

# INDUSTRIAL AUTOMATION

DELIVERING AUTOMATION INTELLIGENCE THROUGH QUALITY CONTENT

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LEADER

## DIGITALISATION OF PROCESS INDUSTRIES



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in Great Workplaces



# INTRODUCING THE UR20

This is the cobot. Redefined.

✓ UP TO 65% INCREASE IN SPEED DEPENDING ON JOINT TYPE    ✓ NEW JOINT ARCHITECTURE PUTS LESS STRESS ON ARM MECHANICS    ✓ 25% INCREASE IN JOINT TORQUE CAPABILITY



**PAYLOAD**

20 kg / 44.1 lbs

**REACH**

1750 mm / 68.9 in

**FOOTPRINT**

Ø 245 mm

**WEIGHT**

64 kg / 141.1 lbs

## UR20

### The Cobot Redefined.

With a 1750 mm reach and 20 kg payload capacity, UR's next generation cobot handles more tasks, fits more applications, and assists in more environments than ever before.

The UR20 is the first in Universal Robots' next generation of industrial cobots designed to take performance to new heights, while embracing the UR hallmarks of versatility, usability and small footprints.

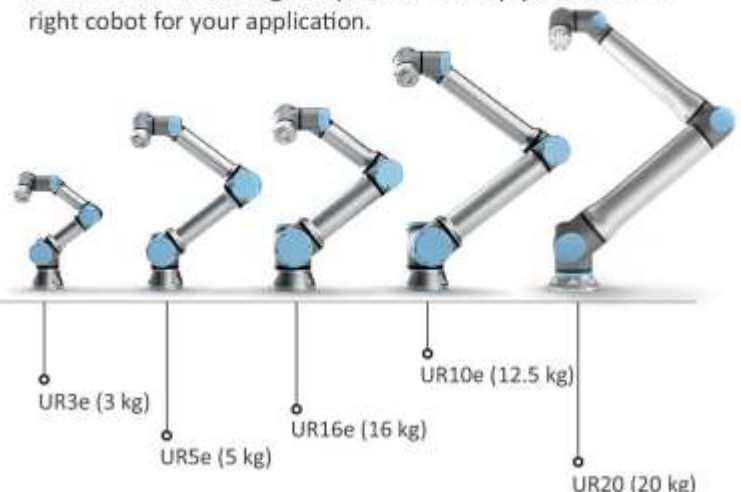
## ALSTRUT

### Leading Cobot Company in India.

Alstrut has been a partner of Universal Robots since 2016.

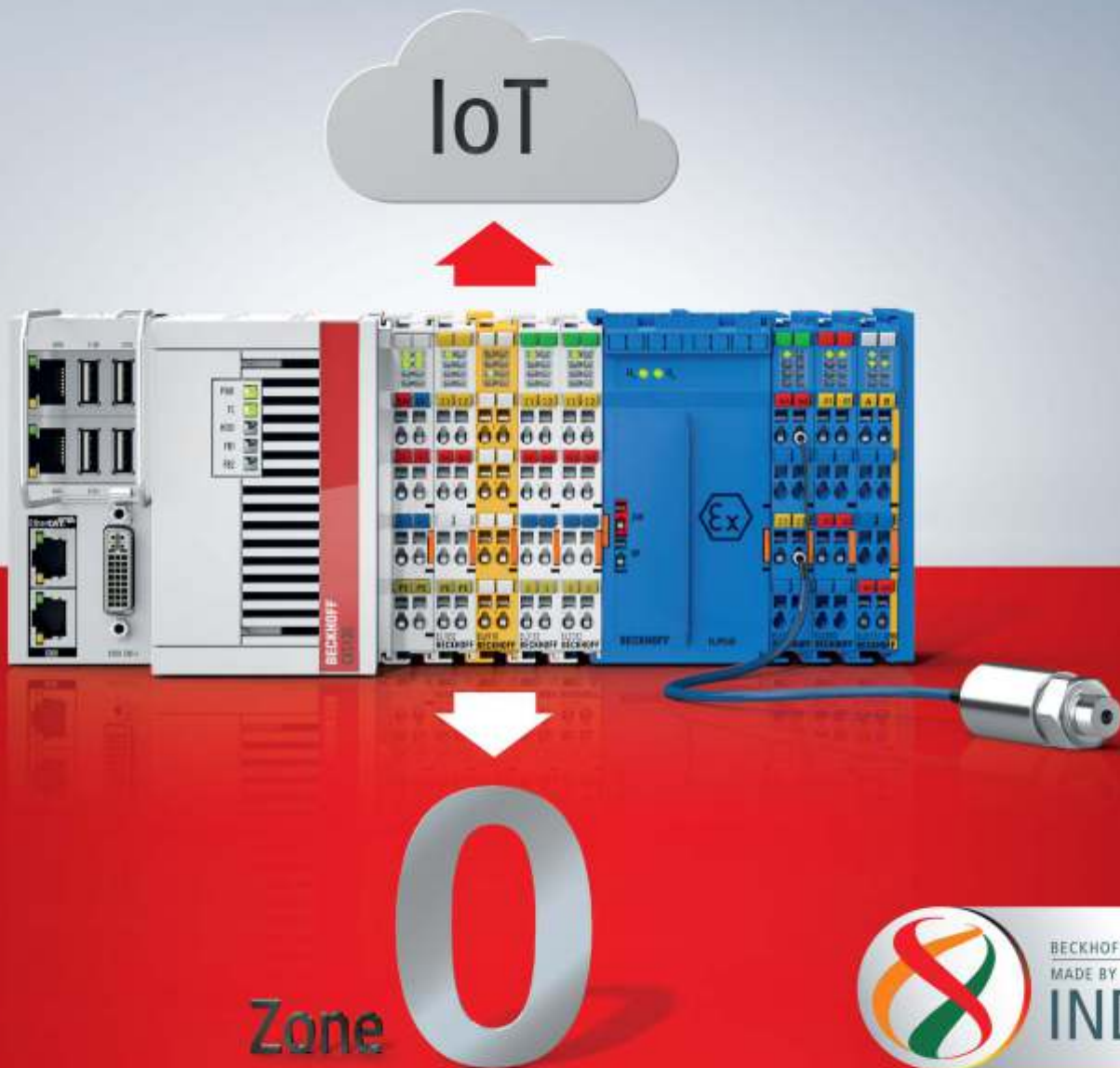
With the largest cobot install base across India, Alstrut is the only 'Gold Partner' of Universal Robots in India, and has emerged to be the leading collaborative company in the region.

Successfully deployed applications ranging from machine tending, palletizing, welding, pick & place, glue dispensing, the Alstrut team has the right experience to help you select the right cobot for your application.



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**Hall 1 and Hall 2**

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# “Empowering Today, Tomorrow: Unleashing the Potential of Automation at AUTOMATION EXPO 2024”

## CEO Networking Nite

21st Aug, 2024 | 06.00 PM Onwards | Nesco Grande  
Uniting Visionaries in the Automation Revolution 2024!

## Conference on Process Automation

22nd Aug 2024 | 10:00 AM to 02:30 PM  
BEC, Goregaon, Mumbai

### Sub-Topics

- Digital Twin applications
- Cybersecurity and protection of critical infrastructure
- AR/VR Applications
- OPA,APL
- AI in PA

## Conference on Factory Automation

23rd Aug 2024 | 10:00 AM to 02:30 PM | BEC, Goregaon, Mumbai

### Sub-Topics

- Impact of AI & Robotics on Manufacturing
- AI in Logistics, Supply Chain
- AI, Robotics, Virtual Reality, Augmented Reality, Mixed Reality applications
- Applications of Computer Vision and NLP applications in operations
- 4.0 innovative use case, successful Digitally transformed businesses

## Conference on Robotics

24th Aug 2024 10.00 am to 02.30 PM | BEC, Goregaon, Mumbai

### FOCUS :

- FACTORY AUTOMATION
- PROCESS AUTOMATION & CONTROL
- TURNKEY SOLUTIONS
- FIELD INSTRUMENTATION
- CYBER SECURITY
- CONTROL ROOMS
- ELECTRIC AUTOMATION
- HYDRAULICS & PNEUMATICS
- WAREHOUSE AUTOMATION
- VALVES & VALVE AUTOMATION
- INTEROPERABILITY TECHNOLOGIES
- SOFTWARE SOLUTIONS
- BUILDING AUTOMATION
- INFRA LOGISTICS

### ZONES

- ROBOTICS
- MACHINE VISION
- IIoT
- AI
- INDUSTRIE 4.0
- START UPS
- INTERNATIONAL PAVILIONS

### EXPECTED

- 2000 Companies
- 40000 Business Visitors
- Over 500 business delegates to the Conference



***Papers are invited from world class speakers.  
Kindly send us synopsis by 15th February 2024  
for selection by the committee.***

# EDITORIAL CALENDAR 2024



# INDUSTRIAL AUTOMATION

DELIVERING AUTOMATION INTELLIGENCE THROUGH QUALITY CONTENT

## READER PROFILE

### PEOPLE WHO ARE

Presidents, Vice Presidents, Maintenance Managers, Manufacturers, Project Managers, Maintenance Engineers, Operation Personnel, Cloud Computing Specialists, Traders, Chief Engineers, R&D Manager, Maintenance Personnel, Managing Directors, Plant Managers, Business Managers, Technical Directors, Operations Managers, System Integrators, OEM's, Design Engineers, Marketing Managers, Software Engineers

### DEPARTMENTS / INSTITUTES

R&D Lab, Electricity Boards, Defence, Space, Power Plants, Testing Centers, Railways, Solar Energy, Atomic Energy, BARC, Engineering Colleges, Technical Universities, Automation Institutes, Industry Forums, Associations, Advisory Group, Events, Private Technical Institutes, Industry Training Centers, Startup Zones, Launchpads

### INDUSTRY SECTORS

Manufacturing, Logistics & Warehousing, Instrumentation, RPA, IIOT, Healthcare, Robotics, Renewable Energy, Adhesives & Additive, Defence, Instrumentation, Automotive, Sensors, Research Labs, Datacenter, Maintenance & Monitoring, 3D printing, Cyber Security, Network & Communications, Factory Automation

## APRIL

**Close Date**  
20/03/2024

**Robots & Cobots in Manufacturing**  
Robots, Cobots, Mobile Robotics – AMRs & AGVs, Machine Vision, etc

## MAY

**Close Date**  
20/04/2024

**Material Handling & Warehousing**  
Automated storage and retrieval systems (AS/RS); AGVs; Cranes Conveyors, Carousels, Vertical lift...

## JUNE

**Close Date**  
20/05/2024

**The Future of Oil & Gas – Green Energy**  
Green & Blue Hydrogen, Green Ammonia, Synthetic Fuels

## JULY

**Close Date**  
20/06/2024

**Test & Measuring Instruments**  
The instruments used to test various parameters – electrical, electronic, signals, mechanical...

## AUGUST

**Close Date**  
20/07/2024

**Digitalisation of Food & Beverage Industry**  
Sensors, HVAC, Cold Chain, Factory Automation, Material handling, etc

## SEPTEMBER

**Close Date**  
20/08/2024

**Technology Transformation of Process Automation**  
The quest for increasing efficiency of existing processes and drive...

## OCTOBER

**Close Date**  
20/09/2024

**Motion Control in Industry**  
Motors & Drives; Position Controls; Actuators & Mechanical Systems; Sensors and Feedback Devices

## NOVEMBER

**Close Date**  
20/10/2024

**Intralogistics & Packaging Automation**  
Packaging solutions for Case Packing, End of Line Packaging ...

## DECEMBER

**Close Date**  
20/11/2024

**The Carbon Conundrum – How Oil & Gas Companies Can Help**

## Event Focus 2024

### July

**ARC Industry Forum Asia**  
Bangalore, July 10-11

### August

**Automation Expo 2024**  
August 21-24

### September

**Globe-Tech Engineering Expo**  
September 19-22

### April

**Hannover Messe**  
April 22-26

### May

**Metal Forming Expo**  
May 16-18

### June

**INTEC 2024 Coimbatore**  
June 06-10

### October

**34.BI-MU, Milan**  
October 09-12

### November

**SPS Nuremberg**  
November 12-14

### December

**bauma CONEXPO India**  
December 11-14

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## INDUSTRIAL AUTOMATION



From  
The  
Editor

Nvidia Corporation, the American MNC known for graphics processing units (GPUs), application programming interfaces (APIs) and system on chip units (SoCs), is also a formidable force in artificial intelligence (AI) hardware and software. Two weeks ago, the company surprised the global business and financial fraternity posting record results that beat expectations, with revenue up 265% on booming AI business. Away from the glare of media and never-ending controversies, AI is no hype as far as the world of technology is concerned. The benefits are real and tangible. CEO Jensen Huang was quick to allay investor fears that this was not a one time surprise and the company is confident of demand for its GPUs remaining high due to generative AI.

The Indian government had framed a National Strategy for Artificial Intelligence as early as in 2018, and has now announced that a draft AI regulation framework shall be released by July 2024. According to Rajeev Chandrashekhar, Minister of State for Electronics and Information Technology, the government's approach to regulating AI includes establishing principles and a comprehensive list of harms and criminalities related to the technology. To that end, it shall provide clear standards for platforms that address concerns like bias and misuse during model training, rather than regulating AI at certain stages of its development. The potential is huge if one goes by a joint report released by Nasscom and the Boston Consulting Group (BCG) that predicts the domestic AI market in India is expected to reach USD 17-22 billion by 2027.

AI is also playing a role in the ongoing Digitalisation of Process Industries, the theme of the Cover Story this month. An expert contributing to the discussion on the topic believes AI related learning of the process to be able to help the visibility, monitoring and hence control of the process more and more effectively.

### Dr M Arokiaswamy

Editor & Publisher

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CASH PRICE WORTH

Rs. 100000/-

STAGE 1



# INDIA AUTOMATION CHALLENGE 2024

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banaye  
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# Industrial USB Hubs



## Reliable and Secured Connection

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### USB Hub Challenges in Industrial Environments

**Hazardous Environment**  
Harsh conditions such as power spikes endangering systems

**USB Port Loosening**  
Early disconnects in high-vibration environments

**Limited Charging Capacity**  
The Downstream Port accommodates a limited current capacity

### Feature Highlight

**Industrial-design and Hazardous Area Certification**

- Surge / ESD / Isolation / wide temperature for heavy-duty applications
- UL, CE, IEC certified for oil and gas applications

**High Retention USB Port**

- 50% stronger withdrawal force than standard USB connectors
- Withstands 3.4 lbs pull force
- Stays connected in high vibration environments

**Screw Lock Design**

- Metal housing
- Screw lock designed for 180° Visual
- DIN rail, wall-mount and desktop install

### Product Highlight Industrial USB 3.2 SuperSpeed Hub

**ULI-414H**  
(BB-USH204-B)

4-port

- USB 3.2 SuperSpeed 5Gbps
- ESD protection up to 15 kV (level 4)
- Downstream port supports up to 2.4A

**ULI-417H**  
(BB-USH207-B)

7-port

- USB 3.2 SuperSpeed 5Gbps
- ESD protection up to 15 kV (level 4)
- Downstream port supports up to 2.4A

**ULI-417HC**

7-port

- USB 3.2 SuperSpeed 5Gbps
- ESD protection up to 15 kV (level 4)
- ESD protection up to 15 kV (level 4)

### Product Offerings Industrial USB 2.0 Hub

4-Port, Isolation 4kV, High Retention Connectors

**ULI-414CI**  
(BB-UHR304)

7-Port, Isolation 4kV, High Retention Connectors

**ULI-417CI**  
(BB-UHR307)

4-Port, ESD Level 4, High Retention Connectors

**ULI-414LI**  
(BB-UH104)

[Discover More](#)

### ULI-200 Series

Serial to Serial Converters and Repeaters

### ULI-300 Series

USB to Serial Converters



Enabling an Intelligent Planet

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**AUTOMATION  
EXPO2024**  
17th India International Trade Show  
Bombay Convention and Exhibition Center, Goregaon (East), Mumbai

21st - 24th August, 2024  
BCEC, Goregaon (E), Mumbai

**HALL NO. 1 & 2**

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ESTABLISHED IN 1980

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## Why Subscribe to us ?



### Industry Updates

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**Feintool launches new production site in India**



With the founding of Feintool System Parts India Pvt Ltd and a new production site in the metropolitan region of Pune, Feintool is consolidating its strategic position as an important supplier of high-precision parts in Asian automotive production.

With an initial investment of CHF 15 million, Feintool is moving closer to long-standing customers who already produce in the region. Feintool System Parts India Pvt Ltd is establishing its presence in a promising market and reducing its CO2 footprint through significantly lower delivery-related emissions. Feintool production in Pune is expected to start in summer 2025.

“With our expansion into India, we are meeting the needs of our long-standing customers, entering a promising geographic market and contributing to shorter and, therefore, ecologically sustainable supply chains,” says Torsten Greiner, CEO Feintool.

The new facility in Pune complements Feintool's presence in Asia, with two production sites each in Japan (Atsugi and Tokoname) and China (Taicang and Tianjin). In the initial phase, starting from 2025, seat adjusters for various major automotive manufacturers will be produced in India. Feintool is the global market leader in the production of this fineblanked component. The site will also facilitate the implementation of new applications in the areas of battery and hydrogen-powered mobility, industry, and renewable energies in the future.

“We are pleased that we can now meet customer demand for production in India with the new Feintool plant in Pune,” concludes Torsten Greiner.

**PM Narendra Modi dedicates NTPC power projects to the nation**

Hon'ble Prime Minister Shri Narendra Modi dedicated NTPC Darlipali Super Thermal Power Station (2x800 MW), NSPCL Rourkela PP-II Expansion Project (1x250 MW) and laid the foundation stone of NTPC Talcher Thermal Power Project, Stage-III (2x660 MW) with a total investment of Rs 28,978 Crore during a programme at Sambalpur.



Located in Sundargarh district of Odisha, Darlipali STPS is a pit-head Power Station with Supercritical (highly efficient) Technology, and is supplying low-cost power to its beneficiary states. The 250 MW project of NTPC-SAIL Power Company Ltd is established in Rourkela Steel Plant (RSP) to provide reliable power for the steel plant which is vital for economic growth.

Further, NTPC is developing Talcher Thermal Power Project, Stage-III within old TTPS plant premises in Angul district of Odisha, which was taken over by NTPC from Odisha State Electricity Board in the year 1995. The old TTPS plant was decommissioned after completing more than 50 years of service to the Nation.

The upcoming plant will have highly efficient Ultra Super Critical Technology based units and approximately three times capacity of the old TTPS plant. While 50% capacity from this project is dedicated to the state of Odisha, other beneficiary states such as Tamil Nadu, Gujarat and Assam will also get low-cost power from this pit-head station.

**Vedanta Group shines at S&P Global Sustainability Assessments 2023**

Vedanta Limited, one of the world's largest diversified natural resources, hydrocarbons and technology conglomerates, has secured 3rd place in the S&P Global Corporate Sustainability Assessment (CSA) 2023 in the Metal and Mining sector, while Vedanta's Group Company, Hindustan Zinc Limited, the world's second-largest zinc producer, led the score rankings with 1st position in the sector. In addition, Vedanta Aluminium, India's largest aluminium producer, topped the rankings as the world's most sustainable aluminium producer.



Speaking on the occasion, Priya Agarwal Hebbar, Non-Executive Director of Vedanta Limited and Chairperson of Hindustan Zinc commented, “We are proud of the Vedanta Group's remarkable performance in the S&P Global Corporate Sustainability Assessment. Our improved rankings are testament to our commitment towards building a sustainable future. We continue to march on this transformative journey, creating global benchmarks in our industry. I would like to express my gratitude to our colleagues, partners and investors, without whose support, this rare distinction would not have been possible.”

Vedanta Limited's ascent from 23rd place in 2018 to 3rd place in 2023 demonstrates the sustained and impressive progress it has made over the years. Hindustan Zinc and Vedanta Limited are now the only Indian companies in the global top 10 within the Metal and Mining category.



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The MTL SUM5 combines five functions into one modular design for the lowest lifetime costs and lowest installed costs.

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## Anybus achieves maturity level 3 certification in industrial cybersecurity



HMS Networks, the global leader in industrial network communication solutions, announced that its Anybus brand has successfully attained Maturity Level 3 (ML3) certification in the International Electrotechnical Commission (IEC) 62443-4-1: Secure product development lifecycle requirements, an industrial cybersecurity standard.

The IEC 62443-4-1 certification has become integral to the entire Anybus operation. The accompanying image features key individuals involved in this process. Pictured from left to right are Björn Mattson, Project Manager; Joakim Wiberg, Head of Technology; Erik Asp, Development Process Manager; and Bartek S. Candell, Senior Vice President, Control Centric.

Independently audited by TÜV Rheinland, a globally recognised testing service provider, this achievement signifies Anybus' dedication to robust cybersecurity practices.

Maturity Level 3 represents a significant milestone in Anybus' cybersecurity journey, demonstrating heightened maturity and sophistication. It highlights Anybus' ability to integrate cybersecurity measures across its operations and products, further solidifying its position as a trusted partner in industrial automation. Anybus received the certificate after demonstrating that its product development and life cycle management processes met the stringent criteria throughout the development of two new products.

Bartek Candell, Senior Vice President Control Centric, commented on this significant achievement: "In today's interconnected industry, every component of a network must be fortified against cybersecurity threats. At Anybus, we are unwavering in our commitment to providing the best and most secure products, assisting our customers in protecting their critical infrastructure."

## Milestone Achievement: GRSE Bags CII-AI Award

Garden Reach Shipbuilders and Engineers Ltd (GRSE), has made history by becoming the first Public Sector Undertaking to receive the esteemed AI Award instituted by Confederation of Indian Industry (CII). GRSE has been conferred with this prestigious award for 'Excellence in Best Use of AI Technology/Products/Solutions by Industry through Academia Collaboration' at the Global Artificial Intelligence (AI) Summit & Awards 2023 organised by CII on the theme 'Responsible AI for Accelerated Growth in India' in New Delhi. The award was received on behalf of GRSE by Shri Gulshan Ratan, General Manager (QA, VD & Indigenisation) and Shri Umesh Paswan, Senior Manager, QA.



This prestigious Award recognises GRSE's pioneering work in developing 'Artificial Intelligence Enabled NDT', a rule based, AI software implemented for weld quality evaluation of Radiography film. The software aims to replace manual film evaluation system with an intelligent solution. The software, marketed as 'intelligent Weld inspector (I-weld)' utilises Deep Learning Tools of AI for identification, classification, and localisation of weld defects with decision-making capabilities based on Naval, Marine and ISO standards. The AI CNN module with robust Graphic User Interface facilitates automatic report generation, paperless record keeping and retrieval of quality documents. Adoption of this AI software has significantly reduced dependency on human expertise, thereby streamlining the evaluation process of Radiography Test (RT) Films.

## NMTronics India and IIT Kanpur introduce CoE at IITK campus

NMTronics India Pvt Ltd, a frontrunner in end-to-end electronic manufacturing solutions, and the esteemed Indian Institute of Technology Kanpur (IIT Kanpur) proudly unveiled the "NMTronics Center of Excellence for Electronics Manufacturing & Skills Development" in IIT Kanpur campus today, marking a significant leap forward in industry-academia collaboration. This initiative marks a significant milestone in the company's commitment to fostering industry-education partnerships and delivering unparalleled value to its customers.



MoU signed between IIT Kanpur and NMTronics India Pvt Ltd on 23 February 2024, symbolises a new era of collaboration between industry and academia. This center will be equipped with state-of-the-art facilities and cutting-edge technology with fully automated SMT Line. The center aims to propel groundbreaking research, technological advancements, and skill development initiatives in electronic manufacturing through IIT Kanpur learning & development program. IITK and NMTronics will initiate a joint certification program for industry professionals for skill development, and NPI (New Product Introduction) site for startups and small businesses.

Mr Soni Saran Singh, Founder, CEO and Managing Director of NMTronics India Pvt Ltd, expressed his enthusiasm about the collaboration, stating, "We are thrilled to announce the establishment of the 'NMTronics Center of Excellence for Electronics Manufacturing & Skills Development' in IITK Campus."



Control Cabinet  
Socket

Controllers and  
I/O Systems

Power Supply  
Modules

Rail-Mount  
Terminal Blocks

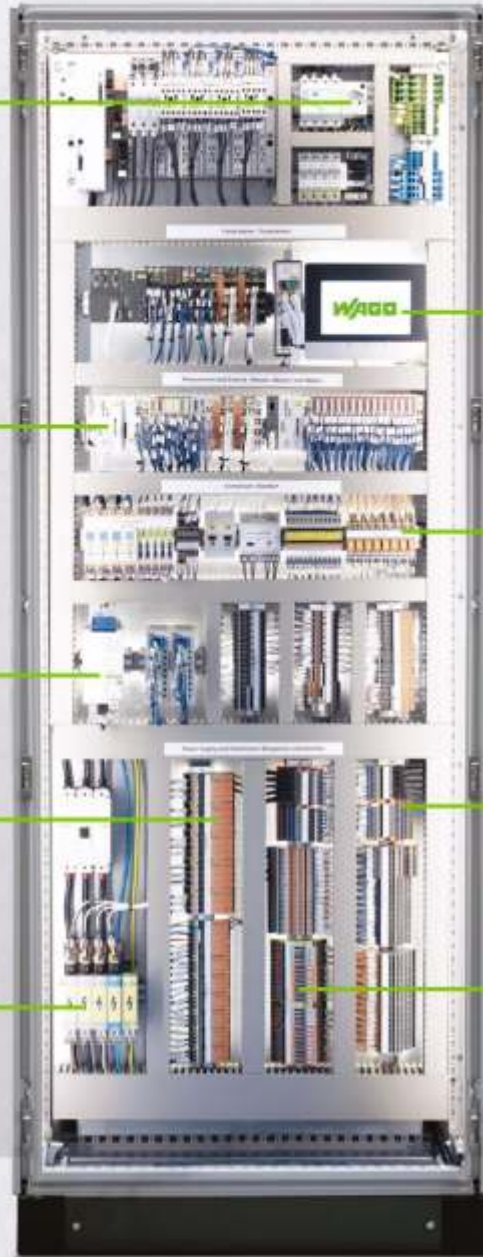
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## SIS from Softing Industrial offers structured solution



The Secure Integration Server (SIS) from Softing Industrial offers a structured solution for complex server architectures. It combines various OPC UA servers at the automation level with their associated address spaces. This enables a standardised mapping of these address spaces in accordance with the OPC UA Companion Specification. The data provided in this way is then available for IoT cloud applications via a standardised OPC UA interface.

The latest version of the SIS, V1.30, integrates the MQTT protocol (versions 3 and 5), making data integration more secure and flexible. The most significant benefits include:

- MQTT Publisher & Subscriber: enables bi-directional data traffic for efficient communication.
- MQTT Authentication Settings: Ensure security and identification between clients and brokers through various authentication methods such as anonymous, username or certificates.
- MQTT Store&Forward Function: Protects against data loss.
- Various Publishing Modes and "Dynamic Payload": Guarantee high flexibility for different data requirements.
- Up to 25 MQTT Connections: Ensure seamless communication and provide a scalable solution.

Product Manager Andreas Röck commented on this development: "The integration of the MQTT protocol into our Secure Integration Server underlines our commitment to advanced solutions in industrial data integration. The enhanced security and connectivity features open up new possibilities for efficient and reliable data transmission for our customers."

## BPCL hosts compressed biogas workshop

Bharat Petroleum Corporation Limited (BPCL), a leading Fortune 500 Maharatna Energy Conglomerate, in collaboration with the Ministry of Petroleum & Natural Gas and GAIL, hosted a comprehensive workshop aimed at advancing the adoption of Compressed Biogas (CBG) as a sustainable energy solution. The event took place on 26th February, 2024 at the Renaissance Bengaluru Race Course Hotel in Bengaluru, Karnataka.



The workshop, held under the initiative of the Ministry of Petroleum & Natural Gas, facilitated open dialogue among stakeholders, including bank officials, CBG producers, entrepreneurs, technology providers, and representatives from various organisations such as the World Bank, Indian Biogas Association, and Oil and Gas marketing companies. The discussions centered around the pivotal role of CBG in India's energy transition, emphasizing its significance as a green fuel and its contribution to the SATAT (Sustainable Alternative Towards Affordable Transportation) initiative.

Shri Anurag Saraogi, CGM Biofuels, BPCL, mentioned in his speech that, "In our pursuit of a cleaner, greener future, today's workshop in Bangalore, hosted by BPCL under the Ministry of Petroleum & Natural Gas, is pivotal. We're sensitising bank officials about financing Compressed Biogas (CBG) projects, vital for advancing sustainable energy solutions. Through insightful discussions, we aim to deepen their understanding of CBG's potential. CBG, with properties similar to CNG, holds promise in replacing it across sectors."

## Schneider Electric delivers open automation infrastructure

Schneider Electric, the leader in the digital transformation of energy management and automation, in collaboration with the technology companies Intel and Red Hat, has announced the release of a Distributed Control Node (DCN) software framework.



An extension of Schneider Electric's EcoStruxure™ Automation Expert, this new framework enables industrial companies to move to a software-defined, plug-and-produce solution, allowing them to enhance their operations, ensure quality, reduce complexity, and optimise costs. Aligned with the goals of the Open Process Automation Forum (OPAF), which is dedicated to driving interoperability and portability, the three collaborators have worked together to create a modern, network-based experience that will lead the way to the next generation of industrial control.

"This project is the culmination of two years of co-innovation to create efficient, future-proof distributed control systems," said Nathalie Marcotte, Senior Vice President of Process Automation at Schneider Electric. "The DCN framework is key to fostering an open automation approach, enabling industrial businesses to grow and innovate for the future. Its interoperability and portability help our customers enjoy the freedom of shaping technology around their business needs – and not the other way around."

Red Hat, in collaboration with Intel, recently announced the creation of a new industrial edge platform that helps provide a modern approach to building and operating industrial controls.



## Rohde & Schwarz and Samsung collaborate for secure ranging test cases



Rohde & Schwarz and Samsung have collaborated to verify secure ranging test cases for the ultra-wideband (UWB) PHY layer and assess the secure receiver characteristics of devices based on FiRa specifications. There are new test cases specified in the FiRa 2.0 Technical Specifications, which covers the prevention of physical layer attacks on secure ranging applications based on UWB technology. These test cases were verified with the R&S CMP200 radio communication tester from Rohde & Schwarz on Samsung's latest UWB chipset.

Having passed the FiRa® Consortium validation process, the Rohde & Schwarz CMP200 radio communication tester is a certified tool for FiRa 2.0 PHY testing. With the successful verification of physical layer security test cases, Rohde & Schwarz and Samsung contribute to making standardised ultra-wideband (UWB) applications more resilient to malicious attacks.

UWB has unique capabilities for secure fine ranging, based on accurate Time of Flight (ToF) estimation and relative position determination. Therefore, UWB-enabled devices can accurately and securely measure the distance and direction of connected devices. These capabilities make UWB an ideal technology for a wide range of use cases, such as untracked indoor navigation, social distancing, hands-free access, asset tracking, ticket validation, mobile payment, and point-and-trigger applications. The PHY Secure Ranging test cases specified in the FiRa 2.0 Test Specifications have now been implemented by Rohde & Schwarz and verified using Samsung's latest UWB Chipset.

## Socomec India unveils strategic expansion plans to Sri Lanka and Bangladesh

Socomec India, a leading global specialist in Low Voltage (LV) power management, has unveiled its ambitious expansion plan. The Chennai-headquartered French powerhouse is set to venture into the markets of Sri Lanka and Bangladesh, effective immediately. Termed as 'Greater India,' this strategic move consolidates the three countries into a unified business entity, marking a significant milestone for Socomec India and opening up new opportunities for business growth.



Speaking on the expansion, Mr Meenu Singhal, Managing Director of Socomec India, stated, "Our commitment to meeting the evolving energy needs with innovative power solutions in the Asian market remains unwavering. Engineered in Europe and proudly manufactured in India, our products are poised to make a substantial impact in the markets of Sri Lanka and Bangladesh. This reaffirms our commitment to support the Atmanirbhar Bharat initiative and energise the country, while also solidifying our dedication to the 'Make in India' initiative with India serving as a pivotal hub for Socomec's strategic growth in the Asia Pacific region. Our adherence to global quality standards positions us to navigate this journey with ease. We look forward to building lasting partnerships and empowering businesses with sustainable and efficient power solutions, further strengthening Socomec's position as a trusted leader in the industry."

## Verlinde to supply solution for biomass-fired power stations

STEPHAN the Swiss specialist company in structural steelwork, facades, lifting equipment and mechanical welding turned to its 30-year supplier of lifting equipment, Verlinde, to supply a high-performance, robust winch. The PDW winch, an excellent model with a high class of use rating, met the requirements of the application as standard, without the need for costly engineering.



STEPHAN SA is a Fribourg-based company founded in 1902 and specialising in structural steelwork, facades, lifting equipment and mechanical welding. It employs almost 130 people at its 140 000 m2 site in Givisiez. STEPHAN's expertise is renowned resulting from over 120 years of experience at the service of its customers. The company is recognised on the market as a trusted partner, capable of taking on the most specialised projects, ranging from design to after-sales service, including the manufacturing, surface treatment, assembly and commissioning phases. STEPHAN sets itself the highest quality standards, which is why it continuously invests in its production facilities. It holds the most demanding certifications in various fields, and works in partnership with manufacturers renowned for the quality of their products. This is the case with VERLINDE, which has been supplying lifting equipment for nearly 30 years.

# DIGITALISATION OF PROCESS INDUSTRIES

## COVER STORY



**Jerome Gnanaprakasam**  
Global Head – Projects,  
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**PV Sivaram**  
Evangelist for  
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**Shirish Kulkarni**  
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**Prasanna Lohar**  
CEO at Block  
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**Sharul B A Rashid**  
Head, Technical Excellence  
and Group Technical Authority,  
Instrumentation and  
Control at PETRONAS.

# Digitalisation of Process Industries

Digitalisation results in flexible and modular plants for faster reaction times and better outcomes.



Process Industries have traditionally adapted well to automation by using sensors & actuators, and instrumentation & controls in its operations. With growing trends of digitalisation, new opportunities are created with the convergence of IT/OT and integration of cutting-edge technologies like low code, edge, cloud computing and artificial intelligence. Most process industries are capital intensive and legacy systems still operate far too many assets which do not make the process of digitalisation easy. However digital transformation can improve outcomes across the sector, helping to provide solutions to mitigate these risks, improve operational efficiency, evolve business models, and provide better customer experiences. The result is more flexible and modular plants for faster reaction times and better outcomes. But before that, it is necessary to understand **how process industries have historically automated with sensors, actuators, instrumentation and control in their operation?**

“25 years ago, particularly in life sciences and similar industries, batch operation processes were controlled and recorded manually. Later in

the early 2000s, with the introduction of data loggers the critical process parameters were recorded and printed during batch operation. These systems are in compliance with regulatory requirements like FDA. However, all the operations were done manually. As we all know manual operations may have problems related to quality and safety due to complete dependency on humans. With the support of automation industry process controls are being transformed from manual to auto through extensive use of actuators like control valves, sensors and transmitters for flow, level, temperature, pressure, pH, conductivity, etc., by integrating to PLC (programmable logic controllers)/DCS (distributed control systems). This helps organisation to improve efficiency, quality and safety to a great extent,” says **Jerome Gnanaprakasam**, Global Head – Projects, Engineering, EHS & Sustainability, Dr Reddy’s

**The process industries, due to the inherent complexity of the process, require built-in controls for basic working and process flows**

Laboratories, who has over 30 years of industrial experience in leading pharmaceutical operations, capital projects, engineering, safety, environment, ESG & sustainability.

“The process industries, due to the inherent complexity of the process, require built-in controls for basic working and process flows. These are built-in as a design with considerable numbers of the sensors, instrumentation and feedback control loops, and hence ensuring the overall visibility-monitoring-and-control on the process as an inherent feature of the process industry,” says **Shirish Kulkarni**, Founder & MD, STROTA ConsulTech Pvt Ltd. Shirish, an industry veteran with large corporate experience of 30+ years, is now helping the Small and Medium Businesses as a Business Advisor. “Further efficiency and effectiveness of these basic building blocks are achieved with the latest of the trends in the technology space,



**‘Today process industries are shifting towards flexible and modular plants’**

**Jerome Gnanaprakasam**  
Global Head – Projects, Engineering, EHS & Sustainability, Dr Reddy’s Laboratories.

which are segmented under the Industry 4.0 or Smart Manufacturing parlance. The objectives, and hence the challenges, for the process industry are completely different and unique against the discrete manufacturing – covering the elements of continuous flow, critical thresholds to prevent system going out-of-control, check-points at all the critical process steps, inter-dependency and hence inter-connectivity of the process parameters takes the technology to be implemented to the next level of complexity and hence usage,” he explains.

**Prasanna Lohar**, CEO at Block Stack and President at India Blockchain Forum, recalls his time at Tecnimont/ICB, a company with decades of experience in development of projects. “I witnessed the seamless integration of sensors, actuators, instrumentation, and control systems in EPC turnkey projects. This integration enabled process industries to automate repetitive tasks, optimise production processes, minimise human error, and ensure consistent product quality. By harnessing these technologies, companies could achieve greater efficiency, reliability, and precision in their operations, ultimately leading to improved competitiveness and customer satisfaction. Eventually we have seen technological

advancement in these areas with artificial intelligence, cloud computing, advanced analytics, IoT integration, wireless connectivity, integration with robotics, remote monitoring, says Prasanna, who has worked globally for banks, fintech, micro-finance, engineering, and multi-national companies for digital & architecture transformation.

## What are the examples of specific technologies or methods that process industries have used to enhance automation in their operations?

According to **Sharul B A Rashid**, Head, Technical Excellence and Group Technical Authority, Instrumentation and Control at PETRONAS, 'Automation' describes a wide range of technologies that reduce human intervention in processes, mainly by predetermining decision criteria, subprocess relationships, and related actions, as well as embodying those predeterminations in machines. "Depending on the complexity of the process industries, certain levels of automations are designed, constructed, tested and commissioned to enable excellence asset management and reliable plant operations including managing the supply chain better in response to business and market needs, safeguarding employee safety and ensuring environmental compliance. As customers look into innovation in the products and user experience, leveraging technology and digital as they are maturing and advancing is key for survival," says Sharul, who has spent over 22 years at the PETRONAS Group in Malaysia and is now Head, Technical Excellence under TDEX, GTS (PD&T) focusing on technical excellence in safeguarding and shaping of PETRONAS Group towards asset operational excellence and growth in decarbonisation.

"There are various technologies adopted in different industries that best suit them. When it comes to the life science industry the quality and safety go hand in hand and it's a foundation for manufacturing which cannot be compromised. Of course quality and safety is important in all industries whereas in life science it is more stringent and lifeline of the process and non-negotiable as it is directly impacting the patients in a larger way. Process is operated and controlled through batch application as per ISA88 standards hosted in systems like DCS. Also control systems are integrated with the Manufacturing Execution System (MES) for

paperless e-batch manufacturing reports and process control," explains **Jerome Gnanaprakasam**.

For **Shirish Kulkarni**, the elements of Industry 4.0 have been making an impact on the process industries as well. Their application and use-cases are specific to the context of the process industry. The elements of Industry 4.0 enable utilising real-time data and advanced analytics, to help process manufacturers to optimise and control their processes and to reduce costs, resulting in higher efficiency and increased profitability. "The key perspectives of Industry 4.0 like Process Automation, Simulation (Process/Product), Shopfloor to Topfloor connect, IIoT (Industrial Internet of Things), Elements of Security – IT and Cybersecurity, the Digital Forces like Cloud, Mobility, Augmented Reality – Virtual Reality are helping the key scenario like predictive maintenance, Big Data Analytics, etc., bringing in the ability of forecasting of process parameters," says Shirish.

## Digitalisation enables process industries to collect, analyse, and leverage data from across the production chain

## What role does digitalisation now play in the transformation of process industries with the convergence of IT/OT (Information Technology/Operational Technology)?

"Digitalisation is of late strongly associated with the discrete manufacturing industry. Indeed the allied terms for digitalisation – smart manufacturing, Industry 4.0 – are also used in conjunction with discrete manufacturing. This has occurred from the fact that process industries are highly instrumentated; meaning that there was always a good amount of instrumentation in a process plant. With this foundation, it was relatively easier for these industries to implement automation," says **PV Sivaram**, Evangelist for Digital Transformation and Industrial Automation, who retired as the Non-Executive Chairman of B&R Industrial Automation and earlier the Managing Director.



## 'Digital Twin has close cousins – simulation and modelling'

**PV Sivaram**  
Evangelist for Digital Transformation  
and Industrial Automation.

Prior to B&R, Sivaram has worked at BARC where he began his career after graduation, and then with Siemens, where he gained considerable experience in Distributed Systems, SCADA, DCS, and microcontroller applications. "Process automation has been until lately a centralised concept. There are sensors all across the plant, all connected to controllers at a central location. Increasing cost of instrument cabling, and associated maintenance problems led to the concept of distributed control systems (DCS). At present, an actual direct intervention of digitalisation into plant operations does not seem to appeal. But how about broadening the view beyond plant control? Then many applications suggest themselves; right from supply-chain to quality, recipe management. Take a step back and you can see design and validation of control algorithms as a worthy topic," he elaborates.

