THE SMART MANUFACTURING POST

NASSCOM®
Center of Excellence-IoT & AI
A MeitY Initiative with Govt. of Karnataka, Haryana, Gujarat & AP

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The Revival of Manufacturing, Made with Digital.

Warm Greetings, hope you along with family & friends are keeping well.

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I am excited to launch "The Smart Manufacturing Post", an initiative from NASSCOM CoE, to regularly bring to you insights on adoption of Industry 4.0 in manufacturing and share upcoming digital solutions that can help drive productivity and efficiency improvement in plants.

We all are going through a major crisis; probably one of the biggest in our collective lifetimes. While lockdown has been lifted, the situation on ground has changed a lot, as challenges to run plants is looming larger every day with several uncertainties in supply chain and workforce availability. Everyone is doing their best to estimate product demand, inventory, raw material and resource availability. Working remotely was unheard of in manufacturing but the world is now moving towards it rapidly. Leaders are faced with a tough question - **how to balance people's safety and business continuity?**

The new normal in manufacturing is the shift from monthly or weekly planning to daily production planning. Constraints to run manufacturing operations have evolved with new norms such as social distancing, wearing masks, enhanced safety protocols and worker migrations. What seems certain in this era of 'new normal' is that digital will rule the world. Looking at the manufacturing plants that are operating now - fully or partially - digitisation done earlier will definitely help them produce with limited workforce. Automation of production process was always taken with a pinch of salt but now it will be the most desired attribute. Every organization, large or MSME, should use this time as an opportunity to accelerate the adoption of AI, IoT and Analytics to integrate customers, employees and vendors through digital platforms. While automated production lines can help, the challenge is that investments are very high. With current pressures, companies would not have big capex budgets. So, more simplified ways to improve worker productivity, safety and reduced operational costs will have to be thought of.

Some of the solutions that can help are analytics-led demand prediction and production planning, remote-assisted assembly operations through AR/VR, AI-based face tracking solutions to manage access control instead of biometrics. IoT solutions can be of great help in energy management and monitoring machines and workers' health. Energy is the biggest operational expense in plants today and the current solutions can help us save 10% to 20% energy cost. With worker safety of prime importance getting health parameters like temperature, pulse rate through sensors placed in protective gear can give early warning on health issues with a worker. Location tracking can help to improve worker productivity and ensure they stay in designated areas only.

These are just a few suggestions; and there can be a lot of other applications where digital can help in remote monitoring. This will need every boardroom to come up with future strategies and action plans. Fortunately, lockdown gave manufacturing leaders some time in hand to prepare for the future and manage the crisis effectively. Manufacturing companies, large or small, must look for design thinking to define future digital adoption or digital solution roadmap. The pandemic has had a deep impact and it will not be easy to lay out plans without following a structured approach. Design thinking is a proven methodology under these kinds of scenarios and the tools under it need to be leveraged as much as possible.

In this issue of the Smart Manufacturing Post, we will touch upon how COVID19 has triggered, and in many ways, accelerated big change for the manufacturing sector. Happy Reading and stay safe.

Trends in Modern Manufacturing: What to Expect

ACHYUTA GHOSH
Head of Research
NASSCOM

Digital adoption by India's businesses has so far been uneven, but new digital business models could proliferate across most sectors. Also, the changing market dynamics is impacting the industrial manufacturing industry. Recent research by McKinsey indicates India's core digital sectors accounted for about $170 billion that is 7% (in 2017–18) comprising of electronics manufacturing ($10 billion) and this could grow $100 billion to $130 billion in 2025. According to McKinsey estimates Government's "Make in India" programme seeks to increase manufacturing's share of GDP from about 16 percent to 25 percent by 2022, digital transformation is likely with the government taking measures on implementation of more digital technologies to allow supply-chain consolidation & analysis.

The adoption of digitisation has a commendable score in manufacturing sector with maximum leaders and lesser laggards. Sector median digitisation score is 45, highest being in ICT with 50. A recent EY study indicates two-thirds of the manufacturing firms in India ranked big data and predictive analytics as the top investment priority in technology in the next 1-2 years. This was followed by sensors and IIoT along with cloud integrated platforms and robotic automation. The key factors driving digital manufacturing in India include predictive maintenance, connected supply chain, reduced energy consumption, production optimisation, lower price of sensors and high computing needs and connected customers. In addition, overall monitoring and visualisation is the most sought-after use case by manufacturing firms, followed by track and trace of the product across the value chain. However, unclear economic benefits from digital investments stand as a major constraint. Inefficient people skilling on tech, analytics, cybersecurity also remains a significant concern.

