



Confederation of Indian Industry



Innovation

Excellence Compendium 2024

Showcasing Pioneering Case Studies from
Leading Innovative Organizations

2024

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For any details feel free to contact

Rahul Katna (rahul.katna@cii.in) | Tiksha Madan (tiksha.madan@cii.in) | Namita Bahl (namita.bahl@cii.in)



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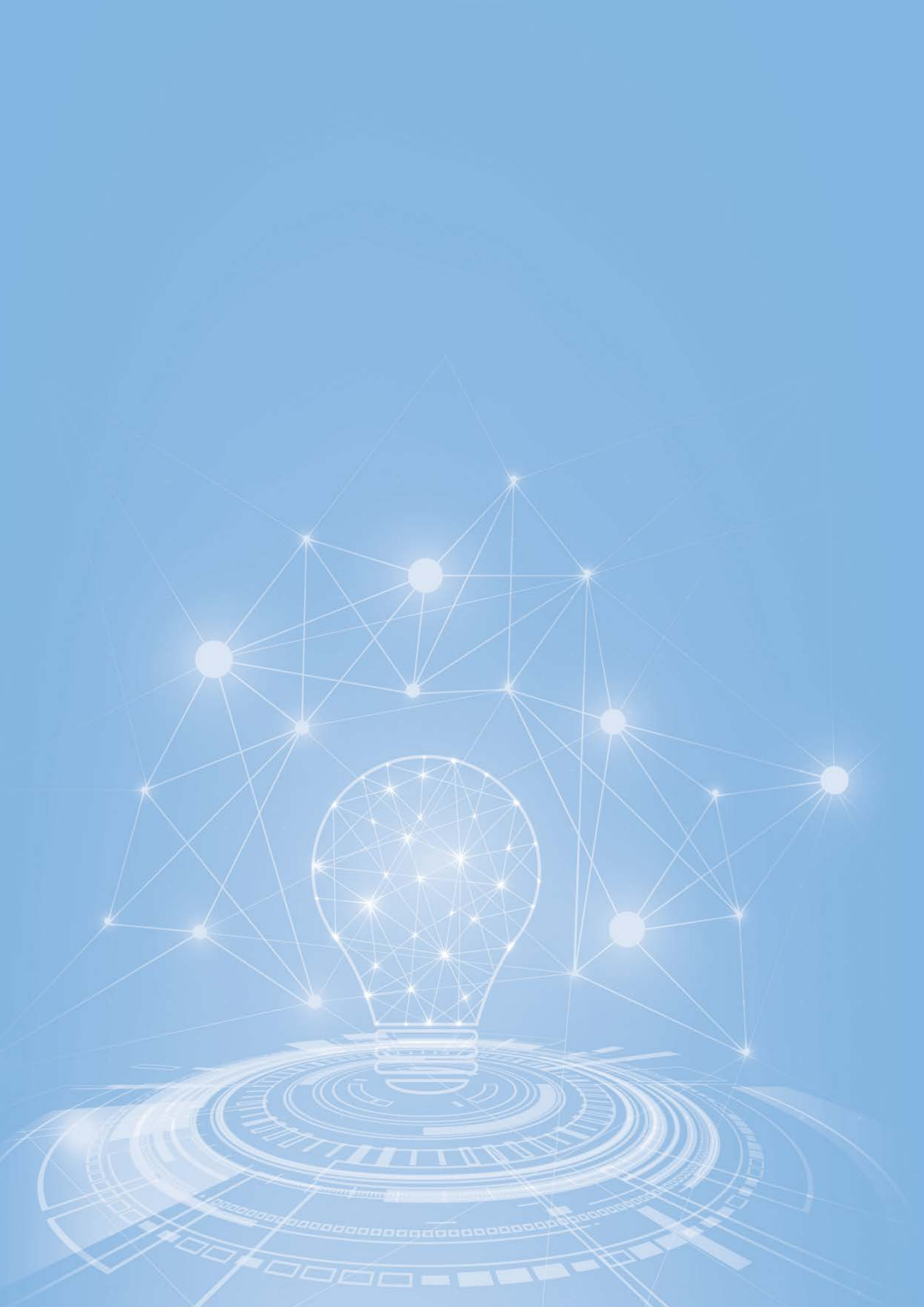


Table of Contents

| | |
|--|-----------|
| Forewords | 09 |
| Message | 11 |
| Executive Summary | 13 |
| 1. Case studies from Leading Innovative Companies | 15 |
| • Abellon CleanEnergy Limited | 16 |
| • Abilities India Pistons & Rings Ltd..... | 17 |
| • ACSEN Agriscience Pvt Ltd | 19 |
| • Acsia Technologies Private Limited..... | 20 |
| • Addison & Co., Ltd..... | 22 |
| • Aditya Aluminium (A unit of Hindalco Industries Ltd.)..... | 23 |
| • Aditya Avartan Technologies Pvt Ltd | 24 |
| • Aequus Pvt. Ltd..... | 26 |
| • Aeroflex Industries Limited | 28 |
| • Afcons Infrastructure Limited..... | 30 |
| • Ajax Engineering Limited | 32 |
| • Alchem Synthron Pvt Ltd | 34 |
| • AM/NS India..... | 36 |
| • ArcelorMittal Nippon Steel India | 38 |
| • AMNS Khopoli Limited | 40 |
| • AMNS Gandhidham Limited | 41 |
| • ArcelorMittal Nippon Steel India (AM/NS India)-Hazira | 42 |
| • ArcelorMittal Nippon Steel India-Odisha | 44 |
| • ArcelorMittal Nippon Steel India (AM/NS India)-Vizag..... | 46 |
| • Amrutanjan Health Care Limited..... | 47 |
| • AMTZ Ltd | 49 |
| • Ashok Leyland..... | 53 |
| • Ashok Leyland Limited (Hosur Unit-2) | 54 |
| • AVA Chodayil Health Care Private Limited..... | 56 |
| • Avantel Limited..... | 58 |
| • Bell O Seal Valves Pvt Ltd..... | 60 |
| • Bharat Biotech International Limited (BBIL) | 62 |
| • Bharat Forge Ltd | 64 |
| • Birla White (Unit of Ultratech Cement Ltd)..... | 66 |
| • Bosch Limited | 68 |
| • BrahMos Aerospace | 70 |
| • Collins Aerospace | 72 |



| | |
|--|-----|
| • Comsat Systems Private Limited..... | 74 |
| • Conceptia Software Technologies Pvt. Ltd..... | 75 |
| • D'Decor Home Fabrics Pvt Ltd..... | 76 |
| • Daimler Truck Innovation Center India..... | 77 |
| • Dakshin Bharat Gateway Terminal Private Limited..... | 79 |
| • DCM Shriram Ltd, Kota | 80 |
| • DCM Shriram Ltd, Gujrat..... | 84 |
| • Deloitte Touche Tohmatsu India LLP (DTTILLP) | 86 |
| • Eaton Power Quality Pvt Ltd..... | 88 |
| • Elico Ltd | 90 |
| • EPL Limited..... | 92 |
| • Equinox Software and Services Pvt. Ltd.” (EQNX)..... | 94 |
| • Expleo Solutions Limited | 98 |
| • Flexible Steel Lacing Company Private Limited..... | 100 |
| • Fluid Controls Limited | 101 |
| • Forbes Marshall Pvt. Ltd. | 104 |
| • GHCL Limited | 106 |
| • Global Engineers Limited | 107 |
| • Hanon Automotive Systems India Private Limited, Chennai | 109 |
| • Hindalco Industries Limited, Renukoot, Reduction Plant..... | 111 |
| • Hindalco Industries Ltd, Muri Works..... | 114 |
| • Hindalco Industries Ltd, Renukoot Alumina Refinery | 115 |
| • Hindalco Industries Ltd., Unit Birla Copper, Dahej..... | 117 |
| • Hindalco Specialty Alumina Business – Belagavi Works | 119 |
| • Hindalco Renukoot Refinery | 120 |
| • Hocco Industries Pvt. Ltd | 122 |
| • Hyloc Hydrotechnic Pvt. Ltd | 123 |
| • IBS Software Pvt Ltd | 125 |
| • Indian Immunologicals Limited..... | 127 |
| • Integra Software Services | 128 |
| • IRIS Business Services Limited | 130 |
| • Ishan Technologies..... | 132 |
| • JAMIPOL Limited | 133 |
| • Kanchan Metals Private Limited | 135 |
| • Kent Intelligent Transportation Systems (India) Pvt. Ltd. | 136 |
| • KONE Elevator India Private Limited..... | 138 |
| • KPI Green Energy Limited | 140 |
| • L&T Construction: Water & Effluent Treatment IC | 142 |
| • Laurus Labs Ltd | 144 |





| | |
|--|-----|
| • Lohum Cleantech Private Limited..... | 145 |
| • Lucas TVS Ltd..... | 147 |
| • Mahindra & Mahindra Ltd..... | 150 |
| • Matrix Comsec Pvt. Ltd..... | 152 |
| • Mercedes-Benz Research and Development India..... | 154 |
| • Meril Life Sciences Pvt. Ltd..... | 156 |
| • Micelio Mobility Pvt. Ltd..... | 157 |
| • Micron Technology Operations India..... | 159 |
| • Moglix..... | 162 |
| • Muthoot FinCorp ONE..... | 164 |
| • Muthoot Microfin Limited..... | 165 |
| • National Aluminium Company Limited Smelter Plant..... | 166 |
| • Nestlé India Limited..... | 168 |
| • Netlink Software Private Limited..... | 170 |
| • NeuroEquilibrium Dignostic Systems Pvt Ltd..... | 172 |
| • Pakka Limited..... | 173 |
| • Panache Greentech Solutions Private Limited..... | 174 |
| • Paques Environmental Technology India Pvt. Ltd..... | 176 |
| • Philips Innovation Campus..... | 178 |
| • Phoenix Medical Systems Private Limited..... | 180 |
| • Poly Medicure Limited..... | 183 |
| • Pricol Limited..... | 185 |
| • Proxgy (Everywhere As A Service)..... | 187 |
| • RACL Geartech Limited..... | 188 |
| • Reliance Industries Limited..... | 190 |
| • Rico Auto Industires Limited..... | 192 |
| • RSB Transmissions (I), Ltd..... | 193 |
| • Saviant Consulting..... | 194 |
| • Schutzen Care Pvt Ltd..... | 196 |
| • Sieger Spintech Equipments Private Limited..... | 197 |
| • SMC Medical Manufacturing Pvt Ltd..... | 199 |
| • SML Limited (formerly Sulphur Mills Limited)..... | 200 |
| • Spark Minda - Minda Corporation Limited..... | 201 |
| • Strategi Automation Solutions Pvt.Ltd..... | 202 |
| • Subros Limited..... | 203 |
| • Sumax Engineering Limited..... | 205 |
| • Svaya Robotics Pvt. Ltd..... | 206 |
| • Synthesis Winding Technologies Pvt. Ltd..... | 207 |
| • TATA Autocomp Systems Limited (Composites Division)..... | 209 |





- TATA Chemicals Limited..... 211
- TATA Elxsi Limited..... 213
- TATA Motors Limited 215
- TATA Power Delhi Distribution Limited..... 217
- TATA Steel Limited..... 220
- Temenos India Private Limited..... 222
- TMS Technov M Systems Private Limited 223
- Treeni Sustainability Solutions Private Limited 225
- Uflex Ltd 227
- UNO Technology Pvt Ltd 228
- Utkal Alumina International Limited..... 229
- Vara Technology Pvt. Ltd..... 230
- VE Commercial Vehicles Limited 231
- Vikas Ecotech Limited..... 233
- Welspun Living Ltd. 234
- Wrench Solutions Private Limited..... 235
- Zetwerk..... 236
- 4. Case studies from Leading Innovative Institutes..... 237**
 - Birla Institute of Technology and Science, Pilani..... 240
 - Sharda University 242
 - Chitkara University 244
 - Electrical Research and Development Association 246
 - Northern India Textile Research Association 248
 - Central Manufacturing Technology Institute (CMTI)..... 250
 - Indian Institute of Technology Roorkee 253



FOREWORD

Mr Vipin Sondhi

Chairman, CII Industrial Innovation Awards 2024 & Former
Managing Director & Chief Executive Officer, Ashok Leyland,
JCB India and Tecumseh India



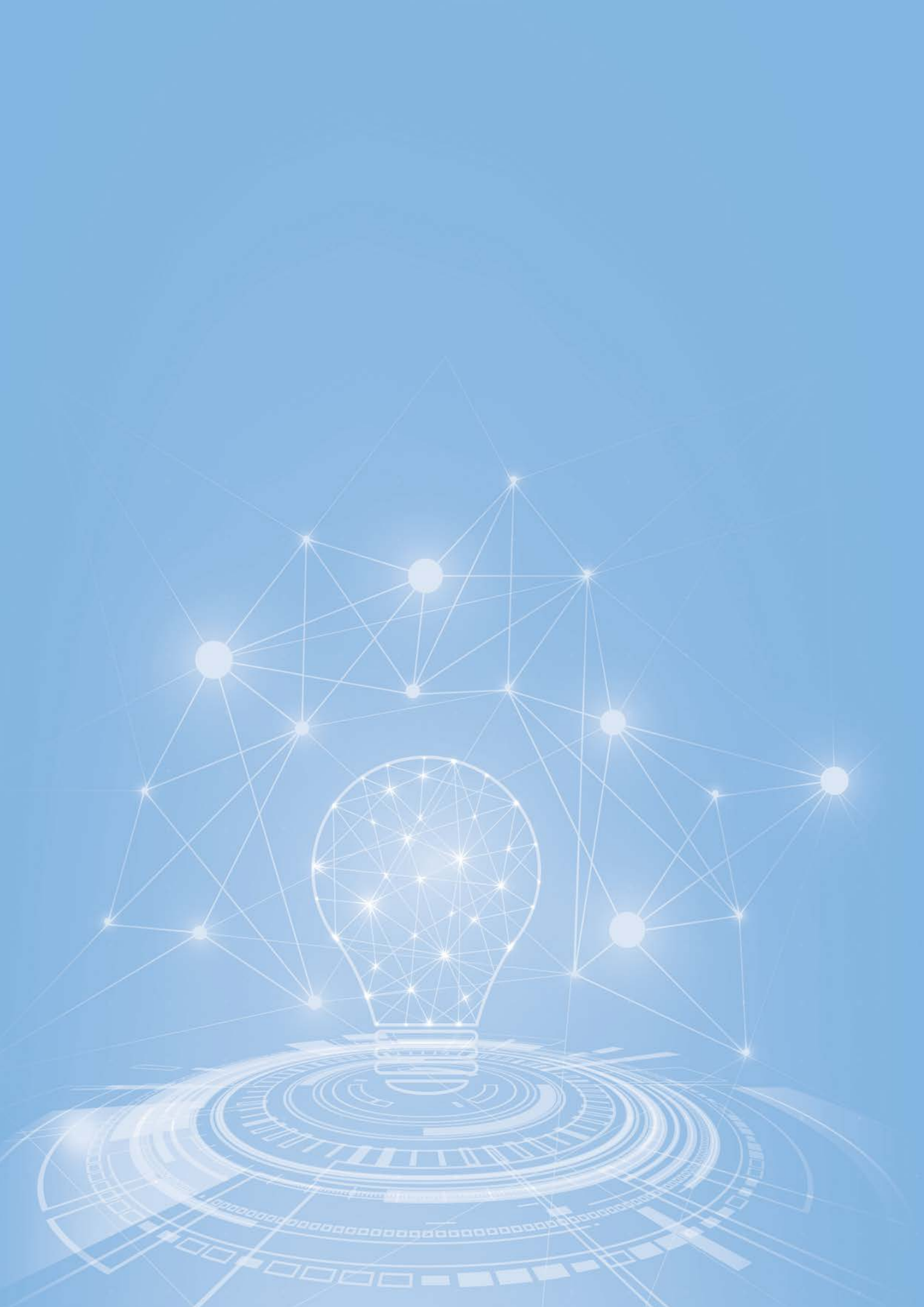
The Prime Minister's vision for India to achieve developed economy status by 2047 is an inspiring call to action, underpinned by a renewed focus on Science, Technology, and Innovation. His addition of Jai Vigyan (Victory to Science) and Jai Anusandhan (Victory to Research) to the motto Jai Jawan, Jai Kisan underscores the critical role of innovation in shaping India's future. Just as advanced economies have built their progress on a strong industrial base and innovative workforce, India, too, is poised to follow this trajectory.

To address global and domestic challenges in energy, food security, climate, and healthcare, innovation will be indispensable in creating solutions that guide India and the world toward a resilient, sustainable future. India's young, educated population, its digitally enabled middle class, and a vast market of 1.4 billion people position it uniquely for rapid, impactful growth.

The CII Industrial Innovation Awards are a prestigious celebration of innovation excellence across India's industrial landscape. Since 2014, these awards have recognized top innovations, encouraging organizations of all sizes to push boundaries. This year, the awards honor the top 75 organizations selected through a rigorous assessment framework developed by CII. An eminent jury of experts evaluated the high-quality applications, reflecting the dedication of Indian organizations to advancing their innovation capacity and capabilities.

This 2024 compendium presents case studies innovations done by the organizations, offering valuable insights into India's dynamic innovation journey. I am confident this publication will serve as a vital resource for all stakeholders—government, industry, academia, startups, and national laboratories—shedding light on the essential role of innovation in advancing national development.

I hope you find this compendium both inspiring and informative as it captures the spirit of Indian industry's commitment to building a stronger future.



MESSAGE

Prof Rishikesh T Krishnan

Co-Chairman, CII Industrial Innovation Awards 2024 &
Director, Indian Institute of Management, Bangalore

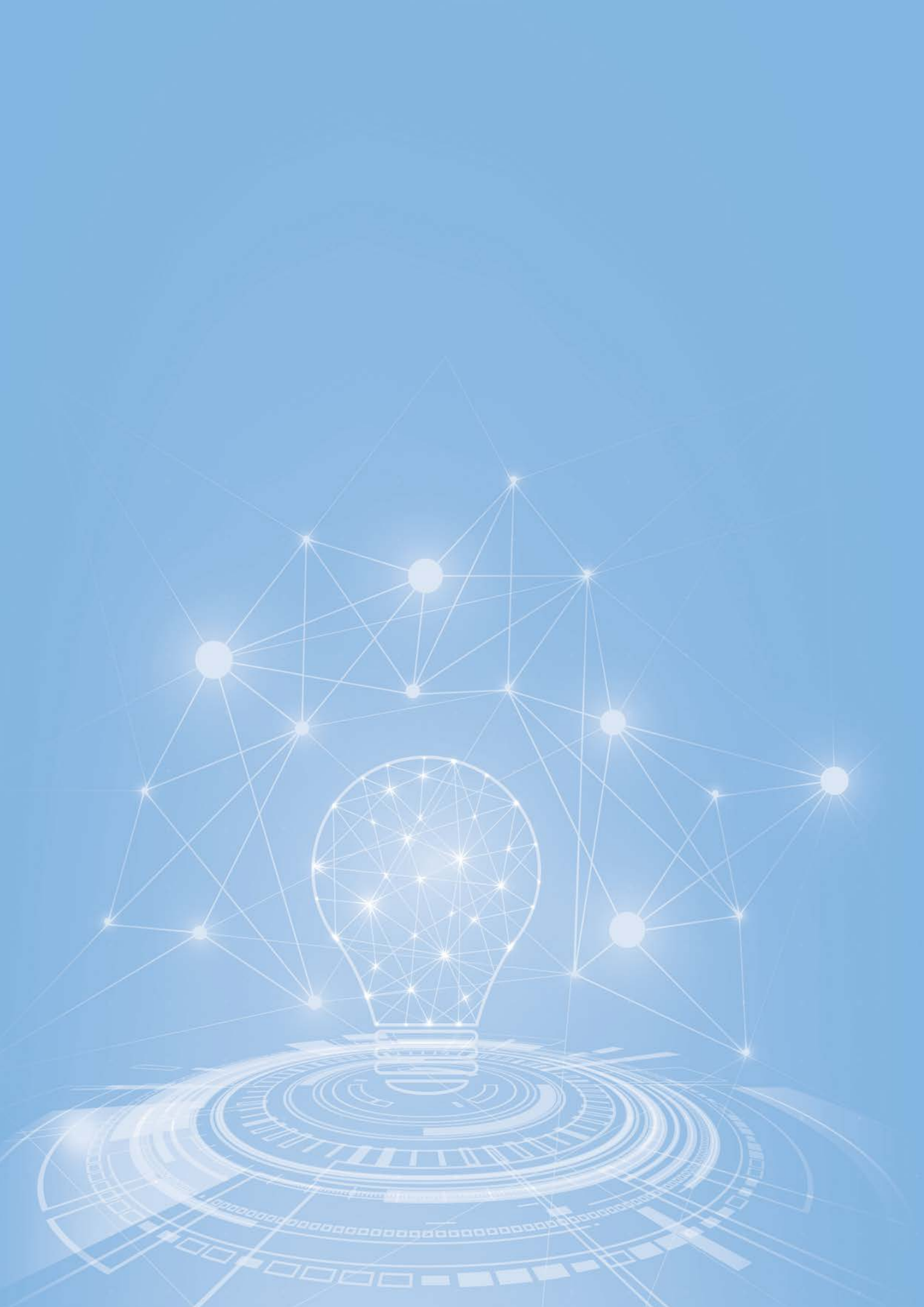


India, recognized as one of the world's fastest-growing economies, owes much of its progress to a strong commitment to innovation. By placing innovation at the core of its developmental agenda, India has positioned itself to expand its influence and innovative impact globally. As we navigate an era of rapid transformation, the need for innovation to address future demands in goods and services becomes ever more essential.

The CII Industrial Innovation Awards, established in 2014, play a pivotal role in celebrating and promoting innovation across India's diverse industry segments. These Awards provide a prestigious platform for companies to showcase their achievements, evaluating innovations in processes, products, and service delivery that drive industry growth. Recognizing the importance of fresh perspectives and measurable results, the Awards foster an ecosystem where pioneering ideas are highlighted, opening up new business opportunities both domestically and internationally.

Companies participating in the CII Industrial Innovation Awards benefit from an insightful evaluation of their innovation maturity, receiving feedback on key innovation indicators that enable them to explore new business avenues and gain a competitive edge. This framework positions award-winning firms as leaders in innovation, enhancing their standing within the business community and offering a distinct advantage.

This publication presents case studies of the companies honored in 2024, showcasing their achievements and underscoring the ongoing commitment to innovation that fuels India's economy. Through these stories, we celebrate the remarkable contributions of Indian industry to shaping a brighter and more innovative future.



MESSAGE

Mr Alok Nanda

Co- Chairman, CII Industrial Innovation Awards 2024 & CII National Mission on Technology, Innovation and Research
CTO, GE Aerospace India & CEO GE India Technology Centre

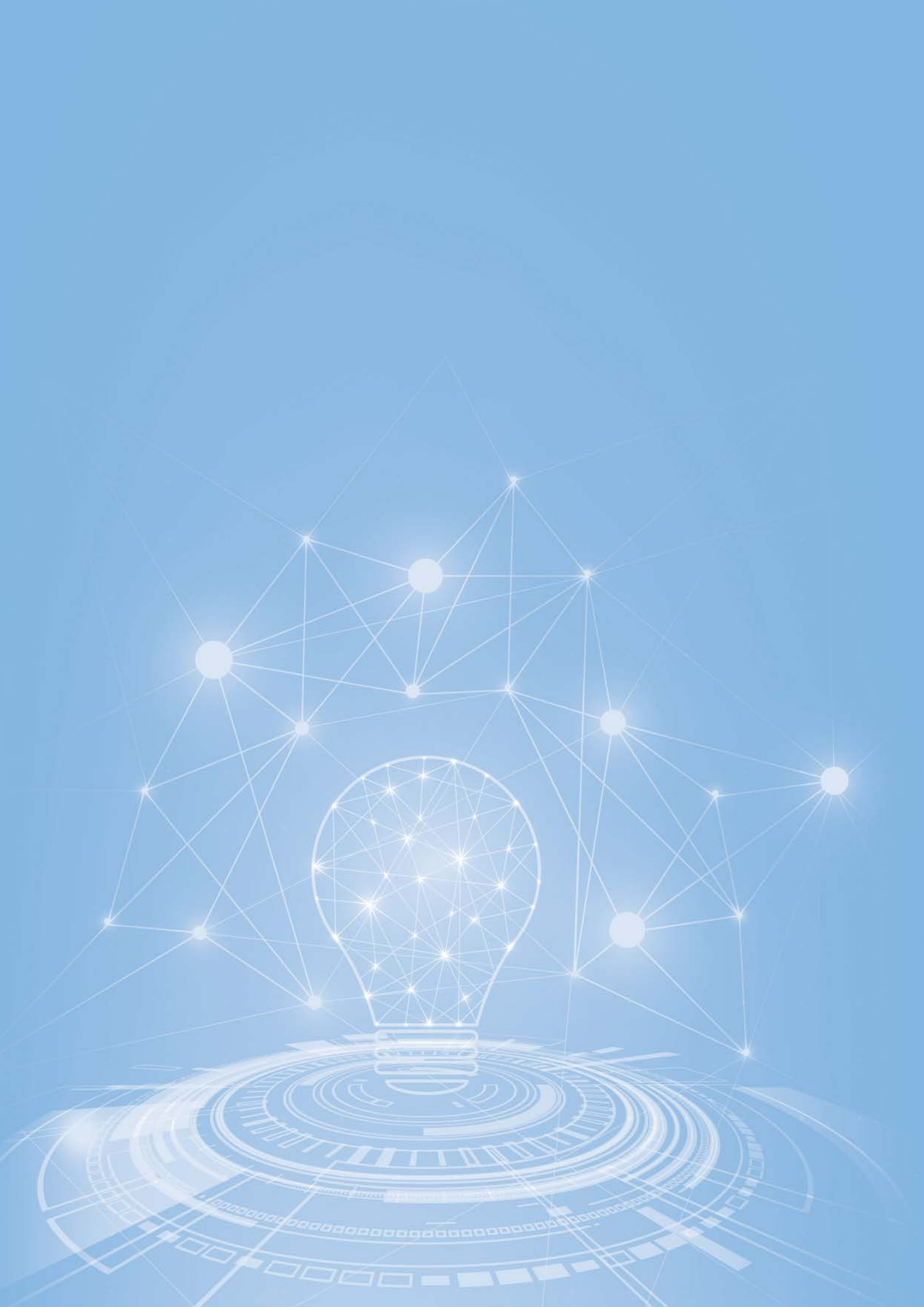


Innovation has always been at the heart of sustained economic growth and societal advancement, serving as a cornerstone for driving measurable improvements in productivity, efficiency, and overall economic value. In this regard, India is embracing a broader, more inclusive vision of innovation, one that places social impact alongside economic growth as central pillars. This vision is mirrored in the Indian industry's journey to become a global leader in innovation, a journey marked by dedicated efforts to enhance firm-level innovation capabilities.

