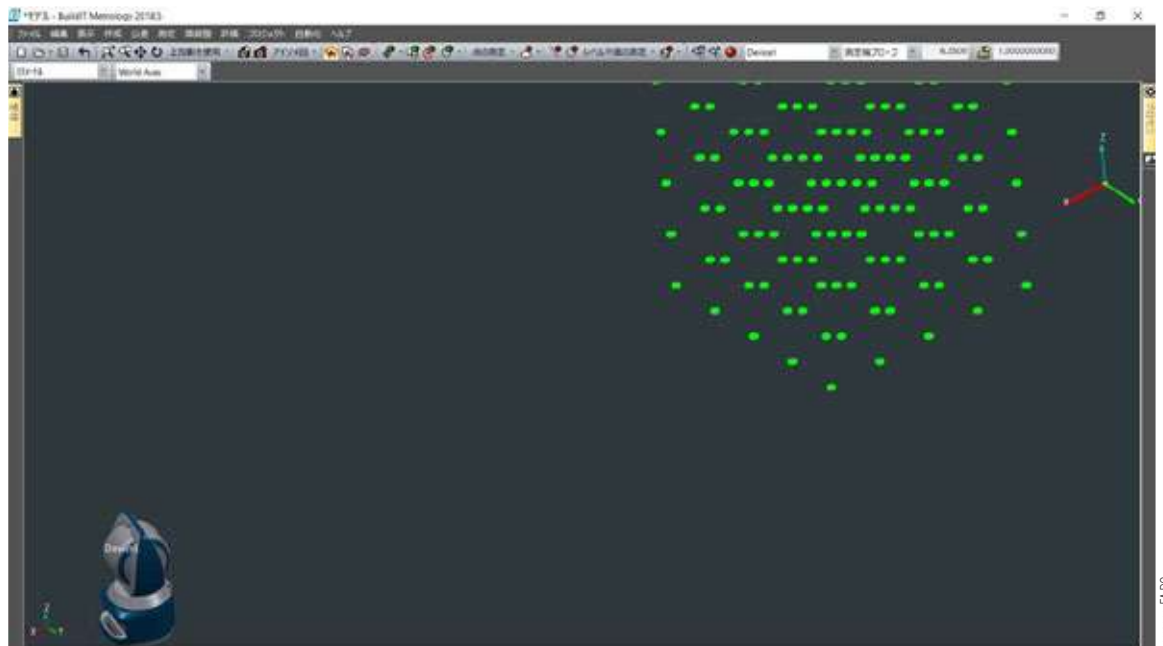
Based on these conditions, FARO's solution was introduced. "The main premise was to meet the same or achieve more than the previous system performance such as 1,000 data collection per second. The solution employs a different type of measurement principle yet is versatile in its application. We found it attractive that we could effortlessly automate the tasks, thanks to the flexible software," states Ryosuke Yamamoto, Robotics Engineering Section of Welding & Robotics Solution Engineering Department, Panasonic Smart Factory Solutions.

Reducing time and optimizing performance

The company was primarily focused on accelerating automation when introducing the new system. "The best benefit was time reduction. Previously, we spent almost all our time at the site. We started the software to operate the robot and when the robot stopped, we stopped the software. But, with the FARO system, we don't have to do anything except pushing the start

button when we start work till the end of the day. When we prepare the night before, the work is done by the next morning, hence our working time is significantly reduced. It is a big advantage to allocate the time saved from this automation to other primary technical works," adds Yamamoto.

Since the FARO system can measure points that the previous system could not due to its mechanical problems, it is another advantage to utilize the robots' performance. They can try out various operation conditions that could not be done with the previous system. It means that the high precision required for robots can be achieved in the new processing field using laser. "With the previous system, we could only measure relative positions. However, with the FARO Vantage, we can measure the arm position as an absolute position. Since BuildIT Metrology software is point based measurement, it is easy to analyze data compared to the element based measurement software," he shares.