Automation in manufacturing and supply chain will find a lot of uptake in the post-COVID era with IoT being the key technology supporting this. This is also reflected in the new innovations that have been led by various manufacturers in the IoT domain. According to our recent report on IoT Patents "IoT: Driving the Patent Growth Story in India" manufactures of electronic and electrical devices, semiconductor devices and telecom equipment filed 60% of the total patents filed by business entities over 2009-19. Moreover, this trend is expected to gain more focus in the post-COVID era as India witnesses a pick-up in automation, and a boost in domestic manufacturing amidst the increasing global pressures to shift out of China, where India is well-positioned to gain.

Voice of Industry

How Covid-19 is changing manufacturing constraints and presenting new challenges in factories.

COVID-19 will leave behind a mark no matter where it goes. It is important for every industry to understand what the fundamental changes in consumer/ employee and market behaviours that will impact its business model permanently. While the challenges may vary industry to industry depending on factory layouts, location, labor mix, customer base, RM sources etc. there are certain fundamental and common changes that would impact many business operations in different ways.

Health and Hygiene would be on top of the mind at individual as well as institutional level, however there would be other **fundamental issues**, some of which are listed below –

- Concentrated or cell layouts that brings people of same skills to work together would be a challenge as if one person is positive and entire cell would shut down bringing the plant down
- Shifts with lesser people both because of government guidelines and shortage of labor means more automation, mechanization or shorter shift
- Supplier management and risk modeling to assess the business continuity would be one of the major challenges and need
- Increase in cost of operations to adhere to disinfection, SD etc. guidelines, that will put more pressure on cost reduction and efficient processes.
- Short term dip in productivity till the new ways of working settles down

Short-term and long-term strategies to handle the challenges?

COVID-19 immediate impact would be sustainable for industries and companies with deeper pockets and healthy balance sheet. However, ability to survive and thrive would depend on how companies are reacting in short term and planning for long term.

Short Term Strategies:

- This would again changes industry to industry. Industries that work against the order book would be more focused on productivity while industries that work on forecast would be more focused on cost reduction to protect the margin and optimize the cash flow.
- Digital assets to enable employee hygiene and health and safety in terms of monitoring movement, attendance etc
- Minimize/Defer CAPEX and Optimize OPEX

SAMIP MUTHA
Vice President & Head
Digital & Innovation
RPG Enterprise

Long Term Strategies:

- Build digital assets that will enable visibility of operations and business continuity which includes visibility of Supply Chain, Logistics, manufacturing in integrated way
- Relook at your supplier strategy to understand the risk and real time visibility to business continuity
- Build hybrid touch points for customer/partner engagement. B2B will take pace given the lot of potential to go Digital
- Relook at your product mix and location strategy to enhance business continuity
- Employee working model would undergo change to explore WFH to minimize office cost
- More automation means rising demand for skilled (Multi, Advanced) resources

NASSCOM-led efforts to help the industry.

Given the depth and breadth of NASSCOM operations, it would be immensely useful if it can take lead in developing a platform of Digital Ecosystem. This would help industries (especially MSMEs) to get access to digital resources to drive the pace Industry 4.0 adoption.

Summary of Recent Events

Manufacturing Under Lockdown Webinar Series:

Manufacturing under Lockdown 1: How to plan for the future

Date: 14th April, 2020

Manufacturing Leaders are faced with very tough question of how to balance between people's safety and business continuity. What seems certain in this era of "New-Normal" is that digital will rule the world. Blend of IoT and Industry 4.0 technologies can help us to minimize the impact of lockdown and of any unforeseen future disaster - natural or manmade. 42% of the Industrial downtime is causes by asset failure, hence Its absolutely critical to prevent machine failure by analyzing machine data to identify patterns and predict failures before they happen. Digital transformation has become the inseparable component of manufacturing sector and has to be adopted by industries of all sizes. Instead of reinventing the wheel, the smart approach is to adopt the innovations from startup ecosystem with a layer of required customizations, which these innovators are always happy to incorporate. NASSCOM CoE has developed such models of collaborative prototyping, already proven with number of industries and is committed to create more such success stories.