CII has been instrumental in advancing this journey through its commitment to fostering innovation at the grassroots of industry. The Confederation's Industrial Innovation Awards Initiative stands as a testament to its focus on encouraging and acknowledging firm-level innovation. This initiative not only champions innovation across industries but also provides a framework for Indian firms to remain competitive, both domestically and globally. This year, the Awards saw a remarkable increase in participation across categories, reflecting the growing prevalence of globally competitive and disruptive innovations within the Indian industrial landscape.

I am confident that this platform offers a unique opportunity for large and medium enterprises alike to support innovation excellence across their supply chains. By actively measuring and recognizing excellence, companies can foster a culture of innovation that cascades through all levels of business, reinforcing their competitiveness on the global stage.

This compendium is a curated selection of case studies showcasing the top 75 companies and research institutions that have demonstrated remarkable innovation and best practices in 2024. It stands as a small yet significant snapshot of India's vast landscape of young, driven innovators, whose entrepreneurial spirits continue to shape the nation's future.



01

Case studies from
Leading Innovative
Companies



About the Company

Abellon has successfully established and commissioned its patented Waste-To-Energy (WTE) Plant at Jamnagar since November-2021. It processes 600 TPD of Municipal Solid Waste (MSW) and generates 7.5 MW electricity. By utilizing about 1 MLD Sewage-Treated-Water (STP) instead of fresh water for process requirement to avoid pollution due to discharge of STP water in sea.

The Plant has configured and executed with integration of nine unique and eco-friendly innovations seamlessly. With more three plants in execution, Abellon aim to expand its positive impact in era of climate threat.

The company's goal is to create Integrated-sustainable-waste-to-wealth-campus in a need of circular economy.

The Innovation

- Country's first made in India cluster based Waste-To-Energy Plant
- Efficient use of grey water generated by Jamnagar City
- Installed innovative mist cooling arrangement
- Developed first of its kind innovative pre-processing plant for Municipal Solid Waste
- Conversion of fly ash of WTE plant into valuable construction product
- Successful completion of co-firing of legacy waste from old dump site and waste from agriculture field
- First of its kind community interactive WTE campus
- Containerized vertical farming (aerophonic) to sequest CO2
- Developed closed glass photo bio-reactor

to cultivate marine micro algae to sequest CO2

The Approach

We read circumstances with correct knowledge base with all available factual information. We implant can-do-attitude with lot of infusion of positivity in team. Direct-&-clear communication to team involved. Close monitoring of efficient implementation and its deviation observation till resolutions.

Approaching uncharted territory- No one in India has developed RDF based WTE Plant with indigenous technology. Abellon took pioneering position in developing country's first cluster based made in India RDF based WTE plant. (Refer-Link-Jamnagar WTE.mp4)

Benefits

Each configured campus of Abellon will address multiple problem statements. These includes efficient disposal of heterogeneous Municipal Solid Waste, use of treated STP water for nonedible processes, integration of energy efficient mist cooling arrangement, understanding of MSW Composition and its pre-processing, working on CO2 separation from flue gas and its application on platform of photosynthesis etc. can create huge positive impact on ecology, environment and society. This model is unique yet replicable globally.

The Future

We are running successfully all our innovations for last couple of years and confident that in era of climate threat, need for circular economy and climate resilience these innovations can add significance value. It is to be noted that our innovations can be tailored as required by each geography.



Abilities India Pistons & Rings Ltd



About the Company

Abilities India Pistons & Rings Limited (AIP) was established in 1968 by Mr. RS Arora and is a renowned manufacturer of pistons and piston rings. The company holds prestigious certifications, including ISO 9001:2015, IATF 16949:2016, ISO 14001:2015, and ISO 45001:2018, affirming its commitment to quality, cost compatibility, innovation, and environmental sustainability.

AIP operates dedicated manufacturing facilities for pistons and piston rings, catering to the lawn and garden segment, as well as 2 and 4-stroke engines for the automotive sector. The company's expertise extends to the production of other machined parts, such as aluminium cylinders and covers. Utilizing Gravity Die Casting (GDC) and High-Pressure Die Casting (HPDC) processes, AIP ensures precision in piston production. Additionally, an Electroless Nickel Plating facility is in place for Flex Fuels.

With a global presence in the USA, Germany, Brazil, Japan, China, France, Turkey, Italy & India, AIP achieved a significant milestone in 2019 by filing two patents, showcasing its dedication to innovation and technical excellence. Recently the company has granted 2 patents, one for Electroless Ni-P-B plating in Nov-23 & 2nd is Piston manufacturing through HPDC.

The Innovation

AIP has developed a technique to produce pistons using HPDC using Hyper Eutectic aluminium alloy, and there are several benefits associated with using HPDC for piston production:

- **Lightweight:** HPDC pistons are 10-15%

lighter than those produced using gravity die casting (GDC). This reduction in weight can contribute to overall fuel efficiency and performance improvements in engines, particularly in terms of reducing reciprocating mass. We have reduced part weight from 109 grams to 93.6 grams (14.1%).

- **Productivity:** HPDC offers significantly higher productivity compared to GDC. This increase in productivity is likely due to the faster cycle times and the ability to create multi-cavity dies. We can make four-cavity dies in HPDC minimum and two-cavity die in GDC maximum, which increases productivity double as a minimum.
- **Lightweight Engines:** As the automotive industry places a strong emphasis on lightweight to improve fuel efficiency and reduce emissions, the use of HPDC pistons aligns with this trend. Lighter pistons contribute to the development of lightweight engines, which are more environmentally friendly and can meet regulatory requirements for lower emissions and increased fuel economy. In summary, the adoption of HPDC for piston production offers several advantages, including lighter pistons, higher productivity, reduced rejection rates, and the ability to contribute to the development of lighter and more efficient engines, which are crucial in the modern automotive industry.

The Approach

AIP believes in learning from past failures, benchmarking best practices, and fostering process innovation. AIP regularly consults with subject experts and consistently promotes



manufacturing excellence, cost innovation, and the adoption of new technologies among its employees to produce high-quality products. The company is committed to making its manufacturing process more sustainable and achieving digital excellence. Team spirit & CFT approach with positive attitude to solve any problem is our major key.

Benefits

After these innovations AIP found out below benefits -

High Pressure Die Casting Pistons: The development of high pressure die casting pistons is a remarkable achievement that has led to multiple benefits for our company. By creating lighter engine components, AIP addressed the industry's demand for enhanced fuel efficiency and reduced emissions. This innovation has not only increased our export business by up to 6%, but it has also positioned our company as a

leader in providing lightweight and efficient solutions for the automotive sector.

The Future

AIP is working to diversify its product range and manpower. AIP has developed a technique to produce pistons from HPDC using Hyper Eutectic aluminium alloy, highlighting the benefits of HPDC pistons. Pistons produced from HPDC are 10-15% lighter than those produced using GDC. HPDC pistons are lightweight and fuel-efficient. Similarly, Electroless Ni-P-B Plating results in lower exhaust emissions due to higher fuel efficiency. This technology is particularly valuable in industries where these characteristics are critical, such as the automotive industry. AIP has also been working for the past couple of years to make its manufacturing process more sustainable. Our focus is to capture future market opportunities in the manufacturing sector.



ACSEN Agriscience Pvt Ltd



About the Company

ACSEN Agriscience Pvt Ltd (formerly known as ACSEN HyVeg) was founded in 2009 to improve the lives and livelihoods of farmers through the continuous pursuit of our purpose 'More Profit per Acre for More and More Farmers, Year after Year'. We are a R&D-driven seed company headquartered in Coimbatore, Tamil Nadu with regional head offices in Gurgaon, Haryana and Bengaluru, Karnataka. We have expanded our operations in Asia and African countries as well.

The Innovation

We are passionate about driving agricultural innovations. Recent initiatives include speed breeding & marker-assisted assisted breeding for disease resistance and value-added traits. Our priority is to develop hybrids with local adaptation based on extensive testing in 22+ locations. Staggered planting windows and integrating biotechnological tools and data-driven agriculture are leading to reduced time to market. For an example we are developing hybrids in temperate red carrots and this special carrot hybrid offers disease resistance, enhanced root quality, tolerance to bolting as compared to local varieties while retaining the preferred colour and eating qualities of local varieties.

We have filed plant variety protection (PVP) applications for 65+ innovative products in 11 vegetable crops for intellectual property (IP) protection in India. Further, Govt of India has awarded us with "Best innovator in agriculture" award in 2023. Our commitment to innovation has enabled us to consistently deliver high-yielding, climate-resilient, and pest-resistant seeds, empowering farmers.

The Approach

At ACSEN Agriscience, we foster an innovation-driven culture build on data, technology, collaboration, sustainability, and customer-centricity. We empower individuals with strategic mindsets to navigate uncertainties & deliver successful projects. While adhering to standard operating procedures (SOPs), we encourage flexibility to foster creative problem-solving & continuous learning. Focusing on the need of smallholder farmers, ACSEN Agriscience was recognized at 5th Rank by the Access to Seeds Index 2021 for enhancing access to quality seeds across South-East Asia.

Benefits

We have developed 324+ market-oriented products in 37 crops (field crops and vegetables), which are high-yielding, climate-resilient, and pest-resistant. The adoption of these varieties has significantly reduced the cost of production and increased profitability for farmers. With a farmer-first approach, we have supported more than 1.25 million acres of farmland. Through our ACSEN SAATHI KISAN (ASK) initiative, we empower farmers by sharing knowledge on best agricultural practices to enhance their profitability.

The Future

In line with our core belief, "Happy Planet, Healthy People," we continuously innovate our portfolio to make farming a rewarding and joyful profession. We envision that our value-added, high-quality products, tailored to evolving consumer needs, will empower farmers worldwide to contribute to global food and nutritional security.



About the Company

Acsia Technologies is a global leader in automotive software powering Digital Cockpits & Displays, e-Mobility, and Telematics. We use our expertise to develop solutions that simplify complex problems and create safer, sustainable, and more compelling driver and passenger experiences.

Acsia's capabilities span AI & ML, AUTOSAR (Automotive Open System Architecture), Android Automotive, Automotive Linux, QNX, Verification & Validation, HMI (Human Machine Interface) Development, Functional Safety, Cybersecurity and Automotive-grade Process Compliance.

With a presence across the United States, Germany, Sweden, Japan, and India, we collaborate with top automobile manufacturers and Tier-1 suppliers.

The Innovation

Acsia has invested deeply over the last year to build an AI/ML-powered Copilot Developer Suite to enhance the efficiency and productivity of automotive software development teams. Acsia AI/ML Copilot LiLA enables shorter development cycles and faster time to market by automating requirements analysis, design, code development, unit testing, document analysis, and defect management. LiLA may also be implemented to drive organizational efficiency by automating support function workflows. LiLA can be custom-built, fine-tuned, and deployed locally/offline for data security.

LiLA allows teams to focus on the creative aspects of design and corner cases of development while managing clerical/analytical tasks.

Scalable Architecture Large Language Model integration

- Quad-layer architecture: Web-based User Interface, Agent, Specialized LLM Agents and Data.
- Integrated with development environments (IDEs).

Latest tools for improving effectiveness

- Supports more than 50 programming languages including Python, Java, C and C++.
- AI/ML frameworks: TensorFlow, PyTorch, scikit-learn, Transformers, Langchain, LangGraph, GraphRAG, LlamaIndex, Llama.cpp, LLamaFactory.

The Approach

Technical

- Requirements analysis: LLM-based feature recognition and use case generation.
- Document analysis: Feature Modelling based on feature extraction using Knowledge Graph and LLM, Document querying using RAG (Retrieval Augmented Generation).
- Design generation: Graph-based algorithms and design patterns.
- Code development: Code completion, refactoring, and optimization.
- Unit testing: Automated test case generation, and execution based on Python scripts.
- Defect management: Log analysis for detection of anomaly and duplicate bug tickets.





Benefits

Improved Developer Productivity

- Reduces development time
- Enhances code quality

Enhanced Code Quality

- Reduces defects
- Improves reliability

Reduced Development Costs

- Automates testing and defect management
- Reduces manual intervention

Industry Applications

- Automotive software development.
- Financial, Procurement services.
- HR activities.

Automotive Standards Compliance

- Meets MISRA, ISO 26262, ASPICE compliance.
- Integrates with automotive-specific tools and platforms.

Feature Modelling and RAG-based Document Analysis

- Enhances requirements analysis, Feature Bidding, and Proposal Comparison.

- Improves design generation through feature modelling and document analysis.

The Future

Integration with AI-Powered Tools

- Expand automation by integrating with other AI-powered tools to improve efficiency.
- Enhance customer and developer experience through seamless integration.

Expanded Industry Applications

- Replace rule-based systems with AI for Autonomous Driving.
- Automotive Systems Education & Training.

R&D Roadmap

- Improve accuracy of AI/ML algorithms in applications.
- Develop scalable applications for big data, improve effectiveness of solutions using Gen AI, Knowledge Graph, RAG etc.
- Expand to Healthcare.



Addison & Co., Ltd



About the Company

Addison, part of the 150-year-old Amalgamations group, has pioneered cutting tool research, development, manufacturing, and exports since 1955. Our High-Speed Steel and Carbide products provide solutions for metalworking applications, including hole making, threading, and surface preparation, across diverse industries. With a portfolio of over 50,000 products—mainly drills, reamers, taps, milling cutters, and end mills—Addison is renowned for innovation, precision, quality, and performance. Our exports to more than 35 countries underscore our ability to consistently deliver world-class products, earning us EEPC awards since 2000 and recognition as a preferred cutting tool partner.

The Innovation

To meet ever-evolving customer needs, Addison & Co. Ltd. drives continuous innovation in cutting tools, with a focus on solution capability, precision, performance, and cost competitiveness at the core. This is supported by consistent investment in resources for developing newer technologies, using advanced raw materials, enhancing design capabilities, and improving processes. With a dedicated Innovation Centre, the company ideates, designs, and tests tools on customer components, delivering cutting-edge solutions tailored to specific industrial needs. Process innovations, such as roll forging drills and eliminating post-cut-off operations, enhance Addison's competitiveness. Product innovations like reduced HSS reamers, along with optical and laser inspection systems, ensure superior tools that boost productivity and durability. Continuous process improvements and automation solidify Addison's position as an industry leader, committed to excellence.

The Approach

Addison & Co. Ltd. follows an application-centric approach to products and a customer-centric approach to services. By focusing on precision, quality, and innovation, Addison develops customized solutions tailored to industrial customer needs. This approach integrates close client collaboration, ensuring products that enhance productivity and efficiency. With outstanding pre- and post-sales support from regional sales teams, Addison delivers exceptional service and competitive pricing, ensuring customers receive the best value for their investment.

Benefits

Addison & Co. Ltd.'s tools offer superior performance and durability, enhancing operational efficiency while reducing costs. In-house manufacturing of critical processes, such as heat treatment, ensures exceptional quality and durability. The company's integrated ERP system streamlines pre- and post-sales activities, with continuous progress monitoring at every stage, improving efficiency and minimizing downtime. With competitive pricing and a focus on continuous improvement, Addison helps customers stay ahead in a dynamic market.

The Future

Addison & Co. Ltd. is deeply committed to the Make in India initiative. This is achieved through the continuous introduction of new raw materials, the latest design concepts, process improvements at all levels, and consistently enhancing our service levels to ensure customer satisfaction. The company will also focus on providing complete tooling solutions and embracing Industry 4.0 for future growth.



Aditya Aluminium (A unit of Hindalco Industries Ltd.)



Aditya Aluminium a part of Hindalco Industries Limited with capacity of 360,000 tons of Al per annum supported by 900 MW coal-based Captive Power Plant. With 3,300-acre complex comprising smelter of Rio Tinto Alcan's AP 36S technology. One of the lowest conversion costs in India as is a leader in premium aluminium production, certified with various international standards and exporting about its 70% production.

Aditya Aluminium's Journey Toward Innovation and Leadership

Aditya Aluminium has emerged as a global leader in the primary aluminium sector through its focus on innovation and advanced analytics. From the outset, the plant has transitioned from isolated digital projects to an innovation-driven approach, guided by insights from a global firms. This shift aims to position the company among Asia's top 10 digitally transformed manufacturing units.

Aditya Aluminium's innovations include advanced products such as the Copper Insert, Copper Onsert, AlSi3, Primary Foundry Alloy, and P0202- which is among the purest aluminium products globally.

To reduce dependence on coal and heavy fuel oil (HFO), the plant is integrating renewable energy sources like solar, hydro, and wind power for its smelting operations. Additionally, natural gas has fully replaced HFO in the baking furnaces, furthering the company's sustainability efforts.

Digital initiatives such as Energy Management Systems, Smart Anode Shops, digital twins, and AI-driven solutions have been implemented to enhance productivity and sustainability. A dedicated Systematic Improvement Key Focus Area (SI KFA) team reviews innovation projects at various levels, with ideas being registered through the Eureka portal. Strategic decisions are supported by comprehensive SWOT analyses and ERM Risk management framework at various levels of the organization, ensuring informed decision-making. Platforms like PRIDE, REPRISM, and IGNITE foster a culture of innovation.

The benefits of Aditya Aluminium's innovations include significant cost savings, improved energy efficiency, reduced emissions, and higher metal purity. For instance, the Copper Insert innovation has saved 150 kWh/T annually, while the shift from HFO to natural gas has reduced sulfur dioxide emissions by 40%.

Looking ahead, Aditya Aluminium is committed to advancing sustainability through projects like low-carbon aluminium production from renewable energy, transitioning entirely to natural gas, and exploring floating solar technology. The company aims to achieve "Lighthouse status," enhancing metal quality, plant reliability, and energy efficiency to remain competitive in a rapidly evolving market.



Aditya Avartan Technologies Pvt Ltd



About the Company

We, Avartan, are solution provider for motors and controllers to advance mobility, consumer goods and industrial applications with patented and sustainable technologies. With its core competence in Switched Reluctance Machines Technology Avartan strives to become a leading supplier of motors and controllers. We stem from a 20 year legacy of innovation and manufacturing at Aditya Auto (www.adityaauto.com). We are truly homegrown Indian company. Our products were imagined, designed and conceptualised in India and they will be proudly made in India.

Our vision.

We aim to equip every home, every factory and every motor vehicle with motors that make them efficient, effective and user friendly.

The Innovation

In the context of environmental sustainability, reduce, recycle and reuse were to be applied to energy. To energy, it would lead to efficiency, efficiency and efficiency.

Developed through a 12 year rigorous research and development journey, our products transcend conventional technologies, taking us to the limits of what physics permits. With 12 granted patents and 8 more in the pipeline we've engineered a modular, scalable design that sets a new global standard in motor technology.

"The motors of the future" are basically Reluctance based technologies that intrinsically have non linear characteristics that are ideal suited for all motoring applications. Reluctance motors being of 2

types. Dash the switched reluctance motors. These motors do not use permanent magnet materials as a magnetic storage method in its construction if used in synchronous reluctance machine. Day would be for flux path shaping and therefore have the non linear characteristics which in the mechanical engineering parlance is equivalent to behaviour of the continuous variable transmission without entering the weight, volume, cost and inefficiency of the same.

Thereby they offer ideal characteristics for 4Q operations as interaction application and 2Q as in the AC fit applications such as ceiling fans, mixer grinders, washing machine, AC compressor, industrial compressors and induction motor replacement solutions.

The Approach

Leveraging technology was instrumental in the successful implementation of our Energy efficient Motor initiative.

1. Advanced design software: We employed state of the art computer aided design software to optimise motor designs for energy efficiency and performance. This enabled rapid prototyping and reduce the time to market.
2. Controller integration: Hey. Our motors were equipped with integrated controller allowing for real time monitoring of motor performance. This enhanced reliability and reduce downtime for our customers.
3. Data analytics: We implemented robust data analytics tools to process and analyse the vast amount of data generated by our motors. This helped us identify trends, optimise energy usage and offer Taylor solutions to customers for further energy savings.





4. Digital Twins.: We created digital replicas of motors allowing for virtual testing, optimization and performance analysis throughout the product life cycle
5. Supply chain optimization: We optimise our supply chain management to enhance inventory level reduce late times and ensure timely delivery to our customers, resulting in cost saving and improved customer satisfaction.

Benefits

1. Efficiency – reduce direct consumption
2. Secondary benefits – reduced need for energy to maintain thermals
3. Tertiary benefits – power device running at lower temperature, ability to use device at higher rating for transient or longer periods
4. Main benefit – Direct power saving
5. Additional benefit – Thermal management, reduced losses
6. Overall saving – More than just direct energy savings, includes cost of manufacture and running costs, replacing a 20% efficiency with 80% reduces the heat released into the atmosphere by 75% or reduction is 300% compared to EV release

The Future

Over the next 3 to 5 years, our sustainability focused motor manufacturing initiative is

poised for significant expansion:

1. Research and development. Continuous innovation is paramount. We will allocate a substantial portion of our revenue to research and development would develop even more efficient and technologically advanced motors.
2. Product portfolio diversification. We plan to diversify our product portfolio by introducing motors for various industries including renewable energy, electric vehicles and industrial automation thereby broadening our market reach.
3. Centric approach We will actively engage with customers to understand the revolving needs, allowing us to tailor our offerings and services accordingly.
4. Insights Leveraging IoT data and analytics, we will refine our predictive maintenance services, providing customers with increasingly valuable insights to reduce down time and enhance efficiency.
5. Sustainability Focus We will continue to emphasise our commitment to environmental sustainability, meeting growing demand for eco friendly products in the market.
6. Global expansion. Our growth strategy involves expanding our market presence beyond our current geographic regions by establishing strategic partnerships and distribution networks in key international markets.



About the Company

Aequs is a diversified contract manufacturing platform providing vertically integrated, high precision engineering & product solutions for Aerospace and Consumer industries. It runs manufacturing operations across three continents to provide supply chain efficiencies to its global customer base in multiple industry verticals.

It employs over 4,000 Aequals across locations in India, France, and USA. It operates three global scale industrial clusters in North Karnataka, India. By leveraging its manufacturing ecosystems, Aequs reliably delivers supply chain efficiencies to its global customer base.

The Innovation

Aequs pioneered Ecosystems of Efficiency®, its proprietary manufacturing model, providing an industrial innovation concept to deliver the most efficient and sustainable solutions to global customers across the Aerospace and Consumer industries.

In 2009 Aequs set up the Aequs SEZ, India's 1st Notified Precision Engineering SEZ and is single handedly responsible for seeding and nurturing an entire Aerospace ecosystem in the second-tier city of Belagavi. Over the years, the Cluster has grown to a sizeable campus housing over 32 Aerospace and other engineering units.

The Aequs SEZ was awarded the Airbus Innovation Award in 2016 in recognition of its unique innovation which combines the benefit of vertically integrated manufacturing capabilities. This model has nurtured a collaborative environment within the ecosystem for several other process and product innovations in its wake.

A few products innovations:

- Unique BLDC motor in collaboration with startups for our Consumer business.
- First in India to implement unique digital printing technology for toys manufacturing.
- Development of AQovent™ through a cross-business innovation project to supply affordable ventilators to hospitals during Covid-19.

The Approach

An Ecosystem of Efficiency® is a conglomeration of everything that goes into a successful manufacturing operation. We look at it as a network of people, manufacturers, tertiary services, or capabilities needed, all within proximity. This approach has driven all activities at the cluster including industrial innovation across Aequs' businesses and units seamlessly in a collaborative manner. This process also includes customers incorporating their feedback and addressing their needs.

Benefits

All Aequs units share respective knowledge, skills and resources which reduces wasteful duplication of work and simplifies business activities resulting in improved production efficiency, reduced time to market and seamless process and product innovations. The process has also helped in cost savings as various units within the ecosystem can share expenses and leverage respective R&D, assets, and facilities.

Aequs has also set up the Aequs Innovation Centre (AIC), in collaboration with the KLE Technological University, for rapid prototyping to solve diverse problems with Aequs entities



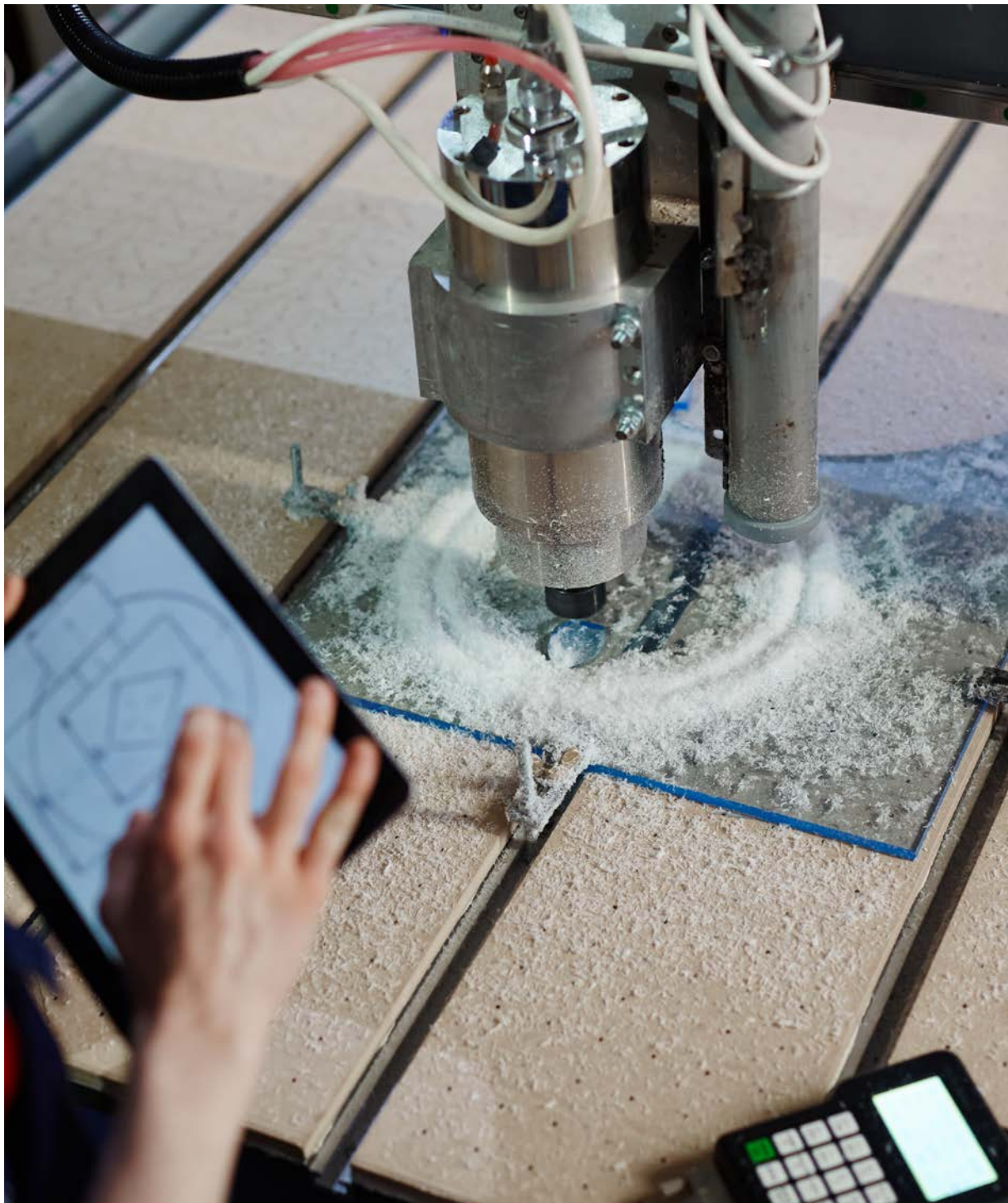


and other industries at large. The AIC has also tied up with the Indian Institute of Technology (IIT) and the IIIT Dharwad for research in Material Science and Manufacturing Simulations for the common benefit of the industry and academia.