To **Prasanna Lohar**, digitalisation plays a pivotal role in transforming process industries through the convergence of Information Technology (IT) and Operational Technology (OT). This convergence blurs the traditional boundaries between IT systems (such as enterprise resource planning and data analytics) and OT systems (such as industrial control systems and sensors), creating new opportunities for efficiency, innovation, and competitiveness. "Digitalisation enables process industries to collect, analyse, and leverage data from across the production chain in real time, facilitating predictive maintenance, process optimisation, and quality control. By integrating IT and OT systems, companies can enhance visibility, agility, and decision-making capabilities, driving



operational excellence and unlocking new levels of productivity and profitability. Digitalisation also enables the adoption of advanced technologies such as artificial intelligence, digital twins, and blockchain, further accelerating the transformation of process industries towards smarter, more connected, and resilient operations,” he opines.

“Digitalisation may refer to digital transformation, the adoption of digital tools to create new or modify existing products, services and operations. Operational Technology (OT) is hardware and software that detects or causes a change, through the direct monitoring and/or control of industrial equipment, assets, processes and events whereas Information Technology (IT) is a set of related fields that encompass computer systems, software, programming languages and data and information processing and storage,” says **Sharul B A Rashid**. “With the unprecedented challenges faced by process industries in the next decade, as the process industries are preparing themselves towards the Energy Transition and Sustainability agenda, the three pronged strategy of People-Process-Technology needs to be quickly adopted,” he adds.

### How do low code, edge computing, and cloud computing contribute to the flexibility and modularity of plants in the context of process industries?

According to **Jerome Gnanaprakasam**, today the

global market is very dynamic and industries should quickly adapt to the changes in order to sustain. “I believe that the use of any latest technologies which can give flexibility and modularity always helps industries in many ways to stay updated and respond quickly to such dynamics. In regard to low code, pre-programmed modules or functional blocks help users to develop applications quickly by eliminating the need for special coding skills. Platforms like IoT and cloud computing bring a lot of value to manufacturing in terms of data analysis, data integrity, reliability, scalability, etc. However, the challenge comes from the right skillset and right implementation which needs to be balanced,” he asserts.

“Edge computing enables real-time monitoring and analysis of data generated by machines and other devices in a manufacturing environment, which can help to improve operational efficiency and reduce downtime. While the low code systems are the ones, which require minimal or NO code to be developed for their implementation or any changes in the business rules. Cloud computing enables the storage and processing of large amounts of data without investing in advanced in-house systems,” says **Shirish Kulkarni**, who is of the view that it is essential for implementing Industry 4.0 technologies like Artificial Intelligence, Machine Learning, and Industrial Internet of Things (IIoT) connectivity. “The process industry generates a huge amount of data (Big Data) in the form of time-series data of various process parameters, set-points, on-the-fly calculations for compound values and forecasting. This data has to be handled for its



### ‘AI provides an avenue for the digital system to define decision making rules’

**Shirish Kulkarni**  
Founder & MD, STROTA ConsulTech Pvt Ltd.

contextualisation, storage, analysis and AI related learning of the process to be able to help the visibility, monitoring and hence control of the process more and more effectively – through these low-code systems, leveraging Edge & Cloud Computing,” he explains.

### Platforms like IoT and cloud computing bring a lot of value to manufacturing in terms of data analysis, data integrity, reliability, scalability, etc

“Low code, edge computing, and cloud computing play crucial roles in enhancing the flexibility and modularity of plants in process industries, enabling them to adapt to changing demands and optimise operations. Low code development accelerates application deployment, edge computing enables real-time data processing at the plant level, and cloud computing centralises data management and analytics,” says **Prasanna Lohar**. “In my view, post Covid-19 and considering Future of Work and current Business Trends, together, these technologies enhance the flexibility and modularity of process plants, allowing them to respond quickly to changes, optimise operations, and drive continuous improvement. Successful organisation should be on cloud and edge computing infrastructure. Eventually I can see the banking industry also started utilising these tools during development and monitoring branch operations,” he states.



## Digitalisation is not complete without cutting-edge technologies, such as digital twins and artificial intelligence, etc. What are the specific benefits that the integration of these technologies bring to process industries?

“Both Digital Twin and Artificial Intelligence are being bandied around so much that it becomes difficult to pin down their meaning and definition. Digital Twin has close cousins – simulation and modelling. In any process of sufficient complexity, modelling is a first serious step. Today, with the tools that are available, digital modelling should be a compulsory first step before design engineering of a plant,” says **PV Sivaram**. To him, a robust model exposes many crucial design parameters and constraints. Once you have a strong model, the next one can use simulation tools to explore several what-if scenarios. With simulation, one can achieve high efficiency, safety and sustainability at viable cost. “Digital twin aspires to have the same process model at its heart. The model becomes a digital twin when the input measurements and outputs are continuously made available to the Digital Twin. The digital twin can help in maintenance scheduling, in production planning, and innovation of product mix,” he elaborates.

For **Shirish Kulkarni**, digital twins are used for simulation and operational phases of a product or process lifecycle. “Regardless of how you build a digital twin, the overall outcome is having a digital representation that you can use to gain more knowledge and deeper visibility into your production process. AI provides an avenue for the digital system to define decision making

**AI-based digital twin of a process keeps learning and becoming more and more capable, intelligent and self-sufficient**

rules through the logic which could be passed through the learning phase based on the decisions arrived at in every cycle. The AI-based digital twin of a process keeps learning and becoming more and more capable, intelligent and self-sufficient to address wider scenarios in the real life of the process plant,” he says. Shirish further draws attention to the fact that digital twins help in simulation to be able to simulate trials of the process, which in reality is not possible at all due to physical limitation, and saving on the costs of each of the physical tests/trials eventually. AI helps automation of the decision making process to be able to have elements of self-controlled process and reduce the continuous manual interventions, by



## ‘Digitalisation plays a pivotal role in transforming process industries’

**Prasanna Lohar**  
CEO at Block Stack/President  
at India Blockchain Forum.

restricting the human acumen to be leveraged for the critical aspects of threshold setting, monitoring for outliers, getting the course corrections in place.

**Sharul B A Rashid** has tabulated the following possible business benefits that cutting-edge technologies and digital bring about to the table:

- **Realtime access to new data source (including used to be stranded data):**

- High visibility into every aspect of process industries operations

- Insightful data for fast decision-making based on real time information.

- KPI dashboard with rich data visualisation

- **Data analytics:**

- Proactive and preventative maintenance

- Higher wrench time

- Increased asset utilisation

- Reduced non-productive time

- **Standardised platform, open standard architecture for wired and wireless infrastructure:**

- Flexible implementation of advanced applications, and reduced time to deployment of devices, avoiding expensive cabling

- Better management of resources and assets with digital worker

-Streamlined management and administration.

- **Pervasive, accurate location-based services and tracking:**

-Improved safety for personnel and asset

-Less logistics and cost-effectiveness

-Safe time from manual searching

- **Cyber and physical security:**

-Increase resilient to cyber attack

-Greater regulatory and security compliance

- **Digital worker/worker mobility:**

-Improved turnaround time and cost savings

-Access to remote expert 24-7 round the clock

- **Remote autonomous operation.**

**AI and other cutting edge technologies like Blockchain, process industries can achieve synergistic benefits**

## How does the trend towards more flexible and modular plants align with broader industry goals, and what are the potential implications for the future of process industries?

“It is the market which dictates terms. When the demand is continuously changing, production needs to be flexible to track the market. Indeed, it is not even sufficient to track the market with a lag; it is needed to anticipate the market. How does one do this? Today we have very good tools which are able to analyse trends from social media, and come out with reliable forecasts. This is something which process industries need to get good at. In other words, no matter what your line of business and product which you make, you must have digitalisation at your core,” says **PV Sivaram**. “Future competition is not going to be between companies, it will be between supply chains. That means companies must integrate strongly with their entire supply chain. The topic is already well developed in discrete manufacturing, and the process industry will do well to benefit from the learnings,” he adds, matter of factly.

**Jerome Gnanaprakasam** is of the opinion that today process industries are shifting towards flexible and modular plants to adapt quickly to dynamic environments. Modular plant supports complex installation and reinstallation with minor reconfiguration based on the product requirements and requires fewer efforts in commissioning. “This helps process industries to stay competitive, adapt easily to changing market environments at lower cost. However, creating a flexible and modular plant needs skilled workforce in designing, automation and digitisation,” he suggests.

“The scalability complemented by the reliability is possible through making the process robust against any of the undulations, disturbances – which is achieved by the self-learning, simulated process through AI and digital twin. The flexibility is offered by the capability of the process to accommodate any changes to any variants of the product or the process to be incorporated due the standardisation and modularity of the process components. This also helps reusability of these established, stable, documented, standardised and approved components of the process or the products themselves to be used for any other processes or for the future expansion to be incorporated,” says **Shirish Kulkarni**.

According to **Prasanna Lohar**, by integrating digital twins, AI and other cutting edge technologies like Blockchain, process industries can achieve synergistic benefits such as:

- Enhanced visibility and control over operations through real-time monitoring and predictive analytics.
- Improved efficiency, reliability, and safety of production processes.
- Greater transparency, traceability, and compliance with regulatory requirements.
- Enhanced collaboration and trust among stakeholders across the value chain.
- Accelerated innovation and continuous improvement through data-driven insights and optimisation.

According to **Sharul B A Rashid**, process industries automation systems have a huge installed-based physical equipment with a 10-year lifetime or longer. Its provision for retrofit of existing systems and their migration to the new architecture overtime to extend the longevity




**‘Intelligence at the device level will increase functionality, performance and reliability’**

**Sharul B A Rashid**  
Head, Technical Excellence  
and Group Technical Authority,  
Instrumentation and Control at PETRONAS.

(useful lifecycle) must exhibit the following attributes:

- Portability – Software tools and agents can accept and correctly interpret library elements (software components and system configurations) produced by others.
- Interoperability – Devices can operate together to perform autonomous and/or cooperative functions as defined by international standards.
- Configurability – Device and their software components can be dynamically configured (selected, assigned location, interconnected and parameterised) by multiple software tools and/or software agents.

“Intelligence at the device level will increase functionality, performance and reliability that facilitate its integration into a more complex production system via network connectivity and web services. System orchestration together with system management is the next generation process industries automation that will facilitate flexible manufacturing that enable rapid integration and reconfiguration of assets to be autonomous and intelligent,” he concludes. 

*Note: The responses of various experts featured in this story are their personal views and not necessarily of the companies or organisations they represent. The full interviews are hosted online at <https://www.iedcommunications.com/interviews>*

# Addressing Privacy Concerns in AI Era

Privacy and ethical considerations are important in the age of AI to safeguard one's privacy, says **Benedicta Chettiar**.

It is no surprise that Artificial Intelligence (AI) has the potential to boost a company's innovation drive and economic growth. However, there is also a dark side to this technology. Among the challenges, individuals' privacy is a critical concern.

Recently, when the fashion world landed on the stage of New York Fashion Week (NYFW) in New York City, there were talks around the privacy concern led by AI.

A New York City-based model, founder and executive director of the Model Alliance, Sara Ziff, said, "When your body is your business, having your image manipulated or sold off without your permission is a violation of your rights".

## The use of AI: Benefits and concerns

Artificial intelligence is being used in almost every industry across various business domains. It presents a myriad of benefits to business leaders in terms of efficiency and productivity, analysis and monitoring, and more. Despite various significant advantages, a range of concerns are associated with this modern-age technology.

Privacy is one of the concerns of AI that has become a red-hot topic across businesses. As personal data collection and evaluation continue to increase, privacy concerns will become more important.

"As artificial intelligence evolves, it further increases the involvement of personal information, thus proliferating the cases of data breaches. Generative AI can be misused to create fake profiles or manipulate images. Like all other AI technologies, it also relies on data. Cybercrimes affect the security of 80% of businesses across the world, and we understand that personal data in the wrong hands can have monstrous outcomes. We need to take active measures to safeguard the privacy of our customers' information with authentication using data platforms," notes



AI can potentially manipulate privacy in several ways. Image by Freepik

Harsha Solanki, VP General Manager ASIA (India, APAC & Eurasia), Infobip.

## Understanding key terms in AI for privacy concerns

There are many languages surrounding AI that can quickly get complicated. To better understand AI privacy concerns, let us discuss some fundamental terms.

**Generative AI:** It refers to AI systems that can produce new content, including text, images, and videos, after learning from a dataset. Generative AI is used for creating art and music, designing new products, simulating real-world scenarios, and more.

**Natural Language Processing (NLP):** This AI technology emphasises the interaction between computers and humans through natural language. It is used to read, extract, understand, and make sense of human languages in a valuable way.

**Data Mining:** It refers to the process of deriving valuable patterns and knowledge from large datasets. Data mining is used by businesses for customer data analysis, market research, and effective marketing strategies.

## AI and privacy: Deciphering privacy concerns

AI systems leverage vast amount of data to train their algorithms and enhance performance. Such data can include individuals' personal information like names, financial information, and other sensitive information such as medical records and social security numbers.

AI can potentially manipulate an individual's

**AI systems leverage vast amount of data to train their algorithms and enhance performance**

privacy in several ways without their explicit consent, which are as follows:

- Data Collection and Analysis
- Predictive Analytics
- Personalised Advertising
- Surveillance and Monitoring
- Biometric Data Collection
- Algorithmic Bias and Discrimination, and
- Data Breaches and Security Risks.

## How to deal with AI privacy concerns

Privacy and ethical considerations are important in the age of AI to safeguard one's privacy. Organisations must prioritise ethical considerations in their AI systems' design and implementation. Some other strategic solutions include transparency and accountability, user consent and control, regulatory compliance, and education and awareness.

For more insights on automation, visit <https://www.industrialautomationindia.in/>



*Benedicta Chettiar is Director, IED Communications and Manager, Strategic Developments, Industrial Automation. Besides these roles, Beni, as she is known, is also actively managing the affairs of Jyothi Process, a state-of-the-art printing press.*



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# Artificial Intelligence: Where Shall We Go Tomorrow?

In the concluding part of the 3-part series, PV Sivaram examines areas where AI is stepping in manufacturing.

The question indeed applies to humans and technology – where shall we go tomorrow? Actually the question becomes poignant because Human Intelligence and Artificial Intelligence have to coexist. It is human intelligence which develops AI. But human intelligence also views AI as a competitor! Since it is an ever-striving goal of manufacturing to improve in terms of the various indices like throughput, efficiency, quality, safety, etc., it does look to be a natural relationship between AI and the industry.

All future gazing is rather hazardous, given the speed of development of technology, and the interaction of different technologies with each other. So we will restrict ourselves to near future, and only put out some dreams of a golden far future.

## State of relationship today

The word 'Artificial' brings up a range of negative connotations – unreal, undependable, cheap, insincere, fake, illusory, mechanical, arbitrary, etc. Artificial intelligence somehow inherits these feelings and brings up a defensive reaction. But manufacturing itself is largely a process to produce artificial items; the linguistic connotations are not so much a road-block.

As it is today, AI is not the heart and soul in manufacturing. As yet manufacturing has not formed a clear picture of the relationship it wants to forge with this new technology. There is much hype about potential and possibilities, but poor articulation of application use cases. There is work to be done, both by AI and by the industry.

## Visual image of AI

People and organisations have projected AI to be many different things. Somewhere it is described as a co-pilot, thereby invoking an entity well equipped with all knowledge and capability of a pilot, however just waiting at the elbow to pitch in when called for, and otherwise staying out of the way.

There is another view of AI as a Jeeves to a



bumbling Bertie Wooster, who miraculously appears as and when the master has a need for help, even if he himself does not know it or ask for it. Yet another view is of a ghost out of the bottle, who can answer any question and perform any task.

**All future gazing is rather hazardous, given the speed of development of technology**

I would liken it to the role of electricity, which is twofold. It enhances speed and performance of every tool, when switched on. It also gets embedded in many tools to enhance performance unobtrusively and makes work more easy and accurate like a power-steering or an automatic gear shift. With this view, AI is actually a good fit for helping out manufacturing processes.

## What makes AI gain power day by day

Progress in AI started in the early eighties after the so-called AI-winter. It has reached a

particular momentum in the new millennium due to a variety of factors, seemingly unrelated to each other. But definitely these factors have a mutual correlation. Some of the factors are – proliferation of computing devices in both industrial and personal space, connected devices – internet, IoT, always online, proliferation of data and harvesting of data.

## Algorithms and data and chips

AI is commonly imagined to be a set of algorithms – a mass of computer SW. This view is not wrong. AI is given rules by human programmers, to respond in specified ways to data which is provided to the AI device. While this is true and correct, it is not the full picture. AI also has the capability to learn from its experience, by working with many different sets of data in the 'real' world (mostly it is a cyber image of the real world), to derive different decision paths. In that sense AI is more than a set of IF-THEN-ELSE constructs. The third component is the hardware. At a full functional capacity, AI needs very high computational power. Development of chips engineered precisely to cater to AI becomes a game changer. By placing enormous computational power, the sort of applications which AI can be used to solve rapidly increases.



Where does manufacturing industry need AI? Image by DC Studio on Freepik

The combination of these three factors increases the 'power' of AI day by day – we mean the application areas where there would be no alternative to AI.

## Race for domination

Power of nations or groups or companies is largely from the economic might. Economic might is obtained by control of access to natural resources, efficient production of items which will be in demand, and accurate prediction of future demand. All of this can be imaginably better, and thereby the groups become mightier, by deploying AI. Therefore AI itself becomes a resource for which there is going to be competition.

If we look at the AI tools and processes as a crop, and the developer activity as cultivation a particular picture emerges. As of today, wealthy nations with foresight actively fund and encourage development activity. As well skilled technical talent is an important ingredient, they encourage better quality workers to produce AI for their purposes. The other material input needed is the HW, viz., chips, which go today by the name of GPUs. Chip development and production is also highly capital intensive and therefore available in few elite lands.

Third aspect, which is very important, is data. AI is a data guzzler. AI needs much data during development of algorithms. When the algorithm or model is developed, data is again needed for verifying or validating the algorithm. Data is actually generated by consumers of a product or service. There is a scramble to get at this data by countries and corporations. Large amount of data is obviously created in places with high populations. So access to data becomes an important goal in global diplomacy.

**AI is a data guzzler.  
AI needs much data during  
development  
of algorithms**

For example in developing AI for medical purposes, much patient data is needed regarding consumption of a particular drug and the resultant effects and side effects. This data for some kinds of treatments are most prolific in teeming millions of Africa and Asia. Giant corporations vie with each other to secure this data.

So in this race, the future of AI is tilted towards the haves and away from have-nots. The have-nots may have to buy the AI tools and products which their own people and data have worked to develop. Else they may have to live and work with more imperfect tools and suffer a competitive disadvantage.

## Competent servant or jealous master?

How would industry and AI live with each other? Industry will treat AI as a set of tools, similar but more powerful than tools of the previous generation. It will need some imagination to reengineer the process when such powerful tools are available freely.

## How AI will help manufacturing industry

We could frame the question differently. Where does the manufacturing industry need AI? Why manufacturing at all would need AI, is a starting point.

The index for excellence in manufacturing depends on the three pillars – Throughput or production volume, Efficiency of operation or the margins earned, Quality of product or

services, and the concerns about environment – that is Safety, Health, and Emissions. Better performance means quicker decisions, which are more and more correct.

That means, better decisions help to run a business more efficiently. Decisions need an analysis of many factors affecting the particular issue, recollection and reference to similar past use cases, immediate constraints. Human intelligence can cope with the factors up to a point. Past experience meaning wisdom, is available with only some individuals. As the complexity of the issue increases, accuracy or probability of being right diminishes. This is the place where AI can step in.

AI can manipulate large numbers of factors; can have a perfect recall of all past cases, and come up with answers quickly. AI is strong in combinatorial mathematics, so having many factors to contend with is not a problem. AI is strong in pattern recognition, so it can evaluate and take reference to previous instances of the same situation, and also can recollect the actions prescribed at the previous instance.

Some areas where we can see AI stepping in manufacturing are – predictive maintenance, inventory planning and sourcing, dynamic logistics, manpower planning and skilling, quality issues. These could be the low-hanging fruit.

In a longer term we look at AI to sit by the side of every employee to augment the capability and reduce stress of his or her routine activity.

## Jobs created or destroyed

Inevitably as time progresses the work humans do, and the way they go about their work will change. This statement is true irrespective of mechanisation, steam power, Electricity, and then in modern era Automation and the latest which is Artificial Intelligence.

## Challenge to skills of workforce

Inevitably, jobs performed by humans will have more creative content. Repetitive and mundane jobs will be performed by machines which have different levels of intelligence starting from simple automation to Super Intelligence. So jobs available for humans will be at once more challenging and more interesting. The actual work ahead is to devise a curriculum and education system to prepare the next generation workforce to perform in such an ecosystem.

## Shape of things to come

A good way to embed AI into the systems and processes of manufacturing actually needs solid foundational aspects. AI might be honoured with the designation of a Revolution when it makes sufficient inroads into the planning and implementation of manufacturing. But there are some revolutions before it which need to be honoured and given the rightful place in manufacturing.

It all started with automation. The concept of automating a machine or process arose quite sometime ago. But today, we define automation as the use of 'Stored Program Controllers' for performing cyclical and repetitive tasks of production machinery. This forms a basis for adding further intelligence into the factory. Summary is that a strong base of automation is a must for next steps.

Here in essence the knowledge of a human operator got encapsulated into an electronic device.

In the beginning of the new millennium, the Data Revolution came about. This focussed on the data being emanated by the automated production machinery and using this data for benefits to the factory in a measurable manner that could be evaluated in terms of money. The techniques are clubbed under a rubric 'Data Analytics'. The analytics can recognise patterns, make predictions and give suggestions. These capabilities lay the foundation for the next step.

Here in essence the decision making techniques of a supervisor get encapsulated into the analytics engine.

Presently we are in the era of AI which rests on the work of an Analytics engine. AI can augment capabilities of a manager in the plant. It is still work-in-progress but it looks like AI can acquire capabilities to run the plant just as a human manager would or could do.


## What next?

The emergence of super intelligent AI will come next. To recollect from the previous episode, Artificial Super Intelligence (ASI) is a software-based system with intellectual powers beyond those of humans across a comprehensive range of categories and fields of endeavour. ASI might conceivably provide strategies and plans for companies, industries, and even countries!

In a dystopian view, ASI could run our countries and our lives making strategic decisions in a competition between ASIs. The rationale behind the decisions and their possible fallout might remain incomprehensible and unexplained to humans. The role of humans can be likened to that of domestic pets today, which are loved and well taken care of, but have no part in decision making. I repeat, this is a dystopian view.

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The utopian view (utopian being opposite of dystopian) would be that the ASI has all the super competence, but remains a faithful servant to the human. To achieve this, humans have to improve themselves in terms of behaviour. They need to stop pursuing individual greed both at personal and national levels. There is a need for greater cooperation and setting common global goals, particularly in such issues as climate change, pollution and so on. Then we can focus development of AI towards tasks that benefit humanity as a whole.

Which view will prevail? I do not know, but I hope for a Utopia! 

*(This is the concluding part of the 3-part series on Artificial Intelligence. Part 1 appeared in the January 2024 edition, and Part 2 in February 2024)*



*PV Sivaram, Evangelist for Digital Transformation and Industrial Automation, is mentor and member of steering committee at C4i4. He retired as the Non-Executive Chairman of B&R Industrial Automation and earlier the Managing Director. He is a past President of the Automation Industries Association (AIA). After his graduation in Electronics Engineering from IIT-Madras in 1976, Sivaram began his career at BARC. He shifted to Siemens Ltd and has considerable experience in Distributed Systems, SCADA, DCS, and microcontroller applications.*



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## PC-based Control for Implementation of NAMUR Open Architecture

How Bayer uses compact NOA edge devices comprising embedded PC, HART I/O terminals, and OPC UA server.

Process analytical technology (PAT) plays a crucial role in the chemical industry. Bayer AG, for example, is enhancing efficiency and transitioning from time-based to condition-based maintenance by embracing the cutting-edge NOA concept. This is implemented through the seamless integration of a compact edge device featuring a CX8110 Embedded PC, EL3182 EtherCAT HART Terminals, and Beckhoff's TwinCAT OPC UA Server, without any alterations to the existing control technology.

Bayer is a globally recognised company that specialises in life sciences, particularly in the fields of healthcare and nutrition. Its products and services are designed to benefit humanity and protect the environment, addressing fundamental challenges presented by an ever-growing and aging global population. Bayer currently operates one formulation plant and six active ingredient facilities at the Chempark Dormagen site, employing approximately 1,230 people. Its product range includes 35 active ingredients and ten intermediates in the realm of fungicides, herbicides, and insecticides, with notable product brands from this site including Luna, Laudis, and Movento respectively.

### Field device monitoring for quality assurance

When it comes to ensuring production processes run with the required level of quality, it is crucial to take measurements at various points in the process workflows. This is where Process Analytical Technology (PAT) enables real-time assessment of product quality online during the process, providing direct feedback to production operators on further process control. A classic analytical quality measurement in this context is the determination of the pH value of the medium.

Given that PAT plays a significant role in quality monitoring during production, ensuring its proper functioning is of the utmost importance. This is why preventive maintenance for PAT has been established in the chemical industry in the



Process technology plants, such as those at Bayer in Dormagen, are generally highly sophisticated and designed for a very long service life.

**Bayer currently operates one formulation plant and six active ingredient facilities at the Chempark Dormagen site**

past, typically following time-based maintenance schedules. Many PAT devices simultaneously provide a wealth of condition information, which currently remains largely untapped. This is due to the non-standardisation of the condition information, necessitating a great deal of preliminary work to interpret the data. With the help of standardised condition information, on the other hand, opportunities arise to transform time-based maintenance into condition-based maintenance and thus further increase the efficiency of PAT operations.

### NOA benefits for brownfield plants

Extracting additional vitality data or condition information from the field level poses a particular challenge, especially in brownfield

plants. Currently, the existing automation architecture almost exclusively captures the measurement data relevant for process control and is not intended to be altered by the integration of new technologies. This is precisely what prompted the User Association of Automation Technology in Process Industries (NAMUR) to develop NAMUR Open Architecture (NOA). The concept described in NAMUR Recommendation NE175 extends the automation architecture without altering the existing control system. The core task of NOA is therefore to provide information from the field level to higher-level applications in order to monitor the field devices and optimise the process (monitoring and optimisation – M+O). The type of data that is forwarded from the field level depends on the field devices used and the respective analysis tools. The focus here is on cyclic parameters, which contain information on the device condition or process quality.

The world of process automation involves a wide range of protocols and communication technologies. For the initial implementation of the NOA concept at Bayer, the Beckhoff project team – comprising Bayer planning engineer Dr Roger Rossmann along with Beckhoff process industry managers Lennart Winkler and Sebastian Böse – opted to utilise the HART protocol. This choice offers three significant advantages for the project:

- The protocol is widely used and thus implemented in many field devices from different manufacturers.
- Superimposing a digital signal onto the actual 4–20 mA measured value facilitates the transmission of further data, such as the field device status.
- A second channel can be opened with minimal effort with the help of special feed isolators, which already form part of the automation architecture in many plants. This means that the connection to the field device is separated into the 4–20 mA signal, the HART communication, and the supply voltage, which means that the existing connection to the



Agitator tank for desalination at Bayer's Dormagen site.

process control system is not interrupted. Corresponding data can therefore be received via the second channel and used for the M+O.

Beckhoff offers a way to connect two field devices via the HART protocol in a very compact installation space in the form of the EL3182 analog EtherCAT input terminal. Combined with an embedded PC (such as a CX8110) and the TwinCAT automation software, a modular expandable edge device can be built without the need for specially developed hardware. Its functionality can be divided into three operations:

- Receiving vitality data via the HART protocol
- converting and translating the data, and
- providing the information for higher-level analysis tools.

Commands have to be sent from the edge device in order to read out the vitality data via the HART protocol. The data to be read out and the commands under which it is stored on the field device depend on the device type (pH, oxygen, temperature, etc.), and manufacturer. Beckhoff has developed a database to store the necessary information for reading out the vitality data. The corresponding file is read into TwinCAT, thereby facilitating communication

with all field devices stored in the database. If a field device is connected to the edge device, it is automatically detected, the corresponding HART commands are sent, and the received

**Depending on the detected field device type, individual OPC UA nodes can be removed or added automatically**

data can then be converted using stored translation tables and TwinCAT functions.

The vitality data stored in the PLC at this time must be made available for further analysis applications in the next step. This is where NAMUR recommends the use of OPC UA. The Beckhoff portfolio offers several products, including the TwinCAT OPC UA Server. This is based on a stored information model and filled with vitality data directly from the PLC. The information model is based on the PA-DIM (process automation – device information model), which is extended by the vitality data for PAT field devices. Users also have the option of customising it to include further parameters. Depending on the detected field device type,

individual OPC UA nodes can be removed or added automatically.

## Successful implementation at Bayer

According to Dr Roger Rossmann, the solution from Beckhoff is characterised by its ease of implementation. He goes on to add that, “When it comes to obtaining standardised vitality data, the approach to managing the library is not only open, but also subject to continuous further development by Beckhoff. Another positive aspect in the long term is that a change of field device is automatically detected by the Beckhoff solution, which means that no new parameterisation is required. Finally, it is definitely worth noting that the edge device is easily scalable and thus allows for ongoing expansion in the brownfield. The product portfolio with Ex-capable I/O terminals also accommodate the use of a second output of the field devices for the acquisition of HART information in compliance with Ex requirements.”

[www.bayer.com](http://www.bayer.com)

[www.beckhoff.com/motion](http://www.beckhoff.com/motion)

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Author: Stefan Ziegler, Editorial

Management PR, Beckhoff Automation

## Digitalisation in the Oil & Gas Industry: Transforming the Future

Digitalisation is ushering in a new era for the Oil & Gas industry, transforming traditional processes and operations.

The Oil & Gas industry, traditionally known for its reliance on complex and labour-intensive processes, is undergoing a significant transformation through the adoption of digital technologies. Digitalisation in this sector refers to the integration of advanced technologies like artificial intelligence, data analytics, the Internet of Things (IoT), and automation to streamline operations, enhance efficiency, and optimise decision-making. This shift towards a more connected and data-driven approach is revolutionising the way companies explore, extract, refine, and distribute energy resources.

**Digital technologies are reshaping the way companies interact with their customers**

### Exploration and production

Digitalisation is reshaping the exploration and production (E&P) phase of the oil and gas lifecycle. Advanced seismic imaging, powered by artificial intelligence algorithms, enables more accurate subsurface mapping, improving the identification of potential hydrocarbon reservoirs. IoT devices and sensors deployed on drilling rigs provide real-time data on equipment health, helping to prevent failures and minimise downtime. Automation in drilling operations enhances precision, reduces human error, and increases overall safety.

### Asset management

Effective asset management is crucial in the Oil & Gas industry, where equipment and infrastructure are often spread across vast and remote areas. Digitalisation enables predictive maintenance by leveraging data analytics to assess the condition of assets in real time. This approach reduces downtime, lowers maintenance costs, and extends the lifespan of critical equipment. Additionally, digital twins – virtual replicas of physical assets – facilitate

better monitoring, simulation, and decision-making throughout the asset lifecycle.

### Data analytics and decision support

The massive amounts of data generated in the oil and gas sector can be harnessed through advanced analytics to derive valuable insights. Data analytics tools process information from various sources, including sensors, production records, and market trends, to optimise operational efficiency and inform strategic decision-making. Predictive analytics helps companies anticipate market changes, optimise production schedules, and mitigate risks associated with equipment failures or market fluctuations.

### Supply chain optimisation

Digitalisation has a profound impact on supply chain management within the Oil & Gas industry. Enhanced connectivity and real-time data exchange facilitate better coordination among suppliers, distributors, and producers. Smart logistics and inventory management systems ensure timely delivery of materials, reduce costs, and minimise the environmental impact. Blockchain technology is also gaining traction in the industry, providing transparency and security in supply chain transactions.

### Health, safety, and environment (HSE)

Digitalisation plays a crucial role in improving Health, Safety, and Environmental (HSE) standards in the Oil & Gas sector. Advanced monitoring systems, wearable devices, and IoT sensors contribute to creating a safer working environment by identifying potential hazards and ensuring compliance with safety protocols. Real-time data analytics help companies respond promptly to emergencies, minimising the impact on personnel and the environment.



Effective asset management is crucial in the Oil & Gas industry. Image by nikitabuida on Freepix

### Market dynamics and customer engagement

Digital technologies are reshaping the way companies interact with their customers and respond to market dynamics. Advanced customer relationship management (CRM) systems, coupled with data analytics, enable companies to tailor their offerings to meet customer needs more effectively. Digital platforms also facilitate real-time communication and collaboration between stakeholders, fostering a more agile and responsive industry ecosystem.

### Conclusion

Digitalisation is ushering in a new era for the Oil & Gas industry, transforming traditional processes and operations. The integration of advanced technologies enhances efficiency, improves safety standards, and enables more informed decision-making. As the industry continues to embrace digital transformation, it is poised to become more resilient, sustainable, and adaptive in the face of evolving global challenges. The digitalisation journey is not just a technological evolution but a strategic imperative for the Oil & Gas sector to thrive in the 21st century.





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# Breaking Boundaries: India's AI Innovators Leading the Charge

As the Artificial Intelligence Market is going crazy across the world, could leading AI players in India make the most out of it?

The beginning of the year 2024 has brought a lot of promises in the advancement and growth of AI. This fact is supported by the leading chip maker, Nvidia, which broke the record for the biggest-ever single-day jump in a company's stock market value, adding US\$277 billion. This tremendous increase fueled Japan's main stock index, European shares and Wall Street's blue-chip listings, hitting all-time highs.

Nvidia witnessed a 16.4% increase in its shares as trading started a day after the company reported bullish results. The company's bumper earnings drove a tremendous stock market rally in the West. From the US to Europe and Japan, equities hit all-time highs. "The AI market had hit 'the tipping point'. Demand is surging worldwide across companies, industries and nations," said Jensen Huang, CEO, Nvidia.

With rising investor interest in artificial intelligence, companies worldwide now tout AI product roadmaps. "This was a 'game-changing moment' for the tech bulls and puts jet fuel in the tech bull market thesis," said Dan Ives, the MD, Equity Research at Wedbush Securities.

## Artificial Intelligence in India

Artificial Intelligence (AI) is one of the most cutting-edge and advanced technologies of modern days. It encompasses various techniques and approaches and enables machines to assess data, recognise patterns, and make data-driven decisions.

According to Statista, the AI market in India is estimated to reach US\$14.72 billion by 2030 from US\$ 5.47 billion in 2024. The market is growing at a CAGR of 17.94% during the projected time frame.

AI in India is the key to driving economic growth. It is paving the way for new opportunities for AI companies in India while creating room for a new generation of talent pool. Indian firms are harnessing AI to expedite customer experience, driving innovation for new products



Companies harnessing the power of AI. Image by DC Studio on Freepik

and services and transforming businesses. Top industries utilising AI in India include: manufacturing information technology; agriculture; defence; automotive; e-commerce & retail; healthcare; education; and government agencies, among others.

In recent years, AI innovation has sparked tremendously to become the buzzword in the agendas of every technology firm worldwide. Not only in big companies, AI has also proven to be incredibly beneficial for startups in India. It gives young businesses the ability to take their operations to the next level.

**Nvidia witnessed a 16.4% increase in its shares as trading started a day after the company reported bullish results**

## Top 10 AI companies in India

As the AI ecosystem in India is thriving, several top Indian companies and startups have made their way into the industry transforming businesses. These AI startup companies leverage AI tools and methodologies to help their clients drive innovation. Here is the list of top 10 Artificial Intelligence companies in India to know in 2024:

### Arya.ai

Founded in 2013, Arya.ai is a Mumbai-based company that offers 'Autonomous AI' product stack for financial institutions. The company builds a comprehensive AI platform to empower other AI companies and developers, streamlining rapid development, training, and deployment of AI-ML models.

### MachineHack

Established in 2018, MachineHack is a premier platform for Generative AI. The company encourages collaboration and knowledge sharing and is serving as a catalyst for the growth and advancement of Generative AI professionals in this ever-evolving field.

### Rephrase.ai

A text-to-video generation platform, Rephrase.ai offers a video and animation creation solution that uses advanced AI technology. The company's deep tech generative AI technology develops hyper-personalised professional-quality videos for businesses worldwide.

### Scribble Data

Established in 2017, Scribble Data is a machine learning and generative AI company that offers AI-powered data products to help businesses

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# AI

streamline their workflows. The company's Hasper GenAI Engine is a purpose-built platform that brings the power of Generative AI and ML technologies to enterprise workflows.

## Beatoven.ai

Based in Bengaluru, Beatoven.ai is an AI-powered music creation platform for video and podcast content creators. The company uses advanced AI music generation techniques to create unique mood-based music. Beatoven.ai has been picked up by Google for its India Accelerator Programme.

## Karya

Another one of the top Artificial Intelligence companies in India is Karya. Founded in 2021, this Bengaluru-based startup focuses on creating employment opportunities for rural Indians by using AI. Karya is used by Microsoft for sourcing local speech data for AI products.

## Endimension

Incubated at IIT Bombay, Endimension Technology is a healthcare artificial intelligence startup for medical image analysis. The startup builds AI algorithms to automatically spot abnormalities and diseases from medical scans. This is another AI startup in India which has been picked up by Google for its India Accelerator Programme.

## CoRover

Headquarters in Bengaluru, CoRover is a Conversational and Generating AI platform. The company specialises in AI chatbots to improve operational efficiency and customer experience. Its BharatGPT is a revolutionary innovation which integrates voice modality in more than 14 Indian languages and 22 languages for text modality. This platform is built in collaboration with BHASHNI, a National Language Translation Mission (NLTM) under MeitY.

## Ripplr

Founded in 2019, Ripplr is a Bengaluru-based AI-powered full-stack distribution and logistics services provider. The company's distribution services include Brand Onboarding, Supplier Onboarding, Warehouse Onboarding, and Store Onboarding (Web, Excel Upload, and Salesman App). Its logistics services include Surface Transport, Warehouse Management, Air Freight, Live Tracking, and End-to-End Fleet Management.



Skill development programmes using AI. Image by Freepik

## Krutrim AI

A part of the Ola Group, Krutrim AI is a full-stack AI solution provider. This one of the AI startups in India endeavors to deliver a state-of-the-art AI computing stack that involves the AI computing infrastructure, foundational models, AI Cloud, and AI-driven end applications for the Indian market.

## Conclusion

Artificial intelligence has a pivotal role in driving significant value across industries. As more and more businesses continue to invest in AI research and development, we at Industrial Automation believe that the importance of this cutting-edge technology in shaping the future of the industry will only continue to grow.

## Frequently asked questions about AI in India

### • Is Artificial Intelligence in demand in India?

As India is witnessing rapid technological advancements, AI is at the forefront of this transformation. Companies across industries are increasingly harnessing the potential of AI to improve efficiency, drive innovation, and gain a competitive edge.

### • What are some key government initiatives promoting AI in India?

As India is now prepping for cutting-edge technologies, several initiatives have been undertaken by the government. Some of the Initiatives by MeitY in AI include Centre of Excellence on Gaming, VFX, Computer Vision &

AI at Hyderabad; INDIAai; Project AIRAWAT, and the National Program on Artificial Intelligence.

**Artificial intelligence has a pivotal role in driving significant value across industries**

### • What are the key challenges of AI adoption in India?

It is no wonder AI has the potential for economic growth. However, there are some challenges in its adoption including data security and privacy, lack of AI expertise and investment, dearth of AI infrastructure, and lack of integrity and ethics with AI and ML solutions, among others.