Manufacturing Under Lockdown 2 - Enterprise Startup Collaboration

Date: 11th May, 2020

In the current scenario of limited resources and the required high speed of implementing innovative solutions, collaborative models are going to be the new trend in Industries. The enterprises need to adopt such ready-made platforms to speed-up their transformation journey and can execute the POCs in a faster and low risk manner. Accordingly, Integration and collaboration models, across various domains and technology platforms, were discussed in this webinar, having Industry leaders from Automobile and Cement manufacturing sector startup founder and the ecosystem integrator NASSCOM, as key speakers.

Voice of Manufacturing Webinar Series:

VoM Edition 1:
Helping Businesses Navigate Economic Downturns

Date: 23rd April, 2020

The Industry Digital Innovation Consortium – IndDIC, an Industry 4.0 collective from NASSCOM CoE – IoT & AI organised a webinar on the 23rd of April 2020 that entailed calibrating a New Normal for manufacturing, circumventing the supply chain bottleneck, financial outlook and amicable adoption of emerging technologies for revival post lockdown. Over 200 attendees from various size of industries – large, medium and small scale from various shades of manufacturing domains such as automotive, auto-ancillary, pharma, medical equipment, metal & alloys, heavy engineering and many more participated. The industry leaders shared their apprehensions and worries on post Covid pain points on business & operations revival that were addressed with plausible measures for business continuity. NASSCOM CoE IndDIC brought out key challenges from an Industry adoption outlook under crisis like workforce planning, production & procurement strategies, building resilient supply chains and business operations maintaining safe guidelines.

VoM Edition 2:
Reviving Manufacturing With New Solutions & Technologies

Date: 22nd May, 2020

Change is buffeting and global manufacturing & supply chains continue to be impacted by the pandemic. Though the factories and plant owners are seeking to resume operations, they continue to face the regulatory uncertainties. To address these combinatorial problems, NASSCOM CoE IndDic (a unit of Industry 4.0) conducted its second edition of the "Voice of Manufacturing" webinar that entailed calibrating protocols for manufacturing, dodging the supply chain bottleneck and implication of emerging technologies enabling revival amidst the crisis.

The webinar had an engaging participation from the industrial front with the leaders sharing their agony on the post Covid-19 pain-points, reviving business & operations and the probable measures that could be taken for the business continuity. IndDic brought out key challenges from an industry adoption outlook segmenting into the 'Convergence of solutions for New Normal'; How would Industry 4.0 address the disruption of global value chain and 'Scaling solutions for New Normal'

Virtual CXO Roundtable Series:

Roundtable 1: Challenges In Manufacturing & Digital Solutions

Date: 2nd May, 2020

Key Takeaways:

- New normal will see reduction in workforce so productivity and throughput improvement is critical to meet the demand
- Manufacturing segments are connected, large enterprises depends upon MSMEs for their raw material. Disruption in any segment will impact the whole manufacturing ecosystem.
- Enterprise – start-up collaboration can be of great help to do POCs and assess the ROI of digital initiatives
- Complete automation/robots are not always required, semi-automation with human intervention can be explored
- Need to develop a structured approach to build the strategy for the future. Lean Six Sigma and Design Thinking methodologies can help in identifying real challenges and prioritization of focus areas. This can help to improve productivity by 10-35%.

Roundtable 2: Manufacturing Under Lockdown

Date: 26th May, 2020

Key Takeaways:

- Going forward, the behavior of the customer will decide the new normal. With a new digital strategy, along with customer the vendor too has to be aligned and considered a benefactor of this plan. The whole value chain has to benefit from these tech additions
- Human centric design and engineering, digitalization and partnership model will be the guiding principles in future. Decentralized systems are gaining popularity, We need to plan and design systems to make them work in a distributed form
- When it comes to implementing technology, one has to understand the value addition vs the value erosion
- If processes are changed gradually, operations can become more efficient and these changes could be implemented with support from digital technologies
- New models are being explored to increase utilization of workforce, for ex the general factory shift is 8-5, but operators work every alternate day for 12 hours and with one-hour gaps between shifts for sanitization

Roundtable 3: Manufacturing Under Lockdown

Date: 19th June, 2020

Key Takeaways:

- India to rethink supply chain and manufacturing strategies following hostile relations between India & China
- Worker Safety is of prime importance and we need solutions to remotely monitor health and environment parameters
- Skilled workforce availability will remain as challenge for long, Industry needs low-cost digital solutions for workforce management, AR/VR based remote assisted manufacturing and IoT solutions to track logistics
- AI can be of big help for Integrated Business Planning to ensure inventory, supply chain, demand forecasting & manufacturing processes are in sync.