The Future

Aequs is now raising the bar with its framework to scale capabilities and create a

definite roadmap for IP-led innovation across its businesses. While the Aerospace business will continue to pursue the 'build-to-print' execution for its global OEM customers, it will also explore deployment of AI-ML and Industry 4.0 innovations (e.g Digital Twin, IIoT etc.). On the Consumer side, Aequs is already well on its way to creating innovative products with ODM products for many of its customers.



Aeroflex Industries Limited



About the Company

AEROFLEX INDUSTRIES LIMITED is an “ISO 9001-2015” company certified by TUV NORD Germany. We manufacture flexible flow solutions made with stainless steel corrugation in an ultra-modern facility in Taloja, Navi Mumbai, India, under the supervision of an experienced and qualified team.

AEROFLEX uses state-of-the-art technology to deliver high-quality products that meet customer satisfaction. As a result of continual improvement in every aspect of the business, within a short span, AEROFLEX has become one of the most reliable sources of quality metallic flexible hose assemblies both in the domestic as well as in the international market.

A full range of metallic flexible hoses and hose assemblies are manufactured in authentic stainless steel with grades AISI 304, 321, 316 & 316L, conforming to highest international quality standards. Our flexible flow solutions made with stainless steel corrugation conform to BS 6501 part-1 and are manufactured as per type A, B, and C flexibility.

The Innovation

Aeroflex’s R&D department is dedicated to innovation, focusing on product and technology advancements, reducing environmental impact, and building a knowledge hub. To meet these goals, Aeroflex has developed various innovative products:

Twin Solar Insulated Hose: The first of its kind in India, designed to address space and connection issues in solar water heaters.

Low NVR Braided Hose: Designed for cleanroom industries like pharmaceuticals and

food, improving the traditional manufacturing process to eliminate surface impurities.

Expansion Bellows: Created for railways to enhance passenger safety by increasing product durability and lifecycle.

Flexible Hose for Compressor Exhaust: Developed for compressors with limited space and dynamic loading, solving fluid flow challenges.

Thermoplastic Vulcanizates Hose: Designed for chemical industries to prevent metallic hose failures caused by contact with corrosive chemicals.

Aeroflex also emphasizes replicating real-world conditions during product testing, using custom fixtures and boundary conditions to ensure products are failure-proof in actual applications.

In technology innovation, Aeroflex has made strides in:

Braid Modelling: Collaborating with IIT PhDs, Aeroflex developed mathematical models for 3D braided products, with ongoing research and patent efforts.

FEA Simulation: Aeroflex implemented advanced simulation techniques for braided wire, enabling nonlinear static, dynamic, fluid flow, and modal analysis. This approach reduces design time and improves product durability.

As a socially responsible organization, Aeroflex is also committed to reducing its carbon footprint through:

- a. **Water Recirculation:** Redesigning machines to recirculate water in manufacturing, reducing waste.





- b. **Eco-Friendly Piping:** Replacing hazardous piping systems with eco-friendly materials like stainless steel, bronze, and Inconel.

In summary, Aeroflex's R&D focuses on innovating products, processes, and technologies while embracing sustainable practices to meet diverse flow solution challenges.

The Approach

Aeroflex's success as a leading OEM in flexible braided hoses is driven by a dedicated R&D team of 18 members, including an Innovation Manager. This team continuously analyses customer needs, creating customized solutions through advanced technology and flexible processes. Collaboration with PhD scholars and research institutes is integrated into our innovation process, contributing to the knowledge bank and ensuring thorough product research. Using the latest machines and adhering to ISO, EJMA, and ASME standards, we ensure high-quality products. Cross-functional collaboration and adaptable project-specific SOPs, along with weekly reviews and ongoing training, enhance efficiency and innovation across diverse industries.

Benefits

Aeroflex's innovation process has delivered multi-dimensional benefits, driving

consistent year-on-year revenue growth. The company introduces more than five new products annually, continuously expanding its portfolio and meeting evolving market needs. Aeroflex provides advanced engineering solutions for critical applications across industries such as spacecraft, steel plants, pharmaceuticals, automobiles, and chemicals. From an eco-friendly perspective, its innovations replace environmentally hazardous materials, significantly reducing the carbon footprint. Collaborations with leading research institutes, including IIT incubated organizations, foster cutting-edge research and inspire new-age innovators. This approach not only strengthens product development but also supports sustainable industry practices.

The Future

The future of Aeroflex Industries Limited centers on continuous innovation and sustainability. We will consolidate our leadership through collaboration, market intelligence, and robust R&D. By developing eco-friendly, high-performance flexible flow solutions, we aim to expand globally and maintain dominance in pharmaceuticals, space, and automotive-sectors while minimizing environmental impact.



Afcons Infrastructure Limited



About the Company

Afcons Infrastructure Limited, part of 158-year-old Shapoorji-Pallonji Group, is a leading engineering-and-construction firm with diverse-portfolio of 350+ infrastructure projects across 25-countries. Afcons has excelled in various sectors: Rail, Metro, Highways, Bridges, and Ports. Globally, according to the Engineering-News-Record(ENR), Afcons ranks 10th in Marine and Port facilities, 12th in Bridges, only Indian company in Top-25 international-contractors for both.

Two-time winner of Most-Admired-Knowledge-Enterprise (MAKE) Award (2016 & 2017), Afcons is the first infrastructure company globally to win Most-Innovative-Knowledge-Enterprise (MIKE) Award at Global and India levels annually from 2018-2022. Afcons was also recognised as Outstanding Global MIKE Award in 2023 by the International Jury.

The Innovation

Afcons Infrastructure Limited's Chenab Railway Bridge is the world's highest single-arch railway bridge, standing at 359m above the Chenab riverbed with a span of 467m-35m taller than Eiffel Tower. Located in seismic zone-IV, it can withstand earthquakes of up-to magnitude 8, high intensity blasts and winds upto 260 km/h. The project features numerous engineering innovations carried out at various stages, including the world's largest cross-bar cable crane for construction, extensive wind tunnel testing and fatigue design - first time in India. One of the most crucial innovations done is the Incremental Launching of deck structure on a combined circular-and-transition curve for

the first time in the world. This was done in two phases: initially launching the viaduct using hydraulic jacks, followed by precise alignment techniques involving central guidance beams and jacks for the straight portion. These advancements exemplify EXTREME ENGINEERING and highlight the project's significance in modern infrastructure development.

The Approach

Afcons fosters innovation through trademarked Improvement™ framework and copyrighted 4-Way test, focusing on on-time project completion. Documentation-Dissemination happens via Annual campaigns-Innovation Fair(Innovate XL), KNOW-vember 2 DISS-ember, Da-Vinci for employee-driven innovations. Comprehensive brick-and-mortar library, digital-subscriptions facilitate knowledge sharing, supported by teams of functional experts(both external-internal) Design, Core-Methods-Engineering-Group, Industry experts, Consultants giving specialised inputs as-and-when needed. Intranet-portal houses Lessons Learned, Innovations and other critical knowledge, cross-learning at all levels happens through our virtual Afcons Talent Management Academy.

Benefits

The Chenab Bridge enhances socio-economic development in Jammu & Kashmir by offering reliable all-weather rail connectivity from Kanyakumari to Kashmir. It boosts tourism, creates jobs, and improves infrastructure, connecting remote communities with the rest of India, opening new opportunities for local vendors and common people. Additionally, the bridge strengthens national security by



enabling faster movement of military supplies and encouraging investment, which increases employment opportunities in the region, thus playing a vital role in nation-building.

The Future

Chenab-Bridge-Project has elevated Afcons global-reputation, receiving accolades from several dignitaries including the Honourable

Prime Minister of India.Chenab Bridge has been highlighted as an example of Indian-engineering-prowess by Indian-Government during several outreach events including high-ranking-ministerial-team from Maldives,Apple CEO Tim-Cook’s visit showcasing Afcons capability in executing-complex-technical projects thereby enhancing market-share, revenue-and-customer satisfaction.



Ajax Engineering Private Limited



About the Company

AJAX Engineering Limited, established in 1992, has become a global leader in Self-Loading Concrete Mixers (SLCM) and the broader concrete equipment sector within the construction equipment Industry. Our purpose is to be an innovative, admired, and trusted brand, dedicated to meeting the evolving needs of our customers. We offer comprehensive 360° concreting solutions that encompass self-loading mixers, concrete batching plants, transit mixers, stationary pumps, and advanced 3D concrete printers, effectively addressing every stage of the concrete process from production to transportation, placement, paving and Printing. With a robust presence in India, including over 53 dealers and 100 touchpoints for sales and after-sales support, AJAX also exports to over 45 countries and partners with authorized distributors in 25 nations. Our ongoing commitment to quality, innovation, and customer satisfaction reinforces our status as a leader in the concrete equipment industry worldwide. At AJAX, we strive to build lasting relationships based on trust and excellence in every solution we provide.

The Innovation

For over 30 years, AJAX has been renowned for its commitment to innovation and category creation, driving the continuous evolution of the concrete equipment industry. The brand focuses on cutting-edge advancements that revolutionize how concrete is produced, transported, and placed. This dedication is exemplified by the introduction of industry-first products, such as load cell-equipped self-loading concrete mixers, integration of boom pump on 4/4 chassis and a pioneering 3D concrete printer which set new benchmarks for efficiency and sustainability. The launch

of ConcreteAI further reinforces AJAX's leadership in digital transformation, optimizing construction cycles and enhancing decision-making. The relentless pursuit of innovation and systematic product development enables AJAX to create new categories and consistently deliver trusted, admired solutions, solidifying its position as a leader in shaping the future of construction.

The Approach

At AJAX, our new product development system is at the forefront of our commitment to design excellence. We prioritize market research to gather insights into customer preferences and align with all stakeholders—including suppliers, dealers, and customers to create impactful products. This integrated approach ensures that every product is designed to meet real-world demands, taking input from all involved parties into account. By developing Minimum Viable Products (MVPs) with essential features, we attract early adopters and gather valuable feedback for continuous improvement. Our advanced manufacturing methods, combined with kaizen activities, enhance processes and optimize efficiency, enabling our products to not only meet but exceed market expectations. Additionally, rigorous quality audits throughout the design and development phases reinforce our dedication to excellence. This stakeholder-driven process, focused on innovation and quality, is fundamental to our success as a leading design company in the concrete equipment industry.

Benefits

Our strong focus on stakeholder alignment ensures that we incorporate feedback from suppliers, vendors, dealers, and customers





throughout the product life cycle. Through effective risk management, we navigate challenges at various stages, fostering a culture of innovation within the organization. This collaborative process enables us to develop products that meet customer expectations, are technically feasible, and commercially viable. With a robust R&D focus, AJAX continues to offer technology-driven solutions that enhance efficiency, reduce costs, and ensure superior quality in infrastructure projects.

For over 30 years, AJAX has been an integral part of nation-building, contributing to India's infrastructure development by delivering innovative, trusted, and admired products, services, and solutions. As one of the largest manufacturers of self-loading concrete mixers (SLCM) globally, we command 75% of India's SLCM market, with approximately 12% of cement produced in India passing through SLCM for marking concrete and around 14% of cement consumption for concrete coming from batching plants. By promoting local entrepreneurship, AJAX has enriched lives at the grassroots level.

The Future

AJAX's future focuses on sustainable construction and technological innovation, emphasizing the rise of eco-friendly materials like fly ash and recycled aggregates. Our commitment to material science drives the development of advanced solutions that enhance efficiency and reduce waste. The launch of our 3D concrete printing technology, coupled with advancements in robotics and artificial intelligence, allows us to optimize production processes and create innovative construction methods. This integration of cutting-edge technologies not only minimizes environmental impact but also ensures superior performance. Additionally, through the AJAX School of Concrete, we provide training to operators, promoting community welfare and ensuring a skilled workforce for the future. Our dedication to sustainable practices and innovation positions AJAX as a leader in shaping the construction industry's future.



Alchem Synthon Pvt Ltd



About the Company

ALCHEM SYNTHON is a specialty and fine chemical manufacturing company based out of Ambarnath, Maharashtra (India), focused primarily in the pharmaceutical and performance based chemical domains. We currently operate out of a 6000 sq. feet manufacturing facility which is equipped with Glass lined reactors, stainless steel reactors and high-pressure vessels. We are specialized in the fluorination chemistry (using Potassium fluoride), medium-high pressure hydrogenation and separation of close-boiling liquids using high vacuum fractional distillation. Our key products and its applications are 2,5-Bis(trifluoromethyl) aniline (Dutasteride, anti-prostate cancer), 4-Chloro-2-acetylthiophene (Avatrombopag, medicine for thrombocytopenia), 3-Chloro-2-fluorobenzylbromide and 5-Bromo-2,4-difluorobenzoic acid (Elvitegravir, anti-HIV).

The Innovation

ALCHEM SYNTHON creates innovativeness of two kinds with respect to i) products, and ii) process. The products offered by Alchem Synthon mainly are import substitutes to China, thus decreasing the dependency of the Indian pharmaceutical industry over Chinese suppliers. Moreover, the developmental efforts also account for attaining the quality standards and impurity profiles of the product as required by customers. The integration of our quality systems into our working methodology helps maintain and control the product quality, sustainability, sensitivity of the process and repeatability across batches; which makes us bankable for our customers. On the other hand, Alchem Synthon invests heavily in innovating their manufacturing

processes and chemistries to come up with more robust, safer, greener, and cost competitive processes. Through our in-house capability of continuous flow manufacturing, we can seamlessly scale-up highly exothermic and hazardous chemistries such as Nitration, Nitrosation, Chlorination and liquid phase oxidations for manufacture intermediates in a safe manner.

The Approach

ALCHEM SYNTHON follows multidisciplinary approach to achieve a bucket of innovative products. One of them is to convert liabilities into assets incorporating renewable and recyclable materials into our product portfolio. We identify products and develop its in-house technology for import substitutes. A consistent effort is always on to a reimagined focus on delivering breakthrough innovations quickly and consistently and advancements in process monitoring and control to ensure the manufacturing process is performing optimally. We also try to improve and modernize our business intelligence to focus on expanding existing value.

Benefits

We create capabilities to manufacture indigenous products thereby saving foreign exchange. Due to extra edge over cost and innovation in process development technologies, we even export our products to other developed countries thereby generating more foreign exchange. Also, we are able to create more skilled and unskilled job opportunities for young aspirants. It's a proud feeling to be able to contribute in some way and be an integral part of "Atmanirbhar Bharat".





The Future

We aim to be one of the globally renowned fine and specialty chemical manufacturer company by creating our own special niche

in the chemical industry. We believe and are confident that Innovation is the key and that can lead our company and even our country to great heights & shine globally.





About the Company

ArcelorMittal Nippon Steel India (AM/NS India)

AM/NS India, a joint venture by ArcelorMittal and Nippon Steel, is an integrated steel manufacturer serving diverse sectors. With over 600 steel grades, many of which substitute imports, AM/NS India serves a wide range of industries, including agriculture, automotive, infrastructure, defence, and energy, contributing to the vision of an Aatmanirbhar Bharat. Prioritizing health and safety, AM/NS India fosters a culture of innovation by placing research and development at the core of its operations. AM/NS India envisions driving sustainable advancement and community empowerment through innovative steel solutions, aligning with India's carbon-neutral goals and fostering purposeful, inclusive growth.

The Innovation

Committed to our purpose of "Smarter Steels, Brighter Future" which is intrinsically linked to innovation, AM/NS India continuously pursues advancements in technology, sustainability, customer centricity and safety. Our efforts are evident in our diverse project portfolio pushing traditional boundaries of the industry.

- **Safety:** The company has enhanced workplace safety with AI-enabled CCTV cameras that utilize minimal bandwidth and provide data privacy while delivering real-time alerts via email, WhatsApp, and IVR in case of any safety deviation.
- **Sustainability:** AM/NS constructed India's first steel slag road, achieved 40%

cost reduction, promoting sustainable development by transforming waste into a valuable resource.

- **Product Innovation & Customer Centricity:** AM/NS launched Optigal and Magnelis, new steel products for construction and solar industries, respectively. These launches were part of the company's efforts to identify market gaps, offer superior solutions, and reduce reliance on imports. Unique technology transfer for both products was done from ArcelorMittal.

The Approach

Product innovation, customer centricity and safety are the cornerstones of all activities at AM/NS India. We have implemented comprehensive strategies aimed at cultivating a future-ready workforce through continual improvement and structured feedback loops that drive innovation and financial value creation.

AM/NS India adopted a DMAIC approach with three-focused strategy to drive continual improvement: Capability building, Governance, and Recognition.

Benefits

We encourage innovation and reward employees for their creative ideas. This has fostered a culture of empowerment, risk-taking, and positive reinforcement. Recent projects demonstrate the following benefits:

- **AI-enabled CCTV cameras:** Improved safety culture, reducing common safety violations by 50% in just four months.



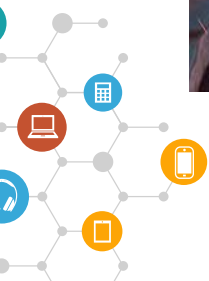


- **Steel slag road construction:** Sustainable solution that reduced road thickness without compromising quality, saving 40% in costs.
- **New product development:** Opened new markets and expanded our business.

Our immediate capacity expansion plan of 8.6 MTPA to 15 MTPA by 2025 and 40+ MTPA by 2030, includes heavy investments in introducing a futuristic product range, largely substituting imports, development of best-in-class automotive R&D labs and efforts towards sustainable steel production practices reducing emissions intensity to 1.8 tCO₂/tcs by 2030.

The Future

AM/NS India aims to position itself as the leading supplier of globally benchmarked steel solutions in the country.



ArcelorMittal Nippon Steel India



About the Company

ArcelorMittal Nippon Steel India Limited (AMNSI) exemplifies a journey defined by relentless innovation, unwavering dedication to sustainability, and a steadfast commitment to India's growth. Established in December 2019, AMNSI combines the formidable expertise of ArcelorMittal and Nippon Steel. Strategically located in Hazira, it stands as Western India's sole coastal steel manufacturing hub, leveraging logistical advantages and reaffirming its regional dedication.

AMNSI is proud to serve a diverse range of steel-consuming industries. The Company's extensive product offerings cater to the unique needs of sectors such as automotive, construction, infrastructure, energy, and manufacturing. With a commitment to delivering high-quality steel solutions, AMNSI supports the growth and innovation of these industries, ensuring they have the reliable materials needed to excel. AMNSI's ability to provide customised solutions and meet stringent industry standards, reinforces its position as a trusted partner in the steel industry, driving progress and excellence across all the sectors it serves.

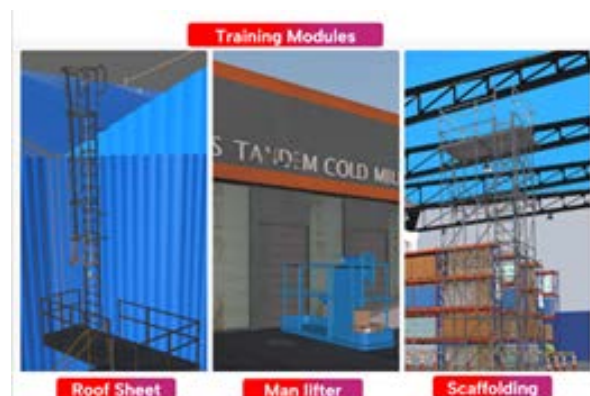
The Innovation

Virtual Reality (VR), Artificial Intelligence (AI), and digital engagement tools are revolutionizing safety, operational efficiency, and customer interaction, particularly in the automotive and galvanizing sectors. VR is transforming safety training by offering immersive, risk-free simulations where employees can practice handling hazardous tasks, such as working at heights or in



confined spaces. These realistic scenarios help trainees master safety protocols without exposure to real-world risks, reducing accidents and improving preparedness.

AI-powered monitoring systems enhance workplace safety by tracking heavy machinery and suspended loads in real-time. Advanced algorithms predict and prevent potential hazards, ensuring constant vigilance and minimizing risks in environments where unstable loads are a concern.



Customer interaction has also advanced with digital product galleries, allowing potential clients to explore automotive and galvanizing products interactively. These galleries provide detailed specifications and



features, enhancing customer engagement and enabling more informed decision-making, streamlining the comparison process and showcasing technical advantages effectively.

The Approach

The approach integrated Virtual Reality (VR) for immersive safety training, simulating high-risk tasks like working at heights without real-world exposure. AI systems were

deployed for suspended load monitoring, using sensors and algorithms to detect and predict hazardous load movements in real-time. In parallel, specialized product galleries for the automotive and galvanizing sectors were developed, offering customers to explore products interactively, view detailed specifications, and make informed decisions, improving both safety and customer engagement.



Benefits

The benefits include enhanced safety through VR training, allowing employees to practice high-risk tasks in a risk-free environment, reducing accidents. AI monitoring of suspended loads provides real-time hazard detection, preventing potential accidents and ensuring operational safety. The automotive and galvanizing product galleries offer customers an interactive platform to explore products in detail, improving engagement and decision-making. Together, these innovations enhance workplace safety, boost productivity, and elevate customer satisfaction, leading

to more efficient operations and stronger business outcomes.

The Future

In the future, further advancements in AI will enable predictive safety analytics, allowing for early identification of potential risks and proactive safety measures. The automotive and galvanizing product galleries will evolve to offer more personalized, immersive experiences, deepening customer engagement and enhancing their decision-making process for greater satisfaction.

About the Company

AMNS Khopoli is a leading downstream unit of AMNS India which is a joint venture between ArcelorMittal and Nippon Steel. AMNS Khopoli was incorporated in 2022 after acquiring Uttam Galva Steels Limited, which had been in operation since 1985. The AMNS Khopoli plant with an area of around 400 acres has a total annual capacity of 0.75 Million Tonnes of finished steel. The plant facilities include pickling lines, rolling mills, annealing, galvanizing, colour coating, and a service centre. The plant's location provides proximity to transportation infrastructure and proximity to the western India market for automobiles and appliances sector.

The Innovation

The innovation in this project focused on developing a scratch-resistant paint that minimized customer rejections and eliminated the need for traditional guard films. The advanced surface protection technology provided exceptional scratch resistance, allowing the sheet metal to withstand significant stress during the shaping process. The scratch resistance of the trial batch paint was evaluated during development, and the customer provided feedback. Additional trials improved the scratch resistance to 3kg, with no reported scratching issues from the customer. The paint was then standardized for use, eliminating scratch-related defects.

The project achieved significant improvements, including reduced internal rejections, lower costs, and enhanced customer satisfaction with rejection rates dropping from 6.5% to 0%. Technology innovation in product enhancement led to a cost reduction of INR 2206/Tonne. Collaborative efforts with purchase team and

vendor management were critical to achieving these results and is sustained through regular performance insights communication.

The Approach

The project initially focused on improving product quality by developing a guard film to prevent surface rejections during manufacturing. Subsequently the approach shifted to exploring alternative technology for creating a scratch-resistant paint that met IS 14246:2013 standards. This innovation enabled enhanced durability without guard films, reducing rejections, costs, and improving customer satisfaction. Cross-functional collaboration and customer feedback ensured the project's success, achieving zero customer rejection rates and substantial cost savings of INR 2206/Tonne.

Benefits

This innovation significantly reduced customer and plant rejections, from 6.5% to 0%. It eliminated the need for guard films, lowering production costs and improving customer satisfaction. The project also reduced process cost by 2206 INR/Tonne. This approach of using alternative technology to solve problems through innovative thinking created value for the customer.

The Future

The future of this innovation project encompasses horizontal deployment across other downstream units within our organization, with potential to expand its application to other industries. The future focus remains on continuous enhancements in durability and eco-friendly formulations, while ensuring cost-effectiveness and sustained customer satisfaction.



About the Company

AM/NS Gandhidham (Formerly Indian Steel Corporation) situated in Kutch Region of Gujarat State produces Cold Rolled Full Hard Steel Coils, Galvanized Plain Steel coils & Sheets, Cold Rolled Closed Annealed Steel Coils and Sheets, Galvanized corrugated sheets, Pre-painted Galvanized Steel coils and Sheets, Profile sheets and Embossed Steel coils and Sheets. This plant was set up in the year 2004 and in June 2023 was taken over by M/s Arcelor Mittal Nippon Steel India limited and became Arcelor Mittal Nippon Steel Gandhidham Limited. We have a state of art facility to cater Automobile, White goods appliances, Construction industries & general engineering industry.

