

THE SMART

MANUFACTURING TRANSFORMATION

THE YEAR THAT WAS!

WHAT'S INSIDE

Message From Amit Saluja, Senior Director & Centre Head, NASSCOM CoE

An insight into 2022 initiatives and the impact we created. As we start with 2023, we look forward to scaling our programs to take the initial successes to next level.

Updates from our Programms

CoE has been consistently working towards digitizing manufacturing industry, especially MSMEs. Our programs are tailored for each of stakeholders who are part of this ecosystem, i.e MSMEs, Large Enterprises and deeptech Start-Ups.

Throwback to our year-round activities and achievement

An insight into how we scale our programs and who do we work with to successfully run the programs and reach the right people



CoE Impact



35+
Industry
Partner



700+
Connected
Startups



65+
Enrolled
Startups



15+
Use Case
POC



Amit Saluja

Senior Director & Center Head,
NASSCOM CoE-IoT,
Gandhinagar

Happy New Year!! It's 2023 already, and what an exciting 2022 we had while we expanded our manufacturing initiatives to bring in focus on SME digitization and completed three wonderful years of operations. NASSCOM CoE, Gandhinagar is a digital India initiative established by Ministry of Electronics and Information Technology and DST, Government of Gujarat with an objective to build a collaborative ecosystem for manufacturing digitization. It been amazing journey so far as we could reach out to 500+ manufacturing enterprises, 700+ solution providers and 15+ academia in the country to create awareness and deployments of Industry 4.0 solutions.

In the last couple of years, we have seen unprecedented growth in the Indian manufacturing sector. It is estimated that the Indian manufacturing sector will contribute more than \$500 billion a year to the world economy by 2030. Growth of this level cannot happen without making our factories smarter as traditional manufacturing will need lot more resources, machine and manpower to fulfill the demand. While its been heartening to see large enterprises have accelerated the technology adoption and moving toward flexible manufacturing but for SMEs there is still long way to go.

This disparity in technology adoption between large and SMEs is not good for the industry as there is a lot of dependency between each other.

SMEs lacks awareness, accessibility, and affordability of digital solutions. Realizing this gap we launched Smart Manufacturing Forum, a focused program for the manufacturing SMEs with revenues less than 1000cr. Under this initiative, we are doing masterclasses, capability building sessions and demo days for the SME leaders and blue collar workers to build digital skills in their organization. We are also providing handholding support to SMEs who are looking to adopt solutions and this happens by doing an assessment to understand the challenges, recommend low cost and easy to deploy solutions that can help in improving efficiency and productivity in their plants. Our team connects SMEs with innovative startups and tech companies who have the right solution for them and oversees the implementation process. We thank the SMEs who trusted us and came forward to adopt solution, excited to see multiple success stories from the deployments that will inspire lot of other SMEs to replicate them.

We also had the opportunity to work with some of the big manufacturing giants as they nominated their complex use cases for the five manufacturing innovation challenges that we executed in last two years. We had 21 manufacturing enterprises and 425+ deep tech startup participate in the challenges that saw examples of new products being developed for the manufacturing industry.

GrowX, our startup acceleration programs continue to attract innovative startups across the country to get support on their growth journey. While 400+ startups have engaged with us in multiple programs, 65+ have been part of the GrowX initiative and have realized the benefits of market access, funding support, mentoring and skill building

Smart Manufacturing Research Conclave is our attempt to bring forward innovative research that has happened in institutes and research organizations and present it to industry leaders for possibility of commercialization.

Hope you will enjoy reading this newsletter, which is a summary of our 2022 initiatives and the impact we created. As we start with 2023, we look forward to scaling our programs to take the initial successes to next level. We invite you to be part of this mission to help digitize our manufacturing industry. Write to us at SmartManufacturing@nasscom.in to know more about our programs and be part of our ecosystem.

INDUSTRY VOICE:

By: Sanjay Jain, President, Amneal Pharmaceuticals Pvt Ltd.