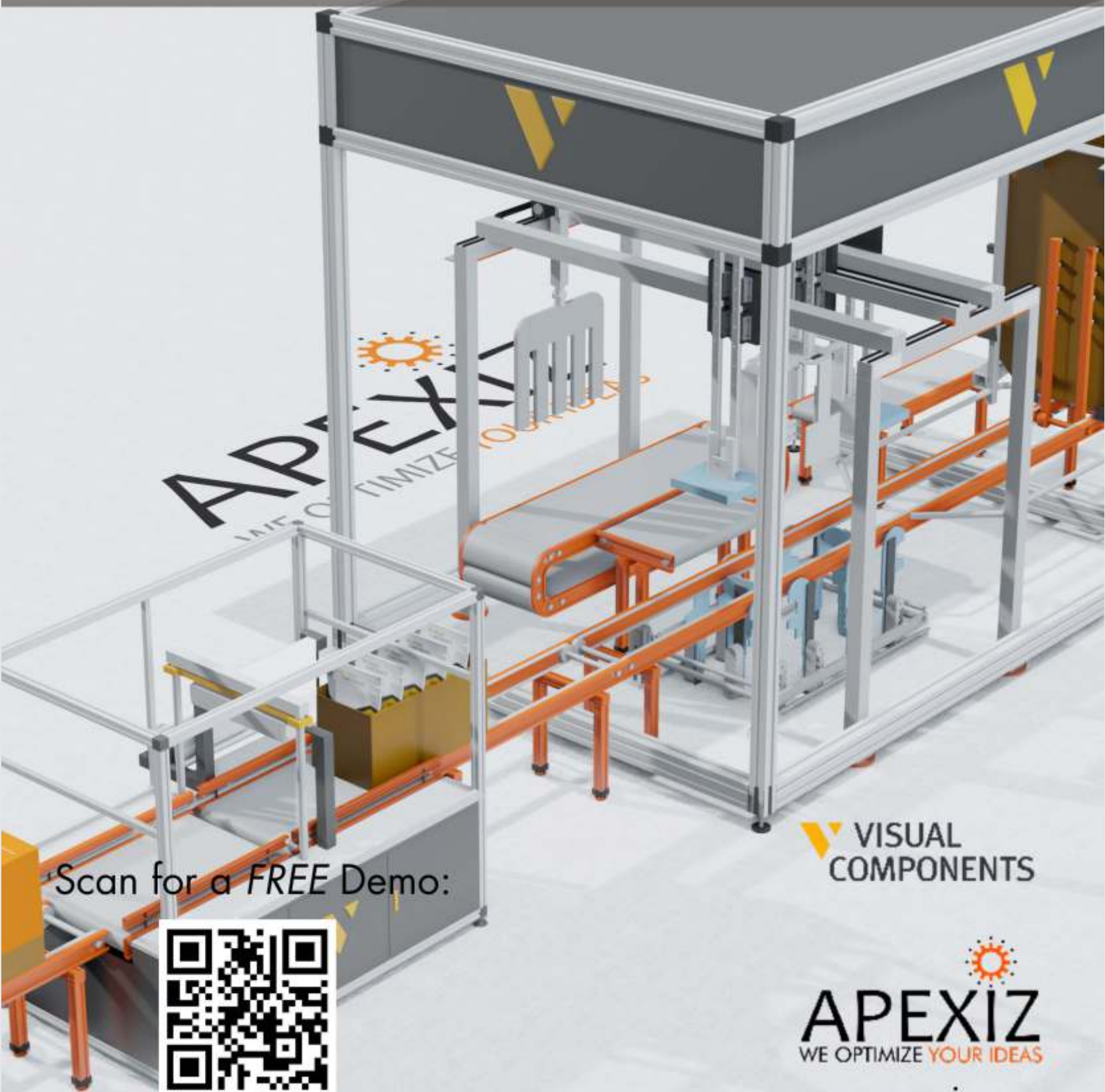
### • What industries do the top AI companies in India specialise in?

The top AI companies in India specialise in a wide range of industries, including healthcare, finance, banking, e-commerce, agriculture, and manufacturing.

### • How is AI contributing to economic growth in India?

AI can contribute significantly to India's economic growth by driving innovation, boosting productivity and efficiency, skill development and creating new job opportunities [A](#)

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## Connected Factory Networks Are the Future of Manufacturing

Adopting digital technologies across distributed manufacturing systems drives powerful efficiency and flexibility gains, writes Keith Chambers, VP, Manufacturing, AVEVA.



**G**lobal manufacturers are battling supply chain headwinds and rampant competition, all the while striving to slash expenses and adopt more sustainable operating practices.

**Digital solutions like Manufacturing Execution Systems (MES) have proven a powerful enabler for manufacturers**

Amid this pressurised backdrop, organisations are addressing the challenge by running multiple plant facilities in various locations – enabling them to respond to local demand and supply chain fluctuations. This type of distributed manufacturing, or multi-site

production, also promotes economies of scale and enables easier access to new markets.

Digital solutions like Manufacturing Execution Systems (MES) have proven a powerful enabler for manufacturers – both before and during the pandemic. From raw materials to finished products, MES software can monitor the entire manufacturing process and oversee manual and automated workflows in real-time. By leveraging these value chain insights, organisations are able to elevate plant efficiency, quality control, waste reduction, cost-efficiency, and sustainability.

Factories have long gleaned competitive gains from MES, such as automated production processes, paperless manufacturing, and data-driven continuous improvements. However, these benefits traditionally tended to be derived from individual, separately-deployed

MES systems, which can be hindered by information silos.

The good news is technologies such as cloud and edge computing now make it possible to centrally host a single MES across multiple plants. Known as ‘enterprise MES’, this approach promotes consistent manufacturing practices by standardising technologies and processes. Enterprise MES enables seamless production reporting, continuous improvement, efficiency measurement, and regulatory compliance enforcement across multiple locations.

The latest MES systems support running application services and data storage in the cloud, as well as remote connections for plant workers and automation systems – yielding powerful value, efficiency, and sustainability gains throughout the plant network.

The concept of Industrial Intelligence as a Service (IIaaS) leverages the cloud to eliminate data silos between information technology, operational technology, and engineering technology, fostering a powerful network effect. This interconnected approach forms the basis of a connected industrial economy, enabling enterprises to share data and analytics insights both internally and externally, collaborate on new opportunities, and address critical industry and environmental challenges.

In the post-pandemic era, a manufacturer's success hinges on its agility and resilience in the face of change. In this context, having a global overview of manufacturing operations offers competitive advantages, unequivocally leading to improved profitability and sustainability outcomes. Multisite MES systems provide the necessary standardisation for consistent visibility and data-driven decision-making in distributed manufacturing operations.

Put simply, making rich and contextualised operational data available from edge to

## Multisite MES systems provide the necessary standardisation for consistent visibility

enterprise can critically enhance business agility and resilience.

What's more, operational best practices can be captured and scaled across all plants, optimising operational efficiency, reducing waste, energy consumption, and carbon emissions, while mitigating quality and consumer safety compliance risks through consistent product genealogy record-keeping and end-to-end material traceability across the plant network.

Consumer goods company Henkel realised just this sort of gain when it built a digital backbone for its laundry and home care production business. The company deployed MES to meet its sustainability and efficiency goals. As a result, it was able to improve supply-chain

resource efficiency on the production side by 5-6% annually.

With such a demonstrable impact on the manufacturing value chain at all levels, the harmonisation of operational technology and data across multi-site manufacturing businesses is essential for gaining competitive advantage and delivering on sustainability goals.



*Keith Chambers, Vice President, Manufacturing, AVEVA, is a business leader with over 20 years' experience in the automation, software and MES business focused on manufacturing operations software in the*

*food and beverage, CPG and life sciences industries. He is responsible for strategic direction, commercialisation and development for AVEVA's operations management portfolio globally.*

## BMW Group partners with Dassault Systèmes to bring 3DEXPERIENCE to its future engineering platform

The strategic partnership will develop BMW Group's future engineering platform with Dassault Systèmes' 3DEXPERIENCE platform at its core.

Dassault Systèmes and BMW Group have embarked on a long-term strategic partnership to develop BMW Group's future engineering platform featuring Dassault Systèmes' 3DEXPERIENCE platform at its core. More than 17,000 employees across multiple engineering disciplines at the premium automobile manufacturer will rely on the 3DEXPERIENCE platform to accelerate the development of all vehicles, from their ideation to their production.

In an industry where quick time to market of sustainable mobility solutions with advanced technology is a competitive differentiator, the partnership between Dassault Systèmes and BMW Group is testimony to the fundamental role of the 3DEXPERIENCE platform in enabling companies to deliver products faster. The platform's virtual twin experiences streamline enterprise-wide collaboration and deliver data-driven approaches to manage the exponential complexity carmakers are

facing in connected, autonomous vehicle engineering.

"We will only optimize our engineering process if we think digital, work connected and rely on an integrated data. For the BMW Group the 3DEXPERIENCE platform will support this approach and help to reach a higher level of quality in our processes," said Julien Hohenstein, Vice President Processes, Digitalization, Governance Idea to Offer at the BMW Group research and development.

With the 3DEXPERIENCE platform at the core of BMW Group's future product development environment, all BMW Group engineering disciplines will be working on a virtual twin of a vehicle that can be configured for the variants of each model with real-time, integrated data. Teams can reuse components more easily, master the complexity of car variability, and improve the engineering to manufacturing cycle time. In addition, BMW Group can seamlessly

migrate data from its existing IT solutions and extend its engineering platform to other disciplines such as modeling and simulation.

The strategic partnership between Dassault Systèmes and BMW Group marks the next phase in their long-term collaboration. For decades, the two companies have pooled their knowledge and know-how to advance technological innovation in areas including production planning and scheduling, part design and production efficiency.

"BMW Group and Dassault Systèmes are technology-driven companies that are entering a new era of shared innovation to deliver best-in-class products," said Laurence Montanari, Vice President, Transportation & Mobility Industry, Dassault Systèmes. "With the 3DEXPERIENCE platform, BMW Group can rethink its engineering development process to deliver the most personalized and sustainable experiences to its customers."

# IIoT in the Chemical Industry Drives Performance

Unlock the full potential of field instrumentation to increase productivity and reduce shutdowns.



Endress+Hauser technologies and expertise unlocks potential for chemical plants.

IIoT in the chemical industry remains an untapped source of competitive edge, despite relentless competitive pressures and stringent safety and compliance regulations. With the right know-how this Industrial Internet of Things (IIoT), an ecosystem of connected devices, can deliver significant efficiency improvements to production processes. From precise data to actionable insights, Endress+Hauser technologies and expertise can unlock this potential for any chemical plant.

47% of automation executives say improving operational efficiency and productivity are the key drivers of IIoT adoption.

(Source: <https://www.morganstanley.com/ideas/industrial-internet-of-things-and-automation-robotics>)

## How we can help

The chemical industry is characterised by intense competition, nevertheless many plant operators are yet to fully explore the benefits hidden in the vast quantities of data produced by their field instrumentation. Comprising

## Edge devices enable connectivity and digitalisation by connecting instruments to the cloud

various IoT applications and algorithms, the Endress+Hauser Netilion ecosystem allows customers to turn field data into actionable insights for efficiency improvements, bypassing the automation pyramid.

- Gain in-depth insights into your installed base and make better data-driven decisions to optimise maintenance, production, operations and supply chain.
- Create digital twins automatically via edge devices with a simple plug-and-play system, no need to touch your DCS.
- Solve unexpected instrumentation errors remotely with your tablet or smartphone.



EuroCloud StarAudit Certificate – for secure, transparent and reliable cloud services.

## Applications

### Connect field instrumentation data to the cloud

Connectivity is the medium through which all information is exchanged and is thus vital for digitalisation. It opens up unparalleled new possibilities for driving performance and safety, and yet can be complex to implement across the installed base.

### Our expertise in the field

Endress+Hauser offers alternative approaches to connectivity, from cabled edge devices to Wi-Fi devices leveraging a SIM card.

- Bridge the gap between the field, your instruments and the Endress+Hauser cloud with the user-friendly and easy-to-install industrial edge device FieldEdge SGC500.
- Connect directly to the Netilion cloud using devices equipped with a SIM card and unlock boundless new possibilities.

### Digitalise instrumentation with ease using the Scannerapp

Taking full advantage of digitalisation services at plant level requires establishing digital twins of all assets, and doing so with installed instrumentation not yet in the digital world can be a significant challenge for plant operators.



## Our expertise in the field

The Endress+Hauser Netilion Scanner App enables digital twins of all installed assets to be created in no time, enabling seamless access to our full suite of Netilion services.

- Download the Netilion Scanner App for free on an iPhone or Android device via the QR code displayed on all Endress+Hauser devices and many third-party products.
- Read out the RFID tag to create a digital twin including photos, tags, GPS coordinates, criticality parameters, serial number and more.

### Combine data for actionable insights with Netilion Analytics

Maintenance managers have a multitude of KPIs to respect including number of suppliers and plant shutdowns. Monitoring and optimising so many KPIs can be a difficult task, particularly in complex chemical plant operations.

#### Our expertise in the field

Combined with digital twins of the installed assets, Endress+Hauser Netilion Analytics enable convenient and accurate monitoring of all KPIs remotely and in real time, as well as the extraction of valuable insights for process improvements.

- Gain full transparency on the number of assets, manufacturers, obsolete devices and possible successors
- Analyse and monitor digital twins both automatically and continuously
- Generate live reports including concise analysis of your installed base
- Test Netilion Analytics for free

### Solve errors rapidly with Netilion Health

When an unexpected error occurs, rapid action is vital to prevent costly downtime. Time can be lost searching through technical documentation for appropriate solutions.

#### Our expertise in the field

Netilion Health is a digital service that not only identifies and signals errors but also gives instructions on how to solve them.

- Access Netilion Health with the Field Xpert SMT70 tablet.



- Solve errors remotely, avoiding direct field interventions.
- Leverage Netilion health safely in the field and hazardous areas (Ex zone 2).
- Test Netilion Health for free.

### Data security you can rely on

Such is the competitive nature of the chemical industry; data security is a prime concern for plant operators leveraging IIoT.

#### Our expertise in the field

The Endress+Hauser IIoT offering is certified end to end for maximum data security. From the edge device to the customer data in the cloud, only leading safety mechanisms are employed:

- Encrypt your data with long key codes (HTTPS / TLS with SHA-256).
- Cooperate with certified data centers (e.g. ISO 27001).
- Rely on certification from an independent authority, licensed by "EuroCloud" with a 4-star rating.

## Find out how we can support your digitalisation

We help customers get more insights into their key business processes via a set of services that translate data into valuable information. Together, they build our Netilion IIoT ecosystem.

- Our Netilion ecosystem offers various Industrial IoT applications for the chemical industry.

- The cloud-based IIoT ecosystem Netilion is also open to devices and clouds from third parties.
- Our IIoT ecosystem is in line with the Namur Open Architecture (NOA).

**Netilion Analytics is a digital service allowing real-time management of all plant assets**

## Benefits

Downtime and unplanned maintenance are common issues in the chemical industry. IIoT and big data are offering exciting new possibilities to tackle these issues. Endress+Hauser has developed the concept and the tools to help our chemical customers start digitalising their plants in a safe and simple way. With us as a long-term partner at your side, you can embrace the Industrial Internet of Things and start optimising your manufacturing processes and driving worker productivity.

- 30% of assets installed in plants are obsolete and this leads to unplanned shutdowns.
- 25,000 health conditions available for you.
- 0 hours of programming effort in the DCS/PLC thanks to automated update of replaced devices.

## Precision Perfected: Inside Bronkhorst's Calibration Centre

Ensuring trustworthy measurements in the digital process industries.



Loop calibration system that allows real gas calibration for high flows of gas, e.g., Hydrogen or Helium

In the realm of digital process industries, where precision and reliability are paramount, the importance of accurate measurements cannot be overstated. Every step of a process, whether in fuel stations or pharmaceutical laboratories, hinges on trustworthy data. This is where accreditation plays a crucial role, ensuring that organisations meet the highest standards of technical competence and reliability.

The scope of services offered by BCC (Bronkhorst Calibration Centre) is both diverse and comprehensive. Acting as both an in-house lab for Bronkhorst's internal needs and an external calibration hub for various industries, BCC leaves no stone unturned in its pursuit of excellence. Additionally, Bronkhorst extends its commitment to precision globally, with a state-of-the-art service facility located at its subsidiary, Bronkhorst India. This facility mirrors the standards of excellence upheld at BCC, providing top-notch calibration services to clients in the region.

### Why calibration matters

Flow meters, integral to countless processes, undergo calibration as a final step in production. This meticulous process compares instrument parameters with fixed references

under specific environmental conditions, ensuring accurate flow measurements. In industries like pharmaceuticals, (petro) chemical, food & beverage, and energy, where precision is non-negotiable, calibration serves as a cornerstone of risk management, providing assurance to process owners and regulators alike.

### The role of accreditation

Bronkhorst's Calibration Centre serves a dual purpose: maintaining calibration standards for internal use and offering external ISO/IEC 17025 calibrations to customers and service stations worldwide. This accreditation, recognised internationally, signifies the highest level of calibration security available, making it indispensable for industries where accuracy is paramount.

### Unparalleled precision

To uphold our commitment to precision, the BCC operates under stringent conditions. The environment is meticulously controlled, with temperature maintained at  $21^{\circ}\text{C} \pm 2^{\circ}\text{C}$  and humidity at  $50 \pm 20\%$ . Strict protocols ensure minimal interference, with non-authorised personnel barred from entering the calibration centre.

### The calibration process

Every calibration undergoes rigorous scrutiny. Before commencement, a leakage test ensures quality assurance. Standard calibrations are conducted across multiple measurement points to ascertain instrument accuracy. Upon successful calibration, instruments are labeled with calibration details for traceability, with all data meticulously documented and reviewed.

### Training and safety

Our calibration operators are extensively trained to perform gas, pressure, and liquid calibrations to ISO/IEC17025 standards. Safety is paramount, with regular checks and close monitoring of all activities to mitigate risks associated with human error.

**The scope of services offered by BCC (Bronkhorst Calibration Centre) is both diverse and comprehensive**

### The intrigue of calibration work

What sets apart calibration work is its dynamic nature. Each day presents unique challenges and opportunities to contribute to our customers' success. Knowing that our precision plays a vital role in their processes adds an extra layer of satisfaction to our work.

### Onsite calibrations

For clients requiring calibration services at their facilities, Bronkhorst India offers comprehensive onsite calibration solutions. Our expert technicians bring precision directly to your doorstep, ensuring minimal disruption to your operations while upholding the highest standards of accuracy and reliability. With our onsite calibration services, you can trust Bronkhorst to optimise your instruments' performance wherever you are.

In conclusion, Bronkhorst's Calibration Centre

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across Europe and the rest of the world, whereby local expertise and service is offered.

For more information on Bronkhorst products and solutions, please email or call: [sales@bronkhorst.in](mailto:sales@bronkhorst.in) / +91 8956 79 4004

<https://www.bronkhorst.com>

## New Dassault Systèmes virtual twin experience helps protect vulnerable patients

Dassault Systèmes has announced its collaboration with the Saint-Louis Hospital AP-HP in Paris on an airflow simulation and augmented reality experience to better understand the respiratory transmission of viruses and optimise patient care.

Dassault Systèmes created a unique learning experience featuring a virtual twin of the hospital's dialysis unit – an open space where 50 people receive dialysis each week – that enabled physicians and nurses to see exactly how virus particles could circulate through the air, and understand the roles of ventilation and masks, for example, in optimising the care of immuno-compromised patients.

To create this virtual twin, Dassault Systèmes worked with building blueprints, coupled with a 3D scan of the room made on site using its HomeByMe mobile application to check for any discrepancies. It then used its SIMULIA applications powered by its 3DEXPERIENCE platform to visualise, simulate and predict the transmission of respiratory and viral particles based on different scenarios involving



ventilation, the locations of medical equipment and patients in the space, mask-wearing, breathing and airflow rates. Equipped with this information, Dassault Systèmes developed the augmented reality experience enabling the stakeholders to view the virtual simulations within the real-life setting.

“Dassault Systèmes had already worked on projects at other hospitals in Paris and understood our mission to offer the highest level of care. Its solutions allowed us to visualise the production of respiratory particles, follow their trajectory, and see how they could spread from

patient to patient,” said Dr Guillaume Mellon, Attending Physician, Head of Infection Prevention and Control team, Saint-Louis Hospital AP-HP. “This incredibly innovative educational experience made our health professionals more aware of respiratory cross-transmission risks in the hospital. The entire experience exceeded my expectations.”

“Virtual twins are poised to transform daily patient care and infection prevention in the coming years,” said Claire Biot, Vice President, Life Sciences and Healthcare Industry, Dassault Systèmes. “We’ve already completed projects with a number of major hospitals that successfully demonstrated how our virtual twin technology can help identify and optimise safety measures. Our long-standing partnership with Saint-Louis Hospital AP-HP allows them to access these technologies without having to invest in them upfront or develop new IT capabilities in house. It also boosts the hospital as a leading health provider and encourages broader transformation across the sector to enhance patient outcomes.”

## 'Make in India' Initiative: Accelerating Automation in Manufacturing

How this government-led program is driving the adoption of automation technologies in the manufacturing sector.

The manufacturing sector in India is one of the industries that contributes a lot to the country's GDP. It accounts for around 17% of India's GDP. The industry has emerged as one of the high-growth sectors in the country. Many reports suggest that India can export goods worth US\$1 trillion by 2030 and become a major global manufacturing hub. But how would it be possible? What role does the 'Make in India' initiative play towards making the country a manufacturing hub?

In this article, we will explore the influence of the 'Make in India' initiative on the adoption of automation technologies in the manufacturing sector. How it is going to enhance production capabilities and global competitiveness. So let's get started.

### 'Make in India' Initiative and Its Impact

The Government of India has taken various policy initiatives to improve the country's economic situation, and 'Make in India' is one such initiative. Launched in September 2014, the objective of the initiative is to facilitate investment, encourage innovation, develop best-in-class infrastructure, and make India a hub for manufacturing, design and innovation.

Since its launch, the 'Make in India' initiative has made significant achievements. Currently, it focuses on 27 sectors implemented across various ministries and departments, central government and state governments.

One of the benefits of the 'Make in India' initiative is that it will create jobs in the country to meet the rising demand for employees in the manufacturing sector. The influence of the initiative can be seen in the electronics, defence



The growing adoption of automation technologies. Image by jcomp on Freepik

sub-assemblies and manufacturing of intermediaries for pharmaceutical domains.

Other impacts of the 'Make in India' initiative include:

- A decrease in the unemployment rate that will affect the government, as fewer unemployment benefits will be given out than earlier.
- The GDP has increased by 7.2% in 2017-18.

Reports claim that India has an immense opportunity to boost its share of global manufacturing exports. The government is seeking to raise manufacturing to 25% of GDP from 17.7% by 2025.

### Investments to influence adoption of automation technologies in manufacturing

It has to be said that accelerated investments can significantly aid India's global

manufacturing hub ambitions as it attracts investors from across the globe. As per a report from PIB, the year 2021-22 recorded the highest-ever FDI at US\$83.6 billion. This FDI has come from 101 countries and invested across 31 UTs and States and 57 sectors in the country.

**Since its launch, the 'Make in India' initiative has made significant achievements**

### 'Make in India' initiative in manufacturing sector

The 'Make in India' initiative has been launched to foster the country as a global manufacturing hub by encouraging both domestic and foreign companies to manufacture their products in the country. The initiative has contributed a lot to

# Manufacturing

influencing the adoption of automation technologies in the manufacturing sector. Let us have a look at some ways how the initiative has created an impact.

**Enhanced Competitiveness:** The 'Make in India' programme emphasises the need for increased competitiveness in manufacturing. It has sparked competition among companies to leverage automation technologies. Automation technologies, from robotics to advanced manufacturing processes, can help improve a company's efficiency, lower production costs, and enhance overall competitiveness.

**Productivity Improvement:** Automation technologies play a vital role in boosting productivity by streamlining manufacturing processes and minimising manual intervention. Many businesses in India nowadays have aligned their processes with the 'Make in India' goal of creating a more efficient and productive manufacturing ecosystem.

**Global Standards:** The 'Make in India' initiative has attracted foreign direct investment (FDI) and encouraged multinational companies to set up their manufacturing units in India. It is essential to adhere to global quality and efficiency standards.

**Upskilling and Workforce Development:** The initiative recognises the importance of upskilling the workforce to meet the demands of modern manufacturing. Automation technologies require a skilled workforce to operate and maintain them, leading to an increased emphasis on training programs and skill development initiatives.

**Technology Transfer:** The 'Make in India' initiative encourages technology transfer and collaboration between national and international companies. As part of this collaboration, the adoption of automation technologies may be facilitated through the transfer of knowledge and expertise from global players to domestic manufacturers.

**Focus on Key Sectors:** The 'Make in India' campaign identifies key sectors for development, including electronics, automotive, aerospace, and defense. These sectors usually involve complex manufacturing processes where automation can have a significant impact on efficiency and quality.

**Incentives and Policy Support:** The government has introduced various incentives and policy



Creating conducive environment to adopt automation. Image by Lifestylememory on Freepik

support measures to encourage the adoption of automation technologies among manufacturers in the country. These include tax benefits, subsidies, and regulatory reforms aimed at facilitating a smoother transition towards automated manufacturing.

Since small and medium manufacturing enterprises in India have been the backbone of the country's economy over the past few years, the 'Make in India' initiative provides a conducive environment for them to adopt automation technologies.

**Industry experts suggest that India can lead the manufacturing sector in the coming years**

Simultaneously, the success of the 'Make in India' initiative lies in the adoption of technology. Harnessing the potential of technology could enhance the efficiency, quality, and cost-effectiveness of manufacturing, making it an attractive destination for foreign investors. Additionally, this would lead to numerous job creations, contributing to making India a manufacturing hub.

## The way ahead

In recent years, we have seen how India and the

manufacturing sector in the country have gained tremendous growth despite a worldwide slowdown (caused by the COVID-19 pandemic). In this scenario, initiatives like 'Make in India' can act as a pivotal catalyst in accomplishing the vision of making India a global manufacturing hub.

Industry experts suggest that India can lead the manufacturing sector in the coming years and it is going to be very fast. According to the Colliers report, the country's manufacturing market is set to reach US\$1 trillion by 2025-26, led by Gujarat followed by Maharashtra and Tamil Nadu.

With a strategic investment in automation technology, Industrial Automation Magazine believes that manufacturers can enhance the quality, efficiency, and cost-effectiveness of the manufacturing sector.

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# 3DExperience World 2024: Design Meets Generative AI

This year marked the 25th Anniversary of the event that was launched in 1999 as the SolidWorks World. Milton D'Silva reports.



Gian Paolo Bassi, SVP, 3DExperience Works.

The venue was the humongous Kay Bailey Hutchison Convention Centre in downtown Dallas in Texas, USA. The occasion was the annual 3DExperience World 2024 – the premier annual event that celebrates imaginations, innovations and communities shaping the future of design and manufacturing. Keeping with the tradition, Gian Paolo Bassi, Senior Vice President, 3DEXPERIENCE Works, made a dramatic entry driving the iconic Shelby Cobra Roadster, but in a 100% electric version powered by a Tesla-based, 600 HP Performance Drive Unit capable of zipping from 0-60 mph in just 2.3 seconds! The car, retrofitted by Denton, Texas based E-Muscle Cars, has obviously made use of the 3DExperience platform and its various software offerings to design and validate the electric drivetrain and accessories while leaving the outer body and look of the classic car unchanged. “This is an amazing community, the strongest, one of the strongest

communities in the world. And we have been together for a very long time. In fact, this is the 25th anniversary of the event, so we will reflect a little on the past 25 years, but more interestingly, we'll work together to imagine what the next 25 years will look like,” said Bassi before he invited Bernard Charlès, Executive Chairman, Dassault Systèmes on the stage.

**For Dassault Systèmes, the harnessing of AI for design had started 10 years ago**

Bernard Charlès, who had already passed the baton to Pascal Daloz, as the new CEO of Dassault Systèmes, informed the audience that his successor was unable to attend the event

this year due to personal reasons, but expressed full confidence in his ability to lead the company, having worked with him for the last 24 years, describing him as the ‘right man at the right place for the next 25 years’. Bernard recalled the time when Dassault Systèmes acquired the startup, SolidWorks, in 1997 and how it has built a wonderful global leadership in design excellence since then. “We have unflattened the world together, making 3D available for more people around the globe. We have introduced the idea of the platform. We have moved the power of SolidWorks, to take advantage of the cloud. And this is going on with an extraordinary speed now. Now, the question is, what are we going to do with the big elephant called AI, and how is it going to play in the new world of design,” he asked.

Next, Bernard Charlès explained how the life cycle is going from product life cycle to resources life cycle as one day the world will





Bernard Charlès, Executive Chairman, Dassault Systèmes.

have to design things from waste. It is here that generative AI will help design and optimise through Magic SolidWorks, combining the power of modelling and simulation or MODSIM, e.g., design the handle bar of an electric bike based on a Picasso art! For Dassault Systèmes, the harnessing of AI for design had started 10 years ago for a confidential defence programme to use generative design, and we are now at the third generation of the AI engine to integrate it in the platform. “So the 3DExperience platform, powering Magic SolidWorks, is going to provide through all applications new types of AI-based interfaces to create and optimise and evaluate different design alternatives by the end of the year,” Bernard announced.

Manish Kumar, CEO of SolidWorks was the next speaker and he started by quoting a leadership mantra from Aviation and Automobile Hall of Famer, Alain Mullally – PGA – Profitable Growth for All, creating value for all the stakeholders, which is what exactly this forum has been doing for the last 25 years. Working together, changing lives. Manish also cited the example of SolidWorks Visualize leader Bastian Krueckeberg whose love for sports was hampered by his Type 1 diabetes, but then how a wearable continuous glucose monitoring device enabled him to participate in the Boston half marathon. The device is a marvel of functional design of a high precision, a result of someone challenging the status quo to



Suchit Jain, VP, Strategy & Business Development, Dassault Systèmes, with Kevin Huang.

deliver an experience of a wearable device; to create a precise virtual twin and run scientific simulations, and test the robustness and performance of this experience.

“This is essentially our vision. Working together, connected by a unifying force called 3DExperience platform, bringing together all the different brands of Dassault Systèmes. Because we want you to focus on making the world a better place by delivering life-changing experiences. And keeping your evolving needs in mind, in my simplistic view, SolidWorks has only two flavours as of today – we come with the platform, or we come on the platform. It is the

**Dr Johnson, who grew up in Alabama in the midst of the Civil Rights Movement, is a highly decorated African American scientist**

same SolidWorks that you know, love and have been using for the last 25-30 years, but it now comes with the platform. It gives you an option to take your collaborative design needs into your control, to the next level,” said Manish, who then made the first big announcement of the day – Dassault Systèmes has extended the ongoing strategic partnership with Cadence Design Systems Inc., by integrating the AI-driven Cadence® OrCAD® X and Allegro® X with Dassault Systèmes’ 3DExperience Works Portfolio, for SolidWorks existing and future customers. This enables best-in-class

collaboration for continuous development across PCB, 3D mechanical design and simulation. The significance of this is, due to trends like increasing electrification, there is an exponential demand for connected electromechanical devices. “We want to democratise electromechanical design, and I am pleased to announce 3D Mechatronics creator to further unify the experience development on the platform. With this tool, you can work with smart off-the-shelf components and create electromechanical products with the ease that is the trademark of the SolidWorks brand,” explained Manish.

Suchit Jain, VP, Strategy & Business Development, Dassault Systèmes provided a perspective of the scale and size of the vibrant community that forms the 3DExperience World – over 7.5 million designers, engineers, students and entrepreneurs standing at the forefront of innovation. “Your creations have the power to change the world for the better and with SolidWorks and the 3DExperience platform you are equipped to do so,” said Suchit who then presented a couple of examples from the SolidWorks for Startups programme. The first of these is Dbox – a game changer in drone automation.

“We have created a network of Dboxes that are scattered around cities on rooftops. Each of these boxes can automatically send drones for a mission and that is achieved by implementing three key points – firstly the pilot does not have to be on site anymore and the whole network of drones can be controlled from anywhere in the



Dr Lonnie Johnson, Founder and Chairman of the Board, Johnson Energy Storage, Inc.

world using Internet connection. Secondly the Dbox is like a garage with a drone – protected from harsh environments like rain and snow and also control the temperature inside so that batteries are happy; and finally a fully autonomous robotic arm swaps the batteries and charges them autonomously,” explained Linas Gelazankas, the creator of Dbox.

The other example was an award-winning AI stroller designed and developed by Kevin Huang, co-founder and CEO of Glükkind, a Canadian startup. Their mission is to ensure parents and their little ones can explore and navigate the world safely and comfortably. “The idea for Glükkind came from our personal experiences as my co-founder and I became parents ourselves. When we had our first daughter, we found the challenges we observed in the parenting space were echoed in the parenting community, which made us wonder what if the baby stroller, an essential parenting gear, could be a bit better, a co-pilot, if you will,” asked Kevin. The result is Ella, a stroller which features automatic ‘rock my baby’ as well as a push and brake assist for hands-free strolling.

The keynote, delivered by Dr Lonnie Johnson, Founder and Chairman of the Board, Johnson Energy Storage Inc., was inspiring to say the

least. A bonafide rocket scientist and prolific inventor with over 150 patents under his belt and more in the works, Dr Johnson, who grew up in Alabama in the midst of the Civil Rights Movement, is a highly decorated African American scientist inducted into several Halls of Fame, having worked with NASA and the USAF on highly sensitive projects. Today, Dr Johnson is known for the Johnson Thermo-Electrochemical Converter (JTEC) that reduces the amount of waste heat from 69% to 40%; and proprietary solid-state battery that doubles the drive time of today’s lithium batteries, from 300 to 600 miles.

## Highlights of the Playground

The most exciting place to be at between sessions at the World event is the 3DExperience Playground where many cutting edge developments are showcased. From ultra high powered workstations to cutting edge CAM software and an assortment of race cars and movie inspired robots and monster machines brought to life, the Playground is the place bustling with makers, hobbyists and entrepreneurs. There was Christain Bagg of Bowhead, the designer of mountain bikes and wheelchairs. Paralyzed waist down after an accident in 1996, Bagg was showcasing the Bowhead RX, an e-bike engineered to suit a person’s level of mobility and specific needs.

The Playground also had two exciting innovations from India, the Qargos scooter and the Tigoona trike. An excellent example of how purpose shapes engineering, the electric F9

### An excellent example of how purpose shapes engineering, the electric F9 Cargo Scooter by Pune-based startup Qargos

Cargo Scooter by Pune-based startup Qargos is a compact logistics vehicle (CLV) intended to fill up the gap between the average two-wheeler that is often used for carrying loads, and the smallest commercial 3- or 4-wheelers used for last mile cargo delivery.

According to Alok Das, the passionate co-founder of Qargos, five years ago, the company embarked on a mission to revolutionise cargo transportation, identifying a missing segment for transporting cargo weighing between 20 kg to 120 kg and up to 225 litres in volume, which




The Qargos F9 would be the first electric cargo vehicle.



Abhijit Bansod and the frugal innovation, Tigoona.

led to the conception of the Qargos F9, catering to unique logistical needs to fill the gap mentioned above. The modular design allows for customisation, including refrigeration options for specific cargo needs. The vehicle is equipped with IoT technology with integrated AI/ML models for advanced fleet management. The company believes the potential market that exists in this space is in excess of USD 5 bn and the Qargos F9 would be the first electric cargo vehicle tailored for this niche.

The Tigoona is an example of frugal innovation by designer Abhijit Bansod, a sustainable urban solution for last mile delivery. For over 40 years Abhijit had been looking at the coconut man dragging the load on the streets – on bicycles or handcarts – and it just started as an expression, ‘let me make one prototype for him and see how his life changes with that’. It is not just the tender coconut seller quenching the thirst of people – it is the story of every vendor on the street, and not just men. Women are out there in significant numbers, and everyone faces the same problem. The pedal-assist Tigoona is a result of that concern translated into a working model, ready for production. 

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# 'SolidWorks is a mainstream solution where we try to cater to the needs of everyone'

Manish Kumar, CEO, SolidWorks, in conversation with Milton D'Silva, Associate Editor, Industrial Automation.



Manish Kumar, CEO, SolidWorks

## What happens when you launch new versions of SolidWorks every year? So how do the customers manage with the previous versions?

Very good question! If you look at the software world, almost everyone is going from a yearly

release cycle to a constant release cycle. Whether it is Microsoft, you no longer get Microsoft Office version 10 or 11...it's a constant update kind of thing. So if you think of it, everyone is moving away from major releases to keep everyone up to date. Now the beauty of that is that everyone will be able to use all the latest features and functionalities. The CAD

user base has been very traditional and one that I would say grew almost with Windows kind of mindset, where people are stuck from one major release to the next. To me that is a problem because what we want is for everyone to be on the latest release all the time, so you never have to worry about any compatibility issues and so on. So we are trying to encourage our users to keep on updating.

Now, knowing that there are people who are stuck in an enterprise kind of environment where they cannot keep on updating their software all the time, we are giving them a new functionality, a new feature which was implemented in 2024 where our users will be able to save their data on up to two previous versions of SolidWorks. So if you are on SolidWorks 2024, you will be able to save your SolidWorks 2024 model with the features on SolidWorks 2023 or SolidWorks 2022. So we did this in order to serve that particular need and the reason why we did it is because even in companies where they have a large installation, if part of the company wants to go ahead to the latest version now they can go because they do not really have to worry whether it will be backward compatible.

## So how does the costing work when a new version is released, especially with companies where not all workstations upgrade to the new version?

At the bug stage and all there is no cost implication. When you are upgrading there is a cost of upgrade right? Do you charge them for the new version when you launch? No. If they are subscription paid customers they get the same. Yes, everyone gets all the upgrades, there is no separate cost involved when you upgrade to the 2024 version. It is purely a mindset because if you go around you will find a lot of companies which are still stuck with Windows 9, even though Windows 10 and Windows 11 was free. Why? This does not happen with Apple because when they release

a new product they do not give you an option of remaining stuck on the previous version.

### **In your presentation there was a reference to Alan Mullally and the Boeing 777. What was that story?**

It is a very interesting story. Alan Mullally was the chief engineer at Boeing in charge of the 777 around 1989. And Boeing 777 was the first plane that was designed totally in a digital environment. Later he joined Ford as the CEO at a time when the automaker was not making money and revamped the company to a point where in 2009 when all the other US automobile companies were going bankrupt, Ford was the only one still in profit. So this guy was a visionary, a revolutionary. And Dassault Systèmes played a role in both these developments. When Bernard Charlès, now Executive Chairman of Dassault Systèmes but at that time President of Strategy and R&D, and Alan Mullally were collaborating, everyone else was going to Boeing with a vision of making larger assemblies. Bernard's pitch was that 'I am going to give you a digital twin of your plane. I'll deliver it whether it is design, simulation, or manufacturing. And if you ask me how he convinced Alan Mullally, it was this way. Nobody believed it was possible, because it was not done before. And in fact, Bernard was very clear with him that you know, it can be done; that it has not been done, doesn't mean that it cannot be done. It can be done. I have worked with a lot of CEOs, even internally in Dassault Systèmes and outside, but the way I see Bernard is that he defines his own sphere where he wants to work in. And then he makes that a reality. So this is the genius of him.

### **What is the average time frame, the call reduction of the product life cycle development cycle, which SolidWorks enables?**

Oh, it's huge. As a ballpark figure, percentage wise, it reduces it by one third or half. I don't think I can make that claim, because it depends on where the company is, and where it wants to go. But I would tell you that the reason why a digital twin is important is because if you want to manufacture something, anything for that money, not just a device. If you create a virtual twin, you will be able to see it, you'll be able to simulate it, you'll be able to in fact, even run the manufacturing simulations on it to make sure that your tools will not break while you're trying to make it and so on. So you will not create a

single prototype and you might be able to build the final thing. In fact, Boeing 777 is the perfect example. Because there was literally a virtual twin which was built and that became the plane without creating prototypes. So it was the first time, right? Yes. And this is the power of the whole CAD and simulation modeling and simulation where now AI is going to be, it's going to bring even more power.

### **Coming to the trending topic, we all know that AI/ML is not exactly new, so what is generative AI now bringing to the table?**

If you look at SolidWorks or the entire Dassault Systèmes for that matter, the amount of data that we have created is huge – I shouldn't say we have created; our customers have created the data. So the first step is how do you consolidate that data in order to extract? Today, the reality is that this data is dispersed all over a given company, scattered everywhere. So our first step is that on our platform, companies now are able to consolidate their data, and we are building AI models with which we'll be able to extract the learning. So we will be able to learn from that data. And once we learn from the data, then only we'll be able to create artificial intelligence where we can give you deeper insights into things that you will not be able to gain otherwise. So far, these things have been happening. There's nothing new in that.

Now what will be the generation leap with generative AI? If I take the example of a bike, knowing how to construct a bike is nothing new. A company which has been generating bikes, they know how to do it. To know that there are multiple variations of bikes that I can possibly create, that is new. So generative data is going to give you multiple options or even deeper insights into things that you might not have thought about! And this is where you as a designer will start to think about creating a holistic environment for your design.


### **Coming to the 3DEXperience Platform, how will SolidWorks integrate with it – as you mentioned, with the platform, on the platform?**

Solidworks, our 30-year old product, is essentially in a silo today. Now, every version, every new license that we give to our users, we give that with a license of the 3DEXperience platform. We give users an option; whether they

want to use the platform or not, it's entirely up to them. Now, you don't really have an option because if it is running in the browser, the data has to go by default to the platform. And that's why I tried to differentiate that there is 'with the platform, on the platform'. Now with the platform, you continue to work the way you have always worked, or you start to leverage the new paradigm. It's up to the company. I would say it's a matter of when, not if, as everyone will have to go there eventually, because if you are not, you are going to start to suffer, whether it is due to security, whether it is due to cost that you are going to incur on your own. So ultimately, people will have to. When that happens, it is the entire Dassault Systèmes bouquet of products – all verticals accessible to them at the same cost. You can use any other product from Dassault Systèmes, you'll just have to buy the product; don't have to buy the platform again. So the platform is a one-time investment. So whether you are using advanced simulation, advanced manufacturing, whatever, it will all plug in beautifully.