Roundtable 4: NASSCOM CoE & FICCI

Date: 25th June, 2020

Key Takeaways:

- China model of keeping the production and logistics costs lower is needed, technology led cost out initiatives are must to improve productivity and efficiency. In India, logistics cost is 12-14% vs 6% in China
- Preventive maintenance and energy management solutions can help in reducing the cost by upto 10%, all high value assets should be digitized to monitor their performance and condition parameters.
- Manufacturing companies should work with solution providers and start-ups to try out new initiatives that can help in reducing cost. Case studies needs to be created to replicate the solutions across industries
- Industry urgently needs solutions to improve worker safety and provide better training & awareness on social distancing
- While ERP helps to manage and view operational data but on top of that we need analytics applications to optimize and take insightful decisions.

Upcoming Events

Manufacturing Innovation Challenge:

NASSCOM CoE presents the Manufacturing Innovation Challenge, a collaborative effort to solve the most common challenges in manufacturing sector using Artificial Intelligence, which are going to be the mandatory part of future manufacturing. Quick implementations of innovative solutions has become the need of the hour, and collaborative models are going to be the new trend in Industries. Enterprises need to adopt such readymade platforms to speed-up their transformation journey by executing the POCs in a faster and low risk manner.

The usecases like Predictive maintenance of machines, AI based Demand forecasting and Remote working environment in manufacturing plants, are some examples which can be shared by the participating industries along with the datasets. The best AI-based startups from the nation would be working on the selected use-cases. We would like to invite you for partnering with us in this initiative and can provide the usecases to be solved in manufacturing vertical.

Last Date for Submission: 10th July 2020

Submit use cases here - https://docs.google.com/forms/d/e/1FAIpQLSdbwDIJRVGGWGFzQ_mFlRqaDL5SX4UD6nKtdTrjL3MGNRoY7g/viewform

3rd edition Voice of Manufacturing eConclave.

Theme: Convergence & scaling innovation for Digital Transformation

Date : 14th July ; 11:30 am onwards

IndDIC presents the 3rd edition of 'Voice Of Manufacturing' eConclave to address hard-pressing needs for manufacturing industry in the new normal. Eminent speakers in this eConclave will showcase scalable digital solutions to economically retrofit & enable shop-floor for Industry 4.0, and solutions to scale digital innovation in asset management & workplace safety.

Contact: Ishani Das (ishani@nasscom.in)

Startup Corner

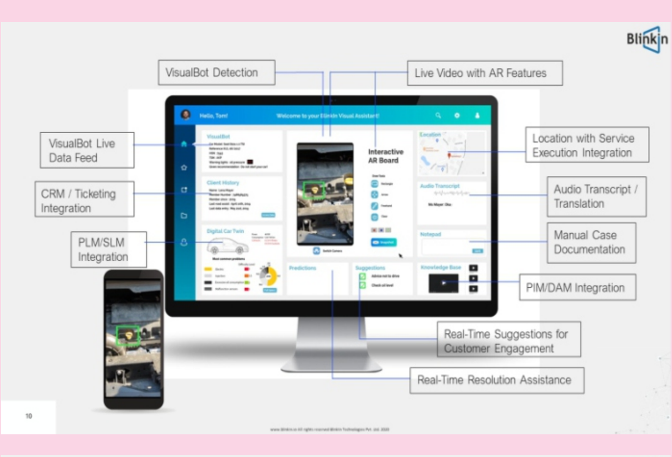
BlinkIn

Team: Harshwardhan, Nitin, Dhiraj, Josef Solution: Scotty and Houston

Use Case: Remote Inspection, Onsite Support Customers, Remote collaborative training, Remote installation and plant commissioning. Facilitates Troubleshooting, Visual data collection, Factory walk through for investigation or remote certifications, and providing status reports, documentations and evidence collection.