Pharma 4.0 – Digital & Paperless Laboratory

Digital and Paperless Laboratory was the need of the hour. In our organization, we use to document the analytical activities on bound laboratory notebooks (LNB) which give 100% compliance for the data integrity, however analyst use to spend a lot of time in writing the complete procedure in LNB followed by actual activities performed by him.

In this process there were a lot of challenges like



Recording the Sample information in Sample inward register



Allotting the sample to analyst and recording the allotted details in sample register.



Analysis performed details are recorded and reported in Laboratory notebook and respective usage logbooks (Also in this process there is a lot of variability in the document writing variation between analyst to analyst despite regular and repeat trainings, also handwriting is always a challenge for all of us for the adequate interpretation of the matter written) whereas digital system generates uniform and automated reports.



Review of Analytical Data need to be performed in combination of paper-based data review and electronic data (as applicable).



Generation of manual Certificate of Analysis.



In case of any compilation of data is required, it take lot of time to collect the data from manual document and again a big potential of transcription error which can lead to havoc

Following are the Benefits of digitization in Laboratory

1. Atomization of Lab Activity.
2. Complete traceability and transactional data review / approval through electronic system.
3. Increase in the efficiency of the analyst by reducing redundant data entry. Increase efficiency of reviewer and Managers to review / schedule activity in one Click
4. Increase the efficiency of the analyst / reviewer by reducing redundant data entry / references so that
 - a. Analyst should concentrate on analytical activities and not writing LNB's and
 - b. Reviewer should concentrate on variable data sitting at one place.
 - c. Manager to see everything at a glance instead of planning the activity on paper / excel etc.
5. Ensure timely alerts and reminders for scheduled activity and task
6. Enhance data integrity and security
7. Compilation of data is just on one click with 100% authenticity and no transcription error
8. Generate uniform and automated reporting
9. Chances of error will get reduced significantly

Digitization in the laboratory created positive impact in the mind of regulators. Regulators need completeness, consistency, and accuracy of data and verify during the audits. Complete, consistent, and accurate data should be attributable, legible, contemporaneously recorded, original or a true copy and accurate. LIMS is designed to meet this requirement. Digitization also ensures integrity of data generated in laboratory.

Reception and login of a sample and associated data identified with unique ID. Complete traceability and transactional data from sample login to review and approvals electronically. Results stored in LIMS via interface with electronic signature which improve data integrity. Results are calculated by LIMS directly / electronic system like Empower / Chromeleon and get transferred in LIMS directly with balances connected directly enhance the data integrity.

Error is identified at point of occurrence based on adequate design of the LIMS system. In short, this digitization in the lab provides complete information related to sample analysis, include traceable to personnel responsible for specific task (when, who, and how).



EVENTS THAT GOT INDUSTRY TALKING

LAUNCH OF SMART MANUFACTURING COMPETENCY CENTRE

In May 2022, Shri Rajeev Chandrasekhar, Union Minister of State for Skill Development and Entrepreneurship & Electronics and Information Technology inaugurated the Smart Manufacturing Competency Centre –one -of-a-kind Competency Centre to help accelerate the adoption of Industry 4.0 solutions.

SMCC is designed for senior leaders from manufacturing companies to experience and learn Industry 4.0 applications through the demos of digital solutions showcased by technology companies and deep tech innovators.

Preparing Indian manufacturers for the dynamic digital era, the centre engages start-ups and technology solution providers to showcase their solution capabilities to senior manufacturing leaders.

This will enable SMEs and manufacturing enterprises to experience end-to-end diverse digital solutions that can improve productivity, efficiency, and safety in plants.

Impact

350+

Manufacturing Industry Members Participated at the Event

20+

Start-Ups/ Tech company Showcasing Their Solutions Real-Time on SMCC platform

20+

Manufacturers have used SMCC platform



FUSION 4.0

5th Edition

NASSCOM CoE, with a vision to make India 'Industry 4.0 hub' globally, has built the largest collaborative ecosystem to co-create solutions that can improve productivity, efficiency, and safety in manufacturing plants by adopting AI & IoT-led digital technologies. FUSION 4.0 - the smart manufacturing Forum Uniting Start-ups and Industries on New technologies is CoE's lighthouse to realize its vision through several result-oriented programs, challenges, and centres. The fifth edition of fusion 4.0 witnessed participation from several manufacturing leaders, start-ups, and MSMEs.