**If you look at the software world, almost everyone is going from a yearly release cycle to a constant release cycle**

### **What about the process industries or the clean energy initiatives like the emerging hydrogen ecosystem?**

One of the 12 leading brands of Dassault Systèmes is Geovia, which caters to the mining industry among others, so there is a lot of processing of everything right from materials, transportation, etc., that needs planning and simulation. As for the hydrogen ecosystem, most of the hydrogen charging stations and hydrogen storage units that are being constructed are using SolidWorks, and they're not just using SolidWorks, rather they are using our simulation products as well, whether it is SolidWorks simulation or Simulia. They are using simulation in order to minimise the risk of what is essentially a highly volatile element. Now if you ask me, did we create something unique for hydrogen? We did not. But our existing tools are quite capable of simulating; satisfy those needs that most of these new tech companies. So SolidWorks is a mainstream solution where we try to cater to the needs of everyone. 

## Digitalisation and Connectivity for Tyre Factory Transformations

How industrial wireless communication solutions realise digitalisation and connectivity for tyre factory transformations.

Automating factory processes starts with digitalising and connecting production line equipment for managing overall equipment effectiveness (OEE), energy consumption, and product quality improvements. A lack of digitalisation hinders data collection and analysis for extracting actionable insights. When relying on manual production line inspections, factory managers are typically notified of abnormalities and interruptions after the fact. This leads to substantial waste from defective products, extended equipment downtime, and operational bottlenecks that impact productivity.

In tyre manufacturing, controlling temperature, humidity, and flow before mixing material formulas are key factors affecting tyre quality. The tyre production process also generally combines two main types of manufacturing. The first is continuous/batch manufacturing, where the ingredients and chemical properties differ for each batch. Thus, data visualisation is necessary to control process-based production. The other type is discrete manufacturing, which involves a single component and minimal variation, but requires digitalisation of the entire manufacturing process.

**A lack of digitalisation hinders data collection and analysis for extracting actionable insights**

However, for tyre manufacturers with traditional factories full of legacy infrastructure, upgrading off-line equipment is difficult because of non-stop production demands. Accordingly, machine operators still rely on paper records for documenting errors and on-site engineers still monitor equipment operations manually. This approach is time consuming and prone to errors, in addition to generating high personnel resource and maintenance costs.



*Traditional tyre factories are full of legacy infrastructure.*

### System requirements

To improve the efficiency of on-site management, equipment and environment data must be digitalised for real-time visualisation and process integration. For managing operational technology (OT), comprehensive data of energy consumption and transformer operations must be collected to effectively improve production efficiency.

The automobile tyre manufacturer needed solutions for remote sensing of key processes, parameter thresholds, equipment status, as well as environmental temperature and humidity data. However, the manufacturer's production line comprised mainly offline equipment installed at considerable distances from each other, making it impractical to install network cables for connectivity. Instead, the production processes relied on manual paper-based inspections and record-keeping, which is difficult to track and manage.

To address these issues, the manufacturer wanted a solution that could be deployed without disrupting operations or requiring additional wiring. Ideally, they wanted wireless

I/O modules that could be integrated with existing equipment for data acquisition and transmissions. To upgrade the factory within budget, the solution also needed to be cost effective and easy to install for remote smart factory data monitoring and analysis.

### Project Implementation

- WISE-4220-S231: 2.4G Wi-Fi IoT Wireless Module with Temperature & Humidity Sensor
- WISE-4220 + WISE-S214: 2.4G Wi-Fi IoT Wireless Modular I/O + 4AI/4DI Wireless Modular I/O
- WISE-4051: 8DI 2.4G Wi-Fi IoT Wireless I/O with 1RS-485
- WISE-4060: 4DI/4Relay 2.4G Wi-Fi IoT Wireless I/O

### System description

For this project, Advantech's WISE-4220-S231, WISE-4220 + WISE-S214, and WISE-4051 wireless I/O modules were deployed as the data acquisition layer and a WISE-4060-B module was used as an alarm provider.

WISE-4220 is a wireless module that can be matched with different I/O boards, while WISE-4060 supports relay output. The upper-level monitoring system is used to set various alarm value thresholds. When these thresholds are reached, the system sends alarm signals to the alarm device through WISE-4060 to facilitate immediate on-site management. Data is transferred to the MES/SCADA system via Modbus and then transmitted to the private server/cloud using the MQTT protocol.

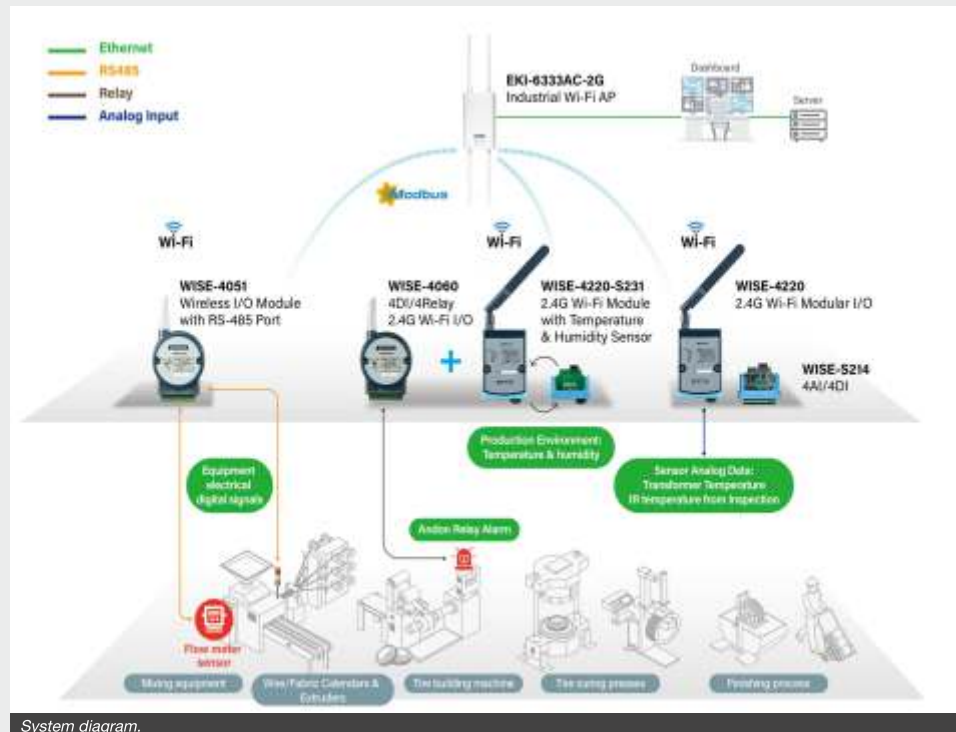
WISE-4220-S231 is a wireless data acquisition module that combines WISE-4220 with a temperature and humidity sensing chip module to convert local sensing data into intelligence for remote applications using the Modbus TCP protocol. The tyre manufacturer chose WISE-S214 because most sensors do not support RS-485 + Modbus and only transmit analog voltage signals. However, the WISE-4051 module can obtain Modbus RTU-supported, RS-485 interface, flow sensor data from mixing equipment directly. This allows the signals collected through the I/O on the lower board to be transmitted using the Modbus protocol to the upper server for integration with the management platform.

## Benefits

The automobile tyre manufacturer succeeded in implementing a remote monitoring system that enabled them to reduce energy consumption, optimise system availability, and improve the quality of tyre products. The first step involved collecting production line data for remote visualisation and machine operations monitoring. In the second stage, environmental and energy consumption data were leveraged to optimise workplace safety and energy efficiency. For the third and final stage, an alarm solution was established for managing process abnormalities in real time.

Advantech's WISE series of wireless communication modules offer multiple I/O and plug-and-play functionality for flexible deployment in both indoor and outdoor environments. These modules can be employed for networking legacy equipment and conducting comprehensive remote monitoring of all infrastructure, including monitoring of production/storage environments, facility energy consumption and efficiency, and manufacturing process parameters.

Because of the successful realisation of



System diagram.

comprehensive equipment networking and remote operations monitoring, the tyre manufacturer decided to extend Advantech's solution to its other R&D centers and



production facilities, including four factories in China. By offering extensive support for diverse PLCs, Advantech's wireless communication modules eliminate complex construction and cabling efforts, allowing manufacturers to quickly upgrade their factory capabilities while saving installation time and cost.

## Why Advantech

Advantech provides an extensive portfolio of mature, industrial-grade products that can be easily configured to deliver breakthrough solutions. For manufacturing automation applications, Advantech offers comprehensive networking infrastructure and wireless communication equipment, including edge sensors, data gateways, and server storage devices.

Additionally, Advantech can assist customers

with integrating unique systems and extended functions according to specific usage requirements. From hardware components to integrated systems, Advantech products offer easy deployment, operational reliability, high compatibility, and flexible expansion for a range of future applications.

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# Skyroot Aerospace Launches Kalpana Fellowship for Women

Kalpana Fellowship from Skyroot Aerospace, the first-ever space-tech fellowship exclusively for women.



Kalpana Fellowship is powered by Skyroot Aerospace.

**K**alpana Fellowship, inspired by the trailblazing astronaut Kalpana Chawla, is Skyroot's groundbreaking initiative to recognise, support and empower talented and passionate women to launch and build coveted careers in the space sector through exclusive paid fellowships that could lead to full-time employment at Skyroot Aerospace.

Kalpana Fellowship is powered by Skyroot. Skyroot is India's premier space-tech company specialising in advanced space launch vehicles for the global satellite launch market. Skyroot takes great pride in its accomplished women workforce, a significant pillar that plays a crucial role in supporting the success of its space missions. Actively leading and contributing throughout various stages, from meticulous planning to successful launches, Skyroot women exemplify excellence. In a commitment to expanding career opportunities in aerospace for women, Skyroot closely collaborates with esteemed educational institutions across India. This collaboration entails meeting, engaging, orienting, and recruiting talented women to contribute to the company's ambitious endeavours.

The Kalpana Fellowship epitomises the boundless opportunities awaiting young women endowed with a profound passion and

talent for space technology. Inspired by the revered astronaut Kalpana Chawla, this pioneering initiative is spearheaded by Skyroot, India's premier space-tech company. The fellowship aims to empower and provide extraordinary opportunities for women space engineers to aspire and accomplish significant milestones in both their academic endeavours and professional trajectories. Kalpana Fellowship nurtures the educational journey of exceptional candidates, propelling them into dynamic careers in space-tech innovation, brimming with a multitude of prospects.

“At Skyroot, we are dedicated to fostering a women-empowered workplace, prioritising the well-being and empowerment of our team members. Our commitment extends beyond the workplace, with initiatives that create a supportive and inclusive environment. To enhance the daily experiences of our female colleagues, we offer subsidised meals and secure late-hours transportation. Personal hygiene is a priority, and we provide amenities such as sanitary pad dispensers for added convenience. Safety is paramount at Skyroot, and our dedicated POSH Committee, led by women leaders, actively works to maintain a secure and caring atmosphere for all our women team members. Fostering community and connection, we encourage participation in

creative and cultural clubs, many of which are led by talented women. These clubs serve as vibrant platforms for building peer networks and camaraderie among our team members. At Skyroot, we proudly promote a culture of care and accessibility, creating a workplace where every individual, especially women, can thrive and excel,” says Pawan Chandana, Co-Founder and CEO, Skyroot Aerospace.

The fellowship is open for Indian nationals alone. Candidates who are undergoing their final year of college will have to secure written approval from their college Registrar permitting them to join Skyroot as a full-time Fellow, if selected. Selected candidates must be willing to spend regular working hours for one full year at Skyroot Max-Q campus in Hyderabad.

**Eligibility:** Final Year B.Tech/M.Tech/PhD degrees and specialisations related to Aerospace/Aeronautical/Mechanical/Electronics/Chemical and Electrical Engineering. Recent B.Tech/M.Tech/PhD graduates (freshers) in the above streams with no professional experience, within 2 years from the successful date of completion of studies are also eligible to apply.

<https://kalpanafellowship.com/index.html#overview>

# How Can Leaders Support Women In The Workplace?

What steps are taken toward building an inclusive workplace, asks Claire Fallon.



Diversity matters in every field. Image by Freepik

A 2008 study by the Harvard Business Review identified something they called ‘the Athena Factor’. The survey showed that 41% of early career scientists and engineers are female – and that many of them chose their fields in order to contribute to the well being of society. Unfortunately, the survey also showed that over half of them – 51% – had quit their jobs due to hostile cultures and unclear paths for advancement and moved to other sectors.

**Supporting women in the workplace is about creating a culture at that workplace where everyone can succeed**

These survey results are meaningful. They tell me that women get into science, technology, engineering, and math (STEM) careers because they want to make a difference. In other words, they are personally motivated to succeed. And many more women are choosing careers in

STEM fields than in previous generations. This is great news! But more than half of them leave – discouraged by behaviours and norms that are considered acceptable by that workplace. External forces, not their own personal choices, impact how well they can perform.

Supporting women in the workplace is about creating a culture at that workplace where everyone can succeed. It is the role of an organisation's leadership to see the problem and want to change the culture, first and foremost. Then, that organisation's leadership has to put the effort in to actually make a meaningful change. This work is not easy but it is necessary. And incidentally, if the work is done thoughtfully and with inclusivity in mind, it benefits more than just women – it benefits everybody.

## Why are women important in the workplace?

Diversity matters in every field – whether we are talking about gender, race, ethnicity, socio-economic status, or any other dimension of

diversity. Automation products and systems increasingly serve every industry sector and workplace, which means all sorts of people are our end users or customers. It is critical to ensure that product and system designers and engineers represent that full spectrum so that all points of view and all use cases are taken into account in the product development and implementation processes. For example, certain early biometric systems were unable to adequately differentiate among skin colours that had not been part of the testing process. Personal protective equipment (PPE) is often designed to be one size fits all, but when that one size means the average male size, that PPE may indeed be more dangerous than protective to a person with a different body type. There is also the question of where to put on PPE. Once when I worked at a nuclear facility and had to change into PPE, there was only a locker room for men available. This was not in the 1950s. This was in the 1990s.

It is also important for young people to see individuals who look like them in their desired field. When I was a student and in my early

career, there were a few women in mechanical engineering I could look up to, but not many. Today I am grateful to work alongside many successful women engineers, including a member of the ISA Executive Board, Sujata Tilak, from Ascent Intellimation in Pune. It is also incredibly important for us all to support each other in the pursuit of our interests. I am grateful that both of my parents and others around me consistently encouraged me to follow my chosen path, even if there weren't (yet) many like me. We must all serve that role to invite and support talent from many places. You never know if you are the only encouraging voice someone might hear.

And above all, what are the steps taken toward building an inclusive workplace in your country?

As an international society, ISA members come from all over the world, including India, the United States, and over 100 more countries.

Answering for our entire membership would be challenging, since such a broad spectrum is represented. But since ISA is headquartered in the US, I can answer that the White House has a Gender Policy Council that sets national

## Are we there yet as a nation? Frankly, we are not. But we get closer with each opportunity

strategy and benchmarks for ensuring that all individuals have the opportunity to live up to their full potential, regardless of gender identity. In addition to that, many individual companies have made diversity, equity, and inclusion critical parts of their operation – including ISA, where 'diversity and inclusion' are one of our five core values.

Are we there yet as a nation? Frankly, we are not. But we get closer with each opportunity to have this conversation and to underscore the importance of a diverse workplace where everyone feels they belong.

You can read more perspectives from women in automation engineering on our webpage for International Women in Engineering Day, which we celebrate each year on 23 June: <https://programs.isa.org/celebrating-women-in-engineering-2023>



*Claire Fallon is Executive Director of the International Society of Automation (ISA), a non-profit professional association founded in 1945 to create a better world through automation. ISA*

*develops widely used global standards; certifies professionals; provides education and training; publishes books and technical articles; hosts conferences and exhibits; and provides networking and career development programs for its members and customers around the world. Prior to joining ISA, Ms Fallon held leadership positions with the American Society of Mechanical Engineers (ASME) and the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). A mechanical engineer by training, Ms Fallon has also worked as a design engineer for Bechtel and served on the board of the American National Standards Institute (ANSI) and appeals board for Underwriters Laboratories (UL).*

## Vedanta introduces a revolutionary Parenthood Policy with job security

Women at Vedanta opting to take a break to nurture their young ones can now avail a sabbatical leave of up to 12 months, with the organisation promising job security to those who wish to take a break post-birth.

Under the comprehensive policy, those choosing to continue immediately after maternity leave now have the option to work from home or avail flexible working hours. This can be availed four weeks before the expected delivery date and until the child reaches two years of age. The policy also ensures career assurance during maternity leaves with additional support for career growth. These policy benefits enable a seamless balance between professional commitments and parenthood responsibilities.

Furthering its commitment towards diversity, equity and inclusion at the workplace, Vedanta Ltd, a globally diversified natural resources company, has expanded its

parenthood policy with enhanced benefits designed to support all new parents.

The unique benefits under the policy now also extend to all employees, including single parents and LGBTQIA+ individuals legally commissioning or adopting a child. For a child under one year, the caregiver (women/single parent/LGBTQIA+) may avail 12 weeks of leave, usable 30 days before the commissioning/adoption date and up to 90 days post-date.

Commenting on the extended policy benefits, Priya Agarwal Hebbar, Chairperson, Hindustan Zinc Limited & Non-Executive Director, Vedanta Limited said, "At Vedanta, we believe in fostering an environment where women employees feel supported and empowered throughout their professional and personal journeys. Emphasizing that parenthood is not a hiatus from professional life but a transformative phase for all caregivers, our new policy underscores our

commitment to diversity, equity, and inclusion. We hope that with this policy, we are able to set a new standard for progressive workplace policies across the nation."

In addition to the above, Vedanta has also introduced a one day monthly 'No Questions Asked' work-from-home to cater to the physical & mental health of women employees.

Vedanta continues to champion employee well-being and the roll-out of this policy is a testament to the company's commitment to fostering an inclusive and respectful working environment for all its employees.

Earlier last year, Vedanta had also rolled out medical benefits for its transgender employees in their inclusion policy. Under the policy, employees are entitled to a 30-day gender reaffirmation leave and financial support of up to Rs 2 lakh for gender affirmation surgery.

# Diversity, Equity and Inclusion

At the 3DEXPERIENCE World 2024 in Dallas recently, Aneesa Muthana shared her perspective on how DEI can foster innovation.



Aneesa Muthana, CEO and co-owner, Pioneer Service Inc.

Who here has been in front of a presenter about DEI? Have you? Have you seen enough talk about DEI? Well, this session is a little different than most sessions about DEI.

It's a perspective from a machine shop owner who's worked with a diverse team.

My name is Aneesa Muthana, and I will be speaking about diversity, equity, and inclusion – DEI. My focus, empowerment without dividing; they have become buzzwords. You hear them all the time. Unfortunately, sometimes, shallow words. But hopefully, today, you'll hear from my perspective and find a little bit of inspiration.

But we know that we have made progress

because the fact that I'm speaking to you today about the topic is a testament to that progress.

**DEI should not ever be presumed as a burden; it is a responsibility**

Engineers, manufacturers, we have so much going on. Designing, processes, building, production, and then what about those metrics? On-time delivery and quality? Lots of going on. But DEI should not ever be presumed as a burden; it is a responsibility. But when you embrace it wholeheartedly, really towards those

efforts, you will reap the benefits of any work you put in. Before I talk about what DEI is, let's talk about and address what DEI is not.

It's not checking off a box or a political agenda. Unfortunately, it has become that. But we as leaders can make decisions while running our departments and our companies, not to fall into that trap.

It is not a trophy employee or a token board member. Success must be earned and never given. This is one of my favorites. It's not playing the victim. Playing the victim fosters a toxic environment. No one wants to work next to an entitled employee. It brings a new culture down. It's one employee, this employee can get away with it because of the color of their skin or

because you just checked off a box. That's not fair. Only qualified employees. And if they're diverse, great. And if they're not, that's okay too. And it certainly isn't us versus them. You know, I hear people, it doesn't work that way.

I have been in this industry my entire life. White males are my mentors, my mentees, and during IMTS, they're my shopping buddies because we love big machines. But seriously, if we want this to work, if any initiative for DEI should work, it will only work by empathy. And progress only happens when you get everyone's buy-in. It doesn't work that you bash a gender or a race. Villainising the white male, yet expecting him to embrace change, is a recipe for failure. It doesn't work. Ladies and gentlemen, that is not advocacy. That is hypocrisy.

So what is DEI? DEI starts with diversity. And diversity means different things to different people. It could be your race, it could be your age, it could even be your educational level. But it's about hiring qualified individuals from a variety of backgrounds. Equity consists of your policies and practices in place.

Ask yourself, are they fair and impartial? No one wants to be a charity case. Everyone deserves to be compensated fairly and provided opportunities to develop their skills. I had no idea I was gonna imagine a background. No idea. So if I blend in, follow the shoes.

Inclusion, it's that warm and fuzzy feeling we get, right? The sense of belonging that we all yearn for – said the wrong thing. I've made mistakes. I obviously have plenty of bad things said to me as well. But it's okay, especially with good intentions. We're learning. It's not walking on eggshells. It's respect, its understanding, its empathy, its compassion. It's accommodating when necessary and respecting our differences.

My motto, everyone has a place in manufacturing. Work hard, you, the company, and the industry will prosper together. Now this

is not brain surgery. This basically DEI, before the acronym came out. What it means is do the right thing. Treat people fairly. That's all. We don't have to make it complicated. But let me tell you, if your company values aren't aligned with this, more importantly, if your company values aren't aligned with your personal values change them. If you can't change them, it is on you to find your plan B.

**Women groups provide inspiration, mentorship, and resources to those that are new in the industry**

So one group of diversity would be women. Look around you. There are not enough women in this room. And especially back in the 1990s and early 2000s, I was the only woman in the room. It still happens, but not as often.


Women groups provide inspiration, mentorship, and resources to those that are new in the industry. These groups, many times, have male allies and male funding because they realize they wanna tap into that group of people, and they want to leave a legacy and help and empower the next generation of women to stay in the industry. There's plenty that come in, but they don't stay. These groups help them. And this is what I mean about not dividing, empowering without dividing, because it starts bashing men, which in all honesty, there's sometimes that happens.

It's on us women to walk out, because that's not empowerment. So as a business leader, there's always, what's the return on investment? Well, with RoI and DEI, besides doing the right thing, there's plenty. I actually wrote an article for Modern Machine Shop, and it lists several. Today, because we're short on time, I'll talk about two.

Innovation is championed through diversity. Different perspectives, different ideas bring creativity to your team. Besides, if everyone on your team looks like you and comes from the same background as you, you haven't even scratched the surface of innovation. So we have a workforce crisis. In the workforce crisis, what better way than to promote the industry to those who may not be inclined to join? It's not brain surgery. We need more people. I hope my perspective gave you a few takeaways.

Don't let your company's values be pretty words on a wall or content for the website. Make sure they mean something to every single person on your team. It's okay to show off your team, especially if they're a diverse one. Not on a pedestal, but on social media and in events like these. Show off your team. Make them feel like they belong. So, supporting groups, mentorships, it's changed my life. I have individuals who I hired as interns in the early 2000s who are now engineers, business leaders, and even my accountant. And now, they're mentoring me.

Giving back and providing resources to groups is a win for us just as much as it's a win for them. We are makers, especially for the next generation, so we can leave a legacy, a legacy we are proud of.

Thank you 

*Aneesa Muthana is the CEO and co-owner of Pioneer Service Inc., providing precision machined parts since 1990. She is a hands-on leader with extensive experience in almost every aspect of a production machining environment. Aneesa believes in building relationships both inside and outside of her company, and in the strength of inclusivity in an industry where success can only be earned, and never given. In 2021, she returned to her family business, M&M Quality Grinding, after 29 years, coming full circle while retaining her role at Pioneer Service.*

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# NARI SHAKTI

HALL OF FAME

## Empowering Women in Great Workplaces

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# 'I feel women need to be open minded and let go of the inhibitions and complexes'

Dr Alka Mahajan, Dean, Mukesh Patel School of Technology Management & Engineering (MPSTME).

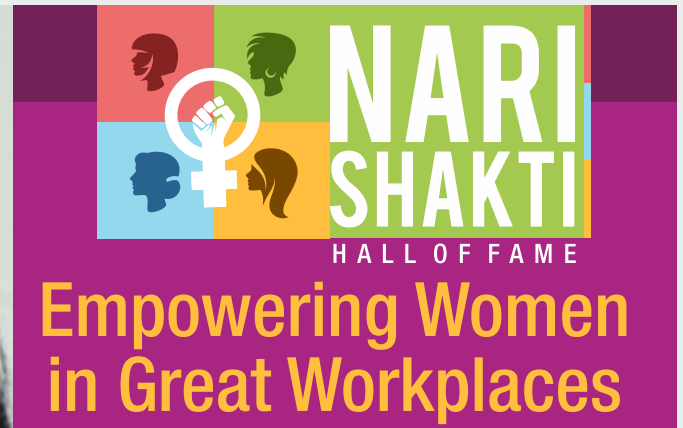


Teaching is continuous learning – Dr Alka Mahajan.

**What inspired you to pursue a career in education and research, and how have your motivations evolved?**

My grandparents and parents retired as

academicians and I had a front row seat observing the pros and cons of the teaching profession. While at that age I never understood what drove them, I also saw the admiration and respect they received from countless students across generations. However, as all rebel



children at that age, I had decided I would never get into academics and aspired to make my career in the industry. But then as destiny would have it, I was drawn into academics partly by circumstances, majorly due to my genetic makeup and possibly due to my subconscious desire to excel and prove myself in the profession loved by my parents. Once I was in, there was no looking back. Teaching is like the performing arts; it brings you instant gratification. That feeling is the motivation to continue giving your best so as to never lose that love and respect. The dull feeling that comes with a class not gone well also acts as motivation to work harder to get that feeling of wellbeing back. Teaching is continuous learning which naturally leads to research as one grows into the profession. So yes, teaching and research go hand in hand and you don't need separate motivation to either as one leads to the other and vice versa.

**As a dean, what vision do you bring to the academic community, and how do you envision shaping the future of your institution?**

My vision is to create an institute which focuses on student learning and the assurance of it. I do not see engineering in silos. I would like to see my institute grow into a seamless structure where students are accorded freedom to choose their courses based on their interest

and strengths. A strong grounding in fundamentals, teachers as partners in learning, a continuously evolving curriculum, interdisciplinarity, experiential learning, equity and inclusivity are some of the things I would like to see firmly embedded in the education delivery at my institute.

## Can you share a specific initiative you implemented as a dean that had a positive impact on the academic environment or student experience?

Engineering is a very demanding programme which leaves little space or time for students to have experiences to broaden their perspective. While they become adept at handling pressure, multitasking or learning new technologies, they tend to live in their own privileged world. I introduced a mandatory course on community service at the end of first year which requires a student to do three weeks of community service. The objective of this course is to sensitise the students towards the challenges, and prevalent issues of the society, like poverty, illiteracy, hunger, untouchability, and more. The course is also aimed at making them aware about current civic society concerns like, traffic awareness, emergency response, cybercrime, gender equality, sensitivity towards the differently abled, knowledge about communicable diseases, natural disaster management, and more. Through this course they get exposed to the urban-rural divide, problems faced by the underprivileged sections of the society, etc. The experience of actually working to better a system or helping a section of society changes their perspective completely. Initially hesitant and protesting, students come back shaken with a completely changed mindset making them more empathetic and aware of societal needs. The learning through community service adds a human facet to the Engineer.

## How do you address diversity and inclusion within the academic community, and what steps have you taken to promote equity?

Fortunately, in a place like Mumbai which is known to be diverse yet inclusive, my job becomes easier as people are well tuned to the cultural/social or gender diversity in the society and inclusivity comes naturally. However, there is always a fear of the existence of hidden biases which hinder equity and inclusivity. As a first step I ensure that in my executive team men and women are equally heard and represented.

At the student level, there is no distinction between girls and boys. Both are trusted equally and allowed to work late hours in the laboratories. We have had a girl as General Secretary of the Student Council for three years in a row now; this speaks well of the fact that the boys accept, acknowledge and support girls to lead the team. We have included a course on

perspective on the problems at hand; and finding innovative solutions to it. Having scholars working under you makes the implementation much easier as the time intensive tasks are undertaken by them. This leaves me with ample time to take care of my administrative and other work.

## What strategies do you implement to enhance the academic experience for students under your leadership?

For me, academic experience is not restricted to the classroom. I believe in students learning more by being hands-on. So while I ensure that my curriculum and program structure remains relevant, my focus is more on experiential and out of the classroom learning. So my strategy is three pronged – effective teaching-learning, exposure to latest technology and facilitation for an all-round exposure to learning. While initiatives to improve the pedagogy, faculty development programmes and continuous evaluation ensure the first, we provide and facilitate many opportunities for students to participate in national, international, technical and extracurricular activities. A substantial separate budget is marked for student activities to ensure all round development. I have established state-of-the-art laboratories in Robotics & Automation, high end Computing Labs with GPUs for AI and deep learning applications, 3D printing, AR/VR; and we are amongst the very few institutes who have established such advanced laboratory infrastructure. Research at undergraduate level is facilitated with interested students working on live projects, cancer research and more, through our MoUs with the industries and research hospitals.

## Beyond your role, what aspects of education or research are you most passionate about and how do you express that passion in your work?

The explosion of information and its easy availability on the internet and the increasing invasion of artificial intelligence in all aspects of our lives have had a very challenging impact on education and the delivery of it. As a teacher at heart, I am concerned about the decline in original thinking and expression, attention span and self-learning. My focus today is more on bringing about a change in classroom teaching and evaluation. I am trying to move the teacher away from being on the pedestal to being a

**Name:**  
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**Designation: Dean**

**Organisation:**  
**Mukesh Patel School of  
Technology Management &  
Engineering (MPSTME)**

**Qualification:**  
**PhD in Electronics &  
Communication from Delhi  
University**

gender communication to ensure that our students are sensitised of appropriate behaviour and communication in the workplace. While sexual orientation is not out in the open as of now, we ensure awareness and its acceptability through informative seminars and open discussions.

## How do you balance your responsibilities as a dean and maintain an active and productive research plan?

Being a woman, multitasking is something which naturally comes to me. And cliché as it may sound, planning time and tasks is the key to balancing all aspects of my profession. What helps in keeping my research productive and active, is supervising PhD scholars. As one grows in the area of research, the focus shifts to generating ideas to come out with a different





Women need to learn to occupy the front seat, says Dr Alka Mahajan.

partner in learning. We are trying to make the curriculum more learner-centric instead of just cramming in content.

### What advice do you have for other women aspiring to enter the education system or leadership positions?

Involvement, Commitment and Accountability are a sure shot recipe for success in any profession and that is gender neutral. It is very important for me to maintain the dignity of the profession we choose and be true to it. I feel women need to be open minded and let go of the inhibitions and complexes that bind them to mediocrity. It is also very important that we do not play the gender card when convenient. It may work short time but is counterproductive long term. Women also have a natural tendency to take the back seat, shy away from taking credit or projecting their worth and in general, and expect that things will fall in place

automatically. We need to learn to occupy the front seat, work hard and then ensure that it is projected through results. If we choose to take up a career, we need to be ready for the extra time and work and sacrifices it demands. That's what work-life balance is all about, and that is the key. Also, it is very important to not feel guilty for every single time that you need to give priority to work. I would suggest women to be secure about their capabilities, work on their weaknesses, observe, listen and learn.

### How would you describe your life in 3 words?

Challenging. Fair. Wholesome.

### What would you write on your own fortune cookie?

'Listen to your heart.'

*Dr Alka Mahajan, Dean at SVKM's NMIMS Mukesh Patel School of Technology*

**It is also very important that we do not play the gender card when convenient**

*Management & Engineering, Mumbai. With over 35 years of experience in teaching and administration, Dr Mahajan has contributed immensely to the design and delivery of technical education. She holds a PhD in Electronics & Communication from Delhi University. She has completed her M.Tech in Electronics Design Technology from the Centre for Electronics Design Technology (CEDTI).*

*Dr Mahajan has played an instrumental role in preparing the 12th Five-Year Plan of the UGC Scheme and Guidelines on Capacity Building for Women Managers in Higher Education. She served as a Member of the General Council of the National Board of Accreditation (NBA), New Delhi (2016-19). Dr Mahajan was part of the apex team providing policy direction and guidelines for managing the activities of NBA.*

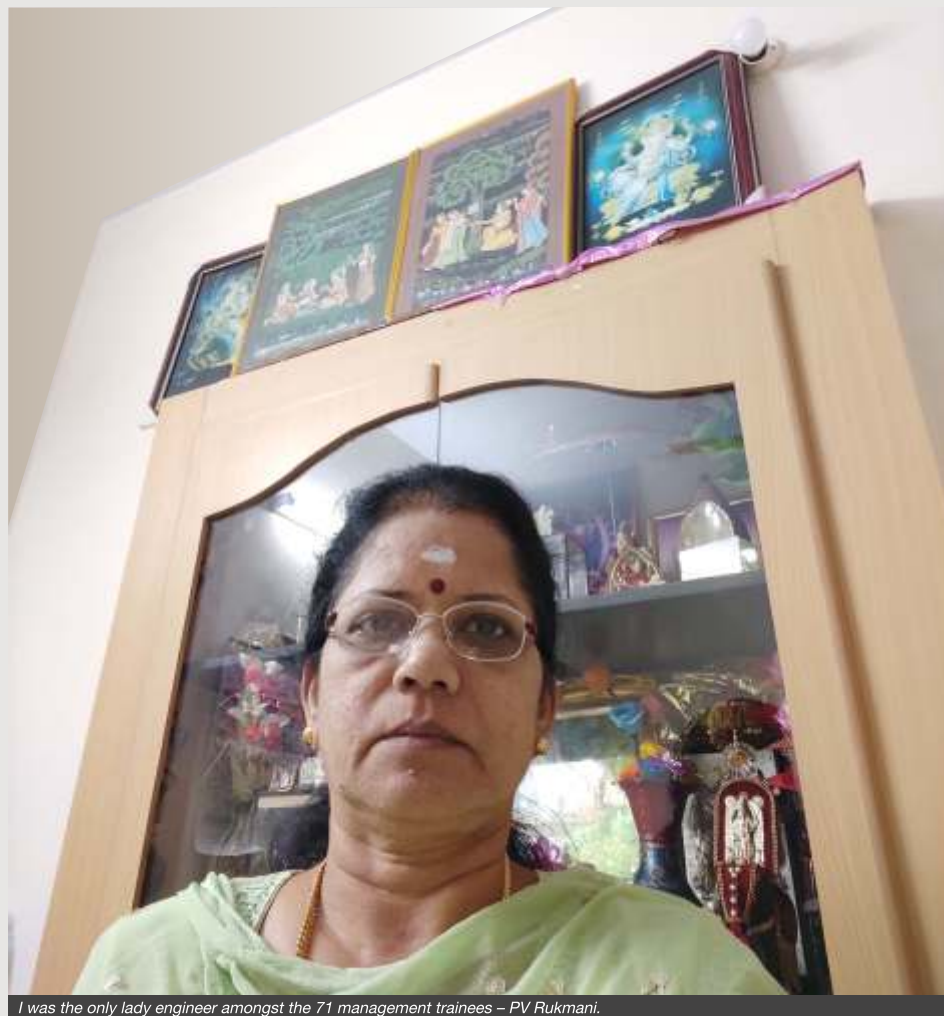
*Dr Mahajan is a Certified Independent Director by the Ministry of Corporate Affairs and is a Fellow of the Institute of Directors. She is also the Independent Director on the Board of Directors of the Indian Dairy Machinery Company (IDMC), a subsidiary of NDDDB Anand, Gujarat.*

*Dr Mahajan is an active researcher who has numerous publications in international journals and conferences. She is a Member of the Standing Committee on the scheme of 'Development of Women's Studies in Indian Universities & Colleges and Capacity Building of Women Managers', constituted by the MHRD, New Delhi.*

*Dr Mahajan serves on the editorial/ reviewer board of several international journals. She is a senior member of IEEE and a Fellow life member of IETE, CSI and IEI. Dr Mahajan is currently the Dean of the NMIMS deemed to be University, Mumbai. She is responsible for the academic administration of its 7 engineering campuses across India. Dr Mahajan is credited with introducing innovative pedagogical techniques to improve student learning and impacting academic administration through her resourceful ideas.*

# ‘Workplace culture plays vital role in development of any organisation’

PV Rukmani, Sr General Manager, IPCL & Reliance Industries Limited.



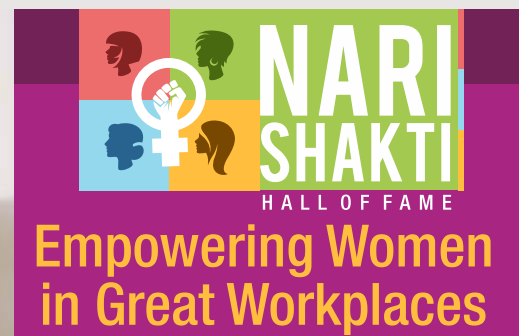
I was the only lady engineer amongst the 71 management trainees – PV Rukmani.

## Could you provide some insights into your business journey and the path that led you to your current position?

My career began as a Management Trainee at Indian Petrochemicals Corporation Limited’s (IPCL) gas cracker complex at Nagothane in Maharashtra in May 1988, where I joined knowing only English and Tamil. I was the only lady engineer amongst the 71 management trainees! It was a Greenfield petrochemical project. I was involved in establishing the repair

shop for instrumentation, installation and commissioning of analysers, etc. Gradually, along with the progression in my professional career, I also learned Hindi and Marathi to effectively communicate with the workforce. In 1996, I was given the opportunity to lead the Instruments Maintenance Team of the MEG plant of IPCL and with dedicated approach improved the reliability and addressed obsolescence issues.

Later I was given the opportunity to lead the LDPE plant (high pressure plant running @2000 bar) and its special instrumentation. It was a



natter of pride for a lady to lead the maintenance team in a petrochemical plant in earlier days. Over a period of time I developed expertise in analysers, which included design, selection, etc., apart from maintenance. Apart from this, I have undergone Six Sigma training and completed 2nd Black Belt projects and also as mentor for Green Belt projects. I initiated standardisation of spares for all instruments installed in Nagothane complex. Meanwhile, IPCL was taken over by RIL and I got a lot of opportunities to work in various areas. As project manager, handled a few projects like the Fire & Gas System in Nagothane complex; Control Room Revamp, DBN projects, brownfield project, etc. Developed expertise in root cause analysis, risk assessment, FMEA, FMA, etc; carried out various system audits within the complex and RIL intersites; was involved in the development of Competency Management System for GET, new joinees and prepared/reviewed various training modules. As section head of Reliability Instrumentation, I handled turnaround, inventory management, budget management, KPI monitoring, reliability of instrumentation assets, obsolescence management, life cycle plan, identify & impart training etc. Thus I had a long business journey of 35 years in the petrochemical industry.

## Discuss a situation in your leadership role that demanded a difficult decision. How did you address and resolve it?

All plants in the Nagothane complex were

manned by engineers and technicians on A, B, C and G shifts. While in the MEG plant as maintenance lead, it was decided by the management to remove the engineers from shifts. This was a difficult decision, but necessary on account of: 1) Engineers removed from shift to be engaged properly. 2) Engineers not available for emergency/odd hours/holidays. Point 1 was addressed by transferring a few engineers to other plants where there was a shortage, and a few were assigned to reliability improvement projects, etc., and the desired result was achieved. Point 2 was addressed by empowering technicians to handle a few activities at odd hours and on a rota basis an engineer assigned to handle emergency jobs.

**It was a matter of pride for a lady to lead the maintenance team in a petrochemical plant in earlier days**

## How do you handle risk and make decisions in the course of your entrepreneurial pursuits?

Risk-based assessment done on a case to case basis, Mitigation/Decision based on the Severity, probability of risk prevailing in the given situation.

## What about your practices for staying updated on industry trends and maintaining a commitment to the continual development of your skills?

I keep myself updated by attending Seminars, Intersite meets, sharing learning experience, reading journals including hydrocarbon processing journals, CCPS safety bulletins, incident investigation, interaction with various instrument manufacturers over phone, mail and presentations, reading manuals, internet surfing, etc.

## Can you share a moment in your career where you felt significant growth or accomplishment?

My industrial career started as a Graduate Engineer trainee at IPCL, Nagothane in 1988

**Name:**  
**Ms PV Rukmani**

**Designation:**  
**Sr General Manager**

**Organisation:**  
**IPCL & Reliance Industries Limited, Nagothane – Maharashtra**

**Qualification:**  
**BE – Electronics & Communication**

**Contribution:**  
**SME in analysers in petrochemicals industry, fire & gas system, general instrumentation**

and after 8 years of service as maintenance engineer, I was given an opportunity to lead the Instrument Department of the ethylene oxide plant. It was significant that a lady engineer was managing maintenance in the petrochemical industry as it was something rare during that time (way back in 1997). My contribution was improvement of reliability of the plant and I was also associated in Advance Process Control implementation.

## How important is workplace culture to you, and how have you contributed to shaping it?

Workplace culture plays a vital role in the development of any organisation. Matters like effective communication, ownership mindset, customer satisfaction, working as one team, striving for excellence, etc., contribute to shaping the workplace culture.

## Can you share a networking experience that led to a valuable opportunity or connection?

During the 21st IEC meet at Thane, Mumbai in

October 2023, I met the Director (Marketing & Content) of Industrial Automation, which led to my participation in the NariShakti 2024 awards.