The Innovation

The 6 Hi single stand mill faced frequent failures in its high-capacity motors, causing production disruptions. After extensive analysis, a unique solution was implemented— Resi-glass bandaging of rotor conductors across the barrel length, along with Vacuum Pressure Impregnation (VPI). This modification enhanced rotor stability under high centrifugal forces, effectively eliminating insulation failures and maintaining the motor's integrity. Since implementation in May 2023, the mill has been running at full capacity without any breakdowns.; The Color Coating Line produces colored sheets for various end applications. Line speed, an important indicator of production measured in meters per minute, couldn't be increased above 90 mpm. After analysis of failures, we inferred that the metal roller sleeve couldn't withstand the high speed and the accumulator proxy switch was found to hit its limit. Paper sleeves were used and the accumulator proxy was repositioned. Currently line speed is 120 mpm.

The Approach

6Hi - The approach involved consulting experts, analyzing failure causes, and reengineering our existing components. Using the PDCA method, we systematically eliminated the weakest components, applied Resi-glass bandaging along the rotor to strengthen weak areas, followed by VPI.; CCL – We analyzed the failures and their root causes to identify the failing component. Using the lean six-sigma methodology we not only increased the production but also reduced specific material consumptions.

Benefits

- 6Hi - This innovation eliminated motor breakdowns, increased mill productivity from 33 MT/Hr to 45 MT/Hr, and ensured continuous operation at full speed and load, maximizing production capacity. Total benefits due to increase in productivity, savings in energy consumption and repair costs amounted to ~INR 31 crores.
- CCL - The project led to increase in monthly production direct savings by reduction in consumption of power, propane and steam of ~INR 8 crores.

The Future

- New Product development through continuous innovation
- Increased cross-site learning and knowledge sharing sessions.
- Increase Collaboration and Partnerships with external agencies
- Transformation from operational excellence to business excellence
- Digital Innovations – AI based modelling of new products

ArcelorMittal Nippon Steel India (AM/NS India)-Hazira



About the Company

AM/NS India is a joint venture between the world's leading steel companies, ArcelorMittal and Nippon Steel. Established in December 2019, post-acquisition of Essar Steel, we are an integrated flat steel manufacturer - from iron ore to ready-to-market products. With over 600 steel grades - many substituting imports, we serve an array of contemporary industries (agriculture, automotive, infrastructure, defence, energy, etc.) and contribute to an Aatmanirbhar Bharat. Our portfolio encapsulates HRC / sheets/ plates, cold rolled coils/ sheets, galvanized coils/ sheets, pre-painted galvanized coils/ sheets, pipelines, etc. We ascribe to advancement with sustainability and envision creating 'Smarter Steels, Brighter Futures'

The Innovation

"Innovative Technique to Eliminate Jam Accumulation in Water-Cooled Fume Elbow"




Steel Making Plant (SMP)-2 team addressed the recurring issue of jam accumulation in the water-cooled fume elbow of the Conarc furnace, which combines converter and electric arc furnace processes. This furnace generates high-temperature fumes (up to 1300°C) with fine dust during steelmaking, leading to jams in the water-cooled elbows due to OEM design. These jams pose safety risks during manual cleaning, increase fugitive emissions, and reduce productivity.

To solve this, SMP - 2 team developed a water-cooled panel with a hydraulic actuator that automates cleaning after each heat from the control room. The design includes a central bottom cut in the elbow to dislodge accumulations using hydraulic energy. The project involved in-house design, fabrication, installation, trials, and performance monitoring with sustainability.

This innovation has significantly improved human safety, reduced fugitive fume emissions, and enhanced suction efficiency and productivity.

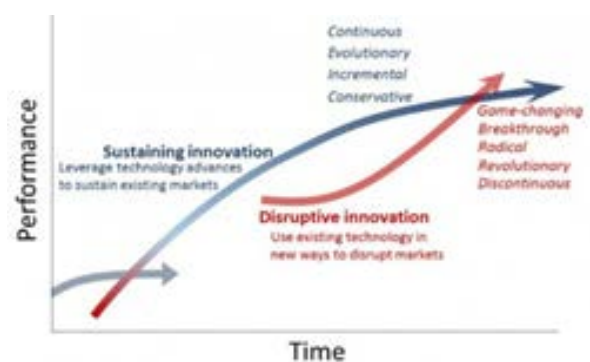
The Approach

AM/NS Hazira, Engineering team employs the DMAIC approach & lean methodologies to address following issues:

- **Safety Risks**
Manual cleaning of the jammed elbow exposes workers to high temperatures and hazardous conditions.
- **Environmental Impact**
Jamming causes suction issues, leading to fugitive fume emissions.
- **Operational Downtime**
Frequent blockages necessitate furnace stoppages for cleaning, reducing productivity.

Patent has been granted by Government of India to AM/NS India

for this innovative in-house design. (Patent No: IN/PA/84).





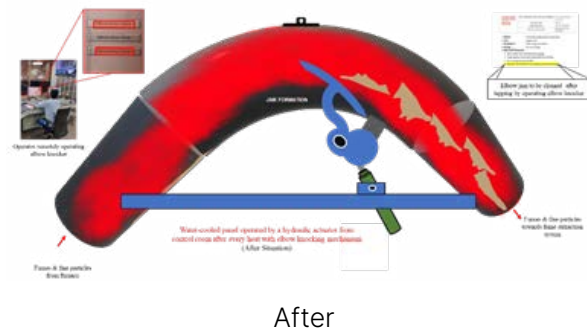
Benefits

The adoption of this advanced solution yields several substantial benefits:

- Enhanced Safety through elimination of human intervention for jam cleaning.
- Reduced Environmental Impact by improving suction efficiency and lowering fugitive emissions from 4908 µg/m³ to 2817 µg/m³.
- Increased Productivity by eliminating downtime of 20 hours /month.
- By implementing this system, we have realized significant cost savings of INR 14.3 crores annually.

The Future

AM/NS India is committed to environmental responsibility, aiming for a 20% emission intensity reduction by 2030. As a part of “Reimagining Bharat,” it focuses on building a stronger, sustainable, and self-reliant India. Through innovation and excellence, AM/NS India envisions steel as a driver of progress and sustainability.



ArcelorMittal Nippon Steel India-Odisha



About the Company

AM/NS India is a joint venture between the world's leading steel companies, ArcelorMittal and Nippon Steel. Established in December 2019, post-acquisition of Essar Steel, we are an integrated flat steel manufacturer- from iron ore to ready-to-market products.

With over 600 steel grades-many substituting imports, we serve an array of contemporary industries (agriculture, automotive, infrastructure, defence, energy, etc.) and contribute to an Aatmanirbhar Bharat.

Committed to achieving net-zero emissions, the company integrates circular economy principles to minimize waste.

We ascribe to advancement with sustainability and envision creating 'Smarter Steels, Brighter Futures', acts as a dedication to innovation and sustainability.

The Innovation

AM/NS India has introduced groundbreaking innovations across multiple domains. Technically, we have patented PMGG (Partially Modified Guar Gum), a binder for pellet production, enhancing efficiency and quality.

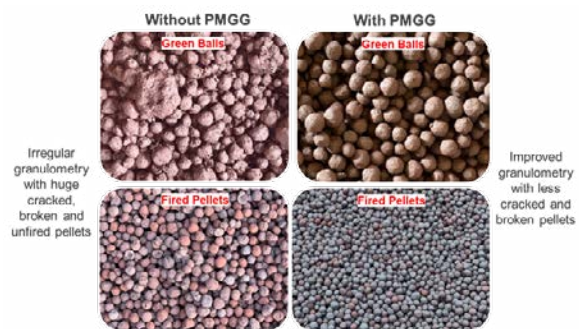
The process innovation is highlighted by the production of DR (Direct Reduction) grade pellets without the need for imported concentrate, demonstrating self-sufficiency. On the sustainability front, we have substituted imported coal with Indian (Swadeshi) coal for their captive power plant, reducing dependency and promoting local resources. Digitally, we have implemented AI/ML, RPA (Robotic Process Automation), and a live dashboard called Odisha Live,

which serves as a comprehensive solution for streamlining operations and improving decision-making.

The Approach

AMNS India employs the PDCA cycle, DMAIC & DMADV approach, and the lean methodologies, alongside Quality Circles initiatives, to drive continual improvement. Innovation management is facilitated through the BE Portal, integrating reward and recognition. The approach emphasizes transparent business excellence portal with cross functional cross locational involvement and robust employee engagement, ensuring a culture of sustained innovation and operational efficiency.

Most Innovative part of the project was modification of Natural Guar Gum.



Benefits

AMNS India's Odisha Operations innovations have led to significant savings: ₹5 Cr. in CY20, ₹72.34 Cr. in CY21, ₹416.42 Cr. in CY22, ₹232 Cr. in CY23, and ₹115 Cr. in CY24. Odisha operations achieved EBIDTA savings through 42, 157, 112, 162, and 186 projects respectively. With 100% employee engagement, the asset won the Best





Operating Asset in BE CEO Award 2023 and Best Asset for BE in CEO Award 2022. Odisha Operations received consecutive safety and pinnacle awards.

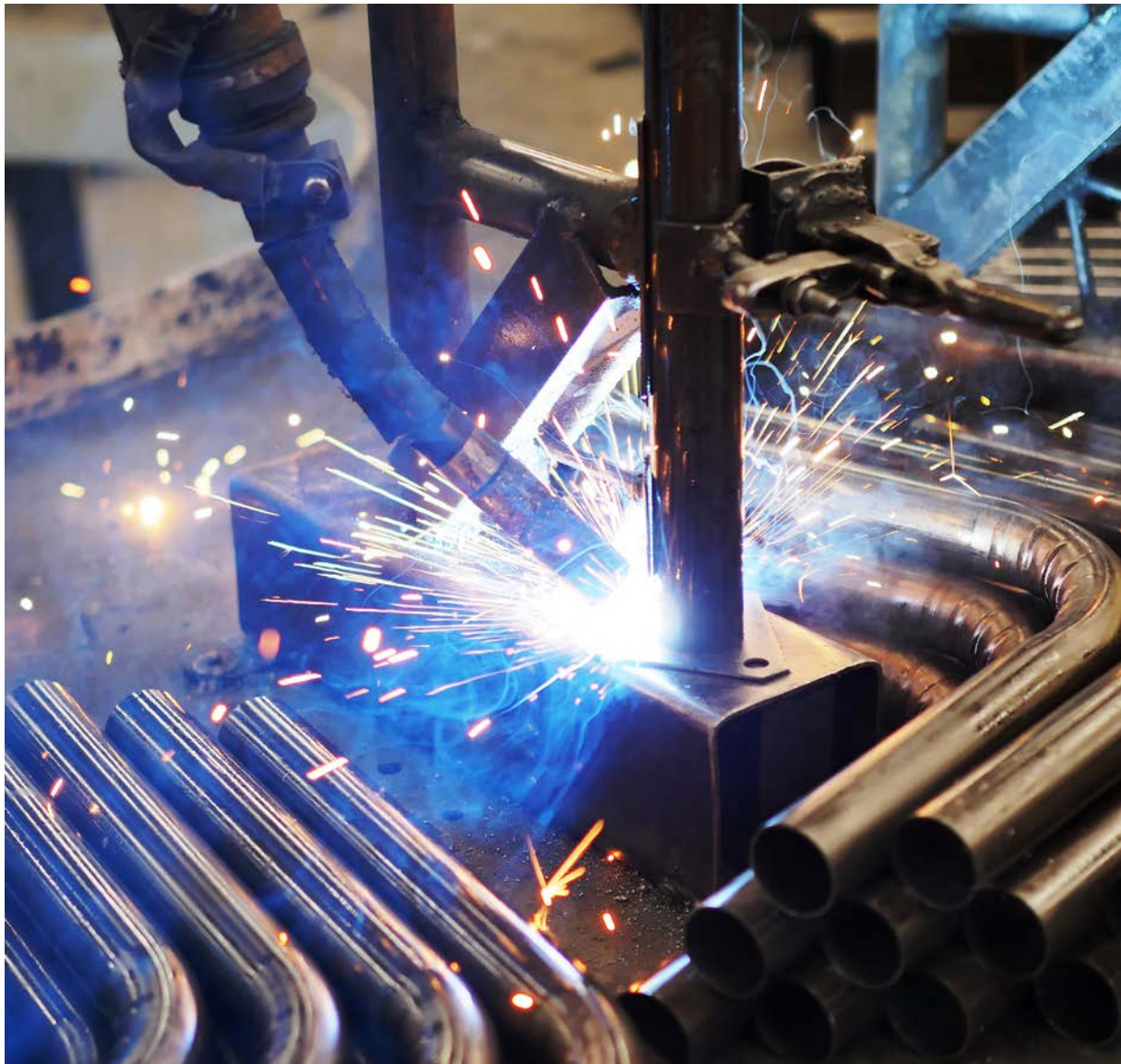
- Reduce plasticity and increase the production of DR grade pellet.
- Control quality fluctuations during high LOI (Loss on Ignition) and high Moisture feed conditions.
- Reduce fines generation during handling.
- Reduce standard deviation of Cold Crushing Strength

The Future

AM/NS India stand in alignment with India's vision to be carbon-neutral by 2070.

The aim to sustain a safe and innovative work culture, secure asset automation and digitization, and establish world-class R&D and manufacturing facilities, driving future growth and excellence.

We prioritize health and safety & foster a culture of innovation by placing research and development at the heart of our operations. We are a committed partner to the nation, and our avid growth story will be purposeful, inclusive, and sustainable.



ArcelorMittal Nippon Steel India (AM/NS India)-Vizag



About the Company

AM/NS pellet plant at Vishakhapatnam has made significant strides in innovation and digitization by integrating cutting-edge technologies. We have optimized our production processes to enhance efficiency and reduce waste. Advanced automation systems monitor real-time data, allowing for precise control over the Pelletization process. This not only improves product quality but also minimizes energy consumption and environmental impact. In addition to operational enhancements, our plant embraces digital solutions that facilitate seamless communication and data analysis. By leveraging artificial intelligence and machine learning, we can predict market trends and stay competitive.

The Innovation

AM/NS pellet plant at Visakhapatnam has developed innovations in green balling automation which is first of its kind for controlling parameters of speed, feed and bentonite addition which helps in producing close range of size of 9 to 16mm for better permeability in induration and steel making. Improving and innovating in refractory design has helped us to move the shutdown requirement from once in a year to once in 2 years enhancing capacities, also innovation in tailing management at beneficiation plant and utilizing low grade ores was taken up. Enhancement of pressure filters are the need of the hour considering the adaptability towards utilising low-grade ores, AM/NS Vishakhapatnam has improved the capacity by increasing the number of plates with consent with OEM which is a learning for the industry. Our focus on innovation and digitization has not only enhanced our productivity but has also set a benchmark for industry practices.

The Approach

At AMNS pellet plant, we use DMAIC and lean methodologies for continuous improvement. We promote innovation by fostering a collaborative environment where engineers and associates share knowledge. Regular brainstorming sessions encourage diverse ideas, leading to efficient and quality solutions. Digital tools support idea management and feedback, refining concepts. Recognizing and rewarding innovation motivates our team to think creatively and take ownership, enhancing the performance and sustainability of our Pelletization operations.

Benefits

AM/NS pellet plant, Visakhapatnam Operations innovations have led to significant savings resulted in value creation. Sustainability has also been a key focus of our innovations. The adoption of digital tools for predictive maintenance has decreased equipment failures, contributing to lower maintenance costs and improved reliability. Overall, these innovations have positioned the AM/NS Visakhapatnam Pellet plant as a leader in the industry, driving both economic and environmental performance.

The Future

AM/NS Visakhapatnam, a pioneering triple deck roller system is being trailed to enhance pellet plant quality and energy efficiency. Additional projects, like wet-mode coal grinding and grate discharge, are planned. The focus is on sustainability through production techniques & optimized energy efficiency, aiming to boost productivity and reduce carbon footprint.



Amrutanjan Health Care Limited



About the Company

Amrutanjan Health Care Limited is a 131-year-old company with a rich legacy and is best known for its iconic brand, Amrutanjan Pain Balms. A purpose-driven and innovative company, Amrutanjan Healthcare offers a versatile product portfolio. Its flagship brand, Amrutanjan, is a pain management expert that provides high-quality solutions using pure and natural ingredients. Recently, The Economic Times felicitated Amrutanjan Healthcare as one of the Best Healthcare Brands at the 7th edition of ET Now Best Healthcare Brands. Amrutanjan's expertise lies in combining science and naturalness, rooted in Ayurveda and believes in ethical business practices. Apart from pain management products, Amrutanjan Healthcare offers products in other categories, including women's hygiene brand Comfy Snug Fit a High-Quality sanitary napkin at affordable price, beverage brands Electro+ and Fruitnik, and in cold and congestion category through the Amrutanjan Relief range. As an employee-centric company, it endeavours to provide a culture that accepts new ideas, embraces change, and encourages innovation. The company's commitment to supporting inclusive growth is uncompromising, which is proven through the social services it has undertaken for generations by the company. The company is actively engaged in the fields of education for the underprivileged sector, preventive health, environment protection, animal welfare, and women empowerment.

The Innovation

The traditional drug delivery pathways are via oral administration or hypodermic injections, but these methods have their limitations.

Transdermal drug delivery can overcome these limitations as it has painless delivery, sustained release potential, and patient ease of use, and it eliminates the risk of disease transmission and contamination as it is a needle-free approach. The main limitation in transdermal drug delivery is uncontrolled drug delivery and skin permeability. Hydrogel patches can act as effective transdermal drug delivery systems and can help overcome these drawbacks, where the adhesive nature of the patches will hold the drug delivery system in place. Patches can be formulated with tuneable pressure-sensitive and strong skin adhesion properties. Also, traditional patches, such as matrix-type sticking plaster or acrylic adhesives used for too many decades, lack functionality. To address this issue of poor functionality, adhesive hydrogel patches have emerged as an efficient multifunctional alternative. With this view, 'Amrutanjan Advanced Pain Relief + Stick-On Patch' has been developed.

The Approach

Hydrogels are three-dimensional, water swell-able, and polymeric materials. The physicochemical properties of hydrogels can be modified easily, allowing them to be suitable for various medical applications. Moreover, adhesive properties can be imparted to hydrogels through a physicochemical approach, making them ideal candidates for supplementing or replacing traditional sticking plaster. In pursuit of this goal, we carefully curated and formulated the ingredients in such a way as to deliver the maximum efficacy for pain care. In addition to this, the manufacturing patch machine was designed and used.



Benefits

Targeted Drug Delivery: It is infused with Menthol providing pain relief. The controlled-release mechanism allows for prolonged and steady absorption of Menthol through the skin.

Cooling Effect: The natural cooling sensation of hydrogel patches and menthol provides immediate relief to localized pain or swelling, making them ideal for conditions like muscle strains, joint pain, or backaches.

Non-Invasive: They offer a non-invasive method of pain management, preferred alternative to oral, injections etc.

Easy Application & Removal: Easy to apply and remove, leaving no sticky on the skin.

The Future

Hydrogel patches have become a go-to solution for muscle pain, joint pain, and back pain. Hydrogel patch technology represents a shift toward more user-friendly, comfortable, and effective solutions for pain care. In the future, this hydrogel technology can be used in cooling patches (reducing temperature during fever), menstrual pain relief patches, etc., by infusing the corresponding active ingredients in the hydrogel.





About the Company

AMTZ, established under the “Make in India” initiative, is a government enterprise fostering India’s medical device manufacturing ecosystem. Spanning 270 acres in Visakhapatnam, it offers state-of-the-art research, innovation, and production facilities. AMTZ played a crucial role during the COVID-19 pandemic, producing ventilators, oxygen concentrators, and RTPCR kits daily. It hosts advanced centers like 3D printing, biomaterials testing, and gamma irradiation. AMTZ also supports startups through incubators like Medi-Valley and Bio-Valley. Collaborating internationally, it drives innovation in MedTech and regenerative medicine, including stem cell research, promoting economic growth and technological advancements in healthcare. Amtz proudly houses the WHO Collaborating Centre for Health Innovation and the World Trade Centre AMTZ

Syringe pump

Approach

The proposed innovation involves a novel syringe pump designed for precise drug administration, improving upon conventional syringe pump mechanisms. It utilizes a motor-driven lead screw, a half-nut mechanism, and a pusher block, all encased in a housing with a drive unit, plunger holder, and solid cylindrical rod. This design enables precise linear movement, which translates rotational motion into controlled, linear plunger movements for accurate drug delivery. The device’s construction reduces malfunctions commonly associated with existing syringe pumps by optimizing the half-nut engagement, providing

a stable plunger holder, and eliminating circular rods that can cause fluctuations.

Benefits

- Enhanced Precision and Control:** The syringe pump ensures exact drug administration by converting rotational motion to controlled, linear plunger movements.
- Improved Reliability:** The device mitigates common mechanical failures, such as the slipping of the half-nut mechanism, which can lead to inaccurate dosing.
- Versatility:** This syringe pump design accommodates various pre-existing syringes, making it adaptable for diverse medical needs.
- Weight Reduction:** Compared to traditional pumps, the simplified design minimizes weight, making it easier to handle and install.
- Reduced Risk:** By eliminating certain failure-prone parts, the innovation significantly lowers the risk of over- or under-dosing, enhancing patient safety.

Future Scope

- Automation and Remote Operation:** Integrating advanced sensors and IoT capabilities can allow for remote monitoring and operation, essential for ICU and critical care settings.
- AI-Enhanced Drug Delivery:** Incorporating machine learning algorithms could optimize dosing based on real-time patient data, adapting to changes in patient vitals.



Expanded Use in Specialized Treatments: The syringe pump could be refined for specific uses in chemotherapy, neonatal care, and other areas requiring ultra-precise drug administration.

4. **Integration with Hospital Management Systems:** Future models could integrate with electronic health records, automatically logging administered doses and alerting healthcare providers to any malfunctions or needed maintenance.



Endoscope

Approach

This innovation introduces an Angulation Locking Unit for Flexible Endoscopes, which addresses the limitations of existing endoscope locking mechanisms. This device provides a straightforward and reliable way to control and lock the bendable section of an endoscope's insertion tube. It consists of two primary locking units, each with its own steering knob and friction disc. The first locking unit controls horizontal deflection, while the second controls

vertical deflection. These knobs are linked to primary and secondary traction chains, which drive the bending of the endoscope in the desired direction and securely lock the tube's position at precise angles.

Benefits

1. **Improved Precision and Stability:** This locking unit allows precise control over the angulation, securing the tube in a stable position during procedures.
2. **Simplicity and Ease of Use:** The locking unit's reduced number of components simplifies the control mechanism, making it easier for operators to use.
3. **Reduced Maintenance:** The innovation requires less upkeep due to its streamlined structure, thus increasing the lifespan and reliability of the endoscope.
4. **Enhanced Patient Safety:** By enabling the operator to precisely position and lock the endoscope, the innovation minimizes movement that could lead to discomfort or harm.
5. **Efficiency:** The simplified operation reduces the time needed to lock the angulation, speeding up procedures and improving clinical efficiency.

Future Scope

1. **Integration with Advanced Imaging:** The locking unit can potentially integrate with real-time imaging technologies, allowing automated adjustments based on visual feedback.
2. **Automation and Remote Control:** Further iterations could incorporate robotics or remote control capabilities, providing operators with remote manipulation and precise positioning in complex procedures.
3. **Enhanced Ergonomics and Customization:** Future designs may improve ergonomics, offering customizable controls tailored to specific medical procedures or practitioner preferences.
4. **Data-Driven Adjustments:** Incorporating sensors could enable the unit to capture movement and angle data, which can inform automatic adjustments and improve procedural accuracy over time.
5. **Use in Various Medical Fields:** While designed for endoscopes, the angulation locking technology could extend to





other flexible medical instruments, such as catheters and laparoscopic tools, broadening its clinical applications.



Scope



ECMO

Approach

The innovation, a Universal centrifugal blood purification pump, presents a transformative approach to improving blood purification in ECMO applications. At its core, this pump is designed to extract blood from a patient and deliver it to an extracorporeal membrane oxygenation (ECMO) system for purification by generating a vacuum through centrifugal force. This is achieved using a levitated rotor within the pump that is driven by a rotating magnetic field. By eliminating the need for direct mechanical contact, the design ensures smooth, uninterrupted blood flow while minimizing the risk of leaks or complications that can occur with traditional systems. Unlike conventional systems that are often model-specific and require costly and time-consuming replacements, this pump is compatible with a variety of existing models, such as the Rotaflow RF-32 and Thoratec CentriMag. This is accomplished through the

use of a specialized dual-wall housing. One wall accommodates the primary pump head, while the second wall houses the secondary pump head, ensuring seamless adaptability across different devices. The spring press-fit mechanism further enhances this flexibility, allowing for easy installation and removal, thus reducing downtime during critical medical procedures.

Benefits

1. **Cost Reduction and Time Efficiency:** By incorporating a universal design, this pump minimizes the need for manufacturer-specific replacements, reducing overall costs and improving time efficiency in critical medical situations.
2. **Improved Patient Safety:** The centrifugal design ensures a consistent blood flow, reducing the risk of complications, such as leakage, during procedures.
3. **Enhanced Flexibility:** Its compatibility with multiple models enhances versatility and accessibility for medical professionals, allowing them to use the pump across different ECMO systems.
4. **Domestic Manufacturing and Innovation:** The pump supports local production and innovation, which can lead to further refinements and reduce dependency on foreign manufacturers.
5. **Extended Lifespan:** The use of a magnetic rotor and efficient materials allows for better wear-and-tear management, potentially extending the pump's operational lifespan.

Future Scope

1. **Expanded Medical Applications:** As the technology evolves, this pump could be adapted for broader use in medical fields beyond ECMO, including dialysis, heart-lung machines, and other critical blood purification systems.
2. **Integration with Smart Systems:** Future versions of this pump could be equipped with IoT and AI-based monitoring systems to adjust blood flow rates, optimize



performance, and provide real-time health analytics for better patient care.

- 3. Biocompatible Innovations:** Further research into the materials used, particularly the magnet-holding member and rotor, could lead to advancements in biocompatibility and reduce risks of adverse reactions during prolonged usage.
- 4. Miniaturization for Portable Use:** The technology could eventually be miniaturized for use in portable ECMO systems, offering mobility and convenience for patients requiring long-term blood purification.