The response to the event has been so overwhelming!!

150

Attendees

14

Startup Solution Demo

15

Speakers

In this event we also felicitated the winners of Manufacturing Innovation Challenge-5th Edition



MANUFACTURING INNOVATION CHALLENGE

5TH EDITION

DRIVING INNOVATION IN
MANUFACTURING ENTERPRISES

MIC is a one-of-a-kind innovation platform that allows enterprises and start-ups to collaborate and solve complex manufacturing problems. Enterprise use cases are presented as challenges to deep tech start-ups, and multiple rounds of rigorous evaluation provide an opportunity to review diverse proposals and find the best solution provider.

Enterprises Partners



Winners



Industry Use Case



Manufacturing Efficiency Improvement



Resource Optimization



Quality Inspection

MIC Impact (From the Five Editions)



21+
Industries Partner



425+
Startups Registered



90+
Mentored Startups



21+
Winner Announced

Industry partners from past editions



UDYAM 4.0 SMART MANUFACTURING FORUM IS GROWING

Inviting Manufacturing Enterprises to Join The



Udyam 4.0: Smart Manufacturing Forum is our initiative for manufacturing enterprises with an annual turnover of less than Rs. 1,000 crores to start, scale, and sustain their digital journey. The adoption of Industry 4.0 solutions can aid in optimizing operations, maximizing capacity utilization, and building a resilient supply chain. The Smart Manufacturing Forum provides support in three verticals, viz. Skill & Capability building, Handholding for Digital Journey, and Branding & Market Reach.

Some of the key activities under Udyam Smart Manufacturing Forum 4.0 are

SKILL & CAPABILITY BUILDING ACTIVITIES

The masterclasses are done quarterly for the MSME leaders, where senior industry experts from large enterprises are invited to share their experiences of implementing digital in their plants. Whereas, the Capability-building sessions are conducted on monthly basis, mainly for the workforce (managers and below) to provide them hands of experience of adoption of digital solutions in the plants. These activities help not only build a learning culture in the organization but also align mindset towards digitalization. A knowledge center has been created on the website, where the participants who missed the sessions can log in and see the recordings.

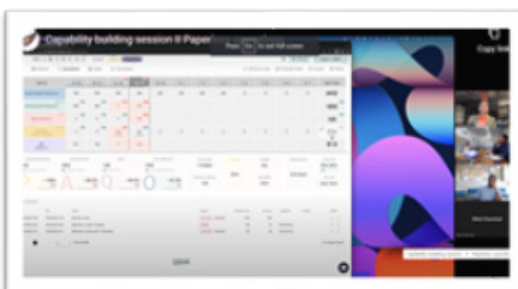
CAPABILITY BUILDING SESSION 1 - SHOPFLOOR DIGITALIZATION

Sandeep Verma, spoke on Digitalization of the shopfloor, how the technology works, what kind of insights can be obtained after deployment and how it empowers workforce of the manufacturing MSMEs.



CAPABILITY BUILDING SESSIONS 2 - PAPERLESS OPERATIONS

MSMEs witnessed the live demo of work orders and maintenance planning at the beginning of the sessions. It was later followed by how paperless operations improves business operations, sighting case studies and discussing way forward for implementation



CAPABILITY BUILDING SESSION 3 - TRACK & TRACE

Aditya Vermani, the founder of ClairViz, explained how MSMEs can digitally track and manage inventory and various other technologies available for tracking and tracing. Along with this, he also highlighted the usage of RFID in detail sighting case studies and demos of solutions.