LT measurement data

Source: FARO



Robot target

Source: FARO

FARO system advantages

Currently, Panasonic Smart Factory Solutions operates the FARO system and everyone can feel the benefit of automation. "With FARO solution we can make efficient use of the time that we significantly save through the automation," Yama-

moto notes. It has also helped to reduce mental burden of staff members by reducing the time they had to spend standing by the system. For the ROI of the FARO solution, he says, "As only half a year has passed since its full-scale operation, we cannot confirm the value yet. How-

ever, if we could increase the sales volume due to the robot performance improvement, it will be the proof. Accuracy determining quality of the welding components will improve 4 times more by replacing the traditional arc welding with laser such as LAPRISS."

The solution, consisting of FARO Vantage Laser Tracker and FARO BuildIT Metrology, is now utilized 24 hours and it is not uncommon to operate it for 10 days in a row. "We are highly satisfied with both hardware and software such as data collecting capability and automation that we were looking for," he adds. In particular, the capability of FARO BuildIT Metrology as well as FARO's support met the company's requirements which has led to a smooth workflow.

Besides the Automotive industry, a wide range of industries and their manufacturing sites including farm machines, construction machines, shipbuilding and two-wheel vehicles, need the welding and cutting systems that Panasonic Smart Factory Solutions provides. The systems need to address new manufacturing processes and various materials. At the same time, demands to improve processing speed and accuracy are also increasing. Panasonic Smart Factory Solutions is committed to focus on its product development and is utilizing FARO's solution to meet the tough demands from its end users. 

Panasonic Smart Factory Solutions is highly satisfied with both hardware and software such as data collecting capability and automation that it was looking for.



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SIMPLIFYING PROCESSES

An efficient process standardization is imperative for organizations keenly looking to gain productivity. Following is a round-up on the benefits that standardization of materials and process specifications can offer...

Today, practically most of the economic or manufacturing activity is underlined – either partly or wholly – by standardization. There is a worldwide acceptance of process standardization which is closely related to globalization and transformation of various regulatory processes at national, regional, and international levels. Standardization helps simplify complicated turnaround processes that, in turn, reduce lengthy

loops and ease out matters that are diversified, intricate, and chaotic, if not controlled. When it comes to improving operational readiness and reducing cost, standardization of materials and processes comes as a relief for organizations in the manufacturing industry. Standardization can be achieved by using the most common, cost-effective, readily available, and reliable materials, parts and processes to ease out the manufacturing cycle.

Specifications and their development

For any manufacturing industry, specifications are required during the design stage of a component, assembly, or system. Specifications are structured documents that set out the requirements which these components, assemblies, or systems are expected to provide and act as a means of communication between producers and users. While standards are mostly developed and maintained by



PANKHURI SINHA
Project Leader
QuEST Global



Source: Magix Wand Media

standards organizations, it is common for industries to develop their independent specifications based on own specific requirements. Development of in-house material and process specifications requires expertise and cost. Quite often, it can be observed that within an industry, there exists parallel material and process specifications having similar requirements. The absence of a systematic approach to standardize material and process specifications development and maintenance activity leads to a loss of effort and money. For critical parts, it is intuitive that OEMs prefer to keep an end to end control on research for new product and, therefore, development and maintenance of specifications is carried out in-house. However,

for all other parts, the entire exercise of specifications development and maintenance can be profitably outsourced.

Development of material and process specifications

The basic principle behind any industry specification is essentially the same. When a need for a specification is identified and established, the specification is drafted by a team of cross-functional experts. Important aspects of a specification draft can be summarized as follows:

Competitiveness: The specification must be as generic as possible so as to attract multiple suppliers and ensure fair competition and get a better bid.

Clarity and Conciseness: Since specifications are essentially documents of pronounced technical significance, it must be ensured that all requirements are clearly defined so as to find the right product. At the same time, it needs to be ensured that the specification is not overburdened with unnecessary details as this will lead to confusion and, therefore, lower the chance of getting the most suitable product at the best price.

Involvement of Suppliers: For critical sectors, it is advisable to involve suppliers in specification development, especially for the key characteristics. However, this should not lead to the formation of a compromised document favoring any particular supplier.

Quantifiable Requirements: It is important to ensure that all the requirements defined within the specification must be quantifiable. Subjective terms must be avoided.


It must be ensured that the specification includes information regarding the necessary precautions that need to be taken during the formation, assembly, or delivery of the product. Also,

the acceptance or rejection criteria and specific delivery requirements must be included in the specification.