Tricycle

Approach

Our Solar-powered tricycle encompasses several unique aspects that contribute to its functionality, efficiency, and sustainability. The Battery Management System (BMS) protection ensures the safety and longevity of the tricycle's battery by monitoring its performance, preventing overcharging and maintaining optimal operating conditions. Mileage range of 40 km showcases the tricycle's capacity for long-distance travel on plain roads, providing users with a reliable mode of transportation. The maximum speed of 23 km per hour strikes a balance between efficiency and safety. Battery level indicator offers users real-time visibility into the tricycle's power status, enabling them to plan their journeys effectively. Option for mechanical braking provides redundancy and reliability in braking systems. The combination of these features makes the solar-powered tricycle a sustainable, efficient, and user-friendly mode of transportation, catering to the needs of environmentally conscious commuters while prioritizing safety, reliability, and convenience.

Benefits

In many regions, especially rural areas or developing countries, access to reliable electricity can be limited. Solar-powered vehicles like the tricycle offer a decentralized

solution, providing access to clean energy for transportation even in areas with inadequate grid infrastructure. The cost of conventional fuels can be a significant burden for individuals and communities, especially in economically disadvantaged areas. Solar energy, once the infrastructure is in place, is essentially free, reducing the ongoing operational costs of transportation. In a wider aspect, the idea of a solar-powered tricycle addresses key challenges in the solar energy sector by promoting sustainability, energy independence, technological innovation, and equitable access to clean transportation solutions.

Future

The solar-powered tricycle holds the potential to revolutionize urban transportation, aligning with global efforts toward sustainability and reduced carbon emissions. Its widespread adoption could lead to healthier communities, economic growth, and a fundamental shift in how we perceive and utilize personal transport. By fostering innovation and encouraging environmentally conscious choices, this tricycle could play a pivotal role in shaping the future of mobility.





About the Company

Ashok Leyland is an Indian multinational automotive manufacturer, with its headquarters in Chennai. It is now owned by the Hinduja Group. It was founded in 1948 as Ashok Motors, which became Ashok Leyland in the year 1955 after collaboration with British Leyland. Ashok Leyland is the second largest manufacturer of commercial vehicles in India.

The Innovation

During the process of grinding the automotive components, lot of metallic waste is generated. The metallic grinding waste is treated since these are hazardous waste. The treated waste is then given to third parties, wherein the waste is treated again and then used in cement industries.

Object

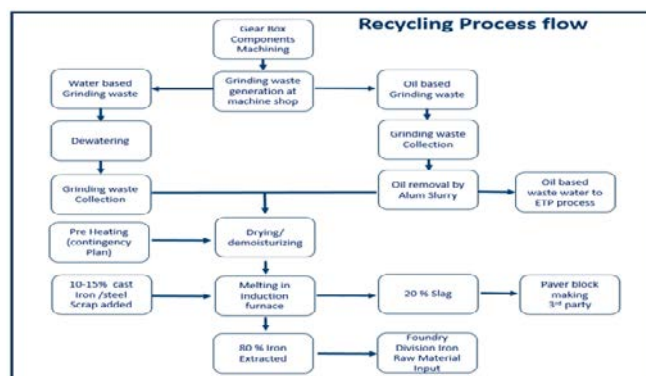
An object of the present invention is to eliminate the deficiencies of the known solutions and to create an alternative procedure facilitating the complete utilization of metal grinding waste, in particular grinding waste obtained from grinding of steel (Cam shaft, crank shaft, Gear Box shaft gears) in a way that it is completely suitable for use as Iron in foundry process.

Summary

- Hazardous waste reduction by iron ore Extraction from Grinding waste
- 80 % Iron extracted from Grinding waste
- 20% slag also used for fireworks process
- 100 % hazardous waste recycled in to useful product - Non-hazardous category
- 120 Tones iron extracted per year Cost savings 40 Lacs
- Natural resource digging optimized – Environment friendly

The Approach

1. Collection of Grinding waste from Machine shop where the Grinding waste generation takes place
2. Dewatering of the grinding waste
3. Drying of the grinding waste at the atmosphere temperature from 2 Hours to 72 Hours based on the Content of the Water in the grinding waste
4. Pretreated grinding waste (solid metal waste containing valuable iron ore) put in to the graphite crucible and re melted in the furnace at High temperature conditions for getting valuable metals separated from other impurities as slag. 10 to 20 % of slag formed and the 90% to 80 % amount of Iron metal extracted.



Ashok Leyland Limited (Hosur Unit-2)



About the Company

Ashok Leyland, flagship of the Hinduja group, is the 2nd largest manufacturer of commercial vehicles in India, the 4th largest manufacturer of buses in the world, and the 19th largest manufacturers of trucks. A US \$ 4.5 billion company, that has a 75 year legacy, and a footprint that extends across 50 countries.

Pioneers in Commercial Vehicle (CV) space, many of our product concepts have become industry benchmarks and norms such as, first CV manufacturer in India to receive OBD-II certification, SCR, iEGR and CNG technologies. Ashok Leyland is the first truck and bus manufacturer outside of Japan to win Deming prize for two of its plants.

Driven by innovative products suitable for a wide range of applications and an excellent understanding of the customers and local market conditions, Ashok Leyland has been at the forefront of the commercial vehicle industry for decades.

The Innovation

The modular platform introduction by Ashok Leyland Ltd is a first of its kind in the Indian CV industry with multiple options of axle configurations, loading spans, cabins, suspensions, and drivetrains on a single platform for the entire range of Rigid trucks, Tippers and Tractors in the 18.5T to 55T category. This enables customers to configure vehicles that are best-suited to their applications and business needs.

While modularity in product design benefits customers, downstream process of manufacturing and its complexity has gone up multi fold. Therefore, the need for establishing the process efficiently and effectively with

innovative process solutions have become critical. Manufacturing team has developed innovative solutions such as,

1. Introduction of MPAS (Manufacturing Process Assurance System), a digital process assistance & assurance towards right part fitment.
2. Design & development of Innovative robotic paint marking system used for marking frame side members for right part fitment.
3. Commonized cabin lifting tackle design using electro mechanical Single tackle to handle 12 different model combinations.
4. Cab painting process with innovative Twin loading concept.
5. Introduction of Roll forming for frame side member manufacturing, Robotic tyre assembly, etc.

The Approach

1. Providing Digital Process assistance towards elimination of difficulty in identifying right part in assembly lines through real time digital part parts data derived from SAP to shop floor.
2. Creating recipe management enabling auto selection of right machine programs at point of assembly due to multi model mix.
3. Monitor real time shop floor data at ERP level for data analytics. Development of m-Alert application towards monitoring health, Predictive, Preventive Maintenance, TPM
4. Process Automation through advance innovative technology solutions.





Benefits

1. Operational efficiency improved by 10% through introduction of prevention & detection Poka Yoke controls which are all driven by digitalization journey.
2. Continual reduction in defect outflow from the level of 6 per vehicle to less than 1 per vehicle. Reduced wastes in manufacturing process.
3. Space optimisation in shop floor by 33% through adaption of various machine automations with modernised tools.

4. Potential cost saving accruals of INR 120+ crores savings in the last 3 years.

The Future

Ashok Leyland's 75-year journey is a story of transformation and innovation. We have set our sights on pioneering sustainable transportation solutions and aim to support India's economic development for years to come. Ashok Leyland has consistently redefined industry standards, setting benchmarks for cutting-edge technology in its products and services, and partnering with marquee names in offering innovative, customer-centric solutions.



AVA Cholayil Health Care Private Limited



About the Company

The AVA Group, promoted by Dr. A V Anoop is a diversified conglomerate with interests spanning its mark with various brands including the renowned flagship brand MEDIMIX in Personal care which holds the title of the world's largest selling Ayurvedic soap, MELAM in the food sector, SANJEEVANAM in Ayurvedic wellness, KAYTRA in Ayurvedic cosmetics for international market, and AVA Productions in cinema.

AVA Cholayil Health Care Pvt Ltd is the manufacturing entity that manufactures MEDIMIX Soaps, Hand Wash & Shampoo in its Five factories located in Tamil Nadu, Pondicherry, and Karnataka. These facilities are overseen by in-house Research & Development division approved by CSIR in DSIR department which is under the Ministry of Science & Technology, Government of India.

The Innovation

1. Mould Cutting Machine

- Transitioning from a manual frame with strings to hydraulic cutting machines.
- The manual method of cutting was labour-intensive and physically demanding, so automating that with hydraulic systems not only enhances efficiency but also reduces strain on workforce.
- By using a single cylinder to apply gradual force, we could achieve more consistent cuts and better precision in the dimensions of the soap plates.

2. Online Soap Bar Chamfering

- Streamlined the chamfering process significantly by moving from a manual method to an online chamfering system with multiple tools aligned from the cutting table.
- This ensures that each soap bar receives uniform chamfering without the need for manual handling.
- By automating this process, we eliminate the risk of inconsistencies and defects that can occur with manual methods.

3. Semi-Automatic Stamping Machine

- Moving from manual stamping machine to a semi-automatic (In-house developed) one that can stamp two soaps at a time.
- The old method was completely relying on workforce which was cumbersome and slow.
- With the new semi-automatic machine, we could be able to increase production speed while maintaining quality and consistency in the embossing.
- This not only helps in branding but also enhances the overall presentation of our products.

The Approach

- In AVA Group, innovation is cultured where many employees in different level participate, this includes promoting risk-taking, tolerating failure, and recognizing innovative efforts, no matter the outcome.





- Encourage open dialogue and feedback across all levels of the organization.
- Tools like brainstorming sessions, innovation workshops, encouraged for new ideas.
- We Implement innovation in a structured processes for idea generation, evaluation, and implementation.
- We establish metrics to measure innovation success and reward the teams for achieving innovation goals.
- Fostered Culture led to enhance the production with improved quality by minimal workforce achieved by Less Capital Investment.
- Improved Safety of workforce and lower operational costs over time as well.
- Innovative efforts contribute to the organization's long-term vision and make us to stay ahead of competitors in the industry.

Benefits

- Developing an in-house innovation allows us to create solutions that are specifically aligned with our unique needs and objectives, leading to more effective outcomes.
- The innovation culture within our organization over the decades resulted in varied range of benefits that could significantly enhance our organization's performance and sustainability.

The Future

AVA group is poised to achieve its future business objectives through innovation initiatives which are directed towards enriching the everyday lives of our customers, by bringing to their doorsteps, a range of value-driven personal and homecare solutions that are convenient, safe and nature friendly.

AVA Group is well-equipped to meet future challenges and opportunities and will continue to lead in shaping the future which is very bright with new innovations, and we have plan for varied range of products with latest technologies for upcoming global markets.



About the Company

Avantel Limited is a technology driven AS 9100D, ISO 9001:2015, ISO 14001:2015, ISO 45001:2018, ISO/IEC 17025: 2017 & ISO 27001:2013 certified company with a legacy of more than three decades in the strategic sector. The company is well known for its capabilities in Design, Development, Manufacturing, Installation & Commissioning, System Integration, Testing & Evaluation of Defence Electronics, Satellite Communication Systems, Software Defined Radios, HF Systems, Wind Profiler Radars, Radar sub-systems, Embedded Systems & Software and Network Management & Application Software. Avantel core competencies include RF System Design, Wireless & Satellite Communication Systems, Embedded Systems, Digital Signal Processing, Network Management & Software Development and Engineering Services.

The Innovation

Avantel has been on the forefront of innovation in offering solutions to the strategic sector. Some of the recent innovative products which have been offered to our customers are listed below.

The Dual Mode High Power HF SSPA delivers 20KW Pulsed Power Output in Pulsed Mode and 2KW Power Output in CW Mode. The SSPA combines multiple RF power devices to derive higher pulsed power at 10% Duty Cycle.



20 KW SSPA

The Static HF Transceiver System is Software Defined Transceiver with Software Communication Architecture (SCA). The System is intended for both Voice and Data communication. The Radio (SDR) consists of the latest state-of-art technology constituents like, Field Programmable Gated Array (FPGA), Digital Signal Processing (DSP), Direct Digital Frequency Synthesis, Automatic Link Establishment (ALE) using 3G ALE (STANAG-4538), 2G ALE (FED-STD-1045),



Software Defined Radio

The MSS Terminals (Xponders) for Marine Fishing Vessels are used for monitoring of maritime assets and Emergency communication with fishing vehicles through a Satcom service network. The Xponder has been developed by Avantel and being mounted on mechanised and motorised fishing vessels across Indian Coastline.



MSS Xponders





The Approach

Avantel has been offering indigenous solutions to the strategic segment since inception and our approach has been to develop the systems based on user requirements / import substitutes / emerging technologies. Avantel's in-house R&D facility is recognized by DSIR, Govt and is a centre of excellence & innovation for self-reliance in strategic electronics and communication requirements of Indian Defense Services. Avantel has been investing around 15 % of its annual turnover year on year in Research & Development activities and thus could provide various fully indigenous solutions to its customers resulting in valuable savings of foreign exchange in the strategic domain.

Benefits

The SSPA is one of its kind unique development and Avantel is the first company in India to develop the same. This SSPA finds applications in High power EW and

Communication fields. The Software Defined Radio compliant to SCA architecture is the future for our Indian strategic establishments and now can be offered in various FFF (Form, Fit, Functionality) variants including as per user needs. The MSS Terminals (Xponders) will be immensely beneficial to the fishermen at sea for emergency response, identification of fishing zones and monitoring by security agencies.

The Future

Avantel is on the forefront of development of state-of-the-art technologies in strategic electronics segment and has been offering highly competitive home-grown products to enhance self-reliance in Indian defence technologies. Avantel aspires to grow from strength to strength in the Aerospace & Domain and solve the problems of the "man behind the machine" while contributing to operational preparedness of the country. The guiding principle for Avantel is always "Nation First".



Bell O Seal Valves Pvt Ltd



About the Company

Bell O Seal Valves Pvt Ltd (BOS) is one of the leading valve manufacturer in India. Company is specialized in manufacturing of Bellow Sealed Valves, which will be used for many hazardous and vital applications like Nuclear, Hydrogen, Phosgene, Ammonia, Chlorine, Fluorine, Bromine and other Halogens. BOS is the only company in India and the 6th company in the world to have Euro Chlor and Rus Chlor certification, for its Bellow Seal Valves to be used in Caustic Chlorine plants for hazardous media such as Chlorine. BOS is one of the vital supplier and significant contributor to the nation under Atmanirbhar Bharat, and has substantially reduced the forex savings and helped nation in becoming self-reliant and cut down the dependency of imports for these major equipment's.

The Innovation

The valve industry has seen significant innovations over the past few years, driven by advancements in technology, the push for sustainability, and the need for greater efficiency in various applications. With increasing awareness of environmental issues, the valve industry is focusing on sustainability. Bellow Seal valves is one of the right solution for all these issues. Innovative sealing using Bellow Seal have emerged, reducing the risk of leaks and improving the reliability of valve operations. These advancements are critical in industries where safety and environmental protection are paramount, such as Chemical Processing, Nuclear, Hazardous Applications and oil and gas. BOS is dedicated to innovation, focusing and developing advanced valve technologies that meet evolving industry needs. BOS R&D department has achieved

significant product certifications, ensuring excellence in sustainability and cutting down emissions. These approach ensures significant contributions to climate change and safety of people.

The Approach

BOS has become one of the vital supplier for Department of Atomic Energy (DAE) and its constituent establishments like BARC, HWB, IGCAR, BHAVINI, NPCIL and others. Valves developed and supplied for these establishments under Atmanirbhar Bharat, has substantially reduced the forex savings to GOI. Our efforts also helped nation in becoming self-reliant and cut down the dependency of imports for these major equipment's. Our team with the guidance of nuclear scientists designed, developed and manufactured special critical valves like Bellow Seal Bellow operated Valves, Frozen Seal Gate Valve, High Pressure Bellow Seal Three Valve Manifold, Isolation Valves and others used for Atomic Power Plants helped in becoming self-reliant.

Benefits

BOS as a part of development of Nuclear Valves has been significantly recognized in the nuclear industry as one of the reliable valve manufacturers in India. Earlier these valves were imported by Department of Atomic Energy. Now indigenous development of these valves has been a significant milestone in valve industry. All these were manufactured first time in India in line with Atmanirbhar Bharat. Also the development of this in house technology helps in long term advantage of importing spares, procurement of new valves and availability of materials in case of any abnormal situations like wars, sanctions etc.





The Future

India aims to significantly increase its nuclear capacity, targeting around 22,000 megawatts by 2030, which will help diversify its energy mix and enhance energy security. Overall, nuclear energy is seen as a vital component in

India's transition to a more sustainable energy future. BOS as a reliable partner in India's nuclear industry helps nation in becoming self-reliant and cut down the dependency of imports for these major equipment's and substantially reduce the forex savings to GOI.



Bharat Biotech International Limited (BBIL)



About the Company

Bharat Biotech is a pioneering biotechnology company known for its advanced R&D and massive GMP-compliant manufacturing capabilities. We deliver affordable, safe, high-quality vaccines and biotherapeutics that help people combat the most dreaded illnesses and live to their fullest potential.

We have delivered over 9 billion vaccine doses to more than 125 countries. We seek to lead innovation in biotechnology and vaccine-preventable diseases, focusing on emerging markets. We own 220 patents and have over 100 publications in several reputed journals. Our manufacturing facilities are approved by the USFDA, KFDA, and WHO.

Instead of competing with our competitors, we see ourselves combating region-specific diseases. Our key priority is solving the health challenges of the developing world through innovative vaccines and bio-therapeutics.

The Innovation

Typbar TCV®:

Typhoid is a neglected disease with inadequate diagnostics, ineffective vaccines, antimicrobial resistance, and the lack of licensed vaccines for infants, representing a significant unmet medical need. Bharat Biotech addressed these gaps through Typbar TCV®, which can be administered to children from 0.5 years. Moreover, Typbar TCV® provides long-term protection (up to nine years). It is the world's first clinically proven typhoid conjugate vaccine.

Our Innovation:

- Typbar TCV® is a vaccine containing polysaccharide of *Salmonella typhi* Ty2

conjugated to Tetanus Toxoid. Vi Capsular polysaccharide of *Salmonella typhi* alone, elicits B cell responses. However, the conjugation of bacterial polysaccharides to a protein carrier provides foreign peptide antigens presented to the immune system, eliciting antigen-specific CD4+ Th cells, referred to as T-dependent antibody responses. A hallmark of T-dependent responses, which are also elicited by toxoids, is to induce both higher-affinity antibodies and long-term immune memory.

- Typbar TCV® the first Indian vaccine to be evaluated in a human challenge study, a high-risk model to evaluate the safety and efficacy of the vaccines.
- It was proven to protect against multi-drug resistant strains of typhoid.

COVID-19 Vaccines - COVAXIN® and INCOVACC®:

Bharat Biotech rose to the challenge when the coronavirus surfaced in late 2019. It embraced a time-honoured 'Whole-Virion Inactivated Vero Cell' derived platform technology to develop a safe and efficacious COVAXIN®.

Our Innovation: What sets COVAXIN® apart from other vaccines is using a novel adjuvant named Algel IMDG to enhance cell-mediated immune responses. Algel-IMDG constitutes a TLR7/8 agonist (m-Amine Gallamide), a novel imidazoquinoline class molecule chemisorbed onto aluminium hydroxide, designed to enhance cell-mediated immune responses.

Similarly, INCOVACC® is the world's first intranasal COVID-19 vaccine. Bharat Biotech conducted the entire product development related to preclinical safety evaluation, large-scale manufacturing scale-up, formulation



and delivery device development, and human clinical trials.

Our Innovation: The recombinant adenoviral vector construct was designed and developed for iNCOVACC® by Bharat Biotech in partnership with Washington University, St. Louis. It stimulates a broad immune response essential for blocking both infection and transmission of COVID-19. The ease of administration, which is non-invasive and needle-free, reduces the risks of injuries and infections.

The Approach

The hands-on approach and empowering style of engagement of upper management foster an innovation culture where the health of the innovation funnel is maintained by rigorous brainstorming of every feasible idea that can be impactful.

BBIL's Innovation team focuses on identifying and deploying solutions for infectious diseases when solutions are non-existent. Until recently, critical products and services were primarily developed by and for high-income countries, which would later be deployed in low-income and middle-income countries.

A few decades ago, industries in LICs and MICs had minimal expertise, resources, or inclination to execute R&D and product development activities; their business models only targeted quick-to-market generics or technology transfer from innovators. Bharat Biotech has repeatedly delivered novel and innovative vaccines designed for LICs and MICs, addressing their public health requirements while focusing on quality and cost-effectiveness. This visionary and experimental leadership among the management makes it the best fit for innovation and leading the business.

Benefits

- Typbar TCV® - Is effective even against Multi-drug resistant S. Typhi. A human challenge study at the University of Oxford demonstrated that the vaccine is safe, 100% immunogenic, and prevents up to 87.1% of infections when using real-life definitions of typhoid fever. Typbar TCV® has been recommended by the experts at the WHO-Strategic Advisory Group for routine immunisations and is WHO-prequalified.
- COVAXIN® and iNCOVACC®: They have proven to neutralise the variants—B.1.1.7 (Alpha), first isolated in the UK, P.1-B.1.1.28 (Gamma) & P.2 - B.1.1.28 (Zeta), first isolated in Brazil, B.1.617 (Kappa), first isolated in India, and B.1.351 & B.1.617.2 (Beta & Delta), first isolated in RSA and India.
- Saved millions of lives through India's first indigenous COVID-19 vaccine – intra-muscular and the innovative nasal route of vaccine administration.

The Future

BBIL has a robust pipeline of innovative vaccines against malaria, cholera, tuberculosis, paratyphi A, non-typhoidal salmonella, chikungunya, and Zika.

We recently launched our novel Oral Cholera Vaccine (OCV), Hillchol®. It is an innovative single-strain, easy-to-manufacture, and scale-up OCV developed by Bharat Biotech International Limited in a global partnership with MSD-Wellcome Trust and Hilleman Laboratories. This marks a revolutionary step in global cholera prevention, resonating with BBIL's vision.

About the Company

Bharat Forge Ltd. stands as a global leader in metal forming and a preferred technology-driven development partner across various sectors, including Automotive, Railways, Aerospace, Marine, Oil & Gas, Power, Construction, and Mining. With ten manufacturing locations spanning India, Germany, Sweden, France, and North America, it holds the title of the world's largest forging company. Backed by the Kalyani Group, a \$3 billion conglomerate, Bharat Forge leverages over 50 years of experience and extensive metallurgical expertise. A strong commitment to technology development, process enhancement, and workforce training solidifies its reputation as a premier forging manufacturer in India.

The Innovation

At Bharat Forge, we are redefining the future through innovative technology and value addition, aiming to be the preferred engineering-driven development partner globally. Innovation is at the heart of our operations, powered by a dedicated in-house R&D team focused on projects that reduce carbon footprints and enhance energy efficiency through lightweight products.

Our close collaboration with customers fosters new product development, enabling us to lead the innovation cycle in various sectors. By leveraging advanced technologies, we now provide high-value products previously imported, establishing ourselves as a vital indigenous supplier.

Our commitment to innovation is further underscored by a significant investment

of 100 Crores in our R&D facility, which supports a culture where ideas flourish. We allocate 1-2% of total revenue to drive technological advancements. This strategic focus has positioned us as a leader in additive manufacturing across industries like aerospace, oil, gas, and automotive, setting benchmarks and shaping the future.

The Approach

Bharat Forge's innovation approach combines significant R&D investments with cross-functional collaboration. With a 100 Crores investment in its R&D facility, the company nurtures an environment for novel ideas to flourish, supported by continuous guidance. By dedicating 1-2% of total revenue to technological advancements, Bharat Forge pioneers solutions that redefine industry standards. This relentless pursuit of innovation cements its reputation as a visionary leader, reshaping industries and establishing new paradigms for the future.

Benefits

Bharat Forge's innovation initiatives bring significant advantages across various sectors, enhancing operational efficiencies and product quality. By pioneering solutions, the company reduces carbon footprints and promotes sustainability while introducing cost-effective, high-value products. These innovations strengthen Bharat Forge's ability to meet evolving market demands, creating a strong competitive edge. Its relentless pursuit of innovation not only reshapes industries but also solidifies its position as a leader, driving progress and setting new benchmarks in the global landscape.





The Future

Bharat Forge envisions an innovative future, leveraging technology to pioneer transformative solutions. With a steadfast commitment to R&D and cross-functional

collaboration, it aims to continue shaping industries, introducing novel advancements, and setting new standards, positioning itself as a catalyst for progress in a dynamic global landscape.



Birla White (Unit of Ultratech Cement Ltd)



About the Company

Birla White is a unit of UltraTech Cement Ltd, flagship company of the US \$48.3 BN Aditya Birla Group. A global conglomerate, the Aditya Birla Group is in League of Fortune 500. Anchored by extraordinary force of over 140,000 employees belonging to 100 nationalities, the Group is built on a strong foundation of stakeholder value creation.

BirlaWhite is construction materials company with leadership in white cement & value-added products. In 1988, Birla White commenced its production of white cement in India since inception, Birla White is the 7th largest white cement producer in the world & cemented its place as a market leader.

The Innovation

The Birla White brand fulfil the needs of consumer, and thus becoming a vital part of construction evolution in India. Birla White's value-added products are also CII certified eco-friendly- green product with no risk health hazard.

In the past two years, we have innovated +15 new product variants in the market.

1. PrimaCoat and ActivCoat Primer (Exterior & Interior) in 04 variants:
India's 1st of its kind white cement based liquid Primer in 04 variants (Interior & Exterior) that provides Superior whiteness, opacity & a safe hygienic environment to consumers.
2. White-Cement based TRUTONEx powder Distemper (06 shades): India's 1st Economical white cement-based powder form TRUTONEx Distemper (Interior) that provides Excellent Whiteness, opacity

& Excellent Trutone colors with No prewetting & curing free features.

3. Dry mix SeepGuard-waterproofing 1K in 03 variants (Vertical, Horizontal & Interior): BW Seep Guard product is White Cementitious One Component solution with elastomeric properties, exceptional water impermeability , durability & Heat Reflective properties. It serves as a Waterproof Coating for Brick Wall & RCC surfaces.