## How do you prioritise your own professional development, and what strategies do you use to continue learning and growing in your role?

I spend an hour daily to learn anything related to the developments in my own field, management books to develop managerial aspects, attending webinars, etc.



## Can you share a strategy or habit that helps you maintain a healthy work-life balance?

The strategy followed by me is to prioritise areas of interest and plan properly with the available resources to maintain a healthy work-life balance.

## What advice do you give to women aspiring to become entrepreneurs?

Set clear goals. Plan well and execute with commitment. Be resourceful to be successful and ready to take risks. Trust but verify, always.

## How would you describe your life in 3 words?

Punctual. Versatile. Risk-taker (PV Rukmani).

## What would you write on your own fortune cookie?

'Never give up!'

*Ms PV Rukmani served as a Senior General Manager, IPCL (Indian Petrochemicals Corporation Limited) and superannuated from Reliance Industries Limited, Nagothane Manufacturing Division (NMD) in 2023. She completed her B.E in Electronics &*

Communication from PSG College of Technology, Coimbatore Tamil Nadu.

Ms Rukmani has contributed to the maintenance of field, DCS, and PLC and enhanced the reliability of instrumentation. Over a period of time, Ms Rukmani has developed expertise in analysers, and gas chromatographs which include design, selection, installation, modification, etc., apart from maintenance.

As an instrument section head, Ms Rukmani has monitored KPIs, carried out Risk analysis, Life cycle evaluation, planning for upgradation, root cause analysis, SIL study, FMA, and Audit of various instrumentation systems. She has completed 35 years of service in the petrochemical industry and recently superannuated and settled in Tamil Nadu.

Ms Rukmani has been involved in the grassroots project of the Maharashtra Gas Cracker Complex (IPCL-MGCC) and the installation & commissioning of Analysers for the process industry. She has undertaken Six Sigma projects: Under DuPont initiatives associated in Risk assessment, Mechanical integrity of Assets, Quality assurance,



PV Rukmani – a long career spanning 35 years in the petrochemical industry.

**Be resourceful to be successful and ready to take risks. Trust but verify, always**

Incident investigation, root cause analysis, etc.

Ms Rukmani has mentored subordinates and new joinees in the industry. She has also

received a special cash prize under the Dronacharya scheme. She has been associated with the development of competency modules in instrumentation for new joinees to develop skill sets.

Ms Rukmani has received several 'Well Done' awards from RIL Site management for completion of projects on time without any incident, improvement in reliability, excellent troubleshooting, and several new initiatives.

**“Women are leaders everywhere you look—from the CEO who runs a Fortune 500 company to the housewife who raises her children and heads her household. Our country was built by strong women, and we will continue to break down walls and defy stereotypes.”**

— Nancy Pelosi

**“Women are leaders everywhere you look—from the CEO who runs a Fortune 500 company to the housewife who raises her children and heads her household. Our country was built by strong women, and we will continue to break down walls and defy stereotypes.”**

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**“Women are leaders everywhere you look—from the CEO who runs a Fortune 500 company to the housewife who raises her children and heads her household. Our country was built by strong women, and we will continue to break down walls and defy stereotypes.”**

— Nancy Pelosi

# 'Empathy is essential in driving inclusive environment in academic institutions'

Dr Jayalekshmi Madhu Nair, Principal, Vivekanand Education Society's Institute of Technology.



Oct 17, 2022  
Teachers need to stay abreast with the latest developments – Dr Jayalekshmi Madhu Nair.

## What motivated you to enter the education field and how has your vision shaped your approach as Principal?

During my childhood, I used to teach my younger sister, who was four years younger than me, since my working mother could not devote time to helping her in studies. I used to love to teach her and felt proud, since I felt I was able to do what my teachers were doing in my school. Perhaps with that childhood experience, I developed a liking for teaching. During my PG student days, the appreciation I got from my teachers and classmates during my seminar presentations boosted my

confidence and cemented my liking. This led me to search for only teaching jobs when I relocated to Mumbai after my PG studies.

Till today I believe that to be a good principal, first and foremost you have to be a good teacher, who has the ability to understand the needs of students. A good teacher will be able to cater to students of all calibre.

## How do you encourage a culture of continuous improvement and innovations among your faculty and staff?

Teachers need to stay abreast with the latest developments considering the voluminous

**A good teacher will be able to cater to students of all calibre**

information available at mouse's click for everyone including the students and the fast decline in the shelf life of technology, especially in the IT field. Therefore teachers are encouraged to participate in refresher courses both online and offline with the institute's support. They are also encouraged to work in development projects and research projects in collaboration with research organisations and industries. Teachers also have to adopt

innovative teaching practices to capture the attention of the students and retain the engagement of students throughout the complete lecture duration of one hour, especially after Covid. Hence best innovative teaching practices are shared among the faculty members.

## What is your teaching philosophy and how do you incorporate it into the educational programs under your leadership?

A teacher should retain her passion for teaching throughout her career. He/She should be agile, adaptable and ready to learn new topics in emerging areas and should ensure that he/she is not getting stagnated in one domain. Multidisciplinary education is given more importance in NEP 2020, so accordingly teachers need to equip themselves in the upcoming technologies in all domains. Since the demarcation between domains is decreasing, many fields have become everybody's domain because of their widespread applicability. Therefore skilling and reskilling opportunities are provided to the teachers. Motivational lectures for teachers are also conducted regularly by the experts. Teachers are also encouraged to participate in Faculty Development Programs conducted in the institute and other reputed institutions.

## Can you share a memorable teaching experience that has a significant impact on your students?

When our institution started the PG course, the first few batches had students who were resuming their education after a gap of almost 10-15 years. Having been a teacher of undergraduate subjects in one area, a subject which needs mathematical background which I was handling was very difficult for them. A full course on required prerequisites, taking extra lectures for them, made them prepare for the advanced course of ME. Subsequently many of them developed a liking for the course and went on to do research in the same field. The additional qualification also gave a career boost to all of them.

## What inspired you to pursue a career in research?

The satisfaction a teacher gets after taking a good lecture is what inspires a very good teacher. No material benefit can replace this

**Name:**  
**Dr Jayalekshmi Madhu Nair**

**Designation:**  
**Principal**

**Organisation:**  
**Vivekanand Education Society's Institute of Technology**

**Qualification:**  
**Ph.D**

**Contribution:**  
**Instrumentation and Control Systems**

satisfaction and the subsequent morale boost. No doubt, every lecture needs thorough preparation demanding exhaustive study. This study generates research interest in any passionate teacher. Getting admission to a premier educational institute like the IIT-Bombay added flavour to my interest. This also helped me to fulfil my parent's dream of seeing their daughters as doctors.

## What innovation or changes would you like to see in the education sector and how do you plan to contribute to changes?

The Indian education sector is already in the transformation phase thanks to the implementation of the new NEP. As an autonomous institute, we were privileged to implement NEP in the first year of autonomy itself. New NEP envisages a multidisciplinary approach and provides more flexibility to students. However, most state universities, unlike IITs, require specific discipline qualification for eligibility, to become faculty in a department, i.e., a teacher competent to teach a subject of multidisciplinary nature in a department may not fit in the qualifications prescribed for faculty in the department by the university. However, the practicing engineers

working in the upcoming areas of AI, ML and IoT come from diverse fields such as statistics, economics, and computer science and other engineering disciplines such as electronics, mechanical, etc. Therefore eligible qualification requirements of teachers also should be modified to attract good talent. So a liberal, need based flexible approach should be exercised in this area. This will also help in turn in the effective implementation of NEP in higher education institutes. This has been brought into the notice of the concerned committee members and initiatives have been taken to make the changes at our university level.

**The satisfaction a teacher gets after taking a good lecture is what inspires a very good teacher**

## What values do you believe are essential in driving a positive and inclusive learning environment as an academic institution?

Empathy is essential in driving an inclusive environment in an academic institution, since empathy involves putting oneself in other's shoes and experiencing their emotions and perspectives. Integrity and humility also play a key role in driving a positive learning environment.

## How do you believe education can be a transformative force in the lives of students?

Education can be a transformative force because it changes the outlook the way one thinks. The demography of students and teachers one is interacting with, also brings in the change in the behaviour of the students.

## What advice would you give younger women aspiring for an academic career and journey in education research?

If one's goal is to always remain young, then teaching will be the best profession. The age group teachers are interacting with shall always be the same, even if one reaches retirement age. Monotony will not be a term in a teacher's life, because students, syllabus and subjects

one is dealing with are always changing. Every lecture should be delivered with the same zeal as one has done for the first time, even if we are teaching for the nth time, since students change every year and are learning it for the first time. The opportunity to remain ever young and ever dynamic should inspire students to become teachers. My advice to young teachers is to make adaptability and agility their habits. These two traits along with a passion for teaching will make a teacher to be remembered by students forever.

**Education can be a transformative force because it changes the outlook the way one thinks**

### How would you describe your life in 3 words?

Simple. Ordinary. Blessed.

### What would you write on your own fortune cookie?

'Your future looks very bright, provided you remain grateful every second of your life'.

Dr Jayalekshmi Madhu Nair is the Principal of Vivekanand Education Society's Institute of Technology (VESIT). Backed by her 19 years as

Principal of VESIT, Dr Nair has significant contributions in areas including Instrumentation and Control Systems. She holds a Ph.D from IIT Bombay.

Dr Nair has dedicated over three decades to the noble field of education, starting as a Lecturer, and now serving as Principal. Her responsibilities include administrative roles working closely with various government authorities, including Mumbai University and DTE. She also serves as a member of the Board of Studies in Electronics and Telecommunication Engineering and is recognised as a Post Graduate and Ph.D Teacher for Instrumentation, Controls, and Electronics at Mumbai University.

Dr Nair has also been involved in research projects and her research endeavours have secured substantial grants and led to patents in high-resolution spectroscopy, common mode voltage removal, and integrated high-resolution timing spectroscopy systems. She has secured research grants from BRNS for the research project 'Development of Methodology for an Evaluated Nuclear Data Library'. She has also played crucial roles as the Chairperson of the ISTE Chapter and the Faculty Mentor of the ISA Chapter.

Dr Nair has more than 30 published works in national and international journals and conferences. She has supervised 21 projects in



Education can be a transformative force – Dr Jayalekshmi Madhu Nair.

the field of Instrumentation & Control Engineering at the undergraduate level and 17 projects in the same field at the postgraduate level. She has also guided 7 Ph.D candidates, with four already completing their research successfully, and three currently in progress.

The recognition and accomplishments of Dr Nair, combined with her personal and professional growth, reinforce the significance of the institute in the world of education and research.

“And one day she discovered that she was fierce, and strong, and full of fire, and that not even she could hold herself back because her passion burned brighter than her fears.”  
– Mark Anthony

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# 'You have to lead from front, accept failures and reinvent'

Sujata Tilak, Founder & Managing Director, Ascent Intellimation.



*I was always interested in creating own products – Sujata Tilak.*

**Can you share about your journey in the manufacturing world and how you got started in your current role and venture?**

I did Instrumentation and Control engineering from College of Engineering, Pune. I was fascinated by software as well as automation and control. Combining the two, I decided to pursue a career in industrial automation

**NARI SHAKTI**  
HALL OF FAME  
**Empowering Women in Great Workplaces**

software. I worked for Alfa Laval and KPIT before starting Ascent Informatics in 2000.

The experience has been very interesting, but there were a lot of challenges too. Ascent Informatics was started as a captive unit of a German company to fulfill their requirements of industrial automation software. This is not an easy field as one has to integrate with various types of hardware, the software is expected to be very reliable, robust and with high performance. Thus, one has to deal with many technological challenges on a daily basis. But I got good exposure to advanced systems in Europe and USA and that broadened my outlook.

**Entrepreneurs have to prove their capability and commitment every single day**

I was always interested in creating my own products and this journey started in 2006. I started promoting the idea of 'remote monitoring of industrial assets' on various platforms. This was amalgamation of my exposure and understanding of both automation and IT technologies. We built a precursor to our IIoT platform PlantConnect in this period. But we were too early. Finally, around 2012, IoT started gaining ground and we shifted the company's focus from services to IIoT solutions. Ascent Informatics pivoted



to Ascent Intellimation in 2015 and now we are exclusively providing Industry 4.0 solutions and consulting based on PlantConnect and other technologies.

## What challenges have you faced as a woman in a leadership role, and how did you overcome them?

At the start of the career, the challenge was to manage work and home with equal commitment. As you know industrial automation demands travel, working in plants in remote places. In this phase, family support is very crucial and I got ample support from my husband Arvind, in-laws and most importantly, my kids.

Entrepreneurs have to prove their capability and commitment every single day. Women probably a bit more than men, especially in manufacturing. Few years ago, customers would have doubts about my ability to deliver the challenging solutions that we provide. You have to get over such reservations by demonstrating your knowledge and leadership abilities!

Who has been your significant mentor or role model, and how have they influenced your career?

There have been many mentors throughout my journey. You keep learning constantly from seniors and peers.

## How do you foster innovation and creativity within your business?

We provide solutions in Industry 4.0 space. This is an evolving area and everyone has to constantly learn and innovate. However, it's not easy to motivate people to do this. It is said that need is the mother of innovation. We encourage people to go onsite and experience customer problems, expectations and priorities first hand. This motivates them to think of innovative ways to improve the product and to apply it to solve customer's problems.

## What strategies do you employ in building and leading a successful team?

Motivation, ownership, confidence and pride are the guiding qualities for our team. We

**Name:**  
**Sujata Tilak**

**Designation:**  
**Founder & Managing Director**

**Organisation:**  
**Ascent Intellimation**

**Qualification:**  
**B.E, Instrumentation & Control**

**Other contributions:**  
**Executive Board Member, International Society of Automation; Founder & Past Director, ISA Smart Manufacturing & IIoT Division**

conduct periodic sessions to brainstorm on these qualities and their application in day-to-day work. This energises everyone to give their best. I am a hard task master and at the same time believe in guiding and mentoring the team. My doors are open to anyone to discuss ideas, achievements and problems. People are free to make mistakes and learn from it...but making the same mistake again and again is a big no-no! I have a good team at 2nd level who independently manages respective areas. Initially I was not very good at delegation, but have learned it since.

## How important is workplace culture to you, and how have you contributed to shaping it?

Workplace culture is very important. Ideally every organisation should have an open, transparent and inclusive culture where people are encouraged to innovate, learn, be proactive, take ownership and deliver value every day. In AIPL, we give utmost

importance to being ethical and trustworthy with customers, partners and peers. This is the age of collaboration and these qualities go a long way in building lasting relations. Innovation is encouraged and so also doing your work with quality and meeting the timelines. Setting the right expectations and then adhering to it without dilution is an important part of culture. We have worked in a hybrid model since the pandemic. But come together for 1 week every quarter. This period helps the team to engage more closely and have fun!

## How do you balance professional responsibilities with your personal life?

For me, family comes first! This is the reason I chose to work free-lance when my kids were young. Now I am done with all the familial responsibilities with both kids married and settled. I and my husband Arvind are business partners. This comes in handy as we support each other on business and personal fronts. I am the grandmother of 3 beautiful grandkids and enjoy every second of the time I spend with them.

## What advice do you have for women aspiring to become entrepreneurs?

It is an excellent time for being an entrepreneur. Everything from mentoring, funding and technology is easily available for young startups. If you have a great idea with good market potential, don't hesitate to jump in. But you have to be ready for a lot of hard work, only smart work won't do. You have to lead from front, accept failures and reinvent. The success belongs to your team, but failures are yours alone!

## How would you describe your life in 3 words?

Happy. Blessed. Grateful.

## What would you write on your own fortune cookie?

'Stay connected!'

*A successful entrepreneur and technologist, Sujata Tilak is the Managing Director, Ascent Intellimation Pvt Ltd (AIPL), a leading solution provider of Industrial IoT (IIoT) solutions. She has earned a B.E in Instrumentation & Control Engineering from COEP Technological University.*



Ideally every organisation should have open, transparent and inclusive culture.

**It is an excellent time for being an entrepreneur. Everything from mentoring, funding and technology is easily available for young startups**

*Sujata is a thought leader in Industrial IoT and the convergence of Industrial Automation and Information Technology. She has led Ascent Intellimation as a leading provider of Industrial IoT solutions. Her focus is to help organisations recognise and embrace diverse ways in which manufacturing data can be beneficially used by various stakeholders.*

*Sujata is also the Volunteer Leader and Past President, Pune Section, International Society of Automation (ISA). She works on various ISA committees at the global level as well as the District 14 (India) level. As Former President and active volunteer leader, she is involved in all activities of the Pune Section. Sujata is also a TiE Charter Member, where she is involved in various activities of TiE Pune Chapter including Nurture program and TIECON. Sujata is very vocal about women entering the technology and manufacturing fields.*

**“I’ve come to believe that each of us has a personal calling that’s as unique as a fingerprint – and that the best way to succeed is to discover what you love and then find a way to offer it to others in the form of service, working hard, and also allowing the energy of the universe to lead you.”**

**“I’ve come to believe that each of us has a personal calling that’s as unique as a fingerprint – and that the best way to succeed is to discover what you love and then find a way to offer it to others in the form of service, working hard, and also allowing the energy of the universe to lead you.”**

**– Oprah Winfrey**

**– Oprah Winfrey**

# 'I have always believed that learning never stops; hence I grab every opportunity'

Rajalakshmi Hegde, Sr Director – Product Engineering: Manufacturing, LTIMindtree.



*Appreciating someone's efforts brings me great joy in life – Rajalakshmi Hegde.*

**Can you share a bit about your journey in the business world and how you got started in your current role?**

I have spent more than two decades in industrial automation on the OT side and worked on various verticals in the Manufacturing industry and in different roles enabling digitisation on the OT side. I was



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always fascinated about the IT side of the industry and was very intrigued in exploring the IT world, but from a domain perspective. I wanted to see how the experience I have gained in the OT world will help the IT side of the industry. Manufacturing and Industrial Internet of Things (IIoT) is an area where the OT and IT world will merge more and more each day and is currently undergoing major transformation. My present role at LTIMindtree as a Sr Director – Product Engineering: Manufacturing is to focus on aspects of Manufacturing and IIoT from IT, and add my expertise and experience from OT to offer the right solution to the client.

**Manufacturing teaches you a lot of things in life and is very inspirational**

**What inspired you to pursue a career in the manufacturing industry?**

Being on the shop floor, understanding the working of machines, the mechatronics part, automating machines, learning the process to bring in intelligence into machines and its working all came as a part and parcel of working in the Industrial Automation environment. Then

came along an avenue to create, explore products and platforms in the IoT space more from a manufacturing domain perspective, which is my current job. Manufacturing teaches you a lot of things in life and is very inspirational. It is a much disciplined industry with a lot of processes and workflows in place to achieve required targets. Every event is logged and traced back to see how a process, a function can be improved to bring in more efficiency. How we can minimise human errors by creating standard operating procedures, steps that operators can follow with a click of a button. Manufacturing is an ever-evolving area and it is a continuous learning process, which has been a driving force for me personally.

## How do you foster a positive and inclusive work culture within your team or organisation?

For me it's very important to treat everyone in my team and organisation with equity. We all come from different backgrounds, different demographics, maybe with different constraints. Each one comes with skill sets they have inherited or learnt on their work journey. Understanding these areas of differences and opening up opportunities where the individual skill sets can be mapped to bring about a successful outcome is how we can embrace Equity. Support individualistic efforts, celebrate inclusive work culture and your team will enjoy the work. Secondly, work with empathy, before you pass a remark or judge someone, put yourself into the other person's shoes and see their perspective, their point of view – that has always been my style of working. Inviting view points from all members of the team helps to build a strong solution for the problem at hand, including the new entrants.

## How do you stay updated on industry trends and develop your skills?

I have always believed that learning never stops; hence I grab every opportunity that comes my way to attend a training or webinar or read on the current trends in the industry.

Moreover, I work on a volunteer basis with the International Society of Automation (ISA) and interact with leaders in the industry, network and attend conferences, which help me to stay updated on the current happenings in the industry. Society of Women Engineers is another volunteer activity that I support as a Global Ambassador and these forums help me connect with women across the globe in STEM.

This is by way of interacting with them on various topics, not just relevant to manufacturing, IIoT or Industrial Automation, but any other topics that would be important to stay relevant in the industry. Also, one must have a mentor or a coach who will help understand the gaps and coach/mentor on how to bridge these gaps.

**Name:**  
**Rajalakshmi Hegde**

**Designation:**  
**Sr Director – Product Engineering: Manufacturing**

**Organisation:**  
**LTIMindtree**

**Qualification:**  
**B.E. Electronics, Executive MBA**

**Contribution:**  
**Industrial Automation, Industrial Internet of Things, Manufacturing**

## There is always a talk about gender equality and diversity in the workplace. How do you promote gender diversity and inclusion in your workplace?

The global arena is pushing to have a percentage of women in every department in leadership roles; this will bring along with practical aspects an Emotional IQ and empathy to the team. Each problem will be looked at from various angles, allowing the flexibility and capability to work together and bring out results. Having diverse backgrounds brings about innovative thinking and aspects from varying angles. The competitive spirit is more and each one strives towards a healthy competition. Women have excelled in supply chain management, operations, and on shop floors, bringing performance to the forefront

and structuring systems and processes to a large extent.

I always emphasise on looking at diverse backgrounds, and provide equal opportunities to men and women in my team.

## How do you see the manufacturing industry in the next few years, and how are you preparing for those changes?

We hear of flexibility in Manufacturing, Agile Systems, Connected Factories, Connected Machines and Adaptive Manufacturing. All of the above and many more indicate the future of manufacturing and digitisation becomes a key element to achieve them, to help improve productivity and efficiency. Automating the operations, electronic workflows, paperless operations, GenAI transforming manufacturing use cases, process and resource optimisation, artificial intelligence, manufacturing sustainability are few new areas manufacturing will have to focus on.

Early adoption to new technologies like GenAI, cloud based products, creating platforms and products that can easily adapt the above technology and accelerate the digitisation process in the manufacturing industry will be key areas to focus on.

## Outside of work, what activities or hobbies do you engage in to maintain a work-life balance?

I continue my classical singing practice and attend concerts as and when possible, along with family and friends. Supporting handloom and handicrafts has always brought me joy. Promoting weavers and artisans in my capacity is a hobby I carry forward.

## How do you personally define success and happiness in your life?

Happiness is how you see it, for me it is important to be grateful for what you have and express gratitude each single day. Appreciating someone's efforts brings me great joy in life.

## If you could choose any fictional character to describe your leadership style, who would it be and why?

My leadership style greatly inclines towards Erin Brockovich, played by Julia Roberts who takes

**Having diverse backgrounds brings about innovative thinking**

on a powerful corporation that has been secretly polluting the water supply in Hinkley with her perseverance and tenacious nature. She fought with courage for her clients.

**What advice do you give to other women aspiring to leadership positions or entrepreneurship?**

Woman employees are now looked up to be working at equal levels as male employees. More and more leadership positions are opening up. If you have a dream and you get an opportunity just jump in and make full use of the opportunity. Do not wait for all the experience and expertise to be gained before you take the plunge.

**How would you describe your life in 3 words?**

Family. Work. Hobby.

**What would you write on your own fortune cookie?**

Express gratitude for who you have today and aspire to capture new targets for the future!

*Rajalakshmi Hegde is a Sr Director – Product Engineering: Manufacturing, LTIMindtree. She has significant contributions in the areas of Industrial Automation, Industrial Internet of Things, and Manufacturing. Mrs Hegde has BE Electronics and Executive MBA qualifications.*

*With over 25 years of experience in Industrial Automation, Product Engineering, Sales, Business Development, Key Account Management, and Application Development, Mrs Hegde has motivated many women to join the Industrial Automation and Manufacturing workforce.*

*Prior to joining LTIMindtree, Mrs Hegde worked in Global Strategic Account Management at B&R Industrial Automation Pvt Ltd. Mrs Hegde has been honored with numerous accolades. She has been*



*T Manufacturing is an ever-evolving area, says Rajalakshmi Hegde.*

*conferred with Women Leader in Manufacturing in 2023 by WOMANUFACTURING and Machine Maker. She was featured in Machine Maker as one of the top 30 Women in Manufacturing in 2023 and recognized as the Corporate Star in 2021 by Inspired Beyond Motherhood.*

*Mrs Hegde was also featured by IED, and Machine Maker Magazine, and received*

*Women Leader of the Organization in 2019 from the Global Institute of Women's Leadership (GIWL) and UBS Forum. Furthermore, she has been involved in mentoring programs whenever possible, Via SWE, and ISA. Mrs Hegde is working with SWE, the World's Largest Advocate for Women in Engineering, as a global Ambassador.*

# ‘I aim to inspire and empower my team, acting as both a mentor and facilitator’

Khanjari D Kumbhar, General Manager, Burns & McDonnell Engineering India Private Limited.



Khanjari D Kumbhar – a passion for engineering.

**NARI SHAKTI**  
HALL OF FAME  
**Empowering Women in Great Workplaces**

**Tell us a little about your venture into the business world and the journey that brought you to your current role.**

My journey started with a passion for engineering during my academic years, where I pursued a degree in Instrumentation, laying the foundation for my career. Early on, I held different technical roles, gaining hands-on experience in design Engineering execution leading all phases of diverse technology

**A key focus is building trust, respect, and open communication**

projects across process industries in India and internationally. These roles not only built a strong technical base but also gave me a deep understanding of project complexities. As I progressed in my career with Burns &

McDonnell India, I took on more responsibilities, eventually moving into leadership roles. Here, I used my technical expertise to lead teams, manage projects, and deliver innovative solutions. In this career journey of 25 years, I've come across many challenges and overcome those successfully, contributing to my growth as an engineer.

**Can you share an experience from your leadership journey where you were confronted with a tough decision? What was your approach to dealing with it?**

Once I had the opportunity to lead a significant project with potential benefits to the company. However, I hesitated due to a coworker's previous unethical behavior. Prioritising ethical standards, I declined the project. I communicated my concerns and proposed alternative staffing solutions to my supervisor. Despite initial resistance from stakeholders focused on the project's gains, I stood firm, emphasizing the company's values. Ultimately, my decision was respected, and the project was staffed with a team aligned with ethical standards. This decision upheld my commitment to integrity and safeguarded the company's reputation.

## Can you shed light on the leadership style you employ and its role in shaping your success?

I aim to inspire and empower my team, acting as both a mentor and facilitator to support their growth. A key focus is building trust, respect, and open communication, creating an inclusive environment where everyone feels valued. Embracing creativity and innovation, I challenge my team to think outside the box, which has helped us stay ahead in our industry. Additionally, I prioritise serving my team's needs and removing obstacles to their success. This leadership style has played a significant role in achieving exceptional results, fostering a culture of collaboration and innovation in our projects.

## How do you balance professional responsibilities with personal life?

I think maintaining a balance between professional duties and personal life is really important for overall well-being and success. My organisation Burns & McDonnell India has been a great contributor to help work life balance through flexi work policies. Also, I prioritise tasks based on their urgency and importance, allowing me to complete my professional responsibilities efficiently and make time for personal commitments. Communication with colleagues about my availability and personal commitments is vital, as is prioritising self-care through discipline, exercise, and adequate rest. This approach ensures I can excel in both spheres with mindfulness and self-awareness. I will want to mention here the unwavering support I receive from my husband, Deepakkumar Kumbhar which contributes to a great extent to help me balance these responsibilities.

## How do you approach mentorship, and do you actively mentor others?

Mentorship plays a crucial role in my professional life, where I actively engage in being mentored as well as mentoring others. I seek out mentors who can provide valuable guidance and insights based on their experiences, viewing the mentor-mentee relationship as a mutual learning opportunity. When being mentored, I approach the relationship with an open mind, valuing constructive criticism and feedback. As an active mentor, I prioritise active listening and empathy, tailoring my guidance to the specific

needs and goals of the mentee. I aim to empower mentees to take ownership of their development, encouraging them to set goals and seek out learning opportunities. Overall, mentorship is an integral part of my commitment to continuous learning and professional growth.

**Name:**  
**Khanjari D Kumbhar**

**Designation:**  
**General Manager**

**Organisation:**  
**Burns & McDonnell  
Engineering India Private  
Limited**

**Qualification:**  
**Bachelor of Engineering in  
Instrumentation**

**Contribution:**  
**Instrumentation Engineering  
and Automation, IT and  
Engineering Innovations**

## In what ways do you prioritise your personal growth and continuous learning?

Prioritising personal growth and continuous learning is essential for my success in the Engineering industry. I start by setting clear goals that align with my long-term aspirations, which serve as a roadmap for my development. Seeking feedback from colleagues, mentors, and supervisors is crucial to identifying areas where I can improve. I see challenges as opportunities for growth and actively seek out assignments that push me out of my comfort zone. Lifelong learning is a priority for me, and I make sure to stay updated on industry trends and best practices. Networking with peers and participating in professional organisations

keeps me connected and provides valuable insights. Reflecting on my experiences allows me to adapt and improve, while maintaining a healthy work-life balance is vital for my overall well-being. This approach ensures that I am equipped with the skills and knowledge needed to excel in the dynamic engineering industry.

## Can you share examples of initiatives you have implemented to ensure a diverse and equitable workplace?

At Burns & McDonnell India, we embrace Diversity, Equity, and Inclusion (DEI) and I have been an integral part of several initiatives aimed at fostering diversity and equity in our workplace. One initiative involves introducing DEI moments during our monthly meetings emphasizing to the team about these important topics. Additionally, I have been proactive in promoting diversity in our recruitment processes by creating diverse interview panels to reduce bias. Furthermore, I proposed the implementation of a 'Returnship Program' designed to support women on career breaks. Another significant contribution has been my leadership of the NOW (Network of Women) resource group, which aims to foster networking opportunities beyond immediate work circles, bridge gender inequity, and create a safer and more professionally conducive environment for women in our workplace. Currently, I am working with the Society of Women Engineers (SWE) to revive the Mumbai Chapter, which will provide a vital platform for networking, experience sharing, and building a strong community where members can find mentorship, guidance, and professional connections. Additionally, I had the opportunity to serve as the Program Sponsor for the Lead Certification Program, which has been instrumental in helping Lead Engineers and aspiring Lead Engineers build relationships, identify competency gaps, enhance project execution predictability, and improve overall client satisfaction. These initiatives are crucial in cultivating a workplace where all employees feel valued and empowered to contribute.

## What books, mentors, or experiences have had a significant impact on your leadership style and approach?

The books 'You Can Win' by Shiv Khara and 'The 5 AM Club: Own Your Morning, Elevate Your Life' by Robin Sharma have had a

profound impact on my career. On the mentorship front, I've been fortunate to have outstanding mentors whose advice and guidance have been crucial in shaping my career path, leadership style, decision-making process, project management skills, and team leadership abilities. By observing their leadership methods and strategies, I've gained insights into creating a positive and productive work atmosphere. Also, as I reflect on my career journey, I owe a significant part of my success to my parents – Gopaldas Badamwala and Devmani Badamwala, who have been all-time mentors in shaping my professional growth with their experiences and advice.

Can you discuss a failure or setback and the lessons that taught you?

A few years ago, I was interviewed for a mid-management-level position. Though I was qualified and experienced, I was not selected for the role. I felt disappointed for a while, as I had invested a lot of time and effort in the interview process.

However, this experience taught me several valuable lessons. Firstly, I realized the importance of constructive feedback on my interview performance. Secondly, this experience reinforced the importance of perseverance and maintaining a positive attitude. While I was initially disappointed, I remained focused on my long-term career goals and continued to seek out new challenges and opportunities within the company. This also prompted me to reassess my skills and qualifications to further develop my expertise in areas that were identified as needing improvement. It turned out to be a valuable learning experience that helped me grow both personally and professionally.

### **What advice do you have for other women with aspirations for leadership roles or venturing into entrepreneurship?**

I'd say confidence is the key. Leaders must have faith in themselves and be able to overcome self-doubt. Meanwhile, it's equally important to have faith in your teammates while being open to new ideas. Knowledge lies everywhere, and constant learning helps a long way. It leads to consistency, which eventually helps growth. While accepting a challenging role like this, it's natural to face numerous challenges on the way. Therefore, one must



*I prioritise serving my team's needs – Khanjari D Kumbhar.*

**Apply sportsmanship in daily life, lifting other women while moving forward**

always be ready to bounce back from setbacks. Teamwork leads to success. Hence, building a supportive community plays a key role. Apply sportsmanship in daily life, lifting other women while moving forward. Focus on developing a strong personal brand; it can make huge impact. Along with all of this, it is crucial to keep one's work-life balanced.

### **How would you describe your life in 3 words?**

Never Give Up!

### **What would you write on your own fortune cookie?**

Believe In Yourself, You Are Your Best Judge!

*Khanjari D Kumbhar is a General Manager at Burns & McDonnell Engineering India Private Limited. With more than 25 years of experience, she has significant technological contributions in the areas of Instrumentation Engineering and Automation, IT and Engineering innovations. Mrs Kumbhar holds a Bachelor of Engineering degree in Instrumentation.*

*Mrs Kumbhar has extensively worked on various project phases like Concept/Pre-FEED, FEED, Detail Engineering & EPC. Her experience working as a Lead Engineer on multiple projects in Oil & Gas, Refinery, Petrochemical, Chemicals, and Offsite & Utilities has always been resourceful. Keeping sustainable development paramount, Mrs Kumbhar also worked on some green initiatives, including proposals like Carbon Capture & Green Hydrogen, Zeeco-IOCL flare system package, and IOCL-SN SRU.*

*Mrs Kumbhar's white paper on "Making the Most of Safety Integrity Levels" was published in Chemical Today. She also has a white paper published on "The Evolution and Future of Engineering: The Path to A Better World". Mrs Kumbhar has been an active part of the Business Development team, identifying the right global business partners to develop long-term relationships. Considering community development as her social responsibility, Mrs Kumbhar works with the CSR team to evaluate permanent CSR projects which have a long-term impact on the global community.*

*Mrs Kumbhar has significant achievements with her name, including TUV Functional Safety IEC 61508/61511 Certification Level 1. She was recognised by Burns and McDonnell with "Rich Mahaley CSR Award" for outstanding contribution to community welfare and the "BMI Mentorship Trophy" for guiding and developing young engineers. Mrs Kumbhar has mentored 20+ fresh graduates and 15+ engineers to Lead Level.*



# 'I feel honoured as the first lady Associate Project Director of a launch vehicle project'

Dr S Geetha, Outstanding Scientist, Former Programme Director, Vikram Sarabhai Space Centre.



Dr S Geetha, Outstanding Scientist.

## What inspired you to pursue a career in the space industry, and how have your research interests evolved?

I hail from Thiruvananthapuram, where Vikram Sarabhai Space Centre – the mother centre of the Indian Space Programme is located. From childhood days, I used to watch the serious scientists travelling in the grey coloured staff buses dashing across the nook and corner of the city. Also the news of sounding rocket launches every month kindled curiosity on Space related activities – knowingly or unknowingly. During my BTech, Control

Systems was one of my favourite subjects, the way in which my professor taught it. Naturally it made me take my Masters in Control Systems and later, the Doctoral degree. Though I got many job opportunities, I chose my career in Aerospace Control which was dear to me.

## Can you highlight a specific project or research endeavor that you found particularly challenging and rewarding in your scientific career?

When I joined ISRO, the hot topic was the consecutive failures of ASLV – Augmented Satellite Launch Vehicle. As a newly joined

**Team work and dedication are key factors in the success of various missions**

engineer my assignment was to attend all Failure Analysis Committee (FAC) meetings. Concurrently the design activities for PSLV were in progress and my assignment was to undertake the flight control system design for PSLV. Over more than 20 years I did the job and as time progressed I became the designer for other launch vehicles also.

Later I moved to the Core Team of GSLV Project handling mission related activities and was the first lady Associate Project Director of a launch vehicle project. As a mission executive my initial job was to coordinate and contribute in critically analysing previous failures of GSLV missions. The mission synthesis activity is multi-disciplinary in nature with aerodynamics, propulsion, control, aerospace structures – to name a few. This opportunity gave me a wide arena to sharpen my research and techno managerial skills concurrently.

## As a Program Director at a space centre, how did you approach the strategic planning and execution of space programs?

Right from inception, ISRO has inculcated a unique working culture – openness. Irrespective of the hierarchy, one is at liberty to highlight their technical points and concerns. Such openness leads to clear decision making and execution at appropriate times. The designs are presented in various levels of reviews and the teams have no hesitation in implementing the suggestions. Team work and dedication are key factors in the success of various missions.

## How do you foster collaboration and coordination among interdisciplinary teams to achieve program goals?

The expertise and capabilities of all teams are utilised in assessing the viability and feasibility from the conceptual stage itself for new initiatives. Technical documentation plays a pivotal role and proper documents are prepared to have coherence and transparency. Apart from the domain experts, quality personnel are fully involved in each and every activity. Reviews are of utmost importance and are conducted meticulously to iron out issues and lapses at the early stage itself.

## Can you share insights into your approach to risk management in space exploration projects and programs?

Space exploration and launching of satellites for various purposes are costly. Hence, redundancy management and zero defect policy are implemented in all domains. Except for high thrust propulsion systems, wherein redundancy management is not possible, either dual or triple modular redundancy is deployed –

coupled with failsafe algorithms. In proposed missions with humans, quadruple redundancy will be used. Another area where we concentrate is the adherence of quality control in each phase of the project. All sub-systems undergo the policy of ‘test as you fly, fly as you test and demonstrate margins’. The mission critical components and computers are MIL certified devices. ‘Failure Modes, Effects, and Criticality Analysis’ (FMECA) is introduced in the project life cycle. Thorough reviews and risk analysis is crucial and over the years ISRO has developed protocols and ‘best practices’ for failsafe missions are sacrosanct, followed scrupulously.

**Name:**

**Dr S Geetha**

**Designation:**

**Scientist & Programme Director (Retired)**

**Organisation:**

**Space Transportation System, Vikram Sarabhai Space Centre, Thiruvananthapuram**

**Qualification:**

**M Tech in Control System Engineering from College of Engineering Thiruvananthapuram**

## How have you continued to develop professionally, and what learning experiences have been most impactful for you?

Yes, of course. Along with the growth of the organisation, I sharpened my techno managerial skills apart from my technical capability over thirty three years of career with ISRO. From a designer, I grew to managerial level and I developed myself as a capable reviewer and could chair various reviews requiring multidisciplinary skills.

## How do you engage with the public or educational institutions to promote interest in space science and exploration?

As an individual, I utilise all available opportunities to instill interest on space related activities to the younger generation – students and public. Also ISRO has well thought out outreach programmes like exhibitions, facility to witness sounding rocket launches at VSSC and also launches from Space Port at Sriharikota. There are programmes like Yuvikaand, pan India celebration of World Space Week during October 4-10 every year. ISRO promotes launch of student satellites as co-passenger satellites to instill enthusiasm amongst university students to foster research in Space in academia. ISRO has also introduced I-GRASP (ISRO-Grant in Aid for Space Research Programmes) supporting joint initiatives of faculty and student community.

## What do you consider to be the most significant societal impact of space exploration, and how does your work contribute to that impact?

Except for limited missions for strategic needs, almost all missions are meant for societal purposes. They include communication, navigation and remote sensing satellites. Remote sensing satellites help agriculture in a big way in terms of mapping of various resources, like crops, terrains, water resources and fishing. Disaster management and their early warning is another area. The purpose of communication and navigation satellites is self-explanatory.

## Have you been involved in mentorship programs for aspiring scientists or professionals in the space industry?

ISRO has an educational arm – IIST (Indian Institute of Space Science & Technology) at Thiruvananthapuram. The graduates from the institute join ISRO and I have mentored many students as part of their induction into VSSC. I make it a point to mentor a lot of juniors also.

## What advice would you give to women aspiring to pursue careers in space science or space program management?



Dr S Geetha receiving an award from Dr K Sivan, then Chairman, ISRO.



Dr S Geetha just before the launch of GSLV-D6.

In the recent past there has been a considerable growth in women joining ISRO and even then, their strength is only around 21% of the total community. With the new Space Policy of the Govt, a large number of private industries also have commenced activities in the space sector. The private sector also has a very good participation of women as designers and also in managerial cadres. There is unlimited scope for women with immense growth potential in various segments of space programmes.

*Director (Retired) at Space Transportation System, Vikram Sarabhai Space Centre, Thiruvananthapuram. She holds a Doctoral degree in 'Robust Nonlinear Control Design Techniques for Aerospace Vehicles' from the University of Kerala. Dr Geetha has completed her M Tech in Control System Engineering from the College of Engineering Thiruvananthapuram with First Rank and First Class with Distinction.*

*Dr Geetha has actively contributed to several projects. One such contribution was in the propulsion system review of Chandrayaan 3. As the Programme Director at Space Transportation System (STS), Vikram Sarabhai Space Centre, Dr Geetha was responsible for Mission design and planning, the Realization of hardware, Guidance, control and simulation, Structural analysis, Programme planning and management for the PSLV, the workhorse of ISRO and prestigious GSLV Project for injecting INSAT series of satellites in Geo Synchronous Orbits.*

*Dr Geetha also led the Digital Autopilot Design Section of the Control Design Division. She was involved in designing and developing Digital Autopilots of Satellite Launch Vehicles of ISRO.*

*Dr Geetha has 35 technical publications and has bagged Best Paper and Best Presentation awards. She has been conferred with numerous prestigious awards, including the APJ Abdul Kalam Award 2022 by the APJ Abdul Kalam Study Centre; the Best Women Engineer Award for 2022 by the IEEE Kerala Section; the ISRO Merit Award of 2018 in recognition of meritorious contributions to the Indian Space programme, and the Best Woman Scientist Award in 2017 by ASI and ISRO.*

*Dr Geetha is a Fellow of The Institution of Engineers India, the Institution of Electronics & Telecommunication Engineers and the Aeronautical Society of India. Dr Geetha is also a Senior Member of IEEE, a Member of the Astronautical Society of India, the Systems Society of India, and the Indian Society for System Science & Engineering.*

**There is unlimited scope for women with immense growth potential in various segments of space programmes**

**How would you describe your life in 3 words?**

Passion. Diligence. Dedication.