Standardization of material and product specifications

Standardization has been a vital ingredient of any manufacturing industry ever since the dawn of industrialization. Henry Ford's hundred-year-old statement, "To standardize a method is to choose out of many methods the best one and use it", is a testimony to the fact that the concept of standardization is not new. However, putting to practice the essence of standardization is a mooted concept still today.

Standardization promotes uniformity, and uniformity of output is the groundwork to ensure quality. Any industry that is committed to standardization ensures - through a scheme of well-defined documents - that the best available method for a particular action is used across the industry by all personnel, until improvised and standardized. Adherence to standardization is an inherent culture in any manufacturing sector which strives to ensure high quality and consistent output.

In recent years, technical standardization has been a priority for many bulk manufacturing industries. There is an ever-increasing focus on innovation and the maximum benefit of innovation can only be leveraged by effective diffusion of latest innovation across the industry, which can be best achieved by inculcating a culture of standardization. With the common intention of industries to be profitable as a unit globally, it would be beneficial for any OEM to have a systematic approach to standardization of material and process specifications. 

Standardization promotes uniformity, and uniformity of output is the groundwork to ensure quality. Adherence to standardization is an inherent culture in any manufacturing sector which strives to ensure high quality and consistent output.

EVOLVING TO THRIVE

Leading machine tool manufacturer, Fenwick and Ravi has been proving the point that one must constantly keep pace with times to succeed. Its current mask making machine, to cater to the demand generated due to Covid-19, is yet another reflection of the company's identity of innovation and evolution...



Source: Fenwick and Ravi (FAR)

F established in the year 1990 in Bangalore, Fenwick and Ravi (FAR) today is a leading machine tool manufacturer. With Hydraulic Steady Rest, Barfeeder, Zero-Point System and Angle Milling Head as its core products, the company has regional offices around India and partners around the world. It exports to over 26 countries. "After nearly two decades in this field, we de-

cidated to create FAR GLOBAL to provide additional support to our customer base. Primarily, FAR GLOBAL caters to product development and assemblies for foreign clients and Indian defense segment like Hydraulic Test Rigs, Heavy Duty Actuators, Slip Rings, Recoil Systems for Field Guns etc.," says Anirudh Ravi, Second Generation Entrepreneur, FAR, sharing the company's growth story.

Comprehensive offerings

FAR and FAR GLOBAL are primarily focused on the Automotive, Energy, Defense, Agricultural Machinery, Construction, and Heavy-Duty Mobility fields. "By and far, all engineering companies have the potential of using our product," adds Anirudh. The company has its manufacturing facility and head office in Bangalore, and boasts an array for CNC and

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VMC machines, along with Wire Cutting machines and a state-of-the-art inspection department equipped with CMM machines etc. "Using our 30-year experience in precision manufacturing and design we have recently developed a fully automatic 3-ply non-woven Mask Making machine," he adds.

Surmounting challenges

Although the SME sector has grown dynamically over the last five decades and contributes a substantial portion of the country's exports, creating millions of jobs annually, it still suffers from a burden of challenges. Sharing the hurdles that came the company's way, Anirudh says, "One of the biggest challenges faced by us in the initial years was market penetration. Our products have no Indian competition. Hence, we were directly against the well-established brands from Germany, Italy, Japan, and the US. Another big challenge was the stereotypical mentality of the Indian consumer that products made in India should be drastically cheaper than the imported goods. This led to immense strain on our resources and we had to expand our infrastructure in a highly conservative manner. Although the 'Make in India' initiative holds a lot of promise, it would take time to make a substantial impact."



Source: Fenwick and Ravi (FAR)

"The development of Mask Making machine was like learning to swim with tied hands. The lockdown restricted mobility and logistics issues posed a huge challenge. But our motive to serve the nation accelerated us to develop, what we believe, is India's first completely indigenous Mask Making machine."

Anirudh Ravi
Second Generation Entrepreneur
Fenwick and Ravi (FAR)

He gives away the mantra which has made overcoming difficulties a breeze for the company. "Perseverance and eagerness to serve our customer is the key. We are of the belief that 'Customer is King'. In the past 30 years, we have not lost a single customer on the basis of quality or improper functionality of the product," he notes.