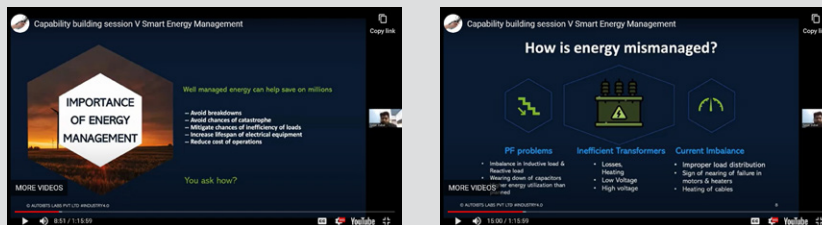
CAPABILITY BUILDING SESSION 4 - MACHINE VISION

Ravishankar Rajgopalan, Co-Founder & CEO of Augur AI explained application of Machine vision solution in the industrial scenario for quality inspection, process efficiency improvement and more.



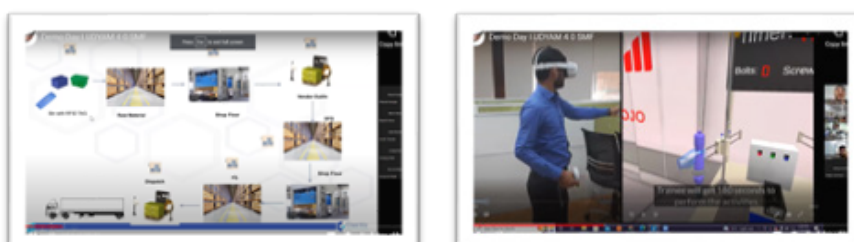
CAPABILITY BUILDING SESSION 5 - SMART ENERGY MANAGEMENT IN MANUFACTURING SECTOR

Sagar Dubal- the founder of Autobits Solutions, shared light on managing energy consumption and reducing power costs. He also shared his thoughts on how smart solutions can help identify hotspots and implement corrective measures, backed by case studies and live demos.



DEMO DAY- 1

NASSCOM CoE organizes demo day quarterly for the members of UDYAM 4.0 Smart Manufacturing Forum. The deep-tech startups are invited to speak on latest innovation and technology in Manufacturing Industry. On this demo day, deep tech mature startups presented digital solutions such as Inventory Management using RFID, Camera based Computer Vision for quality control, AR & Animated Software solutions for worker training and customer engagement and Data acquisition & Overall Equipment Effectiveness (OEE). The start-ups who participated in the Demo day were Clairviz, Autobits, Exposit and Zbox.



PARTNERSHIP WITH INDUSTRY ASSOCIATION (MOU)

Round the year, NASSCOM CoE partners with several leading associations to augment CoE's vision of enabling digitalization in the Manufacturing Industry. Associations and NASSCOM CoE work closely on how digital solutions can help to improve productivity and efficiency in manufacturing plants. This year, CoE partnered with...



AWARENESS WORKSHOP

In association with Govt. and Industrial associations, the CoE organized Awareness workshops in states and UTs across India i.e. Haryana, Gujarat, Maharashtra, DNHDD (Dadra and Nagar Haveli and Daman and Diu) & Tamil Nadu etc. and sensitized around 500+ MSME manufacturing leaders.

NASSCOM CoE partners with associations, and does awareness workshops to help manufacturers realize the true benefit of digitalization and enable them to connect with the right solution providers.

We Truly Value our Partners Facilitating Digital Transformation Journey



SUCCESS STORIES

NASSCOM CoE has connected with over 500+ manufacturing firms over a year, acting as a bridge between Manufacturers and Deep-tech matured start-ups. In the digitalization journey, we ensure manufacturers find the right solution provider for their complex challenges. Our team regularly interacts with manufacturers and startup to ensure smooth execution of Solution Deployment. Here are some success stories that reflect the synergy and importance of co-creation in the industry

NASSCOM CoE Enables

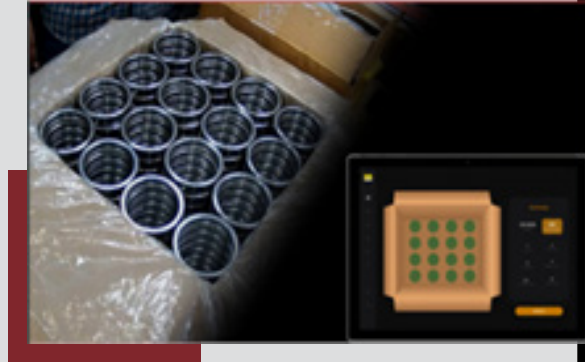
NBC Bearings & ATAI to co-create a solution on smart counting

Problem Statement:

Bearings counting is performed manually, which makes the processing time-consuming and error-prone. An automated solution was needed to validate the quantity received in each lot with increased efficiency.