**What would you write on your own fortune cookie?**

Always be Positive, Success is Yours!

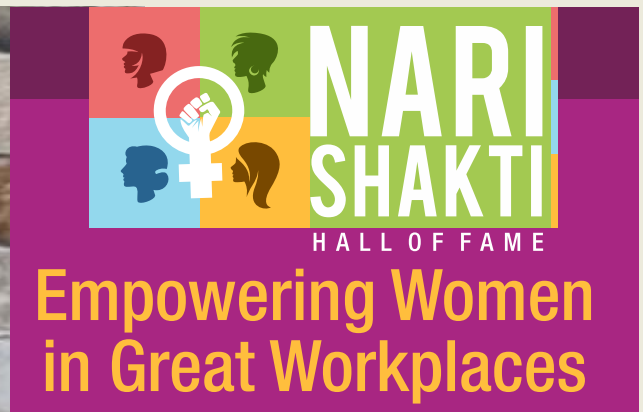
*Dr S Geetha, a Scientist and Programme*

# ‘Sometimes even I used to think that no one believes in my capability’

Banoo Jakkirriaah, Engineering Manager, Caterpillar India Private Ltd.



Sometimes I used to think no one believed in my capability – Banoo Jakkirriaah.



**Can you delve into your experiences in the business world and discuss how you arrived at your current role?**

I was lucky to have been born to parents who believed in the value of education. Despite

familial and societal pressures, they ensured all their three kids graduated as engineers/doctors. I started my first job with a minimal salary to financially support my family. Beyond finishing regular work at the office and at home, I would regularly spend time on a rented computer, (limited resources so could

not afford to buy one) to enhance my programming skills.

Sleepless nights and hard work did its magic, and I got selected to work for a Tier-1 automotive company in the product development department. Progressing to the next level was really challenging, but I continued to learn and execute all the technologies, processes, and projects and it was a great moment when I was recognised as the best programmer!

**To be sustainable in the industry and manage the versatile needs, ongoing learning and upskilling are must**

Later I ventured into bigger and better projects with subsequent companies. During that time, I was a mother of two toddlers and had to cover a long distance to reach the office. There were some sleepless nights again but, this time with two fast asleep toddlers in the lap. However, as with any other demanding work, it paid off well when I became an integral part of a major technology launch. Now, with almost 22 years in the automotive industry, I would still not think twice if asked to climb on a tractor, JCB, or a car, work in the proto shop, or stand in a production line for the benefit of the project.

## What inspired you to pursue a career in the manufacturing industry?

Having been predominantly in the R&D division, I was supporting manufacturing.

## What methods do you employ to stay abreast of industry trends and continually enhance your skill set?

- Networking – being part of conferences and connecting with industry leaders
- Collaborative learning – new technology or process from peers, team members and Gen Z, the millennials, and
- Listening – technical videos/podcasts.

## Have you faced any specific challenges as a woman in your industry, and how did you navigate them?

There were multiple instances; one such instance was the introduction of next gen technology in the off-highway industry. This required a lot of background work which involved competitive study, acceptance by customers, benchmarking the features, redesigning of the mechanical electronic architecture of the vehicle, etc. But the challenge was to get conviction and acceptance from internal stakeholders, which was difficult to adapt in a mechanical vehicle.

Sometimes even I used to think that no one believed in my capability, but I paused and reflected and understood that it was due to lack of knowledge. The same was overcome by sharing knowledge through audio visuals, data and facts, and making every one understand the value proposition and disruption it can bring in the off-highway industry, which later had a buy-in across the organisation.

## How do you promote gender diversity and inclusion in your workplace?

At my workplace, I ensure that there are equal opportunities given. I also represent the Society of Women Engineers and work towards empowering women at my workplace.

I cannot share much as it is part of confidential practices followed at the workplace.

## What role do ongoing learning and professional developments play in your career journey?

I started my career as a Software Engineer, moved on to various roles in the automotive industry in the R&D division. My role demanded knowledge of programming, servicing, manufacturing and leadership. To be sustainable in the industry and manage the versatile needs, ongoing learning and upskilling are must. I strongly believe if you want to break the glass ceiling, and then keep yourself up to date in all areas of the working domain, which

**Name:**  
**Banoo Jakkirriah**

**Designation: Engineering Manager**

**Organisation:**  
**Caterpillar India Private Ltd**

**Qualification:**  
**B.E., Electrical & Electronics**

**Contribution:**  
**Next gen connected solutions for passenger car, affordable technology in farming**

may even push you to move out of your comfort zone. Every exposure is a learning experience.

## How do you see the industry evolving in the next few years, and how are you preparing for those changes?

All OEMs are focussing on emerging and disruptive technologies like Connected Solutions, Electric and Autonomous Vehicles, the Internet of Things (IoT), Artificial Intelligence (AI), and Machine Learning. These technologies

are going to bring a lot of changes in the entire ecosystem, including infrastructure. These technologies go hand in hand; we need to be mindful in applying these effectively. It is very important for all of us working on this to have end-to-end knowledge from customer insights, R&D, Dealers, Regulations, etc., to deliver the right product in the market which can delight customers, organisations and government bodies. I engage myself by self-learning from online sources, attending conferences, connecting with industry friends, networking, etc., and apply those concepts at the workplace too.

## What are the strengths or perspectives you perceive as unique to women in leadership positions?

Resilience & Perseverance – For all choices of challenges you make an untold dream can be a reality. Challenges are going to persist, but get going. Bouncing back and never giving up will help us climb the leadership ladder.

## If you were to offer guidance to other women aspiring to leadership roles or entrepreneurship, what advice would you provide?

Believe in the self, learn & unlearn, work hard, win your battles through internal strength.

## How would you describe your life in 3 words?

Confident. Humble. Aspirational.

## What would you write on your own fortune cookie?

Follow what calls you with grit, but never let go of your dream!

*Banoo Jakkirriah, an Engineering Manager at Caterpillar India Private Ltd. She holds a B.E. Electrical & Electronics degree and has significant contributions in areas including Next Gen Connected Solutions for Passenger cars and Affordable technology in Farming. Mrs Banoo also served as a Head of Advance Technologies - Farm Division - Project Manager, Team lead - AIPL (a JV with Continental & Ashok Leyland).*

*Mrs Banoo feels herself lucky to have been born to parents who believed in the value of education. She began her first job at a minimal salary to financially support her family and*



I engage myself by self-learning, says Banoo Jakkirraah.

## Bouncing back and never giving up will help us climb the leadership ladder

contribute to her mother's failing health. Beyond finishing her regular work at the office and home, Mrs Banoo would regularly spend time on a rented computer to hone her programming skills.

In 2013, as a manager in an Indian OEM, a mother of two toddlers, had to cover a long distance to reach the office. She headed a team full of GETs, who were working on next-generation technologies. Mrs Banoo stood out as a professional in the space of engineering machines and technologies and took up the opportunity as a woman leader in Caterpillar under the Engineering domain.

Mrs Banoo holds several recognitions including Global Ambassador in the Society of Women Engineers '22 and being featured in SAE – Mobility Engineering March 2021 edition. She has been conferred with Disruptive Tech & Innovation awards by Kamikaze. Mrs Banoo is a member of the International Women Forum. She has also served as a Mentor and Jury for the 1000 Women Leaders Program initiative by Jombay.

Mrs Banoo is a strong believer of the phrase "Always aim high, work hard with discipline, and care deeply about what you believe in. And, when you stumble, keep faith. And, when you're knocked down, get right back up with a smile & positivity."



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# 'Risk taking and decision making are routine segments of project execution'

Latha D S, General Manager, Tata Consulting Engineers Limited.



## Provide some background on your business journey and the progression that landed you in your current position.

My career spans its origin from John Brown Engineering (P) Limited – Bangalore, followed by Triune Projects (current rename: Saipem) and Lurgi – India (Current rename: Air Liquid) @ New Delhi, PT Sempec-Indonesia @ Jakarta and Tata Consulting Engineers Limited (TCE) @ Bengaluru.

## I have managed multiple projects and mentored futuristic projects

I started my career in Offshore Design and Detail Engineering at John Brown Engineering India (P) Limited (JBEI) in 1993. Working for 3 years at JBEI gave me exposure to the intricate design considerations of offshore well platform design like fire safe designs to API, importance of personnel and platform safety – prevention of catastrophes and mitigation, material to be considered, pneumatic shutdown panels, solar electric power supply system, standards to be adhered to which form an important basic configuration prerequisite. During my tenure at JBEI, I also gained exposure to polymer plant instrumentation. Working @ JBEI enhanced my

confidence in working with national and international clients/vendors.

In Triune, I was engaged in design and detail engineering for gas gathering station modifications, chemical plants – formulation and sulphonation plant.

Further, Lurgi-India gave me an immense opportunity to work as an EPC contractor for the Refinery sector (multiple units in the refinery – Benzene, Butadiene and PGH units), Calciner, COS Hydrolysis unit. I was actively involved in EPC activities including Design and Detail Engineering, Coordination with multiple parties (Bidders, Vendor, Client for approvals, Sub contractors – to name a few), HAZOP and SIL study, implementation of first TMR ESD – F & G systems in India, Procurement services, Factory Acceptance Test of Control System in South Korea, Commissioning supervision services in Qatar.

My next job at PT Sempec included detailed engineering of wellheads, fractionation units and fixed platform units.

After globetrotting, I joined TCE (present job). TCE being a knowledge-based organisation provided me a platform to venture into the power plant sector with exposure to national and international gas based, coal based, nuclear, renewables including solar, wind, hydro projects. I have managed multiple projects and

mentored futuristic projects – Flue gas desulphurization units, Basic engineering for Green Hydrogen and Green ammonia plants, Hydrogen fueling station, Optimisation/improvements in power plant heat recovery.

In my current role – being a part of Chief Technology Office as Discipline Head, I am responsible for improvisation in utilisation of existing technologies, adopting emerging technologies and driving design innovations.

## How do you define success in your professional life?

During my first 25 years of profession, I have performed various roles in field instrumentation and control systems engineering as Project Engineer, Specialist Engineer, and Project Manager. I have extensive experience in feasibility reports; Pre-bid engineering, basic & detail engineering, extensive use of industry software, FMEA studies, Inspection services of Oil & Gas industry including Offshore and Onshore platforms and Refineries, Petrochemicals, polymer, and power industry. I was also involved in independent site surveys and commissioning supervision.

My current role involves being a part of the thought leadership team in the company with key responsibility for facilitating specialist support to projects and introducing modern technologies in the company. Key work areas include technology excellence and development, delivery excellence, operational support, productivity improvement, Networking and Image building, automation/development of newer software tools accessible to TCEites from anywhere in the world.

I would like to understand success as being an 'All-rounder' in my field of work. Beauty of my successful career is that I have the wonderful opportunity to develop myself and contribute to the same field as I have studied and augmented it

with latest developments in technology, be it Artificial intelligence/Generative intelligence, applications of neural network and deep learning, etc.

To me success in professional life means 'Being Relevant' as on date and help my Team grow with me, leaving behind a legacy for future generations to strive for a better tomorrow making our planet a sustainable and happy place to live in.

## Tell us something of the challenges specific to being a woman in a leadership role and the methods you employed to overcome them.

TCE is an equal opportunity employer with policies like flexi working hours, provision for childcare, etc. I have been involved in national and international projects of significant importance and have been travelling across the world exploring my professional potential whether it is Tehran or Muscat or South Korea in addition to a multitude of local travels. I had the privilege to climb atop a completely assembled Offshore Well Platform during my training days. I was also involved in data collection and review of revamping and reengineering Skids in the scorching hot sun at a site in the Middle East. I was also involved in data integration of the massive existing refinery control system and newly commissioned power plant control system wherein the existing control system was supplemented with required hardware and software to have an integrated control system for the entire plant operation. We also have implemented Fieldbus in one of our plants and have harnessed wireless technology for data transfer from remote intake systems.

However, there were inspections where I faced tricky situations to conclude wherein, if I reject, my plant schedule could suffer, whereas an acceptance at the factory could have posed quality issues. However, based on system design and site deployment requirements, amicable technical solutions were suggested by self to ensure quality as well as on time delivery of equipment. Minor challenges at erection sites were professionally managed. These situations remind me of the quote, 'When the going gets tough, the tough get going'.

## How do you approach risk-taking and decision-making in your entrepreneurial journey?

Risk taking and decision making are routine

segments of project execution in design and detail engineering as well as EPC (Erection, Procurement and Commissioning) projects. Mostly during pre-bid jobs and cost estimation, calculated risks and competitive costing play a vital role. Decision making is specifically important in first of its kind projects like Green hydrogen/Ammonia plants, Small modular

chartered and implemented by team.

## What strategies do you use to motivate and empower your team members?

Few strategies I implemented to encourage my peers and team members include providing growth opportunities support, lead by example, giving constructive feedback, empowerment through delegation and trust, interactive communication, foster collaboration and provide a positive work environment, continuous learning, and development of latest technological trends.

## How do you balance being assertive and collaborative in a leadership role?

Being a collaborative team-player, leading by example plays a pivotal role. Encouraging my team to share their ideas and perspectives, providing clarity and guidelines to achieve desired results builds an inclusive team culture. Collaborative decision-making helps build agreements and ownership among team members. Setting clear expectations reduces misunderstandings and encourages teamwork to achieve the intended goal(s). Also, I adopt strategies based on situational circumstances like active and patient listening, open communication, selective work allocation based on skills and strengths of the individual, assertive expression of thoughts and expectations, delegation of tasks empowering task ownership to individuals creating a positively productive work environment while achieving organisational goals.

## Share your methods for staying informed about industry trends and actively pursuing the development of your skills.

Instrumentation and Controls is an ever growing and evergreen field with multiple multi-layered opportunities. With the advent of automation tools and augmentation of trending Artificial Intelligence (Adaptive AI, Generative AI, etc.), it is imperative to keep ourselves upgraded about the latest technological developments and deliberate on meaningful implementations improvising plant or product efficiency while saving time and cost. Magazines like ISA, Chemical Industry Outlook, Industrial Automation, Automation.com; websites of World Economic Forum, India

**Name:**  
**Latha D S**

**Designation:**  
**General Manager**

**Organisation:**  
**Tata Consulting Engineers Limited**

**Qualification:**  
**B.E. (Instrumentation and Technology)**

**Contribution:**  
**Instrumentation and controls engineering**



reactors, and renewable sector. Based on risk assessment, Market survey and deliberations within the organisation, a practical solution is



## TCE is an equal opportunity employer with policies like flexi working hours

Brand Equity Foundation, reading newspapers, attending seminars and exhibitions, and interactions with OEMs; feedback surveys with plant owners regarding the existing system operation and upgradations implemented after plant commissioning, plant owner's upscaling requirements in an operational plant, etc., provide an in-depth insight regarding trending requirements and associated advanced technology solution engineering for the same upgrades current capabilities.

I am glad to have authored Technical Papers and articulated trending topics like 5G integration with industrial automation, automation and remote monitoring trends in solar PV power plants, role of cloud-based solutions, smart cities in national and international journals like Automation.com of ISA and forums like ARC Advisory Group, and Indian Infrastructure.

### Outside of work, what activities or hobbies do you engage in to maintain a work-life balance?

Well, music is my favourite pastime to unwind myself. Reading, movies, singing, workouts, socialising are other activities enabling work-life harmony. Being well aware that our lives are quite complex, wherein personal life and work intertwine and impact one another, I have embraced their interconnection, allowing them to augment and reinforce each other.

### What book, podcast, or resource has had a profound impact on your professional growth?

Bhagavad Gita, academic textbooks, and journals, Seven Habits of Highly Effective People, The 48 Laws of Power, Atomic Habits, TEDx inspirational talks and encouragement from family and seniors @ my workplace have had a phenomenal effect on my professional growth.

### What words of advice do you have for other women with aspirations for leadership positions or entrepreneurship?



Assertive expression of thoughts and expectations.

Maintain a well-balanced work-life; be agile, learn, unlearn, and re-learn. Develop on your communication skills and work on your positives, reinvent your technical skills and stay relevant in your field of work.

'Go for it' what your heart says and what the company wants.

Believe in yourself and what you do...and Think Big!

### How would you describe your life in 3 words?

Happy. Proficient. Progressive.

### What would you write on your own fortune cookie?

You Will Live Long Enough To Open Many Fortune Cookies!

Latha D S is the General Manager, Tata Consulting Engineers Limited. She holds a B.E in Instrumentation and Technology. Ms Latha has nearly 30 years of experience in process and power plant engineering, including Field instrumentation and Control systems – Conventional Distributed control systems as well as state-of-the-art Fieldbus/Profibus-based control systems.

Ms Latha also has experience in Emergency shutdown systems, Programmable logic controllers; Emergency shutdown systems, Fire and Gas detection systems, Pneumatic shutdown panels in Offshore well platforms, and more. She has extensive knowledge of

industry software – PRODOK, Smart plant instrumentation and 3D tools.

Ms Latha has contributed to various technical papers in national and international journals, including "Smart Automation in Rural Development" published by Viewpoint, Consulting Engineers Association of India in 2023; "Contract management Automation" and "Integrated Automation from Command Control Centres" published by Viewpoint, Consulting Engineers Association of India in 2022.

Ms Latha is an avid speaker and a panelist in national and international conferences and webinars, such as "5G integration for industrial Automation" @ Annual Conference on IT & OT in Oil & Gas" by Indian Infrastructure magazine and "Automation and Remote Monitoring Trends- Solar PV power plants" @ 21st Annual ARC advisory group India forum in 2023.

Ms Latha has worked on many initiatives like the implementation of TMR SIL control system for the petrochemical industry and HAZOP for power plants in India, Failure mode effect and analysis study for power plants. She has also been involved in advanced process control implementation in coal-based plants and worked on special projects in multiple sectors (oil and gas, chemical industry, power plants).

Ms Latha is a member of the Electronics and IT department at the Bureau of Indian Standards (LITD 04, 07,12,14). She has mentored associated project team engineers, peers and trainees in the organisation for quality designing and engineering of solutions.

# ‘I encourage my team to take ownership and communicate without fear’

Mahalakshmi Ramesh Kumar, Additional General Manager & Deputy Head – Customer Service Division, Yokogawa India Limited.



Courage plays a big role in charting our course in life and business – Mahalakshmi.



## Empowering Women in Great Workplaces

**Can you share about your journey in the business world and how you got started in your current role?**

I started my career as a scientist at the Bhabha Atomic Research Centre. It was a great learning experience, and it helped me build a strong foundation in instrumentation and process automation. I then got married, moved to Bangalore, and joined Yokogawa, a leader in process automation. I started as a trainer, quickly progressed to heading the training division and expanded into Repair services and

**I have tried to set my own benchmarks and constantly challenge myself**

Service sales functions. Yokogawa believed in me and gave me challenging roles and avenues to create impact, helping me grow into my current role as Deputy Head of Yokogawa services business in India.

**What leadership qualities have been crucial to your success?**

I have tried to set my own benchmarks and constantly challenge myself, striving to foster

growth and continued development in business models, processes, and people. Open communication and clarity on individual and team goals has helped the team to cultivate a strong positive attitude, thus converting challenges to growth opportunities.

I believe courage plays a big role in charting our course in life and business, and a well aligned courageous team can take on the challenges of life as well as business. I have all along been striving to build such a team and I can say today, with confidence, that my team can navigate through this VUCA world and bring prosperity.

## Can you share a pivotal moment or decision that significantly impacted your journey so far?

The decision to move to a new city and pivot my career from science to industry had a profound impact on my journey. It taught me how to look for opportunities and deal with change, both in my personal and professional life.

My education and experiences had equipped me with valuable critical thinking skills and a versatile set of tools that I could deploy towards any avenue of my choice. Then, and now, I strive to put my best foot forward, and more importantly, enjoy the journey towards the destination.

## What strategies do you employ in building and leading a successful team?

The focus has been to create team synergy, as the combined effort of a team is more effective than the sum of its parts. I try to instill the mindset that every individual's contribution is equally important for the company's success. Every individual in the team has unique potential, ability, personality, and skill sets. If we tap that potential correctly, together, we can create a winning team. We use tools like skill-matching and a 360-degree feedback system to provide development programs for everyone. I encourage my team to take ownership and communicate without fear, and to take pride in our professionalism. I encourage them to build on their success and to manage setbacks with a positive attitude and renewed enthusiasm. I also believe in celebrating our successes and learning from our failures as a team.

## Can you discuss a failure or setback and the lessons it taught you?

In 2008, our team introduced Internet based training globally. In India, we ran into a lot of problems as this was still a very new concept. Connectivity was a huge issue, and many companies did not grant access to our modules for security reasons. We were forced to re-evaluate our strategy and develop an innovative solution to successfully deploy our modules in

challenges to growth opportunities with flexibility, determination, and co-innovation.

## How important is workplace culture to you, and how have you contributed to shaping it?

A workplace is not just a venue for people to come together to perform a task. They must be motivated to initiate innovative ideas and establish a great career for themselves. I believe that an organisation's DNA is built by the values, beliefs, and attitudes of its people. Rewarding an individual or a team's success while helping them navigate failures builds trust and inculcates transparency, creating a solid foundation for a healthy workplace atmosphere. At Yokogawa, we make persistent efforts towards fostering meaningful relationships and encouraging the team to participate in professional team building and social cultural activities. This brings the team together, improving morale and helping keep spirits high.

## How do you stay updated on industry trends and continuously develop your skills?

I am deeply passionate about learning, and my role allows me to interact with domain experts and stay connected to industry trends. I attend workshops and seminars, and this has helped me to continuously develop my skills and tune our services to match evolving customer needs.

## How do you define success in your professional life?

Success for me is to be a better person than I was yesterday. I define success as creating a positive impact for the company as well as for our customers. I wish to leave behind a strong legacy with a balanced, highly functioning team with deep respect for customer relationships. In this pursuit, if I can retain my positivity and maintain a healthy work-life balance, I think that qualifies as success.

## How do you balance professional responsibilities with your personal life?

Professional and personal skills are not mutually exclusive in many areas. Multitasking and people management are natural requirements on both fronts and interestingly, this helps in

**Name:**  
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**Designation:**  
**Additional General Manager and Deputy Head – Customer Service Division**

**Organisation:**  
**Yokogawa India Limited**

**Qualification:**  
**B.E. – Electronics and Communication**

**Graduated from 'Training School' of BARC, Mumbai**

**Contribution:**  
**Industrial Process Automation (Control, Safety and Cybersecurity domain)**

CD version for the local market. Later, with the advent of appropriate technology, we could address these concerns and implement virtual training programs across the globe, resulting in a successful and versatile model. Through this experience, I realised that setbacks pose challenges, but they push us to think outside the box and look for better solutions. Adversities help us to innovate and realise our potential. As I said before, we turn the

# NariShakti 2024

balancing both our lives. Effective time management and prioritising key activities help us to strike a balance.

I like keeping my personal and professional life separate and make conscious efforts to prevent workplace stress from trickling over. I believe that a healthy personal life aids in professional success and vice versa. I enjoy spending time on my interests like reading, cooking, and spending time with loved ones, and I bring along the same commitment and passion to my work. My sense of purpose and a strong support system gives me the confidence to balance both worlds with ease.

## What advice would you give to women aspiring to enter the business world or become entrepreneurs?

It is important for women to be financially independent and realise the full extent of their potential. Pursuing a good education and choosing a profession they are passionate about is the first step. Women need to step out of their comfort zone, believe in themselves and adapt to changes quickly. No favors are dealt out in the professional world and there is no easy path to success. We need to overcome cultural and psychological barriers, be open to new ideas, and face challenges with grace and courage.

## How would you describe your life in 3 words?

A Beautiful Canvas.

## What would you write on your own fortune cookie?

Trust yourself, soar high and free

*Mrs Mahalakshmi Ramesh Kumar is an Additional General Manager and Deputy Head- Customer Service Division, Yokogawa India Limited. Mrs Kumar started her career at Bhabha Atomic Research Centre (BARC) as a nuclear scientist and subsequently joined Yokogawa India in its Customer Services Division. She rose from being an individual trainer in the Industrial Automation and Safety domain to heading the Training, Bench Repair and Southern Regional Services business in Yokogawa.*

*As a Deputy Head-Customer Services at Yokogawa India, Mrs Kumar is responsible for*



*I like keeping my personal and professional life separate – Mahalakshmi.*

*the overall services business of the company. She has transformed the Training centre from a cost centre to a profit centre and ensured Training Business Growth Year after Year. Under her leadership, Yokogawa Training Centre has delivered more than 55,000 man-weeks of Industrial Automation training programs for Energy & Sustainability, Materials and Life Industry Professionals and engineering students across the Globe.*

*Mrs Kumar has been the recipient of the Yokogawa Electric International Pte Limited, Japan Performance Award towards the Development of Net-Based Online Training Modules of Yokogawa. Under her Leadership, Yokogawa India Training Team received ACE Performance Excellence Award for their success in Virtual Trainings Globally.*

*Mrs Kumar has also championed various*

*campaigns in Yokogawa India including the Global Employee Engagement Program; Diversity and Inclusion Initiative; Industrial Automation to Industrial Autonomy (IA2IA); Change Champion for Yoda (Yokogawa Digital Assistant -CRM); ARIBA Cloud Based Procurement Solution for Service.*

*As Training Head, Mrs Kumar mentored, motivated and developed a consistent high-performance team which has received accolades globally. As Bench Repair Head, she mentored and created a highly professional and collaborative result-focused team which could deliver quality results consistently. As Yokogawa strongly believes in Diversity and Inclusion, Mrs Kumar has groomed a second line of women trainers and women leaders to handle multifunctional cross-domain roles to carry the legacy forward.*

# ‘Staying connected with industry trends is crucial in a rapidly evolving field’

Manisha Jain, Senior Manager (Instrumentation & Control Engineering), Linde Engineering India Private Limited.



*Success in professional life is not merely about personal achievements – Manisha Jain.*

## What inspired you to pursue a career in this industry?

My fascination with technology and field experience of almost 22 years in petrochemical plants and of Sales & Business development in leading manufacturing companies has given me perspective of challenges being faced by the industry.

With the aim of addressing these challenges right from the design phase, inspired me to embark on a career in design & engineering. At Linde, a leading global industrial gases and engineering company, I got the opportunity to contribute to the development of high-quality engineering solutions, working with global experts and learning sustainable emerging technologies. This has fuelled my passion for this industry.

## How do you define success in your professional life?

For me, success in my professional life is not merely about personal achievements but revolves around the collective success of the teams I've been fortunate to lead. It is about fostering an environment that encourages creativity, collaboration, and continuous improvement. True success is achieved when

the projects we undertake positively impact the industry.

## Can you share your perspective on your leadership style and the contributions to your achievements?

My leadership style revolves around inspiring my team members and achieving goals. I believe in creating an inclusive environment where diverse perspectives are valued, and everyone feels encouraged to share ideas. Collaboration, open communication, trust and care have been integral to the achievements and milestones we've reached together.

## Can you discuss your approach to risk-taking and decision-making in your professional endeavors?

Risk taking either gives new opportunities or new learnings which makes us stronger and confident for future endeavours. Recognising risk proactively, weighing its likely benefits and possible losses well in advance helps us to find the possible solution.

I approach decision-making by gathering relevant data, analysing potential outcomes, and seeking input from my team and encouraging them to share more innovative ideas to ensure success and sustainability of our endeavours.

## What strategies do you use to motivate and empower your team members?

Motivating and empowering my team is at the core of effective leadership. I prioritise creating a supportive work environment that fosters creativity and acknowledges individual contributions. Recognising achievements, providing growth opportunities, and encouraging a healthy work-life balance are key components of my strategy to keep the team motivated and engaged.

## Recall a challenging decision you had to make as a leader. What steps did you take to handle the situation?

One challenging decision involved navigating a project with tight deadlines and unforeseen technical challenges. I initiated transparent communication with the team, assessed available resources, and redefined project

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**Designation:**  
**Senior Manager  
(Instrumentation & Control  
Engineering)**

**Organisation:**  
**Linde Engineering India  
Private Limited**

**Qualification:**  
**B.E (Electronics and  
Instrumentation)**

**Contribution:**  
**Subject Matter Expert in  
Process Analyzers system,  
Process analyzer  
engineering, and more.**



Women bring structural and cultural differences to the table – Manisha Jain.  
milestones. By fostering collaboration and leveraging the strengths of each team member, we not only successfully met the deadline but

also strengthened our teamwork and problem-solving capabilities.

## How do you stay connected with industry trends and commit to the ongoing improvement of your skills?

Staying connected with industry trends is crucial in a rapidly evolving field. I dedicate time to continuous learning and engaging in professional networks. Encouraging a culture of knowledge sharing within the team ensures that we collectively stay abreast of the latest advancements, allowing us to integrate innovative solutions into our projects.

**My leadership style revolves around inspiring my team members and achieving goals**

## Can you share a mentorship experience that had a significant impact on your career?

Early in my career, I was fortunate to have a mentor who guided me through challenges and provided valuable insights. Their encouragement to embrace challenges as learning opportunities and their emphasis on fostering leadership skills significantly influenced my approach to professional growth.

This mentorship experience has shaped my commitment to supporting the development of young emerging leaders in my own department.

## In your opinion, what distinct strengths or perspectives do you believe women contribute to leadership positions?

Women are wired differently. In my opinion, they can bring structural and cultural differences to the table and demonstrate more contingent reward behaviour. In this way female leaders are more transformational and drive effective outcomes. Women are more honest, smarter and can make bold and wise decisions as leaders which are essential for navigating complex challenges.

## If you could offer advice to women aspiring to leadership positions or entrepreneurship, what would it be?



Staying connected with industry trends is crucial.

**My advice to aspiring women leaders is to embrace their unique strengths**

My advice to aspiring women leaders is to embrace their unique strengths, cultivate a strong support network, and never underestimate the value of continuous learning. Confidence, resilience, and a commitment to lifelong learning are essential elements that can empower women to thrive in leadership positions and entrepreneurship.

As I reflect on my 28-years professional journey in engineering, I am honored to share my experiences and insights with the readers of the Industrial Automation magazine. It has been a rewarding and transformative path that has allowed me to witness and contribute to the evolution of the industry.

In conclusion, my 28-year journey in engineering has been marked by a passion for new learnings, a commitment to teamwork, and a dedication to continuous improvement. As I look forward to the future, I am excited about the opportunities to contribute further to the evolution of industrial automation and inspire the next generation of engineering leaders.

**How would you describe your life in 3 words?**

Inspiring. Collaborative. Adaptable.

**What would you write on your own fortune cookie?**

‘Embrace challenges, lead with purpose, and let learning be your guiding star’.

*Manisha Jain is Senior Manager (Instrumentation & Control Engineering), Linde Engineering India Private Limited. She has earned her B.E in Electronics and Instrumentation. Manisha is passionate about learning, sharing knowledge and mentoring young engineers on Process Analyzer Systems and new technologies.*

*In her professional journey, Manisha has ventured into different industries and worked for Petrochemical plants (Client), Manufacturing (Vendor Supplier) and now in an EPC company. She is a subject matter expert in the Process Analyzers system – a Core member for developing Corporate-wide reliance standards-1. She has also contributed to process analyzer engineering that includes sampling and sample conditioning techniques and interface with DCS; Standard operating and maintenance*

*procedures covering process and personnel safety; and the development of Interactive Training modules.*

*Manisha has a passion for redesigning, and modifying hardware and software to suit the process requirements. She successfully implements cost-effective solutions through in-house efforts to achieve optimal tuning of process operation to improve both the quality and yield of the product.*

*Manisha has bagged several accolades, including Safety Incident reporting awards, Suggestion Scheme awards, and Best Faculty and Virtual Training awards. She has accomplished successful commissioning of Analyzer systems and Fire & Gas detection systems at Gas Cracker, Ethylene Oxide, Polyethylene, PET/PTA, caustic Soda, Asia's largest ETP, and power plants.*

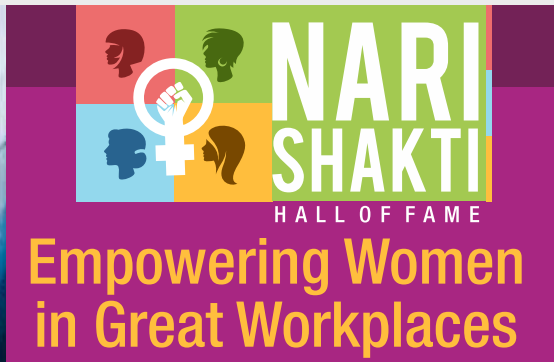
*Manisha has also been recognised as a Training Faculty at Reliance Industries. Her interview on ‘Project execution is Most Challenging part of Project Management’ was published in Industrial Automation magazine. Her potential and contribution were recognised at Linde Engineering by publishing in Linde LEInsight magazine and on LinkedIn. She has mentored Graduate engineer Trainees at Reliance Industries and Linde.*

# ‘You cannot be a true leader if you have not conquered your own fears’

Shalini Verma, CGM & HOD- Project Engineering Management, Engineers India Limited.



*Fearlessness is conquering your own fears to be truly who you are – Shalini Verma.*



## Can you share some insights into your business journey and the path that led you to your current position?

Working with EIL had been my dream ever since I was in engineering college. EIL has provided me with immense knowledge and enriching experience. I started my career in the core electrical engineering and mastered my skills by working in many prestigious projects in Refinery, Petrochemicals, Renewable energy segments, etc. In addition, I was in the core committee responsible for digital transformation and developing strategies for business diversifications. I have also contributed in formulation of various Indian Standards and National Electrical Code of India, with the Bureau of Indian Standards (BIS).

I was felicitated with the Best Women Executive Award by Women in Public Sector

Forum (WIPS) in the year 2020. Presently, I am heading the Project Engineering Management Department in EIL.

Challenges are part of any success one achieves and overcoming them with grit and conviction makes one a true leader. Challenges were also there in the personal front with increased responsibility towards the family especially with my younger son being a differently abled child. But with my family’s support and guidance from my mentors, I could pursue my career as well as bring up my son well.

## How would you characterise your approach to leadership, and in what ways do you believe it enhances your success?

I have been a leader since a very young age and leadership attributes varied with time and the leadership role I assumed from time to time. Being amongst the elder cousins in the family, I learnt that to be a leader you have to be a role model. Being a leader in the classroom, I realised that I could not impose my ‘Role Model’ ideal on my peers. I learnt to accept my peers and it became an important lesson as a classroom leader that I celebrate strengths and work on the weaknesses using those strengths. I found the second key to leadership, which was motivation and influence. As I progressed further in my career

and become Group Leader, I realised that the above two are not enough. I learnt to collaborate with my seniors and colleagues and learnt from their experience through discussions and taking them on board for decisions. Thus, I learnt collaborative and shared leadership.

It is when I headed a department I learnt fearlessness – it is conquering your own fears to be truly who you are; standing tall with the right values and the right causes. You cannot be a true leader if you have not conquered your own fears. We all are required to find the light within us and shine it outward in whatever role we are involved in. We are teachers and leaders at each stage of life. The conscious self embraces the soul within and is set free by the fearlessness that honesty and truth give to all of us. We then are free to lead a life of humility, love, respect and strength as an individual and leader.

**We all are required to find the light within us and shine it outward in whatever role we are involved in**

Share your experiences with challenges in your leadership role as a woman and the approaches you adopted to overcome them.

There are many challenges which women face during their career life in both professional and personal front. In some phases of life, women may lack flexibility due to multiple roles and responsibilities at work as well as on the family front. Women may encounter subtle or implicit forms of discrimination or prejudice that affect their opportunities, decisions, or interactions. The best approach to overcome these challenges is to challenge the bias – women should identify and confront bias, whether in themselves or others, and educate or



influence others to create a more fair and inclusive culture, Build a sisterhood – women should support and empower each other, and form networks or alliances with other women who can offer advice, mentorship, or advocacy.

My mentors and seniors have always guided me and I express my gratitude to them for where I am today.

## Have you faced challenges related to work-life balance, and how have you managed them?

Achieving work-life balance can be challenging for anyone, and especially for working women who often face multiple demands and expectations from their work, family, and society. There were occasions when I also went through the dilemma of prioritising work over family and vice-versa. It is with perseverance and delegation of work both at professional and personal front, alongwith support from family & friends, and one is able to maintain work-life balance and pursue career goals.

## Can you share an instance where personal development positively impacted your professional life?

In my career span, there have been many good and bad experiences. One life changing experience which was actually a turning point for my professional life was when I was given an opportunity to work on a prestigious project which was very demanding in all respects. My learning curve was the highest which gave a boost to my knowledge, confidence and experience. I wish to express my sincere gratitude to my supervisors, project managers who instilled their confidence in me and gave me a platform to perform.

## What inspired you to enter this industry, and how has the journey been so far?

When I began my career about 30 years back, women in STEM were rare. Having lost my father at 11 years of age, as I witnessed my mother's struggle to bring us up, I decided to be financially independent and my aptitude towards science helped me choose this profession.

I was the first female engineer in my family

**Name:**  
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**Designation:**  
**CGM & HoD – Project Engineering Management**

**Organisation:**  
**Engineers India Limited**

**Qualification:**  
**Bachelor of Engineering – Electrical**



Important to maintain work-life balance and pursue career goals.

and had to face many challenges from the family front. I did my engineering from Delhi College of Engineering and thereafter joined EIL. Ever since joining EIL, we have always been encouraged to develop professionally and personally in engineering capacity. From day one, as part of the graduate intake, I've been empowered to take on responsibility for my own career development and everything this entails.

## How do you foster innovation and creativity within your business for growth?

Innovation and creativity are essential for the growth of any business. To foster innovation and creativity within a business, it is important to create an environment that encourages creative thinking and new ideas. In our organisation, we foster a culture of innovation by democratising the innovation process and encouraging collaboration across various engineering teams. In fact, for EIL, last year was declared 'Year of Innovation' and this year it is 'Year of Collaboration'. These are the catalysts for the development of revolutionary products, services, and strategic partnerships that drive growth and success.

## What, in your view, are the special strengths or perspectives that women can offer in leadership positions?

Women bring unique strengths and perspectives to leadership positions. The first and foremost is that women leaders are empathetic and can understand the emotions of their team members, which helps them build strong relationships. They are skilled at building relationships and bridges, and foster a culture of collaboration. Women leaders are able to foresee both the big picture and minute details, which help them make informed decisions. They manage time effectively by juggling through multiple tasks.

These strengths and perspectives are valuable in any leadership position and can help organisations achieve their goals and objectives

## How do you approach career development and set professional goals for yourself?

Setting professional goals and developing



Celebrate small successes one achieves along the way to help you stay motivated.

your career requires a proactive and strategic approach. The most important part is to analyse your skills, to be able to identify your strengths and weaknesses.

**Build relationships with other professionals in your industry and attend networking events to expand your reach**

Efforts need to be made to convert weaknesses into strengths which would help in achieving professional success. Always set small, measurable targets, which help in providing clarity in achieving small term goals in a timely manner to ultimately reach the long-term goals. Many of my seniors have been my mentors who have not only guided me but also provided me with feedback and support. So it is very important to network your way to success. Needless to say that celebrating small successes one achieves along the way helps you stay motivated and focused.

### What words of advice would you give to other women with aspirations for leadership positions or entrepreneurship?

Based on my experience and journey, I would suggest few points for my women colleagues to practice and follow for achieving leadership roles:

1. **Believe in yourself:** Have confidence in your abilities and don't be afraid to take risks.
2. **Find a mentor:** Look for someone who can

guide you and provide you with valuable insights and advice.

3. **Network:** Build relationships with other professionals in your industry and attend networking events to expand your reach.

4. **Stay informed:** Stay up-to-date with the latest trends and developments in your industry to stay ahead of the curve.

5. **Be resilient:** Don't let setbacks discourage you. Learn from your mistakes and keep pushing forward.

6. **Be authentic:** Be true to yourself and your values. Authenticity is key to building trust and credibility with others.

### How would you describe your life in 3 words?

Dynamic. Challenging. Enriching.

### What would you write on your own fortune cookie?

'Dreams don't work, unless you do!'