Industry Challenge: With the integration of emerging and exponential technologies such as AR and AI, Blinkin is able to seamlessly transport human skills and experience to the exact location when and where they are needed. BlinkIN allows an untrained operator to complete a diverse series of tasks, from simple to complex, in a physical environment. BlinkIn is also an AI-powered Self-service system powered by a Virtual Agent. This brings the expertise of senior engineers handy with you over your smartphone with just the click of a button. While chatbots and audio bots can automatically handle easy tasks like answering simple questions, there is no solution for giving people visual support for their problems autonomously. Assisting people remotely over a video call even when it is done by an agent and not by a bot remains an unsatisfactory experience for customers and users. The tools are not smart, you have to download an app and they are not intuitive. We believe that people should be able to get support anytime, anywhere, in a user-friendly way.

Solution Implementation: BlinkIn is empowering support engineer to deliver exceptional tech support anywhere, every time. Our ability to physically experience or utilize our skills in another location is restricted by the barriers of time and distance. It is crucial for us to be able to bring needed skills to the people who need them, as urgently as they are required. With the integration of emerging and exponential technologies such as AR and AI with Blinkin we are able to seamlessly transport human skills and experience to the exact location where and when they are needed. BlinkIN is an augmented visual support tool over phone or wearable display where support agent can see into the customer's environment, allowing them to visually inspect equipment or issues. The agent is able to handhold users and guide them using live pointers and augmented visual annotations overlayed on their screen. Currently, we offer two solutions:



1. Scotty - An AI & AR-powered Live video calling system. The agent is able to handhold users and guides them using augmented on-screen annotations and live pointers overlayed on their screen. This helps to seamlessly transport human skills and knowledge to the exact location where and when they are needed.

2. Houston - An AI-powered Self-service system powered by a Virtual Agent. This brings the expertise of senior engineers handly with you over your smartphone with just click of a button 24x7.

As of today Blinkin is active in 43 countries and growing.

Major Customers: ADAC Germany, TATA steel, WILO Germany, Huber + Ranner and Skanray

Website: https://www.blinkin.io/

ExactSpace Technologies

Team: Rahul Raghunathan **Solution:** Pulse **Use Case:** AI for Zero unplanned failures of Power Plant Assets

Industry Challenge: Power plants are a network of complex assets and operate in highly dynamic environment (changes in demand, input, people, etc). This causes immense stress on the assets but goes unnoticed by human operators many times leading to unplanned failures causing human safety and productivity issues.

Solution Implementation: Pulse is ExactSpace's AI engine which consumes data from Power Plants and learns about the optimal behaviour of an Asset and its interconnectedness with other assets autonomously. It's predictive capability detects early asset degradation signals and provides a diagnosis for the issue to the operations team to help avoid a failure or equipment damage. We have built digital twins of 50+ classes of assets like Turbine, Boiler, Pumps, Compressors which covers over 1500 failure modes.

Major Customers: BHEL, ABB, Aditya Birla Group

Website: https://exactspace.co/

SenseGiz Technologies

Team: Abhishek Latthe & Amol Chougule Solution: SAFR/FIND

Use Case: Social Distancing & Contact Tracing

Industry Challenge: Social distancing has become new norm in manufacturing and it is going to stay for long. Tracking social distancing compliance manually and contact tracing is extremely difficult for any organization, large or small. will be impossible for large enterprise by training or coaching.

Solution Implementation: A Technology based solution where FIND device is given to each person & via mesh network he is traced on online dashboard. If person violates social distancing an alert is sent to him as well as indicated on dashboard. His historical database is stored online for possible tracing for future

Major Customers: L&T, Maruti Suzuki, Airtel, TVS, DCM Shriram, Gulbransen and TCS

Website: https://sensegiz.com/

ABOUT US:
NASSCOM CoE, a joint initiative of MeitY and NASSCOM, is India's largest collaborative platform for startups, enterprises and companies specialising in deeptech solutions; helping manufacturing companies co-create digital solutions for the new world.

If you want to be featured in this newsletter, would like to be included as part of the NASSCOM Manufacturing Initiative or have any queries, contact Titli Chatterjee (titli@nasscom.in)