The Approach

Birla White's 6 stage innovation framework:

1. Ideas, Concepts & Initial Scoping: Assimilating ideas from consumers, employees and ecosystem partners, filter concepts.
2. Business Case: Understanding volume and value, scalability, and target group.
3. R&D-Product Design: Indigenous formulation at reasonable material cost, reverse engineering of competition offtakes and stringent lab evaluation to arrive at desired output.
4. Consumer Validation:
 - Application study-Consumers & Influencers
 - Willingness to recommend (channel) and purchase (consumer)
5. Pilot Launch
 - Testing product in markets
 - Observe product acceptance.
 - Identifying scope for improvement





6. Improve & Scale Up

- Improved product introduced Pan-India

Benefits

- **Liquid Primer**- World's 1st cement based liquid Primer.
 - Environment friendly (Zero VOC)
 - Creating a good work environment for painters due to ammonia free.
 - Superior whiteness, opacity & excellent adhesion.
- **Powder Distemper**- India's 1st Powder Distemper.
 - Environment friendly (Zero VOC)
 - Curing & prewetting is not required.

- Excellent Whiteness, opacity & Trutone colors

- **Waterproofing Solutions** – India's best powder 1k waterproofing products
 - First of its kind long lasting products
 - Offers elastomeric & reflective properties.
 - Excellent Waterproof Coating for Interior/Vertical/Horizontal surfaces

The Future

Birla White will continue to listen to the pulse of the consumer through continuous listening (to understand the changing needs of the consumers) and deep listening (to understand the scope of improvement in products and services) and provide the best of products and services in the market.



About the Company

Bosch is a technology and services leader in India and specializes in Mobility Solutions, Industrial Technology, Consumer Goods, and Energy & Building Technology. Boasting the largest non-German development center, Bosch offers comprehensive engineering solutions, operating through 15 companies and 17 manufacturing sites with 39,769 associates. In FY23-24, the company achieved a 3.74 billion euros turnover.

Bosch Ltd., the Indian subsidiary, excels in Automotive Technology, Industrial Technology, Consumer Goods, and Energy & Building Technology, renowned for smart manufacturing expertise. In 2023, Bosch filed 58 patents, encompassing areas like Fuel Injection, Transmission Systems, and Electric Vehicles.

Certified as a 'Great Place to Work' for the fourth consecutive time, Bosch prioritizes sustainability, and has achieved carbon neutrality in all Indian sites since 2020.

Awards received include the Digital Transformation Award by CII, Sustainability Excellence Award 2023 by TATA Motors, Golden Peacock Award and National Level Platinum Award by CII for exemplary safety practices.

The Innovation

1. Business innovation

a. Mobility Platform and Services (MPS)

MPS, a first-of-its-kind business within Bosch built in India for the world, employs a platform-based approach to foster

innovation and create a scalable mobility ecosystem. Through a unified marketplace, ecosystem centric design, horizontal integration using store-as-a-service concept/digital building blocks and service orchestration, it is able to build scalable, interoperable business models for logistics, parking and multiple other mobility use-cases. This collaborative environment allows Tier 1 suppliers, tech startups, established companies, and OEMs to co-create solutions that would be challenging to achieve individually.

b. Solutions for the Hydrogen Ecosystem

With a vision of carbon neutrality and clean energy goals by the Bosch Board of management and Government of India, Bosch India Leadership carved out a project house with a goal of bringing hydrogen mobility to India. Some of the innovations in this regard are:

- i. H2 Engine including products like Fuel Injection System, Exhaust gas treatment system, Embedded controllers, sensors, actuators and engineering services etc.
- ii. State-of-the-art Fuel Cell Power Module demonstration

2. Market Innovation: RideBuddy

To improve safety and comfort in the Indian ride-hailing ecosystem, RideBuddy offers features such as SOS alerts, rash driving monitoring, smart crash detection, driver assessment and analytics, fleet analytics and a host of other driver and emergency management features.





3. Product Innovation: Sensorless Quick Shift for two-wheelers (2W)

The sensorless quick shifter makes the quick shift functionality available through existing sensors on the 2W coupled with data from throttle, engine & vehicle speed to eliminate clutch/throttle usage while shifting gears in a manual 2W.

4. Service Innovation: Crystal Prediction Model

An innovative crystal prediction model can predict formation of Diesel Exhaust Fluid crystals and trigger regeneration, thereby vaporizing these crystals and maintaining the health of the Exhaust Gas Treatment (EGT) System in commercial vehicles.

The Approach

The Bosch Innovation Framework (BIF) is founded on the understanding of an innovative product's end-to-end lifecycle and combines state-of-the-art knowledge from UX, Business Modelling, Lean Start-up, Engineering and innovation strategy. The BIF emphasizes the early stages of innovation where based on desirability, feasibility and viability, ideas are refined into validated concepts fast and efficiently in order to focus efforts on businesses demonstrating most promise to scale profitably. It also ensures common innovation gates across Bosch globally which are agile and iterative in nature, thus facilitating investment decisions that are more transparent, consistent, and evidence-based.



Benefits

1. MPS

Scalability, interoperability, economic efficiency, equal participation opportunity for mobility players of varying sizes, modular approach and ecosystem orchestration, growth led by network effects, Digital Bharat and world alignment, innovative revenue models.

2. Hydrogen Technologies

Safe, efficient and clean energy ecosystem.

3. RideBuddy

Cost effective mobility experiences with state-of-the-art technology to ensure comfort, safety and reliability at the highest levels.

4. Sensorless Quick Shift

Premium feature for manual transmission two-wheelers with system simplification and an overall cost reduction resulting in TCO benefit.

5. Crystal Prediction Model

Reduced maintenance costs and extended lifespan of EGT components.

The Future

Bosch Limited is deeply rooted in its commitment to R&D, creating new products/solutions and adapting to rapidly changing technology in mobility and beyond. Continuous innovation in alternative energy, creating a holistic mobility ecosystem, delivering new cross-domain solutions, nurturing strong relationships across stakeholders will help empower customers to shape their markets.



BrahMos Aerospace



About the Company

BrahMos Aerospace, a Joint Venture between India's DRDO and Russia's NPOM, was established in 1998 to design, develop, manufacture, and market the BRAHMOS Supersonic Cruise Missile. Starting with a capital infusion of USD 250 million, JV now boasts an order book of around USD 7 billion. The JV, leveraging robust networking between Indian and Russian industries, has successfully penetrated international markets, exemplified by the landmark contract and delivery of BRAHMOS to the Philippines. This achievement reinforces India's 'Make-for-the-world' policy and positions BrahMos Aerospace as a benchmark for future cooperation and defense production in India.

The Innovation

BrahMos Aerospace is renowned for its innovative contributions to defense technology, particularly with the Universal Supersonic Cruise Missile System - BRAHMOS, capable of being launched from land, sea, air, and underwater platforms. The company has developed various platforms to meet the Indian Armed Forces' requirements, including steep dive capabilities for the Army, vertical and quad launchers for the Navy, and twin launcher configurations for export variants. The triad of Army, Navy, and Air Force has successfully inducted the BRAHMOS Missile System. Currently, BrahMos is developing a Next Generation (NG) variant, featuring a lighter weight and shorter length for broader integration. As a system integrator, BrahMos provides turnkey solutions for integrating the weapon system with the SU30 MKI's Combat Management System, as well as land and ship-based launchers. Additionally, BrahMos has extended the missile's life by five

years, continuously enhancing technology and user-friendly systems while reducing costs for the Indian exchequer.

The Approach

- Identify niche areas for product and process development, creating technology clusters with DRDO labs, public-private industries, and academia.
- Infuse innovation in products using user feedback, exemplified by the BRAHMOS Block-III for mountain warfare and the Air version with steep dive capability.
- Appoint top talent from leading institutions and analyze product data for insights into innovation investment and risks.
- Experiment with new technologies to develop the futuristic BRAHMOS Next Generation (NG) while maintaining the original's lethality.

Benefits

BRAHMOS employs advanced stealth technology to evade enemy radars, enhancing detection and interception difficulty. Life extension technologies have increased the missile's operational lifespan, improving cost-effectiveness and sustainability. Its advanced guidance system enables precise targeting and high maneuvers, while optimized fuel management enhances propulsion efficiency for longer ranges. The company acts as a total solutions provider and system integrator for the Armed Forces. BRAHMOS also creates significant employment opportunities in engineering and manufacturing, recently reserving spots for AGNIVEERS, and its first export order has strengthened national pride and the economy.





The Future

BrahMos Aerospace aims to lead Indian defense manufacturing, promoting self-reliance and sustainability. The company envisions developing futuristic systems like the BRAHMOS-II Hypersonic Missile and

BRAHMOS-NG, along with potential exports to friendly nations. It seeks to strengthen long-lasting relationships with industry partners, R&D organizations, and academia to support the Government of India's 'Atmanirbhar Bharat' vision.



Collins Aerospace



About the Company

For more than 25 years, RTX has been bolstering India's economy and growth in aerospace through technology, jobs and community support. Our presence in India is represented by Collins Aerospace, Raytheon and Pratt & Whitney.

Home to the 3rd largest aviation industry in the world, India's air passenger growth is forecasted to reach 478 million by 2036. RTX's Collins Aerospace is the largest aerospace and defense multinational corporation in country, paving the way for advanced technology, products and services to address India's future needs.

Across RTX, our presence in India spans New Delhi, Hyderabad and Bengaluru, with engineering, manufacturing, digital transformation and innovation, advanced aviation training, supply chain and other operations.

ABOUT COLLINS AEROSPACE Collins Aerospace, an RTX business, is a leader in technologically advanced and intelligent solutions for the global aerospace and defense industry. Collins Aerospace has the extensive capabilities, comprehensive portfolio and broad expertise to solve customers' toughest challenges and to meet the demands of a rapidly evolving global market.

The Innovation

We drive product development and innovation to offer differentiating, industry-leading technologies that meet our customers' evolving needs. With a passion for excellence and safety, we build on a rich engineering heritage to offer customers unique, innovative solutions that achieve what others only dream of.

Collins Aerospace reaches across the markets it serves and its vast portfolio of expertise to dream, design and build without limits – so our customers can do the same.

Global Engineering & Technology Center (GETC) - Collins India Engineering is engaged in all the productlines/businesses delivered by the company – Avionics, Interiors, Advanced Structures, Power & Controls, Connected Aviation Systems, Mission Systems. GETC is the host for 4500 highly talented engineers that deliver innovations to our customers. Collins Manufacturing hosts over 2000 employees engaged in operations of all the productlines mentioned above.

From aircraft nose to tail and from the battlespace to deep space, we collaborate with customers, industry and pioneering technology to transform limitless ideas into breakthrough solutions – for today and the next generation, on aircraft and beyond. Because it's not about the pieces and parts, it's about how they all best fit together. And that's what we know better than anyone.

As the industry faces new challenges and embraces new possibilities, Collins is collaborating and innovating with our customers to bring big ideas to life. And together, there's no limit to where we go from here.

We enable hybrid-electric propulsion for more fuel-efficient flights. We create lighter-weight, higher-performing structures to decrease maintenance. We reduce pilot workload with more autonomous operations. We combine modern design with innovative technology for a best-in-class cabin experience. We harness data to connect the aviation ecosystem and modern battlespace.





We drive forward more sustainable practices and products. We accelerate technology and embrace digital transformation. And in doing so, push the limits of what's possible to drive the future of aerospace with one of the deepest capability sets and broadest perspectives in the industry.

Collins India, over last 10 years with a focus on innovation, accelerating high value engagements, has delivered over 2300 innovative ideas, filed 700 patents and 130 Trade secrets creating a healthy competition across the industry and driving new technologies for next generation aircrafts and aviation systems.

The Approach

The work we do to help shape the future of aviation and defense may be complex, but the values that unite us as a company are not. Simply put, our values reflect who we are and what we commit to – as individuals and as part of a larger, Collins Aerospace and Raytheon Technologies culture.

- Safety
- Trust
- Respect
- Accountability
- Collaboration
- Innovation

We trust each other to do the right thing and to keep our word. We welcome and respect each other's backgrounds and perspectives. We hold each other accountable. We work together to tackle big challenges. And we bring our creativity and ingenuity forward in a spirit of innovation.

At Collins Aerospace, we're working side-by-side with our customers and partners to dream, design and deliver solutions that redefine the future of our industry.

We're reaching across markets, disciplines and boundaries to develop new and more advanced technologies. And, together, we're making the most powerful concepts in aerospace a reality.



Benefits

We support veterans

We're working on the cutting edge of connected battlespace, autonomous systems, electrification of aircraft and cybersecurity, all with service members' safety in mind. Our roles help veterans find a great fit for their skills, so we can build a safer future together.

We value diversity, equity & inclusion

We believe in a culture where our employees, customers and communities see themselves in what we do and how we do it. We want to ensure our people feel represented and know that they have equal opportunity to be their best and do their best. Our commitment to diversity, equity and inclusion helps drive performance, innovation, engagement and business results.

We help launch newer employees

We offer internships and co-op programs across all our businesses and functions that provide real-world experience in the aerospace and defense industry.

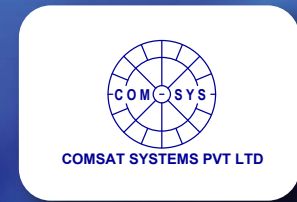
We engineer the future

When you join us, you'll have the opportunity to work on innovative, mission-critical projects that push the boundaries of what technology can do. An engineering career with us is a career on the cutting edge. If you're looking to solve complex problems - many of which have never been solved before - Collins is the place for you.

The Future

We redefine Aerospace. We are working on promoting, building and adopting new age technologies to provide intelligent, autonomous, more connected and more safer solutions with sustainable features. We are working closely with our eco-system partners – industry, academia, R&D's and larger supply chain both strategically and on demand. We are seeing "Make in India" and "Viksit Bharat" as the enablers for us to create larger impact to the "Vishala Bharat".

Comsat Systems Private Limited



About the Company

COMSAT SYSTEMS PVT LTD is in the line of manufacture of Satellite Communication Antenna systems, installed as Ground Stations for GEO Stationary, LEO/MEO Satellites. The company is a pioneer in this line and holds 50% of market share in the country amongst Indian Manufacturers.

Clientele includes Indian Space Research Organization, Defense, Broadcasting Sector, and Government institutions like Indian Meteorological Department, Public sector undertakings like Bharath Electronics, Indian Telephone Industries, Telecom Giants like HUGES, AIRTEL, Tata Advance Systems, Astra Microwave, Avantel, etc.

The Innovation

In 1991, the company developed VSAT Antennas (prime focus and GFRP types) to replace imported VSAT Antennas ranging from 1.2M to 3.8M. This manufacturing initiative saved several millions of US dollars. In 1992, the company expanded to produce 4.6M to 11.0M antennas, supplying to ISRO, Defense, and Broadcasting sectors, effectively substituting imports and saving significant foreign exchange. The company's Comsat Antennas now span from Kashmir to Kanyakumari and Assam to Gujarat.

Since 2016, the company has been producing FAST TRACKING ANTENNAS for ISRO,

initially for Ku Band/C Band, and now for Ka band as well. The reflector panels are made using stretch forming, a niche technique in antenna manufacturing. The company also manufactures 4-Port Combiners for C Band & Ku Band antennas and has acquired know-how for Mono-pulse Feed from ISRO. It now produces antennas up to 13.5M, including exports.

The Approach

We conduct thorough market surveys for antenna systems, focusing on major users like ISRO and Defense. We manufacture prototypes to meet their electrical and mechanical specifications, gaining their confidence for diverse systems, including RADARS, LOG PERIODIC ANTENNAS, and DIRECTION FINDING ANTENNAS. For over 30 years, our antennas have performed reliably. Our prompt maintenance and repair services have earned us goodwill among clients, who now regard us as "THE ANTENNA PEOPLE."

The Future

The company is future ready as we have developed Antennas for LEO/MEO Satellites. We have the latest software's for the design of Antennas RF Systems like CST Studio, and ABACUS for mechanical analysis. Test equipment for Complete RF specifications etc. Also moving with ISRO mainly catering to their latest Antenna Systems, Competing with the World's Best companies for Antenna Systems.



Conceptia Software Technologies Pvt. Ltd.



About the Company

Conceptia Software Technologies Pvt Ltd is an engineering services and solutions provider serving the defence, maritime and mechanical industries across the globe. Conceptia's proven track record of quality and innovative solutions delivered over 20 years includes basic design, detailed design, production engineering, engineering analysis, project lifecycle management, allied product sales, digital publishing, training, staffing services and renewable energy solutions. Headquartered at Bangalore and with offices across the country, Conceptia's experienced skill set ranging from diploma to doctorate degree holders is armed with a vision to "become an acclaimed global corporate doing business in innovative technological solutions and services".

The Innovation

Conceptia's innovation initiatives are classified into two groups – client-facing and internal. Client-facing innovations are driven by market and customer needs which benefit the client and the society. Some client-facing innovations done by Conceptia include - redesign of a diesel-powered tug vessel into a hydrogen powered tug, redesign of motorcycle transportation jigs to meet the rigors of road and sea transportation, development of tide efficient gangway, development of hyperbaric chamber, development of a solar powered incinerator. highly complex projects like digital tank calibration using 3D scanning and development of a methodology for global analysis of ship's hull using FEA. Conceptia has also ventured into hitherto uncharted domains like propulsion system integration.

Internal innovation initiatives focus on internal process improvements which help Conceptia

serve our clients better. Examples include restructuring of the highest revenue earning division – product sales and its processes - to shift from license-based to cloud-based 3D experience software sales.

The Approach

The Sales Strategy meeting @Conceptia held annually consolidates ideas for new or improvement in solutions/services collected from customer inputs and feedback, participation in industry forums, analysis of company performance, collaborations with academia and internal research. Ideas prioritised are assigned as initiatives to key program managers. The senior management periodically tracks the program status and ensures it is validated. The client's program team also participates in the review when the innovation is co-created with the client.

Benefits

Conceptia has managed to maintain a healthy revenue growth in spite of adverse market conditions. Initiatives like hydrogen tugs reduce carbon emissions to zero. Solar powered medical incinerators eliminate reject waste while conserving the use of fossil fuel. Global analysis methodology for ship's hull can save efforts by 30%. Use of 3D scanning for digital calibration reduces overall cost by 25%. Safety, security and improvement in skill levels are some of the intangible benefits.

The Future

Conceptia is committed to the innovation journey. With the advent of AI and machine learning, Conceptia foresees endless opportunities in creating value for both its clients and for its own productivity improvement. Conceptia will also continue to contribute further to the Green Initiatives through innovative design solutions.



D'Decor Home Fabrics Pvt Ltd



About the Company

D'Decor Home Fabrics is the largest producers of curtain and upholstery fabrics in the world, catering to top furnishing brands globally and is a leading brand in India. With exports to 65+ countries, it offers a wide range of furnishing and performance fabrics. Backed by a 250-member product development team and three state-of-the-art vertically integrated manufacturing facilities in Tarapur, India, D'Decor produces 44 million meters of fabric annually. The company operates India's first fully robotic warehouse and consistently delivers the latest in home furnishings. In 2023-24, D'Decor won four Golds at the SRTEPC Awards for Outstanding Export Performance.

The Innovation

D'Decor centres all its activities in culture, operations and end consumers around its philosophy #Livebeautiful.

Furnishing fabrics in India hitherto were limited to beautiful fabrics. D'Decor launched a new brand 'FabriCare' to offer high performance along with beauty – a first in India. FabriCare's Easy Clean fabrics are globally the only fabrics that ensure cleaning against 14 tough stains. Performance finish is achieved using CO chemistry which means it's PFAS free, Fluorocarbon free- the only brand globally to offer performance fabrics which are environment friendly. The chemistry involves a special technology to render the fabrics Flame Retardant – a category disruption to safeguard homes from spread of fire. Launched 4 pass blackout, an industry first to offer curtains that block 100% light eliminating the need for extra lining fabric, enabling 50% reduction in fabric

usage thereby promoting sustainability and value efficiency.

The Approach

Innovation for us is an ongoing process for incremental change and bigger impact. Driven top-down, every employee is inspired to think out-of-the-box post regular market visits and consumer studies and find need gaps or forecast needs. In India, customized sofa and curtain fabrics have a 3-6 year change cycle, with wear and tear causing discomfort. This insight led to the launch of Easy Clean fabrics, backed by advanced technology, years of research, and certified lab tests.

Benefits

'Beauty' in furnishing is table stakes. Innovating them to add 'high performance' is changing the status quo. Consumers with kids, pets, or guests, now do not need to worry about spilling stains, fabrics getting faded in outdoor, or spread of fire through fabrics as FabriCare covers it all. Due to higher shelf life, these fabrics do not need frequent change, thereby increasing value to the consumer and reducing environmental impact.

The Future

We envision expanding the high-performance fabric offerings by pushing the boundaries of sustainability and innovation. With a focus on smart fabrics, advanced automation, and enhanced customization, D'Decor aims to revolutionize home furnishings globally, offering consumers - beauty, convenience, and performance through cutting-edge technologies and eco-friendly solutions, paving way for many more industry firsts in the coming future.



Daimler Truck Innovation Center India

DAIMLER TRUCK
Innovation Center India

About the Company

Daimler Truck Innovation Center India is a hub dedicated to advancing the future of mobility in the commercial vehicle industry. The center focuses on key areas such as vehicle technology engineering, software development, advanced data analytics and IT solutions, and critical zero-emission technologies. A notable contributor to Daimler's global product range of trucks and buses, DTICI also focuses on advancements in connectivity, safety features, sales and after-sales solutions, and predictive maintenance.

The Innovation

Innovation is at the core of what we do. Our projects include developing a comprehensive connectivity and data analytics platform for fleet management while enhancing operational efficiency and safety. We are pioneering advancements in electric and hydrogen fuel cell technologies to deliver sustainable and zero-emission vehicles. Our research encompasses Vehicle-to-Everything (V2X) communication, empowering trucks to interact seamlessly with their environments. Further, we develop solutions in Advanced Driver Assistance Systems (ADAS) ensuring superior safety for drivers and pedestrians alike. The data our products generate allows for advanced AI and analytics solutions that equip customers with elaborate fleet insights to maximize performance while minimizing downtime. DTICI is at the forefront of transformative innovations that redefine the trucking landscape.

The Approach

DTICI follows a holistic approach to innovation. This integrates both internal and external innovation efforts.

Internally, our teams are equipped with the right tools and resources, supplemented with comprehensive training programs, and access to innovation communities that nurture idea generation, development, and cross-functional collaboration. Our advanced tools and platforms for innovation management equip teams with mentor networks and empower them to experiment rapidly with ideas across domains.

Externally, we build strong collaborations with universities, OEMs, corporates, innovation forums, and start-ups to expand our innovation pipeline through co-creation and shared research.

By leveraging both internal and external ecosystems, we stay ahead of technology trends and accelerate the development of groundbreaking solutions to deliver impact across Daimler Truck's global brands.

Benefits

While our innovations present numerous advantages to the commercial vehicle industry across engineering, software, and connectivity, we are particularly proud of our strides in sustainability. The e-Actros, Daimler Truck's all-electric vehicle, is a prime example of how we are driving the industry towards zero-emission transportation. The eActros significantly lowers operational costs and improves fleet efficiency with innovative technology like real-time monitoring and predictive fleet maintenance. These innovations improve the safety, sustainability, and performance aspects of the product range, also setting new benchmarks in the green mobility sphere.





The Future

DTICI aspires to continue leading innovation in smart, connected, and zero-emission trucks and buses. As we fortify our position as the

frontrunners of sustainable transportation, we believe in harnessing the power of data and AI, while pushing the boundaries of electrification, automation, and connectivity.



Dakshin Bharat Gateway Terminal



About the Company

DBGT (Dakshin Bharat Gateway Terminal) is a leading Container Handling Terminal under Public Private Partnership concessionaire at V O Chidambaranar Port, Tuticorin, has been in operation since 2014, handling over 4 million TEUs in July 2024. Safety, Responsibility and Compliance are paramount, with a strong commitment to sustainability across economic, social and environmental fronts. ISO 14001:2015 certified, DBGT actively safeguards ecological balance by adhering to rigorous environmental management systems.

The Innovation

As we embark on forming our Innovation Team, we are engaging with various innovative inclusions from our Engineering Department viz,

1. E - RTG Truck Sensing System
2. E - RTG Container Stack Collision Prevention System

The Approach

We believe that innovation is a continuous process that requires a strategic approach.

As a steady step ahead, we are in the process to introduce an Innovation Dept. Budget and appoint a team lead from amongst our staff, recruit volunteers in the team and form a core team of self-motivated employees across the Dept's

- To create an awareness of Innovation amongst the staff
- To initiate Innovation activities
- To engage, recognize and reward staff for their active participation

Benefits

To enrich our staff knowledge to identify the issues and offer the best solution, cultivate Team collaboration and implement innovation ideas across various platforms to Improve Productivity in men and material (equipment), Reduce cost, Cut down the risk in field works and Elevate Safety Standards, Boost Brand Image. To streamline processes and workflows to minimize delays and maximize efficiency so as to benefit the staff, company, stakeholders and customers.

The Future

Today's innovation is tomorrow's Ease of Doing Business. We look forward to adapting Substantial Innovative Solutions using:

The latest safety tools to enhance safety of our men at work

New ideas in digitalization to focus on our customers core requirements

Create a digital error free avenue by conversion of tedious manual procedures





About the Company

DCM Shriram Ltd. is a diversified business conglomerate with a turnover of approximately Rs 11,400 crores. The company operates across multiple sectors, including Agri-Rural Business, Chlor-Vinyl, and Value-Added Businesses. DCM Shriram is also a leader in Fenesta Building Systems, offering UPVC windows and doors.



Sustained Entrepreneurship of Over 130 Years



Our Founder - Sir Shri Ram (1884-1963)

Sir Shri Ram was an eminent and public-spirited philanthropist, an outstanding industrialist and one of the trend-setting visionary leaders of the Indian business community. He began as a humble worker and went on to set up one of India's largest business houses - the DCM Group.



Strong Leadership



Mr. Ajay S. Shriram
Chairman & Senior Managing Director



Mr. Vikram S. Shriram
Vice-Chairman & Managing Director



Mr. Ajit S. Shriram
Joint Managing Director



Mr. Aditya A. Shriram
Deputy Managing Director



Our Businesses








Agri-Rural
Value Added
Chlor Vinyl













The Innovation

At DCM Shriram Ltd., multiple innovations have been spearheaded to enhance sustainability and efficiency:

Waste Heat Recovery using Hot Water:

- An Organic Rankine Cycle system generates 3 million units of power annually using low-grade waste heat.
- A Vapour Absorption Chiller system harnesses waste heat to replace energy-intensive air compressors.