There is another important factor, Anirudh stresses, which has been fundamental to

the company's success is its employees. "We have about 100 employees and most of them have been with us since the inception. We are a family, and this ensures a very happy and positive environment to work, which reflects in our product quality," he adds.

Indian and global clientele

The company primarily supplies to Original Equipment Manufacturer (OEMs) both domestically and internationally. "We provide solutions to all OEMs in India. We started dealing with OEMs in 1992 and have recently added an OEM in the year 2020. This shows our strong relationship with them," points out Anirudh.

It also caters to the end user in the domestic market extensively. "Our regional offices around India and a network of dealers help us reach smaller towns in our country. On the global level, we export to countries like North America, Brazil, Germany, Italy, the UK, Turkey, the UAE, Russia, China, Japan, Korea and Taiwan. This contributes almost 30 percent to our revenue. We might be one of the handful companies in India who actually export to China," he shares with evident pride.

FAR is also a keen participant in trade shows around the world. "We ensure to participate in 6-7 shows every year, from the most famous Indian show, IMTEX to international shows like EMO and IMTS," he adds. This, he believes, instils confidence in the customers and builds a reputation that promises longevity and product innovation.

Setting examples for MSMEs

When asked to shed light on its latest innovation, FAR's Mask Making machine, Anirudh comments, "The development

"We are of the belief that 'Customer is King'. In the past 30 years, we have not lost a single customer on the basis of quality."

MADE IN INDIA
 MADE FOR THE WORLD



Source: Fenwick and Ravi (FAR)



Source: Fenwick and Revi (F&R)

“The ‘Aatma Nirbhar Bharat’ scheme is a great initiative by the Government, and with many MNCs planning to move out from China, India is in pole position to attract these businesses. This opens up vast opportunities for SMEs.”

of Mask Making machine was like learning to swim with tied hands. The lockdown restricted mobility and logistics issues posed a huge challenge. But our motive to serve the nation accelerated us to develop, what we believe, is India’s

first completely indigenous Mask Making machine.” He adds, “This can be a motivator for other MSMEs that anything is possible in our country. Untapped sectors can be tapped and the Government is keen to provide the necessary support.”

He commends the ‘Aatma Nirbhar Bharat’ scheme inspired by Hon’ble PM Shri Narendra Modi to attain the goal of making India self-reliant, and the opportunities that can open up for MSMEs to this end. “This is a great initiative by the Government, and with many MNCs planning to move out from China, India is in pole position to attract these businesses. This opens up vast opportunities for SMEs and MSMEs to feed off this chance.” He considers the Union Cabinet’s approved funding of up to ₹3 lakh crore to MSMEs a bold move. “A 100% guarantee coverage provided by National Credit Guarantee Trustee Company Limited (NCGTC) is sure to attract all SMEs and MSMEs irrespective of their current situation. This will lead to the creation of more projects, adding of capacities, faster delivery schedules and retention of their employees,” he adds. “India is on the route to become a true world leader in various sectors. Before long we will be recognized as a superpower not based on our history, but on our present and future strengths,” concludes Anirudh optimistically. 



Source: Fenwick and Revi (F&R)

IIoT Servers

Empowering Intelligent Industrial Enterprise

FDT Group has announced the release of its platform-independent FDT 3.0 - FDT IIoT Server (FITS) standard built to empower digital transformational benefits for the automation supplier and end-user communities in the process, hybrid and discrete markets.

The new FDT 3.0 standard will accelerate the evolutionary journey into the Fourth Industrial Revolution by enabling an ecosystem of FDT-based solutions to meet demands for IIoT and Industry 4.0 applications. In addition to the new FDT 3.0 standard that fully describes the FITS platform, FDT Group has released the FDT 3.0 Developer Toolkits to help the vendor community jump start development efforts with a modernized Integrated Development Environment (IDE) to easily create and customize next-generation, cross-platform FDT 3.0 solutions.