NASSCOM COE's ROLE

NBC Bearings wanted to create an effective solution for receiving materials from their business partners which would help them in further strengthening their process and help with increasing process efficiency. After a detailed scrutinization process and inputs from experts associated with NASSCOM, the proposal from ATAI lab was found suitable to meet this challenge. Throughout the whole process, NASSCOM played the role of catalyst, helping NBC Bearings find the right solution.



Solution & Business Outcome:

ATAI conceptualized, designed, and worked with the manufacturing company to develop an AI-ML-enabled vision-based Instant Component Counting solution at the receiving inspection area. The solution provided a visual indication & alert in case of a mismatch in the number of components in a package. The real-time process takes just a few seconds with an accuracy of over 99% for hundreds of items scanned each day



UDYAM 4.0 Smart Manufacturing Forum

Enables Incredible Machines to co-create solution for the Smart Monitoring of Machines

Problem Statement:

Incredible Machines- a machine manufacturer and supplier of hydraulic press machines, was finding it challenging to maintain the machines across different client locations. This affected the production line and increased the after-sales service support.

NASSCOM COE's ROLE

The Gandhinagar CoE team visited the manufacturing plant at Rajkot, assessed the key challenges faced by the manufacturer in the plant, and made the manufacturer aware of the Industry 4.0 solutions that can help in improving efficiency and reducing operational costs in the plant. From the discussion, the company came to know about the solution for smart monitoring of the machines and how it can help to reduce the operational cost after the sales of the machine to the customer.



Solution & Business Outcome:

The solution monitors certain parameters of machine such as vibration, noise, speed, temperature, power consumption etc. and notifies the owner in case of any anomalies which can result in breakdown of machine if not addressed on time. After Configuring the IoT device with the machine, the manufacturer observed the downtime reduced by 40%. The customers using the machine are getting real-time data of Production Efficiency

Problem Statement:

Hemtech Industries' major energy consumption is from their air compressors and draws texturizing machines. They face heavy power fluctuation from the Supply board which resulted in heavy loss in production and down gradation of material. Since machinery has electronic boards and cards to operate, due to power fluctuation they get damaged a lot. The energy consumption was recorded manually on paper and transferred to an excel sheet. No trend analysis was conducted to understand the pattern of consumption.

NASSCOM CoE's Role:

NASSCOM CoE team visited the Hemtech plant to understand its manufacturing process and assessed the current challenges and opportunities for digitization. The CoE team proposed multiple use cases for digitization from which an energy management solution was shortlisted as the highest priority considering energy consumption per unit production had been increasing over the last few years.

Solution & Business Outcome: Autobits designed the technical architecture of the plant and suggested the network route which helped them to connect all these assets with their IIoT gateways, Digital Energy Meters, and the server. With the solution deployed, Manufacturer will have a significant reduction in energy bills. Unlike before, manufacturer will be able to see real-time energy data and track of PF and harmonics that will help figure out leak detection and fluctuation detection of power utilization within the given supply limit.



UDYAM 4.0 Smart Manufacturing Forum

Helps Gurukrupa Jewelry Exports to work with AugurAI for deploy AI based image mapping solution

Problem Statement:

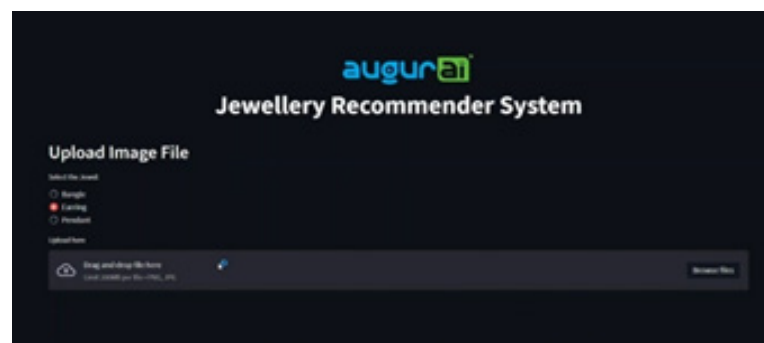
Gurukrupa Exports is a leading manufacturer of Gold and Diamond Jewellery in India. In the existing process, each time customer asked for specific or near-to-exact jewelry, the manufacturer had to go back and check for designs manually in his database. This impacted manufacturer turn-around time.