400 KW Power Generation from Hot Water in Urea Plant

- Utilization of Waste Heat of Water
- Energy Conservation
- Operational Efficiency
- Sustainability

DCM Shriram Ltd is First to Implement the Scheme in Fertiliser Industry

Compressor Suctions Chilling using Hot Water of Urea Plant

- First Time Suction Chilling of Reciprocating Compressors
- Designed by In-house team
- VAM Running on Waste Heat
- Using of CO₂ Gas latent heat

Waste Heat is used for Energy Saving, 1st time in Indian Fertiliser Industry

Usage of Green Fuel:

- Retrofitted boilers designed only for coal
- Integrated Biomass as an alternative to coal
- Significantly reduced fossil fuel dependence

Biomass Co-firing in Boilers

- Creating Facilities
- Modification in Boilers
- Operational Compatibility
- Carbon Footprint Reduction

Smile on Faces

Highest Biomass Co-firing in Fossil Fuel based Boilers in India

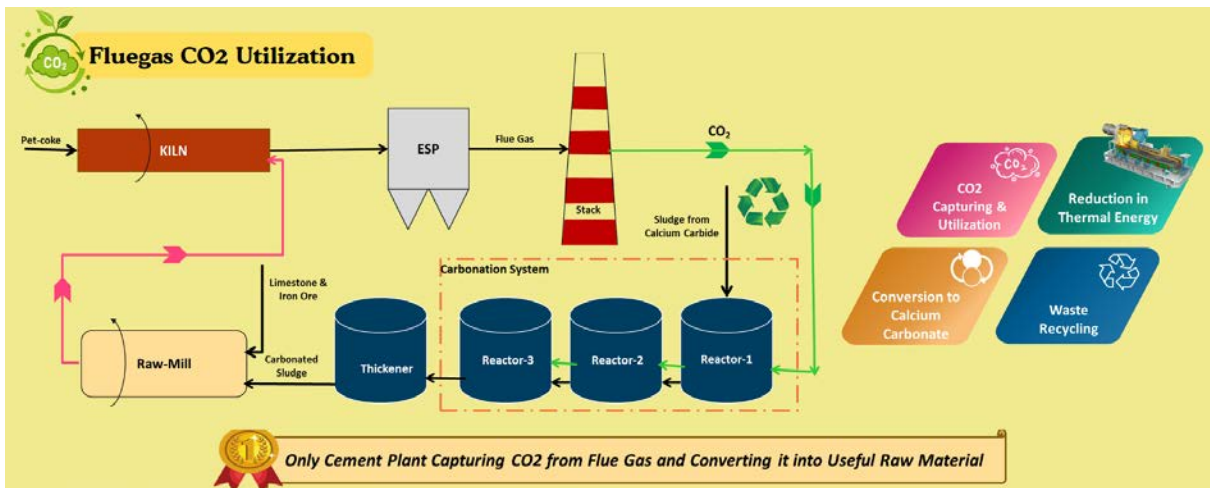


CO2 Capture and Waste Utilization:

- Captured CO₂ from kiln flue gases and converted into Calcium Carbonate using waste Calcium Hydroxide
- Replaced natural limestone in Cement manufacturing.

Waste to Wealth:

- Advanced R&D has transformed waste carbide sludge from disposal issue to valuable resource for industries like ETP, construction and cement.



Energy Innovation: Specially designed VFDs to run non-compatible VFD driven motors, reducing auxiliary power consumption.

The Approach

These innovations reflect DCM Shriram's commitment in tackling critical global challenges like climate change and resource scarcity. With no industry precedence, streamlined approach was adopted:

- Innovative Problem-Solving driven by year-round brainstorming and ideation sessions.

- Cross-functional Collaboration driving breakthrough insights across business units.
- Strategic R&D Investment enabling rigorous lab-scale trials and pilots.
- Continuous Optimization ensuring scalability through ongoing refinements.



This approach highlights DCM Shriram's leadership in pioneering sustainable and impactful solutions.

Benefits

DCM Shriram Ltd. has developed a cohesive strategy promoting sustainability, cost savings, and operational efficiency:

Enhanced Energy Efficiency:

- Implementation of ORC and VAM for waste heat recovery generates power
- VFDs lower auxiliary power consumption
- Reduced CO2 emissions.

Sustainable Resource Utilization:

- Replaced Coal with Biomass integration

- Cut fossil fuel reliance and operational costs
- Waste sludge carbonation captures CO2 emissions
- Reduced need for natural limestone

Waste-to-Wealth:

- Transforming carbide sludge into reusable resources
- Minimized waste & conserved natural lime

The Future

DCM Shriram Ltd. is committed to further growth with continued focus on innovation and sustainability through:



About the Company

DCM Shriram Ltd. stands as a beacon of industrial prowess in India, with over 135 years of legacy and a group turnover of USD ~1.4 billion having diversified products portfolio includes:

- Chlor-Vinyl Business: Caustic Soda, Chlorine, Hydrogen, Calcium Carbide, Aluminum Chloride, PVC Resins & Compounds, and Cement.
- Agri-Outputs: Sugar, Bioethanol, Urea, Plant Protection & Nutrition, and Hybrid Seeds.
- High-Performance uPVC Windows & Doors.

We are expanding into new chemistries such as Epichlorohydrin, Epoxy Resins, Hydrogen Peroxide, and Calcium Chloride.

DCM Shriram serves diverse industries, including Water Treatment, Pulp & Paper, Textiles, Alumina, Oil & Gas, Soaps & Detergents, Dyes & Intermediates, Inorganic Chemicals, Pharmaceuticals, and Agrochemicals. Our products are exported to 73 countries worldwide.

Our Innovation Centre in Vadodara, Gujarat, established in 2023 and recognized by the Department of Scientific & Industrial Research (DSIR), is the R&D hub driving our growth. It specializes in Polymer Science, Materials Science, Water Technology, Organic Chemistry, and Process Scale-Up. The centre develops applications for Polymer Composites, Catalysis, Paints, Construction, FMCG, and Advanced Cleaning Solutions, collaborating with industry and academia.

Key focus areas include Epoxy Polymers, Water Treatment Solutions, Advanced

Performance Materials, and Green Chemistry—fostering innovative and sustainable business growth.

More details about us can be found here <https://www.dcmshriram.com>

The Innovation

Sustainable Innovation: Utilizing Brine Sludge in Rubber & Polymer Products

Brine sludge, a significant waste by-product of the Chlor-Alkali industry, poses environmental challenges due to its chemical content and common disposal in landfills. This innovation demonstrates the feasibility of repurposing brine sludge into rubber and polymer products as a green filler.

The process involves drying the sludge (moisture content 35–40%) to below 2%, milling it into fine powder (mean diameter ~4 µm), and surface-modifying the powder for compatibility in product mixes. The modified powder partially replaces carbon black in rubber formulations and completely replaces CaCO₃ in PVC formulations.

Leaching studies confirm no harmful chemical release from the final products, ensuring safe and sustainable use. This approach transforms waste into valuable materials, contributing to environmental sustainability.

The Approach

DCM Green Filler: A Sustainable Innovation

Brine sludge can be dried naturally under sunlight or using a steam tray dryer to achieve a moisture content of 5%. The dried sludge is then milled using a mechanical pulverizer and surface-modified with a proprietary additive.





The resulting fine powder, branded as “DCM Green Filler”, serves as a sustainable raw material for the rubber and polymer industries, supporting eco-friendly manufacturing practices.

Benefits

The innovation brings significant benefits across key areas:

- **Sustainability:** Minimizes land contamination by repurposing brine sludge, addressing a critical environmental challenge in the chlor-alkali industry.
- **Resource Efficiency:** Reduces reliance on petroleum-based fillers like carbon black, which are costly and unsustainable for long-term production.
- **Enhanced Product Performance:** Enables the development of rubber and polymer products with improved performance, aligning with industry demands for high-quality, eco-friendly materials.

The Future

The Future of Green Fillers: A Sustainable Alternative to Carbon Black

Carbon black, widely used in the rubber industry, enhances properties like tensile strength, modulus, hardness, and tear strength. However, its production is energy-intensive, relies on non-renewable petroleum-based feedstocks, and significantly contributes to global CO₂ emissions, making it unsustainable.

A green filler that delivers comparable or superior properties at lower cost offers a compelling value proposition. By reducing environmental impact and dependence on petroleum-based materials, such innovations pave the way for a more sustainable and cost-effective eco-friendly future in rubber manufacturing.



About the Company

Deloitte is one of the world's largest and most diversified professional services organisations, providing assurance, tax, strategy, risk & transactions, and technology & transformations services through more than 457,000 professionals in more than 150 countries. We have a unique portfolio of integrated competencies and provide consulting/advisory services. We have offices in 14 cities across India, including Mumbai, Gurgaon, Chennai, Kolkata, Bangalore, Ahmedabad, Hyderabad etc. Our 31000+ experienced professionals deliver seamless, consistent services wherever our clients operate. Our professionals are proficient at delivering the right combination of local insight and international expertise to our clientele drawn from across industry segments.

The Innovation

Deloitte's breadth, depth, and scale, combined with a passion for business innovation, create powerful opportunities to enable clients to stay ahead of change, deliver impact that matters, and transform disruption into lasting value.

The Innovation Office leverages disruptive technologies, products, platforms, and methodologies, driving significant growth and transformation under the four pillars:

- Identify and invest: Sense the white spaces and invest in developing new sustainable solutions and products.
- Develop and certify—Digital Excellence Centre: A catalyst for innovation, the centre drives business transformation by developing cutting-edge, sustainable

solutions and products that truly define the standard of excellence.

- Monetise and scale: Build robust go-to-market strategies to maximise adopting the above products and solutions while focusing on better, faster, and more efficient service delivery.
- Collaborate and Expand—Startup Sensing: Discover and partner with emerging startups to create differentiated offerings for our clients.

The Approach

The Innovation team at Deloitte is energising the entire organisation by developing technology products and solutions that enhance our internal service delivery and provide cutting-edge solutions to the market.

Through the recently inaugurated Centre for Innovation and Technology in Bengaluru, Deloitte exemplifies this approach with over 60 use cases. The centre delivers a world-class "phygital" experience, showcasing state-of-the-art solutions and offering clients a fresh perspective on the business landscape.

Benefits

Deloitte is moving towards a "tech-enabled professional services organisation" by creating a seamless model to facilitate product development, operations, and commercialisation. The existing portfolio of over 100 products offers the following benefits to our clients:

- Achieve better outcomes, including shorter time to value
- Deliver more excellent differentiated value than standalone services





- Develop new business models
- Draw on skilled talent and best practices
- Lower cost of ownership
- Realise enhanced insights that drive innovation
- Draw on support from the whole journey
- Reduce complexity and risk

The Future

Our vision is to empower our workforce and clients with tech-driven, sustainable solutions that drive impactful transformation and cultivate a culture of intrapreneurship. Whether blockchain in banking, quantum computing for space, or NFTs in real estate, we aim to lead with innovation.

For instance, our solution, Enterprise Conscious Code (ECC), incorporates eco-friendly techniques that can reduce software-related emissions by up to 30%.



About the Company

As a global power management company, we help our customers solve their greatest power challenges through our industry leading electrical, aerospace and mobility products, and services. For more than 100 years, our teams have helped people work more safely, be more energy efficient and live more sustainably. We are guided by our commitment to do business right, to operate sustainably and to help our customers manage power today and well into the future.

Eaton's Electrical business in Pondicherry, India is providing power distribution, power quality, power monitoring and management solutions, and services to commercial, residential, utilities, alternative energy, IT, and data centers, public sector institutions, and OEMs.

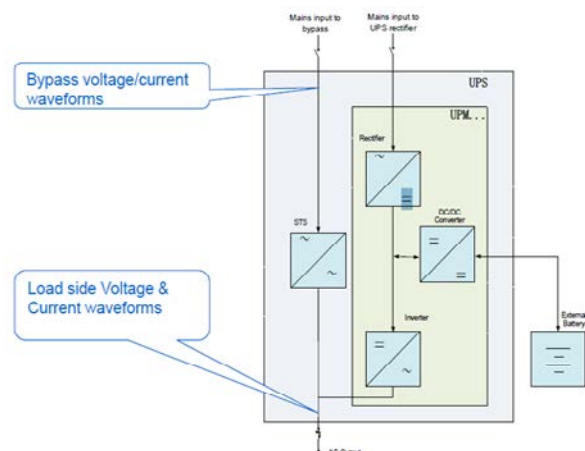
The Innovation

UPS waveform Recording Feature:

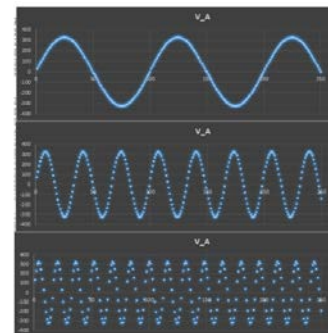
Eaton came up with innovative feature called waveform recording function that record more accurate waveform data before and after the failure which can effectively help to analyze the anomaly and clarify whether the source of the anomaly is the UPS internal or external environment (Grid or load side).

When any of the faults occur at the customer site, UPS will automatically record UPS input and output voltage and current signals. What makes this feature more unique is that there is no additional hardware required. With available circuit input and output voltage and current signals are monitored and the data is saved in a digital form. Data will be retrieved from the UPS using a special Eaton service tool and corresponding waveforms will be

generated. These waveforms clearly depict the site conditions before, after and at the time of fault. This greatly helps customers also to identify site level problems and address immediately.



- **High Precision mode:**
2.5 cycles of high precision waveform data record, to help analysis UPS instant performance
- **Multi-waveform mode:**
7.5 cycles waveform data record, to help analysis UPS behavior
- **Tracking mode:**
15 cycles waveform data record, to help monitor load loss or not



The Approach

Eaton is expanding the role of the UPS, enabling the customers and users to do more with deployed assets. Gone are the days where a specific product is developed to a particular job, adding multiple dimensions to a product, and making it intelligent and resourceful is the key requirement from customers and markets to improve the solutions effectiveness and maximum utilization of assets in which huge capitals are invested.





Being the world leader in innovation and technology for UPS products with advanced features, Eaton came up with the idea of adding intelligent features to the UPS product with the addition of energy feed back to the grid, controlling the energy consumption during the peak demands and maximizing the consumption as per customer selection.

Benefits

Reduced downtime: Critical expectation from UPS customers is to have reduced down time in case of any failure. Waveform recording feature helps both Eaton and customers to

quickly assess site conditions and identify permanent solutions quickly that help to avoid the problem recurrence and greatly helps customers to assess the site conditions.

The Future

Eaton invested in such futuristic innovations to lead the market and provide sustainable intelligent power management solutions to customers to increase the solution efficiency. Eaton will be expanding these features to all high power UPS that support small to large datacenters and industries.



About the Company

- An industry trailblazer for seven decades, ELICO stands at the forefront of India's Analytical Instrumentation sector, leading innovation and excellence.
- Developing Indigenous technologies and setting benchmarks through continuous innovation and expertise.
- Elico has over 100+ registered intellectual property rights, a testament to our relentless commitment to innovation.
- ELICO's illustrious track record is marked by numerous prestigious national and international awards, recognizing its excellence and leadership in the industry
- ELICO is actively contributing to India's growth by fostering innovation, advancing sustainable development, and aligning its products & initiatives with the UN Sustainable Development Goals (SDGs) to create a better future for all.

The Innovation



ELICO has developed cutting-edge technologies for on-site and continuous water and soil quality monitoring, enabling access to safe drinking water in rural areas and empowering the agri-food industry with essential analyses to improve efficiency

and sustainability. These solutions help monitor critical parameters in water and soil, enhancing farm yields while optimizing the use of fertilizers and reducing environmental impact.

Additionally, ELICO's NIR Feed Analyser brings advanced precision to the agricultural sector by providing quick and reliable testing of moisture, fat, and protein content in various agricultural produce and animal feeds. This tool enables farmers and feed manufacturers to maintain quality standards, optimize nutrition formulations, and minimize waste, fostering more sustainable and productive agricultural practices. Together, these innovations support the drive for sustainable development, improving food security and rural livelihoods.

The Approach

ELICO's approach to innovation combines customer-centric design, sustainability, and advanced technology integration to create impactful solutions in water, soil, and agri-food sectors. Collaborations with academic institutions, industries, and government agencies drive cutting-edge research and scalable developments. The company focuses on portable analyzers, real-time monitoring systems, and advanced sensor technologies for accurate and efficient testing.

With continuous R&D investment and a global outlook, ELICO tailors its environmentally responsible technologies to diverse needs and markets. This commitment to innovation fosters sustainable practices, resource optimization, and improved public health while addressing critical challenges in agriculture and water management.





Benefits

ELICO's innovative solutions improve access to safe drinking water and enhance agricultural productivity through on-site and continuous monitoring of water and soil quality. The NIR Feed Analyser ensures accurate analysis of moisture, fat, and protein in agricultural produce and animal feeds, optimizing resource use and ensuring quality. These cost-effective technologies empower rural communities, improve farm yields, and reduce environmental impact by minimizing fertilizer and water wastage. Real-time data-driven insights enable informed decision-making, supporting sustainable practices and food security. ELICO's advancements align with global SDGs, fostering socio-economic development and contributing to clean water, zero hunger, and responsible consumption goals.

The Future

ELICO's future aims to expand smart water and soil testing systems, focusing on sustainability and efficiency. The company plans to use cloud platforms and AI for better insights in agriculture and water management. With advanced tools for precision farming, ELICO seeks to improve crop nutrition and adapt to climate challenges. It aims to grow globally by developing solutions tailored to different regions. By providing safe water and supporting sustainable farming, ELICO will improve health, empower rural communities, and contribute to global development goals, strengthening its role as a leader in analytical technologies.





About the Company

EPL Ltd is a speciality packaging company with a vision to be the most sustainable packaging company in the world. We started production in 1984. EPL manufactures one in every three tubes used in the oral care category across the globe. We are trusted by leading brands in Beauty & Cosmetics, Food, Pharma & Healthcare, and Home Care sectors.

At EPL, we pride ourselves on being a great place to work. With over 5300+ employees from 25 nationalities, at 21+ state-of-the-art facilities in ten countries across all continents. We enjoy a marquee customer base of global, regional, and local niche brands, and are now a fully backward integrated manufacturer from blown film to tubes.



The Innovation

EPL is deeply committed to driving sustainability through our product offerings, ensuring they meet and exceed the expectations of our customers. By harnessing cutting-edge innovation and technology, we create sustainable solutions that embody the core principles of the 3Rs—Reduce, Recycle, and Reuse. Our approach focuses on transforming non-recyclable formats into

Code 2 recyclable alternatives, drastically cutting CO2 emissions and mitigating plastic waste.

A key example of this transition is our shift from conventional foil-based laminated tubes to recyclable plastic barrier-based tubes, enabling a circular economy. We are also integrating post-consumer recycled (PCR) resins into the design, reinforcing our commitment to sustainability.



This breakthrough innovation comprises two critical elements. First, we design mono-material laminates that not only meet the functional packaging requirements but also allow the inclusion of PCR resins. Second, we refine machinery design to efficiently process these modified laminates, ensuring productivity remains high while adhering to stringent quality standards.

The Approach

Plastic-Based Laminated (PBL) tubes were engineered to deliver functional performance





on par with traditional aluminium-based laminated tubes, while offering a significant leap forward in sustainability. Designed specifically for recyclability within the Code 2 HDPE bottle stream, these tubes have garnered full recognition and approval from leading plastic recycler organizations, affirming their compliance with rigorous recycling standards.

By utilizing HDPE-based sleeves, we've also achieved up to a 20% reduction in tube weight through down-gauging, further enhancing the efficiency and sustainability of our packaging solutions.



Benefits

We have successfully transitioned over 30% of ABL tubes in the Indian market to recycle-friendly PBL tubes, fully compatible with the Code 2 HDPE recycling stream. Additionally, we've integrated post-consumer recycled (PCR) resins from the Code 2 HDPE stream into our tube production, making the application truly circular and setting a new benchmark in sustainable packaging.

By utilizing HDPE-based sleeves, we've also achieved up to a 20% reduction in tube weight through down-gauging, further enhancing the efficiency and sustainability of our packaging solutions. This shift marks a significant step forward in the future of eco-friendly tube packaging.



The Future

We are committed to advancing this transition, ensuring the tube packaging format becomes fully recyclable within the Code 2 HDPE bottle stream. This initiative aligns with industry-wide efforts to enhance product sustainability by reducing resource consumption and driving the material economy toward a fully circular, waste-free model.



Equinox Software and Services Pvt. Ltd. (EQNX)



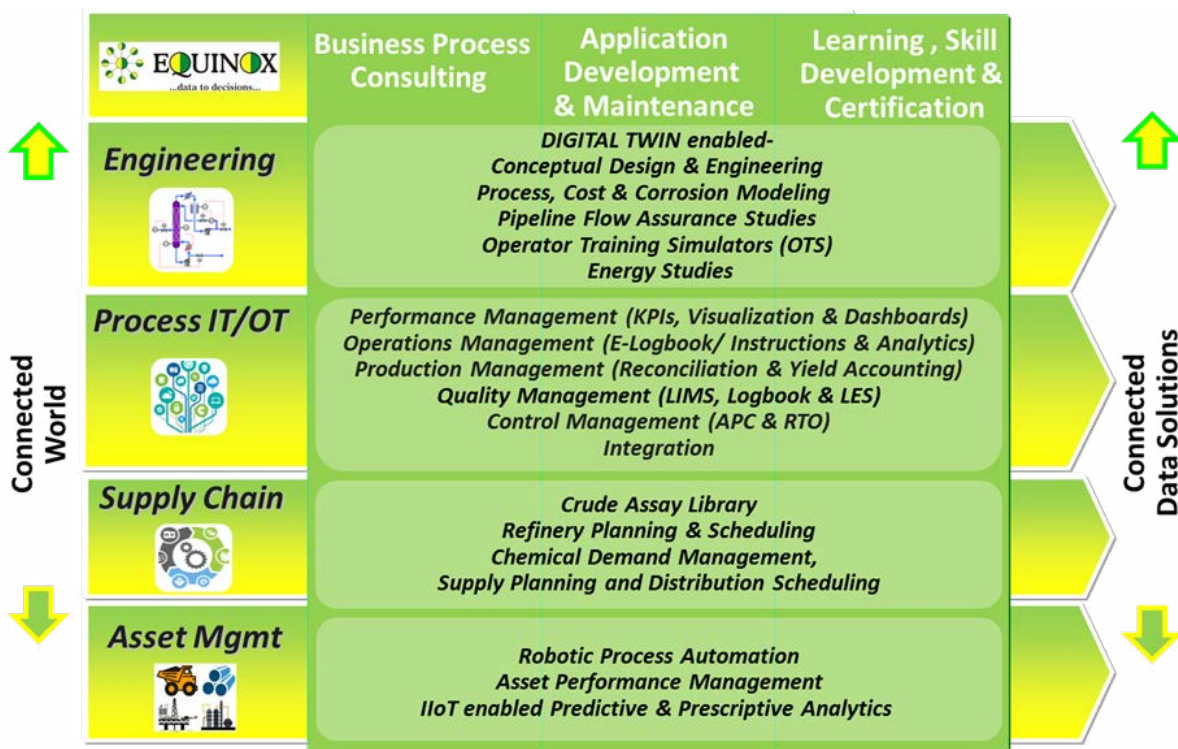
About the Company

EQNX is a Global player in the field of IT-enabled Chemical Engineering. Our solutions and services include First Principles & AI-Hybrid powered Digital Twins & IT-OT-IoT applications to deliver Design, Operations, Reliability and Supply Chain Excellence.

Our solutions have created value worth several million dollars for our clients through

- Safe & Sustainable Operations
- Reduced Energy and Maintenance spends
- Enable Higher Production Throughput
- Higher Product Yields and Desired Quality products.

Through our many firsts, unique and innovative projects in Circular Economy and Green Chemistry across multiple industries, we create-sustain differentiated value.



Headquartered in Pune, India, with offices in Bahrain, EQNX has well defined processes in Quality (ISO 9001:2015), Information Security Management (ISO 27001:2013) certified

by TUV. EQNX is also certified in Energy Management (ISO 50001) and GHG Emissions (ISO 14064-1) by BSI.



Aim "...Gain better *process* understanding to *process* better Gains..."

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| | | | | |
| Founded | Strength | Global | Industry | Projects |
| 2005 Active Operations 2007 | 65 + People Chemical and IT Engineers | Projects delivered 22+ countries 5 continents | Industries served with "Energy" ...across the "value chain" of CPI/HPI/Power/Metals | 175+ Projects <i>Incident Free</i> 1.5 Million Hours |

EQNX-Snapshot

Digital Offerings

Enterprise Resource Planning (ERP)/ Enterprise Asset Management (EAM) Integration

Amongst the largest software platform independent companies

in Chemical and Hydrocarbon Process Industry.