*'Dreams don't work unless you do'- this is what Shalini had read a long time ago, little realising that it will become her life mantra. Working in an esteemed organisation like EIL had been her dream right from her engineering college days and getting an opportunity to be part of EIL was ecstatic.*

*Shalini Verma is a Chief General Manager & HOD- Project Engineering Management, Engineers India Limited. She has earned a B.E. in Electrical. In her 30 years of journey with EIL, Shalini has specialised in the electrical system*

*design for refineries, petrochemicals, fertilizers, offshore projects and power plants. She has executed many domestic and international projects during this tenure.*

*Shalini had volunteered for a change of assignment and moved to ITS for 2 years. "During my tenure there, our core team facilitated the digital revolution in EIL by the implementation of the electronic document management system (eDMS) in our organisation," she said.*

*Shalini has utilised her ITS experience in executing various software packages within electrical as well as other engineering disciplines, to improve accuracy and efficiency in deliverables. Presently, she is heading the Project Engineering Management Department wherein all activities related to engineering coordination across all projects are being carried out, in addition to assisting M & BD in providing complete engineering support in bidding for projects.*

*Shalini has conducted many domain training programs for both domestic and international clients and received appreciation from clients. She is an active member of BIS and is involved in the revision of the prestigious National Electrical Code of India-2023, which was launched in January 2023.*

*Shalini is a strong believer in teamwork. She always believes 'Leaders must be close enough to relate to others, but far enough ahead to motivate them'. She always maintains meaningful relationships with her subordinates, motivating them to perform and deliver their best.*

# 'It is important to make the voices of women heard and valued in decision-making'

Priyanka Kaul, Senior Instrumentation Engineer, Technip Energies.



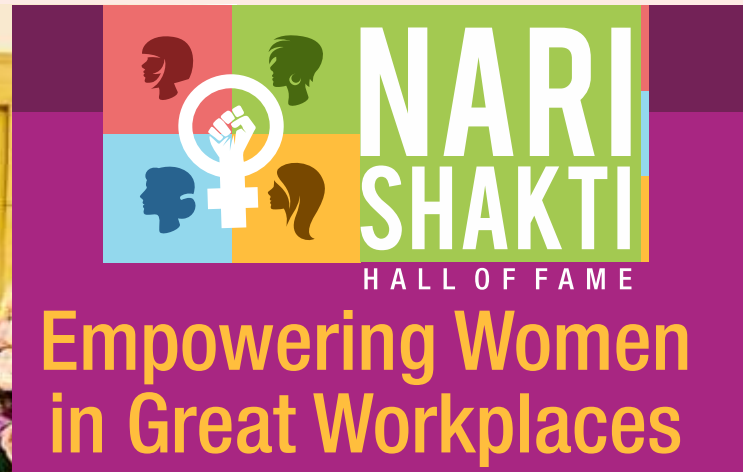
Work-life balance can be maintained by assessing priorities – Priyanka Kaul.

**Tell us about your journey into the energy industry and how you prioritise and maintain work-life balance.**

I started my career in the Energy Industry 20 years back after completing my B.E (Instrumentation) from the University of

Mumbai. I have worked in various reputed EPC companies and MNCs like Fluor, KBR, L&T Hydrocarbon Engineering, L&T Technology Services, Desein, S&B, GSE&C, and Technip.

Work-life balance can be maintained by assessing priorities, setting achievable goals, effective time management, establishing boundaries between working hours and



personal life, stress management, focusing on physical and mental health and flexibility.

**What inspired you to pursue a career in the energy industry?**

As an Instrumentation & Controls Engineer, the energy industry is the best option for a career with the complexity of process plants and the variety of instrumentation used.

**Despite progress in gender equality, many workplaces still hold onto traditional gender roles**

**What hurdles have you encountered as a woman in a leadership position, and how did you conquer them?**

There are basically two types of obstacles:

1. Gender bias and stereotyping in the workplace: One prominent challenge that women leaders face is the gender bias and stereotypes that persist in the workplace. Despite progress in gender equality, many workplaces still hold onto traditional gender roles and expectations, which can make it

harder for women to be taken seriously as leaders. Women may be perceived as too emotional or not assertive enough, leading to unconscious bias in hiring, promotions, and opportunities for advancement.

Additionally, women who do assert themselves may be viewed as too aggressive or unlikeable, creating a 'double bind' that can make it difficult to navigate workplace dynamics. This bias and stereotyping can be particularly challenging for women in male-dominated industries or organisations, where they may feel like outsiders or struggle to fit in with the dominant culture.

2. Navigating workplace politics: Navigating workplace politics can be a significant challenge as well. Women may face more barriers to networking and building relationships with key stakeholders, which can limit their opportunities for advancement. They may also be more likely to experience workplace bullying or harassment, which can be a major barrier to success. Additionally, women may struggle to find their voice in male-dominated spaces or may feel like they have to conform to a certain image or personality to be taken seriously.

Employers can support their female leaders by promoting a culture of inclusivity and respect, providing opportunities for networking and relationship-building, and addressing any instances of harassment or bullying swiftly and effectively. Women can also take proactive steps to navigate workplace politics, such as seeking out mentors or sponsors, building strong relationships with colleagues and stakeholders, and advocating for themselves and their ideas.

## As a woman in engineering, how do you ensure your voice is heard and valued in decision-making processes?

Being in a profession relatively dominated by males is not always easy but with ambition, mutual respect, hard work, and empowering collaborations, we are all contributing to a brighter future for women in engineering. What is important is that we make the voices of women heard and valued in decision-making and listen to the great ideas that our female colleagues have to offer. There might be instances where you have to ensure your voice is heard. The only way to achieve that is through continuous learning and by believing in your

abilities. In my opinion, there shouldn't be differentiation between women and men in engineering. To be a successful engineer, you should possess the same skills: technical, analytical, interpersonal, and organisational.

fostered by diversity and inclusion initiatives, team work, collaboration and mentoring employees.

## What strategies do you use to motivate and empower your team members?

Team work, open communication, collaboration, recognition, delegation, mentoring and training can motivate and empower team members.

Discuss a situation in your leadership role that demanded a difficult decision. How did you address and resolve it?

In a previous role, I faced a situation where one team member consistently struggled to meet deadlines and disrupted team dynamics. To address this challenge, I initiated a one-on-one conversation to understand their concerns. I actively listened to their frustrations and empathized with their workload. Together, we developed a plan to prioritise tasks, delegated responsibilities, and provided additional support when needed. By addressing their concerns and finding practical solutions, we were able to improve performance and foster a more harmonious team environment.

The team member's productivity increased and the positive shift in dynamics resulted in better collaboration and overall project success.

## How do you promote gender diversity and inclusion in your workplace?

Some ways to promote gender diversity and inclusion are:

**1. Eliminate Biases and Stereotypes:** Organisations must challenge and eliminate gender biases and stereotypes in hiring, promotion, and performance evaluation processes. Implementing unconscious bias training and diverse interview panels can help ensure fair decision-making.

**2. Equal Pay and Benefits:** Organisations should conduct regular pay equity audits to identify and address any gender-based pay gaps. Ensuring equal pay for equal work is essential in creating an inclusive and equitable workplace.

**3. Flexible Work Policies:** implementing flexible work policies, such as remote work options and flexible schedules, supports work-life balance for all employees. This can particularly benefit

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**Designation:**  
**Senior Instrumentation Engineer**

**Organisation:**  
**Technip Energies (Agency Contract on Aarvi Encon rolls)**

**Highlighted position:**  
**L&T Technology Services**

**Qualification:**  
**B.E (Instrumentation)**

**Contribution:**  
**Instrumentation & Controls**



## How do you foster a positive and inclusive work culture within your team or organisation?

A positive and inclusive work culture can be

women who may have caregiving responsibilities.

**4. Mentorship and Sponsorship Programs:** Establish mentorship and sponsorship programs to support the professional development of women in the workplace. Pairing women with experienced mentors or sponsors can provide guidance, advocacy, and opportunities for career advancement.

**5. Employee Resource Groups (ERGs):** Encourage the formation of employee resource groups focused on gender equality and inclusion. These groups provide a platform for networking, support, and raising awareness about gender-related issues.

**6. Leadership Commitment:** Leadership plays a critical role in driving gender equality efforts. Leaders should demonstrate their commitment to gender equality by setting clear diversity goals, fostering an inclusive culture, and holding themselves accountable for progress.

Can you share your approach to staying informed about industry trends and maintaining the ongoing development of your skills?

Professional networking, training, vendor presentations and attending seminars help in staying informed about industry trends.

### Can you share some advice for women aiming for leadership positions or pursuing entrepreneurship?

1. Be your authentic self and emphasize your strengths, be ambitious.
2. Find the right mentors.
3. Resilience, humility, and networking.
4. Demonstrate strength with grace and kindness.

### How would you describe your life in 3 words?

Discipline. Punctuality. Focus.

### What would you write on your own fortune cookie?

'You have inbuilt strength and will power to conquer all obstacles and achieve success'.

Priyanka Kaul is a Senior Instrumentation Engineer, Technip Energies. She holds a B.E in



Organisations must challenge and eliminate gender bias – Priyanka Kaul.

**Leaders should demonstrate their commitment to gender equality by setting clear diversity goals**

Instrumentation and has 20 years of industry experience in the Oil & Gas, LNG, and Power sector. Ms Priyanka has been in managerial and leadership positions, leading several International Workshare projects with American Clients, e.g., Sunoco, and Venture Global LNG as well as Indian projects, e.g., HPCL, and Reliance.

Ms Priyanka has served as a Senior Discipline

Lead Instrumentation at L&T Technology Services Vadodara for 3 years. Prior to this, she worked as a Manager – Instrumentation at Valdel E&C/S&B India for 7 years.

Ms Priyanka has a proven track record in executing large projects for International Clients involving excellent communication, diverse skills, innovative ideas, and collaboration across functions and geographies. She has been appreciated by International Clients. She has been recognised with the L&T Technology Services People Champion Award for Best Manager.

When it comes to mentoring, Ms Priyanka has been responsible for the training, performance appraisal and development of her team members as well as technical training for the Instrumentation Department.

# 'I am happy to be part of a company where equal opportunity is given based on merit'

Sonal Singh, Asst Manager Europe – Projects, Valmet India Pvt Ltd.



The learning curve shaped me from an introvert into a confident lady – Sonal Singh.

**Can you take us through your professional journey and highlight key milestones that have shaped your career?**

I started off my career post college with a company in the valve industry and then there was no looking back. I enjoyed the journey where I started off as an application engineer and now, handling Europe region – Projects. Its learning curve which shaped me from an



## Empowering Women in Great Workplaces

introvert into a confident lady with the knowledge I gained from my mentor and challenges I faced while winning orders for my company. It's an exciting role and we have new challenges with more demanding roles.

**The challenges we face with every project in terms of customer requirements are very demanding**

**Could you share a specific challenge you faced in your career and the strategies you employed to overcome it?**

The challenges we face with every project in terms of customer requirements are very demanding and we have this collaboration with our R&D, logistics, documentation so that we deliver.

**How do you stay updated on industry trends, and how do you incorporate this knowledge into your leadership role?**

I follow the industry trends through news/social media/events/exhibitions, seminars, etc.

## How do you stay updated on industry trends, and how do you incorporate this knowledge into your leadership role?

The industry updates help in strategising the product strategy and in deciding on the action required for the project accordingly.

## In your opinion, what are the essential qualities of a successful leader, especially in a fast-paced and dynamic environment?

Learning never fades. So keep learning from the ideas youngsters bring to your table or from industry experts. Be humble to accept your mistakes and learn from them, and never repeat. Improvise with small increments and you can bring a balance to your work and life.

## How do you promote diversity and inclusion within your organisation, and why is it important to you?

I am happy to be part of a company where equal opportunity is given based on merit. It is important both men and women are part of your team as it brings a different perspective of handling a project.

## How do you prioritise your professional development, and what strategies do you use to continue learning and growing in your role?

I take various opportunities whenever they come from as they help me develop personally and professionally. I take a lead in the project and also be part of the HR/POSH/HSE committee/Training and Mentorship.

## Who has been a significant mentor or role model for you, and how have they influenced your career?

I have always been lucky. I had seniors like Atul Sharma, Vinod Joshi and Shiv Kamath to name a few, who had been great mentors in each phase of my life and shaped me into the confident me that I am. The journey was a mix bag of some tough decisions and they helped me to believe in my capabilities and go beyond what I see. To analyse myself and be ready to take the challenge as they always believe that I would be able to achieve it. Not everything was a success, but I know I give my best to everything I do.

**Name:**  
Sonal Singh

**Designation:**  
Asst Manager  
Europe – Projects

**Organisation:**  
Valmet India Pvt Ltd

**Qualification:**  
BE Mechanical

**Contribution:**  
Oil and Gas,  
Renewable Energy



Just prioritise and stick to your commitment – Sonal Singh.

## What advice do you have for women aspiring to enter the industry, become entrepreneurs or start their own businesses?

You will have a challenge/prejudiced

thoughts/struggling with priorities but at the end believe you can do it. Just prioritise and stick to your commitment.

## Can you share a strategy or habit that helps you maintain a healthy work-life balance?

Prioritise and learn to say 'No'. Maintain a strict working schedule and not everything is urgent. You don't always need to give a prompt response, analyse before you respond. Value your family time and me time and put off your phone in do-not disturb mode 1 hour before you go to sleep.

**Prioritise and learn to say 'No'.  
Maintain a strict working  
schedule and not  
everything is urgent**

## How would you describe your life in 3 words?

Honesty, Humility, Values.

## What would you write on your own fortune cookie?

'Accept life as it comes but don't ever give up'.

*Sonal Singh is an Assistant Manager Europe – Projects, Valmet India Pvt Ltd. She is a mechanical engineer who started her journey in the valve industry as an Application Engineer. A valve, even though a small component but a critical component of process function which caters to industries like Oil and Gas, Petrochemical, Chemical, Food and beverages to the latest technology like renewable industry.*

*Ms Singh has more than 15 years of experience in the valve industry in handling bids or tenders/ chemical/ petrochemical projects from Government organisations, semi-government and private organisations. Her journey comprises working closely with EPC (Engineering Procurement and Construction) and providing them with solutions which help in running the plant smoothly. Ms Singh has bagged the Best Performance Award twice, in 2023 and 2016.*

# 'I believe in evaluating the pros and cons so that there are no regrets'

Ritu Agarwal, Deputy General Manager Project Management, Projects and Development India Limited.



I worked in a MNC for 13 years since the beginning of my career – Ritu Agarwal.

**Can you share some insights into your path in the business world and discuss how you entered your current role?**

It's a journey of 25 years in Instrumentation and subsequently two years in Project Management to serve a diverse clientele for larger roles to

manage/coordinate the different disciplines of engineering.

**What inspired you to pursue a career in the construction engineering industry?**

Being an Electronics Engineer in the mid-1990s we had the option to choose IT or core technical

industry. As the daughter of a process engineer, and having seen the various developments of large process plants since childhood, it motivated me to opt for the core industry and join M/s Linde Engineering as a fresher.

**Can you discuss a significant challenge you faced in your career and how you overcame it?**

I have worked in a MNC for 13 years since the beginning of my career. Later, I switched to the Public Sector with a major focus on serving various clients for nation building. It was a significant challenge in my career as my role changed from that of a Technology Licensor's to serve public clients who play a pivotal role in the growth of the Indian fertilizer industry. Subsequently, there were various other challenges that I had to overcome, which I was able to do through my company's support and training, and also all the experience, knowledge and hard work.

**What leadership style do you employ, and how do you think it contributes to your success?**

It is the democratic style – I believe in an active participation and delegation approach as it



empowers the team to take ownership which is the key to success.

**How do you approach risk-taking and decision-making in your professional journey?**

Risk is always a part of life; however, I believe in evaluating the pros and cons so that there are no regrets. Also I would be prepared to absorb the shocks or happiness or disappointments, if any, whichever comes with my calculated decision.

**Can you share a specific example of how you turned a business idea into a successful venture?**

Working in an Engineering Consultancy organisation there are limited opportunities to convert business ideas into a successful venture; however in Engineering, Innovation, Adaptation and Implementation of new technologies is the key to project success, which I have been doing since the beginning of my career.

**How do you foster a positive and inclusive work culture within your team or organisation?**

Being transparent, allowing team members to share their ideas and non-hierarchical ideas – these are the three factors to foster positive and inclusive work culture within the team.

**How do you promote gender diversity and inclusion in your workplace?**

It is the issue of utmost importance and seems to be being addressed effectively now. I personally believe in allowing more women to join the organisation, get their deserved positions, avail of opportunities to travel at project sites and take larger project responsibilities.

**Have you faced any specific challenges as a woman in your industry, and how did you navigate them?**

In the mid-1990s when I joined as a fresher in the process industry, the ratio of female to male was weighed heavily in favour of men, and working in that environment was a challenge. I

**Name:**  
Mrs Ritu Agarwal

**Designation:**  
Deputy General Manager  
Project Management

**Organisation:**  
Projects and Development  
India Limited

**Qualification:**  
Instrumentation Engineer

**Contribution:**  
Fertilizers, oil & gas, air  
separation, etc.

had to overcome this challenge through my knowledge, hard work, extra efforts and support from the management.

**What unique strengths or perspectives do you think women bring to leadership roles?**

Patience, Humour and Efficacy are the distinct strengths which women bring to the leadership role.

**Patience, Humour and Efficacy are the distinct strengths which women bring to the leadership role**

**How would you describe your life in 3 words?**

Transparent. Empowering. Democratic.

**What would you write on your own fortune cookie?**

'God is blissful to me and shall always be!'



Risk is always a part of life – Ritu Agarwal.

Ms Ritu Agarwal is a Deputy General Manager – Project Management, Projects and Development India Limited, a company under the Department of Fertilizers owned by the Government of India. With more than 25 years of experience, she has significant contributions in Fertilizers, Oil & Gas, and Air Separation. Ms Agarwal is an enthusiastic professional who worked with global firms including Linde Engineering for 13 years followed by PDIL (A Govt of India undertaking) for 14+ years.

Ms Agarwal has been actively engaged with professional bodies and inducted as an Executive Board Member in ISA Delhi. She has completed her bachelor's degree in electronics/instrumentation and holds an MBA in Finance degree from Indira Gandhi National Open University (IGNOU). Ms Ritu began her career as Principal Engineer – Instrumentation, Linde Engineering and moved to Deputy General Manager (Instrumentation) role at Projects & Development India Ltd.

Ms Ritu held various leadership roles, including the Lead – Department of Instrumentation and Lead of various Projects in Instrumentation. Now, she has moved over to a larger role as Project Manager for multiple assignments. Ms Ritu always encourages young engineers to learn by doing and from site visits.

# ‘Set clear, achievable goals and work diligently towards them’

Ms Ana Stefanova, Education & Research Division Director, ISA USA.

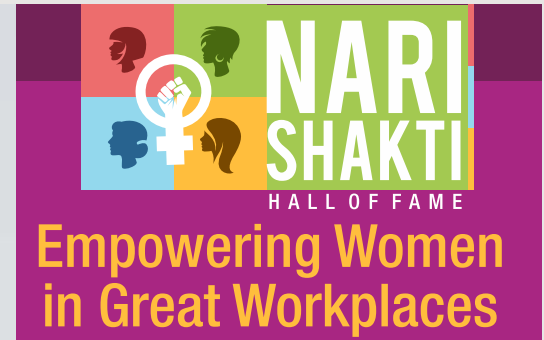


As educators, we serve as facilitators of learning – Dr Ana Stefanova.

**Can you share about your journey into the education industry? What motivated you to pursue this career?**

My inherent desire to continuously learn is

strongly linked to my motivation to help others learn. Since I started my undergraduate studies in Mechanical Engineering in Skopje, Macedonia, I have been tutoring other students. As a graduate student at the University of British Columbia in Vancouver, I worked as a teaching assistant. When I moved



to Edmonton, after finishing my doctoral degree, I was actively seeking a teaching position, and when the opportunity came to join the Instrumentation Engineering Technology program at NAIT, I had no doubt that this was a perfect match with my educational background, the experience that I gained through applied research, my desire to concisely learn and improve, and help others do the same.

**My inherent desire to continuously learn is strongly linked to my motivation to help others learn**

**What is your teaching philosophy, and how does it inform your approach to educating students or supporting educators within the industry?**

As educators, we serve as facilitators of learning. Success in this role hinges upon our ability to collaborate effectively with colleagues, fostering an environment of idea exchange and mutual support. Our primary objective is to inspire students and establish a structured, safe space for learning. Here, students are encouraged to experiment, make mistakes, and continually improve without fear of judgment. By prioritising collaboration and creating a supportive learning environment, we empower students to thrive and reach their full potential.

## What are some of the common challenges you encounter as a woman in technology, and how do you approach overcoming them?

Despite the underrepresentation of women in technology, I've personally found that being a woman hasn't posed any significant challenges for me. Perhaps working in academia has played a role, but I've consistently been treated as an equal contributor and valued member of the team.



*We're in an era brimming with opportunities – Dr Ana Stefanova.*

## How do you stay updated on best practices and innovative approaches to education, and how do you incorporate them into your work?

I actively engage with research papers, articles, and presentations to stay informed about the latest trends and advancements in adult education. Additionally, I prioritise seeking feedback from both students and colleagues, allowing me to continuously refine and adapt my teaching methods to better meet the needs of my learners.

## How do you approach mentoring and supporting the professional development of faculty, particularly women, within your academic unit?

I foster mentorship and coaching relationships through informal dialogues, actively listening to understand the individual's unique goals and needs. This approach allows me to tailor my support to their specific circumstances, empowering them to achieve their full potential.

## How does your research contribute to your field?

**Name:**  
**Dr Ana Stefanova**

**Designation:**  
**Associate Chair & Instructor**

**Organisation:**  
**School of Applied Sciences and Technologies, Northern Alberta Institute of Technology (NAIT)**

**Qualification:**  
**BA.Sc and M.Sc in Mechanical Engineering and PhD in Chemical Engineering**

At my institution, NAIT, research activities are separate from teaching responsibilities to accommodate differences in demands for resources and timelines. Although I've been involved in publishing papers and presenting at conferences during and after my graduate and research assistant work at UBC, except actively supporting my students' research projects during their final year, I haven't been formally engaged in a research role at my current institution.

## How do you perceive the future of education and research, and what role do you hope to play in shaping it?

We're in an era brimming with opportunities where education and cutting-edge research are accessible to all eager learners. As AI continues to advance, we anticipate swift progress in research and a transformation in the educator's role. I aspire for my role as an educator to evolve into one that not only imparts knowledge but also fosters critical thinking, creativity, and a

profound sense of humanity, empowering students to navigate an ever-changing world with confidence and compassion.

## Maintaining a work-life balance can be challenging in demanding roles. How do you prioritise self-care and well-being outside of work?

This is indeed a challenge I actively navigate. Despite the demands of work and volunteer commitments, I prioritise carving out time for self-care and well-being. Spending quality time with my family and friends is essential, as is immersing myself in nature through long walks outdoors. These moments provide a much-needed balance to my busy schedule and rejuvenate me for the tasks ahead.

**Our primary objective is to inspire students and establish a structured, safe space for learning**

## Who has had the most significant influence on your career and served as a source of inspiration for your professional endeavors?

I was very fortunate to have Dr John R Grace as a mentor for my graduate studies. His calming presence, genuine curiosity, and willingness to help others were an inspiration. He was a renowned expert in fluidisation, a recipient of the Order of Canada, and many other prestigious awards in the field of chemical engineering both nationally and internationally. He passed away in 2021, and I will miss him dearly.

## What advice would you give to women aspiring to pursue careers in the industry?

Set clear, achievable goals and work diligently towards them. Seek a mentor early for guidance and support. Don't hesitate to ask for help – it's a sign of strength. Keep learning to stay relevant in an evolving industry.

## How would you describe your life in 3 words?

Creative. Helpful. Connected.

## What would you write on your own fortune cookie?

'Embrace curiosity; it leads to boundless discoveries.'

*Dr Ana Stefanova is an associate chair and instructor in the Instrumentation Engineering Technology Program in the School of Applied Sciences and Technologies at the Northern Alberta Institute of Technology (NAIT) in Edmonton, Canada, where she leads curriculum development and industry collaboration initiatives, supports the teaching team, and teaches Industrial Measurements, Introduction to Unit Operations, Instrumentation Engineering, Process Control, and Technical Report courses. She earned her B.A.Sc. and M.Sc. in Mechanical Engineering at the University of "Ss. Cyril and Methodius" in Skopje, Macedonia, and her Ph.D in Chemical Engineering from the University of British Columbia in Vancouver, Canada. Dr Stefanova's research interests are in multiphase fluid flow, fluidisation, and measurement systems. Her research is published in the International Journal of Heat and Mass Transfer, Powder Technology, and*



Receiving the ISA Edmonton President's Leadership Award.



**Keep learning to stay relevant in an evolving industry**

*other international journals. She is actively involved in the International Society of Automation (ISA), as a Director of the Education and Research Division and Student*

*sections Liaison for the Edmonton section of ISA. Her contributions to the Edmonton Section were recognised by the ISA Edmonton President's Leadership Award in 2020 and 2023.*

*You can find more in this article: <https://www.isaedmonton.org/isa-insider/posts/featured-member-ana-stefanova/>*

**"Always aim high, work hard, and care deeply about what you believe in. And, when you stumble, keep faith. And, when you're knocked down, get right back up and never listen to anyone who says you can't or shouldn't go on."**

– Hillary Rodham Clinton

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# 'When taking a decision attracting high risk, we should always have a Plan B'

Sonal Bhatwadekar, Director, STPI-Gandhinagar, Gujarat.



*One can resolve challenges with a positive, optimistic outlook – Sonal Bhatwadekar.*

**Provide some insights into your journey within the business world and the factors that played a role in reaching your current position.**

I started my journey working as an engineer after my passing out year 1993 as I immediately got an opportunity to work in one of the electronic machines manufacturing companies

in Pune. After an year, I found another opportunity where I learned and adopted knowledge of ISP set of Networking & Telecommunication and Automation of Processes, which is nowadays called Digital Transformation or e-Gov processing – these were emerging needs those days and there was a shortage of such high end technical manpower availability, and I got an opportunity to participate and contribute in setting up such

**I learned and adopted knowledge of ISP set of Networking & Telecommunication and Automation of Processes**

infrastructure for promoting Computer Software Industry through STPI since 1995.

## Could you discuss the challenges you have encountered as a woman in a leadership position and how you successfully navigated them?

We all know that fact. Nevertheless, I have not given any importance to this parameter as my nature is to focus only on my productivity and result oriented work to meet the objectives of the organisation always irrespective of hurdles that came in between due to nature or due to the process of society or environment we are working or living in.

In professional career or in personal life, if I come across any difficult or challenging situation, which could be due to any person or hurdle, it is in my nature to give less importance to gender-based issues. This attitude has helped me in contributing well to complete my responsibilities and to meet all my set goals towards the objectives of the organisation and my duties.

## Share an experience from your leadership journey where you were confronted with a tough decision. What was your approach to dealing with it?

Yes! There are many, as my professional career is almost completing three decades. I could prioritise the responsibilities very well.

There are many situations that occurred while setting up technical infrastructures, breakdowns in telecom infra due to some natural calamities, non-availability of spares and equipment, non-availability of accommodation, non-availability alternate arrangements of human resources, non availability of superiors/seniors support and many more such challenges that I have faced. However I always keep in mind that there are invariably such problems in life and we can resolve these problems with help of money, human (i.e., good relations) and time and this helped me in facing and resolving these challenges with a positive, optimistic outlook.

## What is your approach to risk and decision-making as you navigate the challenges of entrepreneurship?

While taking a decision which is attracting high risk, we should always have a Plan B with us – a

**Name:**  
**Sonal Bhatwadekar**

**Designation:**  
**Director, STPI-Gandhinagar, Gujarat**

**Organisation:**  
**Software Technology Parks of India – Gandhinagar (Gujarat), MeitY, Gol**

**Qualification:**  
**B.E Electronics and Executive MBA**

**Contribution:**  
**Promoting software exporting industry, entrepreneurship development.**

decision of taking 100% risk should not be taken at the loss of 100% when navigating the challenges of entrepreneurship. Preferably, to be on safer side, the decision of taking risk in entrepreneurship can be taken by keeping the vision of at least 'no profit no loss' and gradually can step up towards making profits.

## How do you foster innovation and creativity within your business?

By studying the current market needs well and accordingly upskilling and upgrading and adopting in your set-up as per the current need of the fast growing tech industry.

## What strategies do you employ in building and leading a successful team?

If we deploy the right professionals to the right task as per the skill-sets then the team also works confidently and will show good results and good productivity. We can then delegate to them the task of decision making, and executing those decisions, to let them get that feeling of accomplishment, of seeing the output

of their efforts. In such a way we can create a leading, successful team.

## How do you approach career development and set professional goals for yourself?

I tried my level best to upskill myself by keeping eyes open to find good opportunities within the organisation; to learn about things, and depending on the requirement, upgrading of skills for the related projects. I have taken professional courses to up-skill myself on those technical or managerial skill sets required, and applying the knowledge in the field, which has helped me a lot in my career development.

**If we deploy the right professionals to the right task as per the skill-sets then the team also works confidently**

## How do you balance professional responsibilities with your personal life?

Whenever there is a requirement to give priority to office responsibilities, I explain those to my close family members well so that they can understand my position and they could support and help me by taking care of them in my absence. At the same time, I was performing my professional duties very well with a sense of responsibility, ownership and with a sense of belonging towards the organisation. On the other hand, the management also considered my need when the priority was required to be given toward my family responsibilities. So I am always thankful to all my supporters in the profession as well as in the family.

## How do you approach networking, and what role has it played in your career?

Yes! Networking is very important because I believe that each individual has unique qualities which can be useful for both individuals when they get connected well and come into a win-win situation for both, in any situation. Now this may not produce immediate results, not on the same day of making the right connection, but certainly some day in future.

**Is there a piece of advice you wish you had received when starting your own business?**

I have not gone through such a situation yet. But in case I get an opportunity, I am sure I will think of Plan B first, before proceeding with Plan A!

**Networking is very important because I believe that each individual has unique qualities**

**How would you describe your life in 3 words?**

Always Smiling, Happy.

**What would you write on your own fortune cookie?**

'Be Honest & Keep Working'.

A Gujarat Woman Leader Awardee and the mentor to IT Start-ups, incubatee, MSME, Enterprise Founders, IT product & Electronic Hardware manufacturers for exports, and students, Sonal Bhatwadekar is a Jurisdictional Director, Software Technology Parks of India (STPI), Ministry of Electronics & IT, Government of India.

Sonal holds a B.E in Electronics and an Executive MBA degree. Before being posted as Jurisdictional Director STPI Gandhinagar, Gujarat in 2022, she headed many divisions for STPI – Pune (for Maharashtra and Goa Jurisdiction) like Data Communication Facility Group, Statutory Service, i.e., (EXIM) Group, Incubation Service Group & MIS Group for more than 25 years.

Sonal has extensive experience in working with eco-system partners to grow the IT/ITES & Electronics industry from the respective region. She was an active member in the implementation of the digitisation of STPI Services. She has facilitated various IT/ITES/SMEs/Start-up companies established under the STP & SEZ umbrella.

With her visionary leadership, Sonal has conceptualised and performed significantly for the creation of the Centre of Entrepreneurship for domains of Automotive Engineering and IoT based – Smart Agritech CoE, in Pune and Akola, respectively. She has also worked on establishing the LAB set-up for the project of the creation of the Centre of Entrepreneurship for Smart-Agri Tech CoE, in Akola.

Further, Sonal has facilitated the ITES companies, operating under the India BPO promotion Scheme which was for incentivising the ITES operations from Tier-II



Networking can lead to a win-win situation – Sonal Bhatwadekar.

& Tier-III cities for generating employment from these regions. She successfully handled the activities as a Nodal Officer from STPI-Pune for operationalising as an implementing agency for IBPS.

Under her leadership as Director of STPI-Gandhinagar, the region witnessed 42% growth in Exports from units under STPI. She has managed to increase awareness and proper coordination with ecosystem partners in the region. She bagged the Gujarat Woman Leader Award felicitated by CMO Asia & World Women Leadership Congress.

“I just love bossy women. I could be around them all day. To me, bossy is not a pejorative term at all. It means somebody’s passionate and engaged and ambitious and doesn’t mind learning.”

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# Women in Technology: Empowering Leadership, Diversity and Innovation

**Industrial Automation** celebrates the invaluable contributions of women in technology.

In today's connected world where technology is the cornerstone of progress, women are emerging as trailblazers, breaking stereotypes and spearheading innovation in every sector. From engineering to artificial intelligence, manufacturing to energy and academia, women are not just entering the technology and research fields but are also increasingly taking the helm, driving change, and redefining the landscape.

The quote by Prime Minister of India, Shri Narendra Modi, 'When women prosper, the world prospers', denotes the importance of women in economic growth and their access to education drives global progress.

Visionary women in tech are becoming prominent, bringing with them a fresh, unique perspective and a wealth of talent. Their contributions are not only advancing the tech landscape but are also inspiring future generations to follow suit.

## What is the role of women in technology?

Women leaders in technology understand the importance of innovation. They are paving the way for a more equitable future by encouraging inclusive work environments and introducing diversity initiatives. They do not only sit in a cabin and direct others but their advocacy extends beyond the boardroom, influencing policies and practices that promote a better workplace for budding women leaders and diversity in technology.

Having women in technology leads to:

- Increased diversity in workplace
- Better business ideas
- Improved decision-making processes
- Bridge the skills gap, empowering leadership and innovation, and
- Increased business revenue.

"Technological transformation now provides new avenues for the economic empowerment



of women and can help contribute to greater gender equality in the professional world. However, gender biases in technology have led to an underrepresentation of women in technical areas and organisations must help bridge this gender divide," says Yulia Aslamova, Head of Asia, DRIM Global. "Organisations must seize this opportunity to allow women to access knowledge and information to build a more inclusive, technically sound world. One such initiative has been taken by us where we provide work-from-home opportunities to our women employees which are about 90% of our total workforce," she adds.

**Visionary women in tech are becoming prominent, bringing with them a fresh, unique perspective**

It is no wonder that challenges persist for women in technology and engineering despite significant strides. Gender bias, unequal opportunities, and imbalanced representation continue to create obstacles in progress.

However, these challenges have only served to spark the determination of women leaders, who navigate adversity with resilience and grace, turning challenges into opportunities for growth and advancement.

## Why is it necessary to have diversity in technology?

Efforts to boost gender equality in tech jobs benefit the industry and individual organisations. Workplace culture plays a critical role in women's uphill struggle in the IT field. A Pew Research Center report shows that 50% of women had experienced gender discrimination at work, while only 19% of men faced the same.

Diversity is not just a word; it is a catalyst for innovation in IT. Research shows that diverse teams outperform a homogeneous group as they bring together diverse perspectives, experiences, and ideas that lead to more creative solutions and better outcomes.

Here are some key reasons why diversity in technology is necessary:

- Innovation
- Workplace culture
- Social responsibility
- Women empowerment
- Talent acquisition and retention, and
- Financial performance.

In the words of Megan Smith, a former CTO of the United States, "Innovation comes from diversity. When you have different perspectives, you have a different way of looking at the world, and that can only be positive for the tech industry."

## How are women in technology helping drive the digital revolution?

Women in tech are instrumental in driving the digital revolution. A woman digital leader can lower the risks of digital transformation. She can also maximise its added value for the



organisation. Women in technology can serve as leaders and mentors and can guide and inspire others to pursue careers in STEM (Science, Technology, Engineering, and Mathematics).

Women in tech play a crucial role in driving the digital revolution in several ways:

- Leadership and mentorship
- Advocacy for gender equality
- Tech entrepreneurship
- Community building and networking, and
- Tech for social impact.

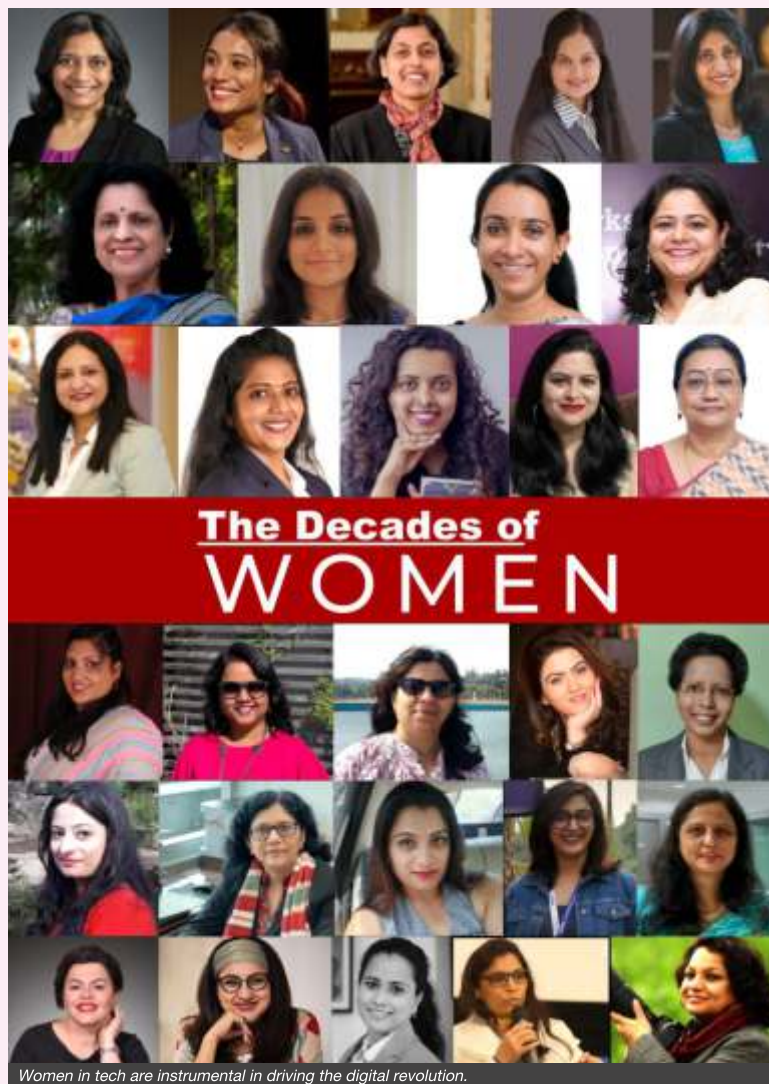
Bindiya Vohra, Director at ThoughtSol Infotech Pvt Ltd, says, “As a female entrepreneur and technology aficionado myself, I strongly believe that technology is and will be a major driver of gender equality in the coming years. Through technology, it is becoming easier for women to access education, find jobs, and start businesses while breaking down traditional gender roles and stereotypes.”

## Building a supportive ecosystem for more women in tech

When talking about women empowerment, the Indian Prime Minister Shri Narendra Modi underlined that the most effective way to empower women is through a women-led development approach and India is making huge strides in this direction.

While individual success stories of women are encouraging, a dynamic, systemic change is necessary to address the root causes of gender disparity in technology. This significantly requires a collaborative effort from all stakeholders, including policymakers, industry leaders, educators, and communities, to develop a more inclusive and supportive ecosystem for women in technology.

It is also essential for companies to prioritise diversity and inclusion as core values and bring policies and practices that foster gender equity and support the advancement of women in the workplace. This majorly includes initiatives like flexible work arrangements, mentorship



programs, unconscious bias training, and transparent hiring and promotion processes.

**From pioneering startups to leading multinational corporations, they are bringing a fresh and creative mindset**

Furthermore, educational institutions have a critical role to play in nurturing the next generation of women leaders and empowering women in tech. Schools and universities can encourage women's power and capability to pursue their passions and overcome obstacles to entering the tech industry by providing them with access to quality STEM education and fostering a supportive learning environment.

Additionally, governments and policymakers


can introduce policies that promote gender equality and support women in the STEM field. They can invest in STEM education and workforce development programs, providing funding and resources for women-driven startups and research initiatives while implementing policies to address gender pay gaps and workplace discrimination.

While addressing the G20 Ministerial Conference on Women Empowerment, PM Modi said that the number of women in technical education in Industrial Training Institutes has doubled since 2014. He said that nearly 43 per cent of STEM graduates in India are women, and about one-fourth of space scientists in the country are women. He said, “Behind the success of our flagship programmes like Chandrayaan, Gaganyaan and Mission Mars lies the talent and hard work of these women scientists”.

Thus, in an era and age defined by rapid technological advancement, the role of women in shaping the future of technology and engineering cannot be overstated. From

pioneering startups to leading multinational corporations, they are bringing a fresh and creative mindset, driving innovation, pushing boundaries, and challenging the status quo. They are also championing diversity and promoting gender equality to not only shape the future of technology but also lead to a more equitable and prosperous world for emerging women leaders.

In this special edition, we are celebrating the achievements of women in technology, emphasizing their remarkable journeys, groundbreaking innovations, and invaluable contributions to the global tech ecosystem. These visionary leaders are redefining what it means to excel in the world of technology.

As Industrial Automation magazine embarks on this journey of progress, let us recognise and celebrate the invaluable contributions of women in technology. 

# Unleashing the Power of the Industrial Metaverse

Industrial metaverse offers significant opportunities for the manufacturing sector, says Arvind Kakru.