NASSCOM CoE's Role:

NASSCOM CoE, Gandhinagar team visited the Jewelry manufacturing plant of Gurukrupa Exports and proposed an AI-based image mapping solution to help design team reduce manual efforts of finding best match existing CAD design file. CoE team helped Gurukrupa Exports to frame use case requirements and monitored the solution building process to ensure it gets developed as per the specifications. CoE team also provided technical guidance to AugurAI on building the solution approach

Solution & Business Outcome:

AugurAI team developed an AI based computer vision model to extract the shapes from both user and CAD images. Color and the jewelry shape were used as the criteria to match which helped Gurukrupa to pick from top 5 design recommendations with an accuracy of over 80%. This exercise will significantly reduce design search time by over 60% for the Gurukrupa.



Oriental Engineering Works Pvt. Ltd. manufactures hydraulic equipment: high-pressure cylinders, pumps, and hydraulic systems. The manufacturer wanted to start its digital journey but was finding it challenging to identify areas, to begin with, that can provide a higher impact.

NASSCOM CoE conducted Digital Maturity Assessment, which started with an introduction to business priorities, products and challenges, followed by an awareness session on Industry 4.0 and its evolution. After setting the priorities straight, the NASSCOM CoE team visited the shopfloor to understand the operational challenges of the plant and mainly spoke to the workforce to gather their perspective on challenges. CoE evaluated the current state of digital maturity of the plant and suggested a way forward.

Solution & Business Outcome:

The SIRI assessment helped the manufacturer to create a roadmap to prioritize the areas in the adoption of smart solutions. In Mr. Raman Saluja's- Director of OEM, words: "The assessment demystified many myths about Digitalisation and brought a lot of clarity in how to adopt the digital in plant"



 **WATCH HERE**

ACCELERATING THROUGH INNOVATION - STARTUP CORNER

Grow X

A Startup Growth Accelerator Program by NASSCOM CoE, helping deeptech Start-ups engage in building digital solutions for the manufacturing industry.



Startups

700+
Connected

400+
Engaged

65+
Incubated

2022

COHORT OF GROWX

GROW X Offerings For Start-ups



Market access by leveraging industry engagement initiatives



Product development infrastructure



Business and technology mentoring through Samvad 4.0



Opportunity to showcase your products/solutions



Funding support from grants & Venture capitalist



Capability Building

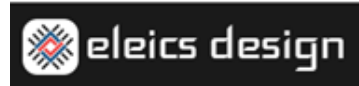
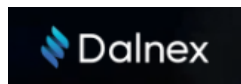
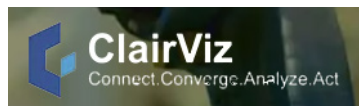
AR/VR-based smart manufacturing solutions



AI/ML & computer vision solutions



AI & IOT solutions for smart manufacturing



AI & Data science



ROBOTICS





ABOUT US

NASSCOM Centre of Excellence for IoT, Gandhinagar, is a Digital India initiative led jointly by Ministry of Electronics and Information Technology, Department of Science and Technology, Government of Gujarat and NASSCOM. It is India's largest collaborative platform for start-ups, enterprises and companies specializing in deep-tech solutions, helping manufacturing companies co-create digital solutions for the new world.

We invite manufacturing leaders, startups, researchers and academicians to come forward and share write up in and around Industry 4.0 to be featured in this newsletter, would you like to be part of the NASSCOM Manufacturing Initiative or have any queries, write to us on: smartmanufacturing@nasscom.in

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