“The new FITS architecture is a powerhouse that is the enabler for scalable, remote access business solutions and services that are needed now to meet changing market demands,” said Glenn Schulz, Managing Director, FDT Group. “By delivering the FDT FITS specification and platform-independent toolkits simultaneously, we are enabling the immediate deployment of this new technology. To meet the digital transformational needs for next-generation smart plants and factories, the FITS architecture is scalable from skid to cloud, sits at a peer level with the control system, and integrates all industrial control networks. This approach provides secure, remote access to live device and network data across the enterprise without PLC/DCS host intervention. While the FITS standard is fully browser-based, we have also built in a full OPC UA server to provide an industry-standard conduit for IT and OT information integration.”

Evolution of the FDT standard

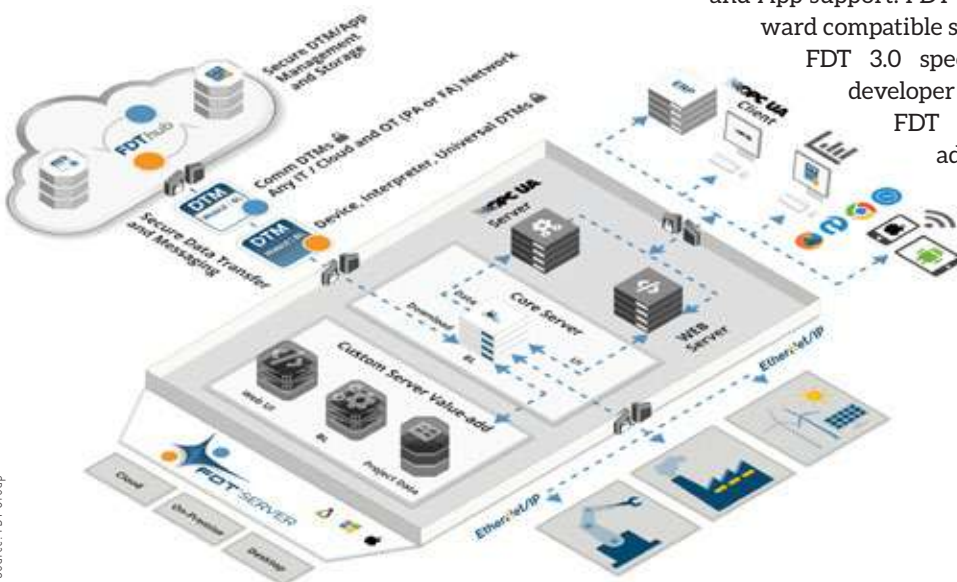
FDT Group, founded by a group of leading automation manufacturers during the Third Industrial Revolution, developed FDT technology as an open, integration standards-

based solution to fix interoperability issues for the control system and device end-users. The standard quickly gained global, industry-wide acceptance and today is widely deployed as the de-facto integration standard providing end-users with the freedom to choose systems/devices that best fit their application and seamlessly connect and communicate independent of the chosen vendor or network. Over the years, the FDT standard has evolved from a single-user, desktop environment (FDT 1.x) to a distributed, multi-user client/server approach (FDT 2.x) with OPC Unified Architecture (OPC UA) compatibility for enterprise-wide integration and asset management. The newly launched FDT 3.0 standard builds off its solid foundational base and brings enhancements empowering an FDT Server embedded with OPC UA and Web Servers. The new Server delivers universal device integration and a data-centric platform to mobilize the industrial workforce with modern and diverse deployment options, including cloud, enterprise, edge, on-premise, and single-user desktop environments.

Ideal for expanding portfolio

The FDT IIoT ecosystem consists of FDT Server, FDT Desktop and FDT DTM components, which are fully deployable out of the box using the IDE tools, known as Common Components. Now, system and device suppliers can take a well-established standard they are familiar with and easily create and customize standards-based, data-centric, cross-platform FDT IIoT solutions—expanding their portfolio offerings to meet requirements for next-generation industrial control applications. Each solution auto-enables OPC UA integration and allows the development team to focus on value-added features that differentiate their products, including WebUI and App support. FDT Desktop applications are fully backward compatible supporting the existing install base.

FDT 3.0 specification license agreements and developer toolkits are now available on the FDT website (www.fdtgroup.org). In addition to the FDT 3.0 standard and developer toolkits, an IO-Link Interpreter DTM is under development along with FDT communication annexes for HART, Profibus, IO-Link and CIP networks slated for release in the latter half of 2020.



Source: FDT Group

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