Industrial metaverse can unleash unparalleled efficiency in business. Image by Freepik

India's flourishing technology sector and vibrant entrepreneurial culture position the country as a key player in the development of the industrial metaverse. With the government actively nurturing a digital economy projected to reach \$1 trillion by 2030, India's innovation ecosystem has surged, propelling it to the top 40 of the Global Innovation Index. As India's digitally empowered youth population and rising consumer demand create a favorable landscape, it becomes imperative to delve into the transformative potential of the industrial metaverse in revolutionising the manufacturing sector. However, it must be noted that the industrial metaverse is still in its nascent stages and has not yet become mainstream in India's manufacturing sector.

## Capitalising on the industrial metaverse in India's digital age

By embracing the industrial metaverse, businesses can unleash unparalleled efficiency, productivity, and innovation. This transformative technology transcends

industries, empowering companies to reimagine manufacturing processes, optimise supply chains, and craft products with unparalleled precision and customisation. The industrial metaverse serves as a conduit for seamless collaboration, dismantling geographical barriers, and fostering global connectivity. Moreover, it resonates with India's unwavering dedication to sustainability and responsible growth. By enabling virtual simulations and optimisations, businesses can curtail material waste, minimise energy consumption, and diminish carbon emissions, thereby embracing the principles of a circular economy and spearheading sustainable, eco-friendly operations. The industrial metaverse holds the key to unlocking a future where technology and sustainability intertwine harmoniously, propelling businesses towards a prosperous and environmentally conscious era.

## Industry 4.0: Enabling the metaverse age

At the forefront of the industrial revolution's

evolution lies Industry 4.0, empowered by pivotal technologies driving the metaverse age. The Internet of Things (IoT) seamlessly interconnects devices, facilitating real-time data exchange. Artificial Intelligence (AI) and Machine Learning (ML) fuel data analysis and informed decision-making. Cloud and edge computing provide agile and scalable infrastructure, bolstering processing capabilities. Augmented Reality (AR) and Virtual Reality (VR) revolutionise interaction and collaboration, transcending physical boundaries. Cybersecurity safeguards critical data and infrastructure from

malicious threats. Collectively, these technological enablers redefine manufacturing, optimising processes, nurturing innovation, and propelling businesses into an epoch marked by unparalleled connectivity, automation, and data-centric operations. Industry 4.0, at the nexus of the metaverse age, paves the way for a transformative leap forward.

## Exploring potential use cases of the industrial metaverse

The industrial metaverse presents an array of compelling use cases within the realm of manufacturing. Virtual prototyping empowers companies to design and test products in a virtual environment prior to physical production, enabling faster iterations and mitigating the risk of costly errors. Seamless remote collaboration fosters enhanced teamwork among global teams, amplifying productivity and efficiency. Leveraging real-time data and analytics, supply chain optimisation becomes a reality, streamlining logistics and elevating overall

operational efficiency. Immersive virtual simulations revolutionise training and skills development, offering secure and cost-effective hands-on experiences. Moreover, augmented reality serves as a guiding force for technicians in tackling intricate tasks, providing real-time data for predictive maintenance and reshaping the landscape of maintenance and repair.

## Transforming the manufacturing sector with the industrial metaverse

The industrial metaverse heralds a transformative shift in the realm of product design, production, and distribution. Through virtual prototyping, manufacturers can expedite design iterations, resulting in reduced time-to-market and cost savings. Real-time data and analytics optimise production processes, driving efficiency and minimising waste. Seamless collaboration among global teams fuels innovation and accelerates progress. Augmented reality and virtual reality technologies enhance training and maintenance procedures, cultivating a highly skilled workforce. Embracing the industrial metaverse unlocks boundless prospects for growth, productivity, and sustainability, empowering manufacturers to embark on a remarkable journey of advancement.

Benefits of the Manufacturing Metaverse for Manufacturers: It expedites innovation cycles, reduces costs via optimised production, ensures superior product quality through virtual testing, streamlines supply chain management,

**The industrial metaverse serves as a conduit for seamless collaboration, dismantling geographical barriers**

and boosts workforce productivity. By harnessing the power of the metaverse, manufacturers can gain a competitive advantage, meet the ever-changing needs of customers, and achieve sustainable growth in an ever-evolving market.

## Prepping the workforce for industrial metaverse

Effectively preparing the workforce for the industrial metaverse is paramount in fully embracing and harnessing the potential of this transformative technology. Companies must make significant investments in upskilling and reskilling programs to equip employees with the indispensable digital literacy and technical competencies that are prevalent today. Training initiatives should prioritise areas such as virtual collaboration, data analysis, augmented and virtual reality, and cybersecurity. Moreover, fostering a culture of continuous learning and adaptability is vital to ensure that the workforce remains agile and responsive to the ever-evolving technological landscape. By proactively preparing employees for the industrial metaverse, companies can unlock its

complete potential, enhancing productivity, and propelling innovation throughout their operations.

Therefore, as we can see, the industrial metaverse offers significant opportunities for the manufacturing sector. Embracing this technology enables businesses to enhance efficiency, productivity, and innovation. Key technology enablers like IoT, AI, and AR/VR redefine manufacturing processes, propelling companies into a new era of connectivity and automation. Virtual prototyping, supply chain optimisation, and immersive training are notable use cases. Preparing the workforce through upskilling and fostering a culture of continuous learning is crucial for successful adoption. By investing in the workforce, companies can maximise the potential of the industrial metaverse, boosting productivity and driving innovation. The industrial metaverse has the power to revolutionise manufacturing and fuel sustainable growth in India's digital age.



*Arvind Kakru is Vice President of Industrial Automation at Schneider Electric. Based out of Gurugram, India, his role includes the businesses of Discrete Automation, Process Automation and*

*Control & Automation (erstwhile L&T) as a combined entity. In his prior career, Arvind was with Rockwell Automation for 5 years and before that at General Electric for 23 years.*

## Global travel-tech leader, FlixBus launches in India

FlixBus, a global travel-tech leader offering the world's largest bus network across 42 countries, has announced its arrival in India. In the second biggest bus market in the world, the company promises to revolutionise intercity passenger transportation with convenient traveling at a competitive price and the best-in-class safety standards.

With FlixBus making its debut in the country, a multitude of comfortable, safe, and reliable travel choices are now available for thousands of Indians, connecting cities and routes across New Delhi, Himachal, J&K, Punjab, Rajasthan, and UP.

Tickets for FlixBus India will be available starting today, 1 February, with the first routes starting from February 6th at a special launch price of INR 99 connecting Delhi with Ayodhya, Chandigarh, Jaipur, Manali,

Haridwar, Rishikesh, Ajmer, Katra, Dehradun, Gorakhpur, Varanasi, Jodhpur, Dharamshala, Lucknow, and Amritsar. The routes will include 59 stops and more than 200 connections in total.

In strategic collaborations with local bus operators, FlixBus is employing its proprietary tech platform to empower its partners to enhance their business operations. Taking the lead in network planning, revenue management, and yield optimisation, FlixBus ensures an efficient and seamless travel experience for passengers and operators alike, committing to quality, safety, consistency, and delivering exceptional customer experience. Moreover, FlixBus is exclusively operating premium bus models equipped with BS6 engines, adhering to stringent emission norms that significantly reduce pollutants, and reinforcing the dedication to environmental sustainability.

# AI-driven Augmented and Mixed Reality

AI-driven AR/MR is the next frontier in immersive experiences and operational efficiency, says Gaurav Taywade.

The convergence of Artificial Intelligence (AI), Augmented Reality (AR), and Mixed Reality (MR) is more than just a technological trend – it's a transformative force that's reshaping industries. As AI algorithms become increasingly sophisticated, they're enhancing AR/MR applications in ways that were previously unimaginable. From advanced object recognition to natural language processing, AI is setting new benchmarks for user engagement and operational efficiency.

## AI-enhanced object recognition: the cornerstone of immersive AR/MR

One of the most compelling applications of AI in the AR/MR ecosystem is its role in object recognition. Machine learning algorithms can process visual data in real-time, allowing AR/MR applications to identify objects and their contextual surroundings with unprecedented accuracy. For instance, facial recognition technology powered by AI can identify individual facial features, paving the way for hyper-personalised user experiences.

## Natural Language Processing: voice-activated interactivity

Natural Language Processing (NLP), a specialised domain within AI, is revolutionising how users interact with AR/MR applications. By understanding and interpreting human speech, NLP enables voice-activated controls, which are particularly useful in hands-free environments like healthcare and manufacturing.

## Adaptive user engagement: the power of personalisation

AI's capacity for learning from user behavior is a game-changer for AR/MR applications. Machine learning algorithms can adapt content



A more simplified and focused use of augmented and mixed reality.

and interactions based on user engagement metrics, offering a more personalised and engaging experience. For example, an AR-based training program can track user performance and adapt its content to ensure optimal learning outcomes.

**One of the most compelling applications of AI in the AR/MR ecosystem is its role in object recognition**

## Strategic applications of AI in AR/MR

To fully harness the potential of AI in AR/MR, businesses must identify specific use-cases that align with their objectives. For instance, an eCommerce platform could employ AR to allow customers to visualise products in their living spaces, while AI algorithms could enhance object recognition for a more accurate depiction. In healthcare, machine learning can power AR/MR applications to offer more precise diagnoses and treatment plans.

## The future is bright: AI, AR, and MR in spatial computing

As we look ahead, the integration of spatial computing promises to make AR/MR experiences even more immersive. Imagine

navigating a virtual world using spatial awareness, all powered by advanced AI algorithms. This isn't a glimpse into a distant future; it's the next evolutionary step in AR/MR technology.

## Conclusion: the synergistic impact of AI, AR, and MR

The fusion of AI with AR and MR is not just enhancing user experiences – it's revolutionising business operations across sectors. From object recognition and natural language processing to adaptive user engagement, AI is unlocking new avenues for innovation in AR/MR applications. As these technologies continue to evolve, we can anticipate even more groundbreaking applications that will redefine industry standards and user expectations.

Article Courtesy: NASSCOM Community – an open knowledge sharing platform for the Indian technology industry: <https://community.nasscom.in/communities/emerging-tech/ai-driven-augmented-and-mixed-reality-next-frontier-immersive-experiences>



Gaurav Taywade is Chief Software Architect + Pune Studio Head, Centrex. As the Studio Head and Chief Software Architect, Gaurav leads and oversees the development

teams, ensuring seamless execution of various projects while upholding the highest standards of quality and innovation. Diverse experiences as Studio Head, Chief Software Architect, and Product Manager have allowed Gaurav to foster a holistic approach to product development, aligning technical excellence with market demands and user needs to create solutions that exceed expectations and drive business success.

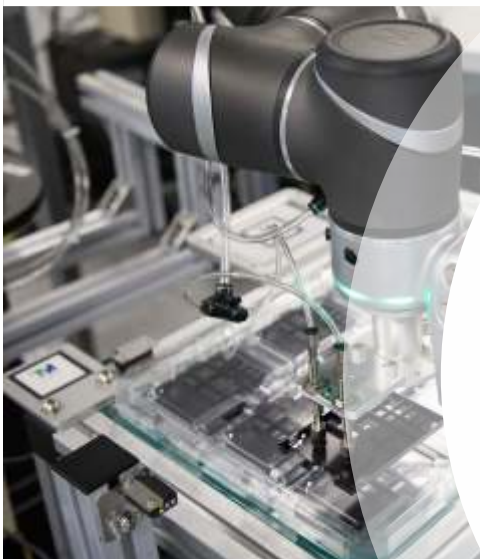
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## Proline Prosonic Flow G 300/500 Ultrasonic Flowmeter



Endress+Hauser has launched the Proline Prosonic Flow G 300/500 Ultrasonic Flowmeter.

This robust ultrasonic gas flowmeter has integrated pressure and temperature sensors to provide a wide array of highly accurate measured and calculated values.

The Prosonic Flow G can be supplied with either of 2 different transmitters: as a compact version (Proline 300), or as a remote version (Proline 500) with up to four inputs and outputs. These inputs and outputs provide flexibility with the ability to output not only flow, but also pressure, temperature, and numerous other process variables.

This flowmeter is ideal for demanding applications, measuring both dry and wet gases with high precision ( $\pm 0.5\%$ ), unmatched repeatability, and high reliability—even when process and ambient conditions fluctuate significantly.

Robust industrial design makes it possible to operate the flowmeters long term without maintenance, saving time and money. The meter operates at process temperatures up to  $150^{\circ}\text{C}$  ( $302^{\circ}\text{F}$ ) and pressures up to 100 bar (1450 psi) and can be ordered with built-in pressure and temperature sensors. The input from these sensors can be combined with the measured sound velocity to calculate additional gas properties, often important for process control.

The Prosonic Flow G measuring system has been developed in accordance with IEC 61508 (SIL), making it suitable for use in many safety-related applications.

Endress+Hauser is a global leader in measurement instrumentation, services and solutions for industrial process engineering. The company provides process solutions for flow, level, pressure, analytics, temperature, recording and digital communications, optimising processes in terms of economic efficiency, safety & environmental impact.

*For more information:*

<https://www.endress.com/en/media-center/news-and-press-releases/Prosonic-Flow-G-news>

Endress+Hauser (India) Pvt Ltd. Email: [marcomm.in.sc@endress.com](mailto:marcomm.in.sc@endress.com)

## New-Generation x86 Industrial Computers



Moxa Inc., a leader in industrial communications and networking, recently announced the launch of a new family of x86 industrial computers (IPCs) with exceptional reliability, adaptability, and longevity to address the increasing demands of data connectivity and real-time processing of large volumes of sensor and device data at the industrial edge. The industrial sector is rapidly embracing digital transformation with increased awareness about resource optimisation, which is driving up the demand for reliable x86 IPCs as edge devices to interface with the industrial IoT application platforms and accelerate the deployment of Industry 4.0-enabled solutions.

According to ABIResearch's research report on Industrial Automation Hardware Innovation: PLCs, IPCs and HMIs, the industrial personal computer (IPC) market will see the highest growth rate of the three industrial automation hardware types—the other two being the programmable logic controller (PLC) and human-machine interface (HMI) markets, with spending increasing by a CAGR of 6% and from US\$11 billion to US\$19.7 billion between 2023 to 2033.

To respond to the need for reliable and rugged IPCs in retrofit and upgrade projects at the industrial edge, Moxa has new x86 IPC families—the BXP, DRP, and RKP series, in multiple form factors, adaptable interface combinations, and with various options of Intel® processors, totaling 75 different models. The comprehensive IPC portfolio is specially designed to meet the changing needs in the industrial automation field.

The BXP, DRP, and RKP series are each backed by a robust 3-year hardware warranty and 10-year longevity commitment (released in 2023). These products reaffirm Moxa's dedication to delivering exceptional product quality and ensuring stable, long-term support for our customers' evolving business needs. Furthermore, the simplified configure-to-order service (CTOS) also supports customers in quickly identifying the best fit for their applications in just a few steps.

Moxa India, Bangalore. Tel: 080-41729088. Email: [india@moxa.com](mailto:india@moxa.com)

## Chatbot Technology in TwinCAT engineering



Beckhoff has developed the TwinCAT Chat Client for the TwinCAT XAE engineering environment. This makes it possible to use Large Language Models (LLMs), such as ChatGPT from OpenAI, conveniently in the development of a TwinCAT project for increased productivity in control programming. It also opens up optimisation potential for direct support; and more productive control programming with AI-assisted engineering.

Large Language Models are created based on a neural network and trained with a large number of texts. LLMs have become widely used in recent years and are used for a whole host of tasks, including as the basis for chatbots or language translation tools.

The TwinCAT Chat Client enables AI-supported engineering to automate tasks such as the creation or addition of function block code, and even code optimisation, documentation, and restructuring (refactoring). Implemented in TwinCAT XAE, this client connects to the host cloud of the respective LLM (e.g., Microsoft Azure™ in the case of ChatGPT), provides a user interface, and provides communication to the PLC development environment via the Automation Interface. This is available via a corresponding chat window in Visual Studio, whereby the LLM functionality has been optimised especially for TwinCAT 3 users – i.e., extensively supplemented with TwinCAT-specific content.

The TwinCAT Chat Client opens up a whole new world of chatbot possibilities for control engineering.

Beckhoff implements open automation systems using proven PC-based control technology. The main areas that the product range covers are industrial PCs, I/O and fieldbus components, drive technology, automation software, control cabinet-free automation, and hardware for machine vision. Product ranges that can be used as separate components or integrated into a complete and mutually compatible control system are available for all sectors.

**Beckhoff Automation Pvt Ltd, Pune.**  
Tel: 020-67064802. Email: [info@beckhoff.co.in](mailto:info@beckhoff.co.in)

## Flow Meters and Controllers Designed for Gases and Liquids



Bronkhorst India, a wholly owned subsidiary of Bronkhorst High-Tech BV based in The Netherlands, is committed to sustainability with 40 years of expertise. Explore our extensive range of (mass) flow meters and controllers designed for gases and liquids, utilising thermal, Coriolis, and ultrasonic measuring principles.

### Gas Flow Meters & Controllers

Full scale ranges from 0,7 mln/min up to 11.000 m3n/h

- Thermal mass flow meters/controllers
- Coriolis mass flow meters/controllers for (ultra) low flow
- Direct Through-Flow (inline/CTA) measurement principle

### Liquid Flow Meters & Controllers

Full scale range: 5 g/h - 600 kg/h or 5 ml/h - 300 l/h (higher on request)

- Coriolis mass flow meters and controllers, for (ultra) low flow rates
- Digital liquid flow meters and controllers; Through-flow principle
- Ultrasonic flow meter for small flow rates of liquid - Fluid independent

With a global presence, our sales and service network offers localised assistance in over 40 countries, providing dedicated support for calibration, repair, application engineering, and user training programs.

Benefit from our local sales and after-sales support, showcasing our proficiency in gas and liquid flow measurement with integrated control, pressure control, and vapour delivery. Bronkhorst's flow instruments find applications in laboratories, machinery, industrial settings, and hazardous areas. Collaborating closely with OEM customers, we customise low-flow solutions, such as multi-functional, pre-tested modules or skids for gas, liquid, or vapour flow control. Rely on Bronkhorst for cutting-edge flow solutions tailored to your specific needs.

**For more information on our products and solutions, please feel free to email us or call on:**

**Bronkhorst India. Tel: 91-89567 94004. Email: [sales@bronkhorst.in](mailto:sales@bronkhorst.in)  
<https://www.bronkhorst.com>**

## Lean-Managed Switches from WAGO



WAGO is now offering Lean-Managed Switches for secure and robust network installations, as well as for ensuring high availability and security. The new switches complement WAGO's line of network infrastructure solutions with new functions – particularly for network diagnostics.

The switches are available with 8 or 16 copper ports capable of baud rates up to 1000 Mbit/s. Devices with two extra SFP slots (100/1000 Mbit/s) are available as an option for connecting fiber optic cables. A Power over Ethernet version supplies connected PoE devices with 24 VDC, which is common in control cabinets. The power output per PoE port can be up to 30 W.

WAGO has placed a great emphasis on creating an intuitive and easy-to-use interface. The Web-Based Management allows installation, commissioning and diagnostics to be performed without extensive IT knowledge. Users enter the switch's IP address in a standard browser and then directly access the diagnostic dashboard or network view (topology map). The diagnostic pages of the Lean-Managed Switches accelerate system troubleshooting.

The individual connection status is indicated by the familiar concept of green, yellow and red traffic lights. A detailed status overview of individual connections is displayed when the mouse hovers over a connection. In a new window, the user can then see the bandwidth, the load and any transmission errors.

During commissioning, the individual network participants can be easily taught-in. As soon as a physical connection is established at a port, clicking the 'Teach-in' button will register participants. Identification is performed via LLDP or the MAC address of the connected devices. If a connector on the switch is disconnected, the port is shown in red on the diagnostic dashboard.

**WAGO Private Limited, Noida (UP). Tel: 0120-4388700.**  
**Email: [info.india@wago.com](mailto:info.india@wago.com)**

## Remote I/O Boxes, ADIO Series

The ADIO series remote I/O boxes from Autonics transmit various input and output signals between master devices such as PCs or PLCs and secondary devices including sensors and actuators. The IO-Link master type ADIO-ILD can exchange signals from secondary devices (IO-Link, standard I/O) to industrial networking protocols (EtherCAT, EtherNET/IP, PROFINET). The IO-Link HUB type ADIO-HUB is connected to ADIO-ILM to expand and relay multiple standard I/O through IO-Link communication. The devices also offer enhanced durability with IP67 and IP69K protection rating. Features: upper level communication protocol: EtherCAT, EtherNet/IP, PROFINET; lower level communication protocol: IO-Link ver. 1.1 (port class: Class A); housing material – Zinc die casting; protection rating – IP67, IP69K (EtherCAT communication type model); daisy chain connection (network communication and power supply); maximum output current per port – 2 A I/O port setting and status monitoring (cable short / disconnection, connection status, etc). Available in IO-Link Master type and IO-Link HUB type.



**Autonics India, Navi Mumbai. Tel: 022-27682570. Email: [india@autonics.com](mailto:india@autonics.com)**

## KMC Pressure Transducers

Gefran presents the new KMC pressure transducers with CANopen and SAE CAN J1939 digital outputs. The KMC series of pressure transducers add CANopen and J1939 connectivity to the communication interfaces of Gefran's ultracompact pressure sensors range. Being an ideal fit for the main control systems in the field of mobile hydraulics, the KMC sensors guarantee precision and temperature stability in applications like agricultural machines, construction machines and material handling equipment. KMC pressure transmitters are based on film-sensing elements deposited on a stainless steel diaphragm. Thanks to the latest state-of-the-art SMD electronics and compact all-stainless steel construction, these products are extremely robust and reliable, especially suitable for mobile hydraulics applications. In particular, the KMC series combines high accuracy with temperature stability, resistance to extreme environmental conditions, and CAN digital output with mobile hydraulics typical protocols. Developed to ensure a robust and high-performance solution for applications such as agricultural machines, construction machines, and material handling equipment.



**Gefran India Private Ltd, Pune. Email: [gefran.india@gefran.in](mailto:gefran.india@gefran.in)**



### 3-Phase 3M Advanced UPS

Schneider Electric recently introduced the Easy UPS 3-Phase 3M Advanced, which is a robust uninterruptible power supply designed to protect critical loads. The UPS offers modular scalable architecture, making it an easy-to-install, easy-to-service, easy-to-configure, and easy-to-scale solution for small and medium data centres, as well as critical



commercial and industrial applications. The product has a power range of 100-250 kW (400V) 3-Phase and is ideal for businesses that require reliable and efficient power supply. Made in India, this UPS provides reliable power with advanced features, robust electrical specs, and a compact design. Start-up service is included for optimal performance, quality, and safety. This EcoStruxure-connected UPS is designed to be installed quickly and easily in your data centre or electrical room. It features a wide operating temperature range and strong overload protection, all within a compact footprint. With low ToC, competitive specifications, and ease of use, this is the obvious choice for ensuring business continuity.

Schneider Electric India Pvt Ltd, Pune.

Email: [shrikar.paithankar@schneider-electric.com](mailto:shrikar.paithankar@schneider-electric.com)

### IO-Link Products

Turck recently included an 8 port Class A IO-Link module, which includes TBEN-L4-8IOLA and TBEN-LL-8IOLA in its expanded family of IO-Link products. This new solution helps improve cost efficiency in typical IO-Link applications for complex sensor systems and terminal devices. This IP69K rated block offers 8 IO-Link master channels and 8



configurable PNP I/O channels, or you can configure the IO-Link channels to give you a total of 16 points of configurable PNP standard I/O. The TBEN-L4-8IOLA is a compact multiprotocol I/O module designed for Ethernet connectivity, featuring 8 IO-Link master channels for versatile communication in various applications. With 16 universal digital PNP channels and channel diagnostics, it ensures precise control in tasks like small part assembly and precision electronics. The TBEN-LL-8IOLA is a compact multiprotocol I/O module designed for Ethernet connectivity, equipped with 8 IO-Link master channels for enhanced communication in various applications.

TURCK India Automation Pvt Ltd, Pune. Email: [india@turck.com](mailto:india@turck.com)

### Retractable Cleaning Device

Preventing contamination is a crucial element in the design of hygienic processing lines. Yet manufacturers often face uncertainty when cleaning ducts, tanks and other confined spaces with hard-to-reach shadow areas. The new Alfa Laval Free Rotating Retractor, a high-efficiency retractable cleaning device, provides complete cleaning assurance, enhancing product safety while boosting uptime and productivity. Preparing



hygienic vessels quickly and economically so that all interior surfaces are spotlessly clean and ready for production is easy with the Free Rotating Retractor. Dynamic and resource-efficient, this retractable Cleaning-in-Place device remains sealed off from the product area during production, flush with the vessel wall. The spray head slides out, expelling cleaning media in a 310°-up spray pattern across the vessel surface. Upon completion of the cleaning cycle, the spray head retracts, and the vessel is production-ready. The Free Rotating Retractor quickly and effectively removes residues from the interior surfaces of hard-to-clean vessels, limiting cross-contamination, minimising downtime, and increasing productivity.

Alfa Laval India Pvt Ltd, Pune. Email: [india.info@alfalaval.com](mailto:india.info@alfalaval.com)

### Motor Condition Monitoring Device

OMRON has recently launched the K7DD-PQ Series, an advanced motor condition monitoring device designed to automate the detection of abnormalities in manufacturing sites. The K7DD perfectly fits in OMRON's view about smart maintenance: by collecting, monitoring, and analysing live data, OMRON provides solutions that will allow users to use this



data for decision making. By analysing over 400 types of feature values derived from current and voltage measurements, the K7DD-PQ can detect specific failure modes such as worn blades, chip entanglement, or deteriorating bearings in machine tool spindle motors. This automation eliminates the reliance on skilled workers' experience and senses, reducing inspection effort and preventing unexpected equipment failure. K7DD-PQ ensures accurate and comprehensive data processing. It is equipped with high-speed 2.5-µs sampling technology that catches even the most fleeting anomalies, and 6-channel simultaneous/continuous operation capability that processes data without omission or deviation. It can effectively monitor servomotors and induction motors, detecting anomalies.

OMRON Automation Pvt Ltd, Mumbai. Tel: 022-71288400.

Email: [in\\_enquiry@ap.omron.com](mailto:in_enquiry@ap.omron.com)

# PRODUCTS

## Wi-Fi 7 Multi-Channel Single-Box Test Solutions

Rohde & Schwarz recently showcased its latest Wi-Fi 7 test solutions for R&D and production to meet the ever-increasing test challenges posed by the technology and the parallel operation with LTE and 5G cellular standards. The R&S CMX500 multi-technology multi-channel signaling tester comes with newly added Wi-Fi 7 testing capabilities. With this functionality, the one-box tester allows R&D engineers of wireless devices to comprehensively test their design's operation in cellular and non-cellular standards of the latest generation in a single instrument setup. In addition to this, the R&S CMP180 radio communication tester will verify a signal waveform of 480 MHz bandwidth in loopback mode, attesting to be a future-proof solution for users in R&D and production, even beyond the requirements of Wi-Fi 7. While the market for the sixth generation of Wi-Fi, IEEE 802.11ax, is still growing, the development of Wi-Fi 7, or IEEE 802.11be, is in full swing.



Rohde & Schwarz India, New Delhi. Tel: +91-11-42535400.  
Email: [Anitha.Nambiar@rohde-schwarz.com](mailto:Anitha.Nambiar@rohde-schwarz.com)

## Strain Gauge Modules and CAN Protocol Sleds

Red Lion® a manufacturer of innovative technologies that empowers industrial organisations to access, connect and visualise their data, has launched new strain gauge modules and J1939 and CAN



protocol sleds designed to enhance and scale its FlexEdge® Intelligent Edge Automation Platform. The new strain gauge modules are easily installable and configurable and come in both SSR output and relay output options. Both offer single loop PID capabilities to monitor, measure, and control equipment. Designed to thrive in harsh environments, the modules accept signals from load cell, pressure, and torque bridge transducers. With a software-selectable 5 VDC or 10 VDC stable bridge excitation voltage, each strain gauge module can drive up to four 350W bridges. The inputs are also software selectable for low level inputs at  $\pm 20$  mV,  $\pm 33$  mV, and  $\pm 200$  mV full scale. Alongside the new strain gauge capabilities, Red Lion launched two field-installable sleds, serving either the J1939 or CAN protocol.

Red Lion India. Tel: 022-62416140.  
Email: [india@redlion.net](mailto:india@redlion.net), [support.saarc@redlion.net](mailto:support.saarc@redlion.net)

## Laser diffuse sensor

Leuze unveiled its ODT3CL1-2M, a laser diffuse sensor with an operating range of up to two meters. Featuring time-of-flight (TOF) technology, the switching and measuring sensor features background suppression and two independent switching points, which allow it to perform detection and measurement tasks at the same time. Measuring 11.4 x 34.2 x 18.3mm, the sensor is small enough to be used on the gripper of a robot arm, on shuttles or stacker cranes. Its light spot allows fast alignment during commissioning and its operating range can be set numerically via IO-Link. The new ODT3CL1-2M diffuse sensor has been developed for applications where the presence of objects is to be detected over long distances and measurement values are to be output via IO-Link. The laser sensor with background suppression works with TOF (time of flight) technology and achieves an operating range of two meters. The 3C series includes compact photoelectric sensors and diffuse sensors.



Leuze electronic Pvt Ltd, Bangalore. Email: [info.in@leuze.com](mailto:info.in@leuze.com)

## Knurled Thumb Screw to DIN standard

Leeds manufacturer and supplier of standard parts and components, WDS Components, has launched a new DIN 653 knurled thumb screw variant. The new thumb screw is based on the brand's existing design but features a wider, low profile head that



conforms to the DIN standard. The new release is also joined by a new range of knurled thumb nuts, designed to the DIN 6303 standard. The new WDS knurled thumb screw DIN 653 has been developed to meet the requirements of machine builders, as well as end users, that require DIN design standardisation. DIN (Deutsches Institut für Normung), the German Institute for Standardisation, covers various products for manufacturing and design, to ensure product quality, safety and compatibility. Also known as a cylindrical head screw or flat thumb screw, the new thumb screw design features a knurled circumference that features a raised triangular pattern.

WDS Components, UK. Tel: +44 (0)333 043 5443.  
Email: [sales@wdscomponents.com](mailto:sales@wdscomponents.com)

## Battery Technology for e-Mobility

The Automotive Masterminds 2024 takes place with the theme "Driving innovation: Accelerating automotive through software, electrification and collaboration". Farasis Energy's comprehensive portfolio – from battery



cells to -modules and -packs – offers a wide range of solutions for future requirements. In addition to off-the-shelf products, the company also offers individual customisations. The high-performance battery technology from Farasis Energy impresses with its long range and fast-charging capability. With an energy density of 330 Wh/ kg, a range of around 1,000 kilometers can be achieved. Customers who place more value on fast-charging capability benefit from a battery with an adapted cell design. This can have an impact on the energy density but still allows the battery to be charged from 10 to 80 percent in just 15 minutes in fast-charging mode. With more than twenty years of experience in research and development and over 300 patents, Farasis Energy is shaping the future of e-mobility.

**Farasis Energy, Germany. Tel: +49 7022 7894484. Email: [press@farasis.com](mailto:press@farasis.com)**

## Ultrasonic Metal Welders

Emerson has launched the Branson™ Series GMX-Micro, a line of high-precision ultrasonic metal welders that feature a new computerised operating system, multiple power levels and configurations, advanced controls, and improved connectivity. The new welders are able to meet changing material and production requirements for electric vehicle batteries, battery chargers, conductors, and electronics



applications, with faster cycle times that can increase productivity and reduce costs. Redesigned and upgraded from the existing Branson GMX-20MA and GMX-20DP welders, the GMX-Micro series is available in two power levels: With 4,000 watts of welding power, the GMX-Micro is equipped with a standard weld stack, while the more powerful 5,500-watt GMX-Micro is available with either a standard metal welding stack or a direct press weld stack. The direct press stack is specially designed to exert higher downforce with greater stability, making it possible to complete complex, many-layered battery film welds or large-conductor welds with greater stability and consistency.

**Emerson Process Management (India) Pvt Ltd. Tel: 91 22 6662-0566. Email: [infocentral@emersonprocess.com](mailto:infocentral@emersonprocess.com)**

## Cable Entry Frames

Cable management specialist icotek recently presented its new cable entry frames KEL-ER-BL. The KEL-ER-BL is a split cable entry frame for cables with and without plugs. Depending on the size, cables with a diameter of 1 to 35 mm are inserted, sealed with IP65 and, at the same, time strain-relieved



in accordance with DIN EN 62444. IP65 protection is achieved through the injected seal and the use of single grommets. The cable grommets are placed into compartments and are securely fixed into the frame during assembly. After the assembly is complete, the end cover is screwed on. The new cable entry frame fits standard cut-outs for 10-, 16- and 24-pin heavy-duty connectors. The cut-out size can be up to 46 mm instead of 36 mm, meaning that cables with larger connectors can also be routed. The size KEL-ER-BL-B is based on cut-out size 46 x 46 mm (e.g., for controllers and meters).

**icotek India Pvt Ltd, Bengaluru. Tel: +91 953 567 3112. Email: [info@icotek.in](mailto:info@icotek.in)**

## Constant Torque Embedded Hinge, ST-20L

Southco has expanded its successful line of friction hinges with a low profile version that enables reliable position control in limited space applications. The ST-20L Constant Torque Embedded Hinge offers a new solution for mounting small lids and display screens that need to be lifted and held securely in place, at any angle.



Southco's ST-20L Constant Torque Embedded Hinge enhances ergonomics, safety and perception of value by making lightweight panels feel more substantial and providing a seamless experience for the end user. Designed for limited space applications, including automotive center consoles, small industrial enclosures and lighting equipment, the ST-20L delivers proven constant torque in compact package. Southco's Constant Torque Embedded Hinges are designed for applications requiring constant torque functionality in a molded assembly. Press-in or bolt-on mounting styles easily integrate into plastic, cast metal and sheet metal applications, enhancing the overall feel and performance of the end product.

**Southco India, Ranjangaon – Pune. Tel: 02138-670558. Email: [info@southco.com](mailto:info@southco.com)**

## IoT Suite for Industrial Gear Units, DriveRadar

SEW-EURODRIVE has launched DriveRadar® for industrial gear units. DriveRadar is an ultra-modern condition monitoring system, which digitally records and automatically assesses gear unit data. The results of such analyses can be used to evaluate the current condition of gear



units. Forecasts derived from this also allow you to predict future changes in condition. All the results and findings obtained serve as a basis for predictive maintenance. An extensive package of sensors, with which your industrial gear unit is equipped, provides the database for this. These sensors capture all operationally relevant physical parameters: vibration behavior, oil level, oil temperature, ambient temperature and input speed. Benefits include: transparency about the condition of gear units and forecasts for critical changes; condition-based planning of service and maintenance; precise localisation of faults and corresponding recommendations for action allow maintenance measures to be carried out in a targeted manner; transparency from any location; and resource conservation.

**SEW-EURODRIVE India Private Limited.**  
Email: [support@seweurodriveindia.com](mailto:support@seweurodriveindia.com)

## Solenoid Valves, Direct-Acting

Flow control specialist, Bürkert, has launched a new range of tool-free, easy to service valves for the control of liquids and steam. Long-lasting and able to withstand high temperatures, the range also achieves FDA approval for use in food & beverage as well as medical applications.



The valves are actuated directly by a solenoid, and design simplicity enables cost efficiency for high-volume OEM procurement. The new valve range is ideally suited to OEMs of a wide range of equipment, such as commercial coffee machines and hot drink vending machines. The valves can channel detergents, and they're also suitable for applications including medical machines that need to control the flow of water or a saline flush. The valves provide on/off control and the range includes the two-port (2/2) 7015 plunger valve, the three-port (3/2) 7016 plunger valve, as well as the three-port (3/2) 7017 rocker valve for media separation, such as milk dosing.

**Burkert Fluid Control Systems, UK. Tel: +44 (0)1285 648761.**  
Email: [kirsty.anderson@burkert.com](mailto:kirsty.anderson@burkert.com)

## Drive Concept for Warehouse Logistics

With the LogiDrive solution space, NORD Drivesystems offers its warehouse logistics customers two industry-optimised drive concepts. LogiDrive Advanced and LogiDrive Basic both impress with their low weight and compact installation space.



Chain and roller conveyors, belt and pallet conveyors, container and overhead conveyors: In warehouse logistics, they all require reliable drives with sufficient power for the corresponding application. This is guaranteed by both solutions from the drive specialist NORD. Furthermore, both feature maximum user-friendliness, easy wiring, low weight and compact installation space. What sets them apart: LogiDrive Advanced was optimised for energy efficiency and LogiDrive Basic with regards to costs. The drive solutions in detail: 1. LogiDrive Advanced – highly efficient IE5+ synchronous motor; decentralised NORDAC ON+ frequency inverter, which was specially designed for combination with the IE5+; and a gear unit from the NORD portfolio. 2. LogiDrive Basic – IE3 asynchronous motor; decentralised NORDAC ON frequency inverter; and a gear unit from the NORD portfolio

**NORD DRIVESYSTEMS Private Limited, Pune. Tel: 020-39801217.**  
Email: [india@nord.com](mailto:india@nord.com)

## Lamp Camera, Turbo HD

Hikvision India has introduced Turbo HD Lamp Camera (DS 2CE18D0T-LFS) for a wide range of use in the market. This latest product in the Hikvision India product portfolio has been introduced to meet the customer requirements. These Turbo HD Lamp Cameras are



applicable in various application scenarios. As ColorVu-enabled cameras continue to gain popularity, people are becoming accustomed to the supplemental visible light that accompanies their use during nighttime: in poor infrastructure areas without street light and security cameras, they have strong demand for security products with strong deterrence, such as large bullet, and bright light. The Lamp Camera serves the dual purpose of Camera as well as light. The Smart Hybrid technology helps to meet various needs. It has low power consumption, max 9 W. The dual use (2-in-1 camera) has the 2 MP camera with 60 metre IR, Built in camera and 9 white lights.

**Prama Hikvision India Pvt Ltd, Mumbai. Tel: 022-68229999.**  
Email: [sales@pramahikvision.com](mailto:sales@pramahikvision.com)

## 5G IIoT Gateway for Remote Edge Networks

ADLINK Technology Inc., a global leader in edge computing, and a global supplier of industrial PCs and motherboards, has announced the launch of the new MXA-200 Arm-based 5G IIoT gateway with a 1.6GHz NXP i.MX 8M Plus quad Arm Cortex-A53 processor. The MXA-200 5G IIoT gateway delivers high performance with low power consumption, bundled in a rugged



and fanless package with an optional external heatsink, and combined with wireless options for Bluetooth, wireless LAN, 4G, and 5G. The MXA-200 is the ideal choice for remote edge networks in smart manufacturing, renewable energy, and smart city applications. The MXA-200 Arm-based 5G IIoT Gateway has a 1.6GHz NXP i.MX 8M Plus processor with 4x Arm Cortex-A53 cores, providing high performance while keeping power consumption as low as possible. The NXP i.MX 8M offers high-performance graphics, virtualisation, and security for AI, graphics, and industrial applications with a 10- to 15-year product life.

**ADLINK India Liaison Office, Bangalore. Tel: 080-42246107, 23464606.**  
**Email: india@adlinktech.com**

## Pressure and Vacuum Generator, PGVA-2

Higher demands on throughput and precision – this is only possible with more automation in laboratory technology. Sensapex already equips more than 800 customers worldwide with high-precision micromanipulators, microscopes, and pressure controllers –



from neuroscience research to in vitro fertilization (IVF) – to name only a few application examples. To work successfully the pressure controllers from Sensapex rely on the decentralised pressure and vacuum generator PGVA from Festo. For Sensapex, an important component for delivering well controlled and reliable application of pressure is the decentralised pressure and vacuum generator PGVA-2 from Festo. Festo is a global player and an independent family-owned company with headquarters in Esslingen am Neckar, Germany. Festo has set standards in industrial automation technology and technical education ever since its establishment, thereby making a contribution to sustainable development of the environment, the economy and society. The company supplies pneumatic and electrical automation technology to 300,000 customers.

**Festo Controls Pvt Ltd, Bangalore. Tel: 01800 425 0036, 01800 121 0036.**  
**Email: sales\_in@festo.com, christopher.haug@festo.com**

## Switches for Robust SPE

HARTING has launched the Ha-VIS eCon 4000 M12T1 SPE, a single pair Ethernet (SPE) switch with IP67 protection. The robust metal housing stands up to the adversities of harsh outdoor environments (tested for rail vehicles according to EN 50155) and enables secure data communication – also in challenging and demanding indoor industrial scenarios.



Transmission is protected against shock and vibration and is operational in a wide temperature range (-40 to +70 °C). The switch is extremely compact (191 x 60 x 42 mm), provides eight ports and comes in two different versions: 1. The eCon 4017GBT-BXT features a Gigabit uplink to the Ethernet network (M12 X-coded) and integrates up to 7 SPE devices via 100BaseT1. 2. The eCon 4035GBT-BXT has a Gigabit uplink, and provides five 100BaseT1 and two 1000BaseT1 ports as SPE interfaces. The automatic master/slave configuration is a new feature for an unmanaged switch. On making the connection, the master and slave roles are automatically defined between the communication partners.

**HARTING Technology Group. Tel: 044-43560417. Email: Email: in@harting.com**

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I, Dr M Arokiaswamy, hereby declare the particulars given above are true to the best of my knowledge and belief.

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