Industry 4.0- Digital Twin, IT-OT Integration, IoT

Quality Integration

Technology Partners Ecosystem

| Oil & Gas | Refining | LNG/ GTL | Chemical/ Petrochemical | Food/Pharma/ Spec Chem | Metals, Mining Mineral Processing/ Power | EPC | Technology | Consulting/ Certification |
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Select Client list

| # | Client | Geography | Solution/ Domain | Innovation |
|----|--|--------------|---|--|
| 1 | National Chemical Laboratories, Pune | India | Process Design | <ul style="list-style-type: none"> National & International patents awarded for the DME process Innovative Scale-up, Process Optimization using Process Digital Twin |
| 2 | GRASIM Chemicals (8 x Sites) | India | Electrolyser Optimisation | <ul style="list-style-type: none"> Industry-first Electrolyser Optimiser Agnostic to multiple type/ vintage/ make of Electrolysers |
| 3 | Deepak Phenolics | India | Advanced Process Control | <ul style="list-style-type: none"> First APC in India in Chemical industry- Cumene & Phenol Plants |
| 4 | Tata Steel | India | | <ul style="list-style-type: none"> First deployment in Steel Industry First deployment in spiral heat exchangers |
| 5 | Confidential Chemical Client | South Korea | Prediction of optimum cleaning schedule for heat exchangers | <ul style="list-style-type: none"> First implementation in Petrochemicals First overseas client |
| 6 | BPCL | India | | <ul style="list-style-type: none"> First development and implementation in TACIT |
| 7 | Global Innovation & Technology Alliance (GITA-DST) | India, Spain | New decision support system for crude unit (CDU) operators | <ul style="list-style-type: none"> Fast Prediction of CDU Operating Conditions AI-ML Application for predicting the Crude quality |
| 8 | Multiple Pharma clients | India | Solvent Maximization | <ul style="list-style-type: none"> First application for Solvent Maximization awarded "Most Promising Application" at International Green Chemistry Conference-2015 |
| 9 | Indian Oil Corporation Ltd. | India | IIoT enabled Predictive Maintenance | <ul style="list-style-type: none"> Industry First IIoT project of scale 1200 sensors, 900 equipment of 15 types |
| 10 | Confidential | Middle East | Asset Health Care Project | <ul style="list-style-type: none"> Fastest AI-ML based Predictive Maintenance project ~220 equipment- Rotating & Stationary in 6 months |
| 11 | ADNOC | UAE | Hydrocarbon & Energy Management | <ul style="list-style-type: none"> Innovative integrated architecture of disparate point solutions First ever for the Technology OEM |
| 12 | Confidential | Australia | De-Polymerisation of PET | <ul style="list-style-type: none"> Circularity, Unique Process Digital Twin Reactor Kinetic model |

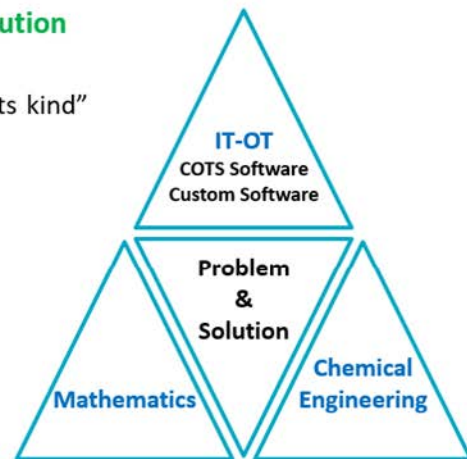




The Approach

EQNX Innovation Approach- Problem Definition & Solution Architecting

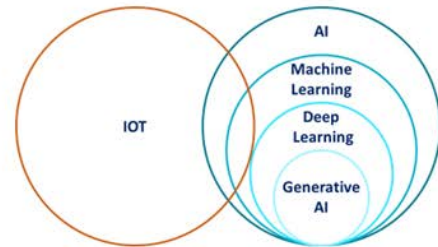
- Routine does not excite us... We love to pick up “One of its kind” problems
- ..These problems need conceptualization from bottom up.
- Use cross-section of tools
 - Information Technology & Operations Technology
 - ✓ Commercial Off-the-Shelf [COTS] software/ Technology
 - ✓ CUSTOM software
 - Mathematics
 - ✓ Algebraic / Differential equations
 - ✓ LP / NLP / MINLP Optimizer
 - Chemical Engineering
 - ✓ Chemistry / Reaction engineering
 - ✓ Heat / Mass transfer



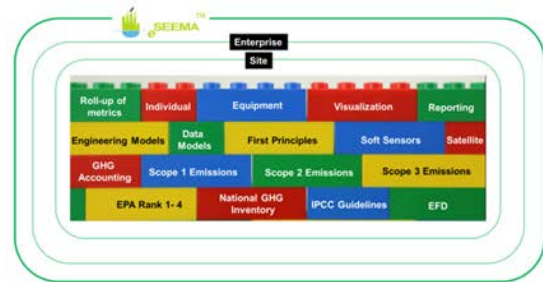
EQNX Innovation Approach

- Venture into emerging / frontier technologies
 - AI/ML/Gen AI, IoT
 - Sustainable technologies
 - GHG abatement

..... **enforces continuous learning**



- Modular architecture (eSEEMA)
- Creation of IP –Trademarks / Patents



Benefits

- Benefit of all EQNX projects have resulted in multiple tangible and intangible benefits. However, the common thread being energy reduction; resulting in lower emissions translating into an equivalent of planting 3,000,000 trees.
- NCL DME Process has a potential of saving \$355 Million to \$ 889 Million per year of foreign exchange.
- Electrolyzer Optimization has delivered overall electricity savings of 65,000 kWh ~\$ 2.7 Million.
- Advanced Process Control Projects

delivered annual benefits of ~Rs 50 crores+ due to reduced fuel costs, increased throughput.

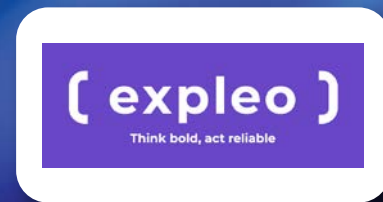
- Utilities Optimization resulting in multi-million dollar benefits for our clients due to effective utilization of utilities.

The Future

Equinox, a self-acclaimed, idea / jugaad generation factory will collaborate with other players to augment the resource and finance base to hasten the development of innovative solutions. Its recent joint effort with DIAT, NCL and VIT is a clear pointer towards the need of such collaborative effort.



Expleo Solutions Limited



About the Company

Expleo Solutions Ltd. is a global engineering, technology, and consulting company that specializes in providing innovative solutions across various industries. With a strong focus on quality assurance, digital transformation, and engineering services, Expleo helps businesses accelerate their performance and embrace technological advancements. The company serves a wide range of sectors, including automotive, aerospace, banking, financial services, healthcare, and energy, offering end-to-end support from design to implementation. Expleo has been working with customers from 30 countries and employs ~19,000 innovation driven bold minds and with group revenue of €1.4B and Expleo Solutions Ltd, India's revenue of INR972Crores in 2023. Our customer-centric approach and commitment to excellence make Expleo a trusted partner for businesses seeking to drive innovation, reduce risk, and achieve sustainable growth. In Expleo, "bold" and "reliable" play on the same team to drive Innovation.

The Innovation

Expleo Innovation is a continuous journey. Our innovation programs are outcome focused to realize the value of innovation through customer centric approaches. Expleo runs innovation programs like a) Innovation Jam (10th Year now), b) Bright Minds c) Global Innovation Hackathon d) I-Square & Co-Innovations and e) IP/Patents Support to build impactful innovations. All these programs are run with objectives of improving efficiency and productivity for Expleo and its customers, building differentiators, generating revenue, creating innovation culture and creating patents. We do regular employee awareness

sessions and spread messages from leadership about importance of innovation and success stories in innovation. Our Core innovation team proactively monitors all activities and recommends ideas in implementation for innovation and provides all the support from ideation to implementation. Expleo has built more than 50 accelerators through innovations which are integral part of our services since they help our customers reduce cost, improve quality and achieve outcomes in time. Our innovations range from optimizing business processes by reducing waste to advancing technology solutions in the software development lifecycle. We have our own nanosatellites currently in space built through collaboration with academic institutes. We have Autonomous Vehicle systems built inhouse for automotive industry. We have built Smart City Digital Twins for environmental studies. For our customers we have built library of ready to use Data, ML & AI driven solutions. We've developed advanced AI solutions to automate and streamline the SDLC, improving quality and reducing time. These tools assist Project Managers, Developers, Testers, and System Engineers with requirements documentation, test case generation, code writing, reviews, and migrations. Our GenAI and ML solutions have boosted team productivity by 5x and cut costs. Additionally, our GenAI-based Researcher and Generative BI solutions have reduced license costs and accelerated customer operations.

The Approach

Expleo follows a common innovation framework tailored to each program. Individuals or teams submit ideas to an idea management system, where the core innovation team and relevant leadership





review and refine them. Ideas are either accepted or archived. Selected ideas are further refined by experts, who identify resources and create execution plans. Once the MVP scope is finalized, implementation begins. Prototypes are demoed to Marketing and Sales for collateral development, and a future roadmap is created based on feedback. Ready ideas are handed to platform teams for management, and lessons from killed ideas are shared to celebrate learning.

Benefits

Expleo's innovations have directly in generate revenue by selling subscriptions to solutions. Expleo's innovations has been differentiators in our offerings due to their benefits to our customers. Expleo's innovations boost efficiency and productivity through optimized processes and advanced technologies like AI,

GenAI, and ML, increasing team productivity by up to 5x. With a customer-centric approach, Expleo delivers scalable solutions, new services across industries and patented solutions. The company fosters continuous improvement by refining successful ideas and sharing lessons from failures, driving sustainable growth and long-term value for its customers while enhancing quality and reducing costs.

The Future

Expleo plans to embed Innovation as a Culture and Strategy deeply, driving every aspect of the business. Focusing on Innovation with Impact, Expleo plans to deploy KRAs that will emphasize patents and disruptive innovations, encouraging breakthrough technologies and fostering transformational change across industries and services.



Flexible Steel Lacing Company Private Limited



About the Company

Flexco is a global organization of highly skilled people dedicated to responsibly providing quality branded products and services to our customers worldwide. We work together every day to pursue our vision to be the most valued partner for conveyor solutions, purposely helping keep the world's industries moving forward. We are all expected to model the behaviors provided under our five corporate values and three essential foundational elements. We do this in every interaction with customers, channel partners, suppliers, colleagues, shareholders, and the communities in which we operate.

The Innovation

We have created innovations keeping in mind about the environmental outcomes, Technological advancements and People. We have a lot of initiatives and product research and developments done to focus on what our world really needs at this time. As we have in our Values, the first value being for the People, People First, we have various initiatives done for the people, we are a company that follows values and Values are not just on the walls but imbibed into every Flexco Employee and use in everything we do. Environmental pollution is currently the topic on the coffee tables are being addressed with our innovative product that eliminate the dust and keeps the rate well within the government guidelines. With recent technological developments, Customers

expect the data to be on their mobile devices and access the same on the Go. This made us have a unique product in the market.

The Approach

Our main thought of creating or innovating comes from our visits to customers and interaction with them. Though our company is headquartered in USA, it's a global entity and we follow Think Global but Act Local . The views will be discussed and listened to before the first stages of the project.

Benefits

The benefits of the items are not quantified and will never be. We have a lot of benefits that's helpful to us as well as to our environment and the world. In regards with the people , When we invest in our teams improvement and their wellbeing , we believe that will be the maximum benefit that we reap in future or entire growth of the company.

The Future

The innovations and the commitment to serving our customers better will continue in our future. The yearly budget for the innovations that we do will always be on the rise YOY. This is the importance that we give for innovations. We are having lot of programs and initiatives in coming years like the introduction of Kaizen Day and suggestion boxes to promote innovations.

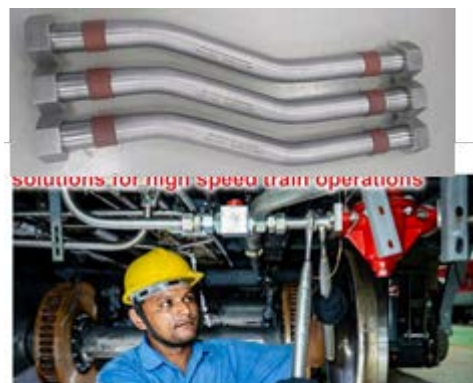


Fluid Controls Limited



50years back Fluid Controls' laid the foundation for Fittings in Indian market. Current Business verticals are Railways (Metro, Coaches, Locomotives), Oil and Gas, Power(Nuclear, Thermal), Defence and Aerospace Industries(NADCAP and AS9100D Certified).

In order to drive Design, Engineering, Manufacturing and Test-Lab i.e. Wing-to-Wing approach, for any Product, we have a state-of-the-art R&D centre, a 3D Modelling and Finite Element Analysis Team along with a Test Lab which is NABL (ISO17025) certified. Government of India(DSIR) has recognized Fluid Controls® R&D as an "In House R&D Unit".



| | | MARKET SEGMENTS | | | | |
|----------|----------------|-----------------|-----------|--------|---------|-----------|
| | | Railways | Oil & Gas | Power | Defence | Aerospace |
| PRODUCTS | Fittings | Orange | Black | Yellow | Green | Blue |
| | Valves | Orange | Black | Yellow | Green | |
| | Clamps/Flanges | Orange | Black | Yellow | | |
| | Hoses/Tubes | Orange | | | Green | Blue |
| | Lab Testing | Orange | Black | Yellow | Green | Blue |

1 Patented Case Hardening Process for Ferrules and Crimping on Tube!

The Innovation

1. To case hardened the Ferrule, one needs a furnace and need to standardize the Process, along with the Furnace. Later need to work with associated components.

2. And 5-axis CNC Tube Bending Machines is used to impart any shape to the tube.

3. Do the 3-D dimensioning of the tube with FARO CMM arm.

4. Crimp the Ferrules on the Bent Tube.

5. Leak test the assembly.

6. Easy to Fit the assembly at any location and no rework on Leakage !!



Innovation: 2 – ISO17025(NABL) High Pressure Oil Testing @ DRDO

DEFINE
The Problem

MEASURE
The Data

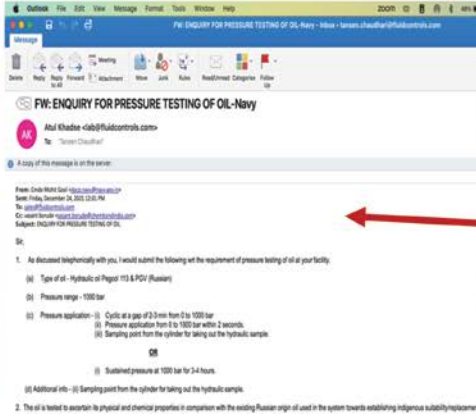
ANALYZE
The Process/Design

DESIGN
The Process/Product

OPTIMIZE
The Changes

VERIFY
The Process

DRDO High Pressure Oil Testing for Air Craft Carrier
Russia was supplying this Oil to India, DRDO succeeded in developing this oil chemically. But testing the oil to 1000bar pressure in 1.5 seconds with an hold time, relevant test facility was not available in India. Fluid Controls made this facility successfully.



War ship: Wire hooking Aircraft

National Accreditation Board for Testing and Calibration Laboratories
NABL
SCOPE OF ACCREDITATION
Laboratory Name: FLUID CONTROLS PRIVATE LIMITED (TESTING LABORATORY), GAT NO 3781/2, TALEGAON, CHIKAN ROAD, KHARBARDE, TALUKA-KHEDI, PUNE, MAHARASHTRA, INDIA.
Accreditation Standard: ISO/IEC 17025:2017
Certificate Number: TC-9338
Validity: 08/03/2021 to 07/03/2023
Page No: 1 of 7
Last Amended on: 23/11/2021

Tel: 011-2608 2405
Fax: 011-2606 2769
Government of India
Ministry of Defence
ANKANWSHA
Development Enclave
Raj Park Road Marg
New Delhi-110002
No. 15/009/03854/00PC/3TECH
26 Jul 23
The Director
(Dr Shri V Vishal)
DMD Establishment
No. 1, Mithibai Road, Turband
Secunderabad-500 003

TESTING OF HYDRAULIC FLUID

- Refer to following:
 - (a) Askanksha letter of even no. dated 02 May 23 regarding development of Fire Resistant Hydraulic Fluid.
 - (b) Askanksha letter of even No. dated 27 Jun 23 regarding forwarding of MOM held on 02 May 23 & 23 Jun 23 (Copy enclosed).
 - (c) Discussions with undersigned on the subject.
- Fire Resistant Hydraulic Fluid (FRHF) is under development by M/s KOCL for ATV Programme (para 1 (a) above). Phase 1 development of Hydraulic Fluid has commenced at KOCL. Phase 2 (Enhancement) development should be carried out post successful completion of Phase 1 development (para 1 (b) above).
- Phase 2 trials will be conducted at M/s Fluid Control, Pune. M/s Fluid Control has previously carried out testing of Hydraulic Fluid PEGCOL-113 and PEGCOL-113 for the Indian Navy (INS) (M/D equipment) with involvement of DMS/DOE (DRDO lab).
- In view of above, request engage M/s Fluid Control (Shri Rahul Paul - 9730748895) to look out & studies test set up required to carry out Phase 2 development of FRHF. Phase 2 trials are likely to commence in Nov 23.

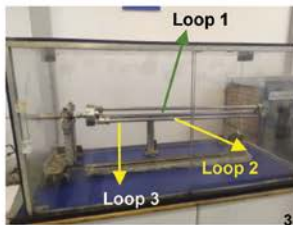
(Rajag Shastri)
Sd/-
(DR)

Encl: As stated

DIRECTORATE GENERAL OF AERONAUTICAL QUALITY ASSURANCE
MINISTRY OF DEFENCE, GOVERNMENT OF INDIA
REGISTRATION CERTIFICATE
This is to certify that M/s Fluid Controls Private Limited, Registered Office: JV Parel, ITI Compound, B. Mathurkar Marg, Mumbai-400013 Factory Address: Gat No. 3781/2, Talegaon, Chikan Road, Taluka Khedi, Pune - 410561 (Regd. Mail ID at CGP Portal: fluidcontrols@doqaa.gov.in) after verification of its capacity / capability is registered with Registration No. **DGAGAREGN/1982823** and is found capable of Design-Development & Production (Development & Production) "Production" Major-Regain & Overhaul/Authorized dealer/Supplier of foreign OEM of the following Defence aviation stores. (S/Ns to which is not applicable)
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DGAQA Certificate

DRDO : Oil Testing Recommendation



3 Sample Testing at 1000bar !!



About the Company

Forbes Marshall helps build and sustain highly efficient plants by reducing waste, optimising process and energy efficiency, and by complying with regulatory requirements.

Forbes Marshall is a leading provider of energy and process automation solutions worldwide through innovative and differentiated offerings. Our distinctive sales approach delivers customer benefits. We have always taken pride in the way we offer solutions, exceeding customer expectations on quality and delivery. Over the decades, we have built a great place to work; one that thrives on diversity and benefits communities around the areas we operate in.

Forbes Marshall offers a wide range of products, solutions and services to help bring down the cost of steam throughout the process. With our instrumentation solutions we help Industry achieve better throughput, and reduced process time, resulting in better productivity and reduced cost of operation. Our range of water quality analysers and emission monitoring equipment help Industry comply with norms and regulations and reduce environmental impact.

The Business Case

- Forbes Marshall provide energy solutions for global market, that prevents significant loss of Energy in various industries like Process, Pharma, Textiles, Paper, O&G, Metal, Chemical etc.
- Fabricated products, constitutes significant portion of this offering. Making them fast with global quality standards, builds resilience for the business to sustain longer

- This project, deals with development of “State-of-the-art” Fabrication Factory, that makes fabricated products in 1 Week, instead of 4-12 weeks earlier
- Use of High End Technology, ensures, world class quality, that eliminates, excess welding joints, hazardous dust and noise creating grinding, wasteful waiting time and transportation between various processes
- Double the productivity, by eliminating waste, balanced operations, reduce dependence on human beings and use of laser for cutting and robots for welding

Deliverables required

- Delivery in 1 Week instead of 4-12 earlier
- Double “Per Person Productivity” & build capacity for 20% YOY business growth
- Achieve cost saving of INR 5.7 Cr per annum, to make products cost competitive
- Consolidate entire value stream of fabricated products under 1 roof to make it fast
- Enhance product quality to the expectations of Global Customers
- Elimination of laborious processes and outside processing of parts
- Build “Gender Neutral” Manufacturing set up to enhance Diversity in Shop

Business Challenges

- Traditional, Labour centric production methods posed delivery, quality and reliability issues



- Age old practices and technology
- Contract manpower
- Eliminate Supplier dependency

Technology Challenges

- Laser Vs Plasma
- Output after Cutting should be suitable for Robotic Welding
- No post processing desired after Cutting and welding
- Reduce number of weld joints
- Skill up gradation

Solution:

State-of-the-art fabrication factory with modern & sophisticated machines to manufacture high quality and robust products.

Timeline: 15 months

Budget : 21 Cr in three phases

Status : Operational since Nov 2023 with following unique features

1. Automatic Pipe Dispenser
2. India's largest Laser Pipe Cutting Machine
3. Flange Manufacturing cell
4. Automated Band Saw for Pipe cutting
5. Hydraulic Pipe Bending Machine with Booster Mechanism
6. Robotic Welding Cells
7. Mistake Proofed Welding Fixtures
8. Ind 4.0 Hydro & functional test rigs
9. Single Piece Flow Model Cells
10. End of the line Packaging

Key innovations or unique methods utilized

- Low spatter control technology is used in the welding so that there will be minimal post processing on account of welding spatters.

- The robots (6 degrees of freedom) are mounted on column in an inverted position (one degree of freedom) to have better access and movement around the work piece. L type welding positioners (2 degree of freedom) are used for work piece position and rotation. Thus in one welding joint 9 degrees of freedom is used.
- We have used unique sensor technology for robotic welding - thro arc sensor, seam trackers, laser sensors for good best deposition rate and uniform welding and penetration.
- We developed India's largest pipe laser cutting machine with SIL Suresh Indu Laser, a Pune based supplier. There are 25 servo motors used in this machine with one hollow and two fixed chucks. The max pipe that can be held is 650 MM dia and 6 mtr length.
- Hydraulic pipe bending is also one of the main equipment that has helped to eliminate more than 60 weld joints as well as develop many joints in house.

Benefits

1. Manpower Reduction - 123 to 50
2. FTY – 98-100%
3. Thro put time – 1 week
4. ROI – less than 2 years
5. 100% Traceability
6. Product Quality enhancement - (Consistence Weld Quality, Consistency in Product dimension & fitment)
7. Sustainable manufacturing

The Future

Taking forward the recorded success, developments are on for extended applications in the factory for various other business verticals & JVs.

GHCL Limited



About the Company

GHCL Limited, established in 1983, is a leading player in the chemical and textile industries in India. The company is a major producer of soda ash and sodium bicarbonate, which are vital for glass, detergent, and textile manufacturing. Known for its sustainable practices and innovation, GHCL has a strong commitment to environmental stewardship and corporate social responsibility. With state-of-the-art manufacturing facilities in Gujarat, GHCL aims to drive long-term value creation for stakeholders while making a positive impact on society.

The Innovation

At GHCL, innovation is not the responsibility of a specific team but a mindset embraced by every employee. The company believes in embedding an innovation-driven culture through various platforms like MILAP, Incarnation, and Disha Meets, where employees actively contribute ideas to improve processes and solve long-pending issues. Senior leaders also play a key role, with innovation targets integrated into their key result areas (KRAs). GHCL has structured initiatives like TEA (Think, Experiment, Adopt) and SIR Day (Strategy, Innovation, Research), which provide a platform for employees to present, develop, and refine innovative solutions throughout the year. These platforms ensure a continuous flow of creativity across all levels, from frontline workers to senior management. By fostering an open and inclusive approach to innovation, GHCL consistently drives improvements in its operations, sustainability efforts, and business processes, ensuring long-term value creation and growth.

The Approach

GHCL adopted a holistic approach by combining technological advancements and sustainable practices. Through collaborations with research institutions and a focus on resource efficiency, the company optimized its production processes. Employee engagement and continuous training also played a crucial role in aligning the workforce with the company's innovation goals. This approach ensures that GHCL not only meets market demands but also contributes to environmental sustainability.

Benefits

The primary benefits of GHCL's innovation include a reduction in energy consumption, minimized environmental impact, and enhanced product quality. By adopting advanced production techniques, GHCL has also significantly reduced operational costs, thereby improving profitability. Additionally, the company's eco-friendly processes strengthen its brand reputation as a leader in sustainability, while ensuring long-term growth and market expansion.

The Future

GHCL aims to expand its production capacity and continue refining its innovative technologies to meet evolving industry needs. The company plans to explore new markets and applications for its products, particularly in renewable energy sectors, while maintaining its focus on sustainability and resource efficiency.



Global Engineers Limited



About the Company

Global Engineers Limited is a leading Innovative, Technology company established in 1982 to provide customized plants and equipment on turnkey basis and has consistently delivered satisfactory results to its clients/partners through Excellent quality control and State of the Art Technologies.

The company has designed, innovated and manufactured the plants for the following Customers: -

- Nuclear Power Corporation of India Limited (NPCIL) for Fast breeder Reactors
- Bhabha Atomic Research Center (BARC)
- Department of Atomic Energy (DAE)
- Nuclear Fuel Complex (NFC)
- Heavy Water Board (HWB)
- Indian Ordnance Factories
- 1 Indian Railways

The Innovation

Global Engineers is innovative Company known for developing new Technologies and Products. Since inception company has innovated following Products/Technologies: -

- Company innovated and developed a product for high security fencing Punjab Border Pakistan which successfully eliminated Sikh Terrorism in the year 1985-86. For which, the then President of India, conferred National Award upon the company.

- The company has indigenously innovated and developed fully Automatic Painting Plants for Air crafts, Helicopters and Railway Coaches which stopped imports completely.
- Ordnance Factories of India are not self-sufficient in the production of Ammunitions needed by Defence Forces hence depended heavily on imports of various Calibre Ammunitions or raw materials. The company together with a leading European Company innovated developed technologies for the production of Propellants and Explosives and set up facilities at various Ordnance Factories and stopped imports.
- The company innovated and developed Pilot Plants for BARC.

The Approach

Since inception of the company, the approach has been to develop / innovate products which are either need based or import substitution.

As a result, the company developed a high security fencing product in the beginning years of the company and continued to develop automatic painting plants for Railway coaches, Aircrafts and Helicopters. Pilot plants for BARC, Fast Breeder Reactor for Nuclear Power Plants Explosives, Propellants Manufacturing plants for Ordnance Factories.

Benefits

As a result of our innovative efforts, the country eliminated Sikh terrorism at Punjab Border in 70s, Indigenization of Automatic





Painting plants, Explosives and Propellant Plants for Ordnance Factories, Pilot Plants for BARC etc. resulted into saving of sizeable Foreign Exchange to the country and established Indigenous Manufacturing Facilities, providing direct and indirect employment to several hundred people.

The Future

Currently, the contracts signed with the Government Agencies have a Foreign Exchange and Indian Rupee components. Now, we intend to offer the innovative Technologies and Plants under Indian Rupee Payment only.



Hanon Automotive Systems India Private Limited, Chennai



About Hanon Systems

Hanon Systems is a full-line global leader specializing in automotive thermal and energy management solutions. The company supplies a full line of products and systems for automotive thermal applications including heating ventilation and air conditioning; powertrain cooling; compressors; fluid transport; and electronics and fluid pressure solutions for conventional, electric, hybrid, fuel cell and autonomous vehicles.

For more than 30 years, Hanon Systems has grown as a technology innovator by continually adapting to industry trends and exceeding customer expectations. The company that formed in 1986 as a traditional automotive climate supplier has grown dynamically in its technology breadth, technical expertise and global reach to become what is Hanon Systems today, a full-line thermal and energy management solutions provider. The history of Hanon Systems is one of growth, which has been made possible by its unwavering commitment to support its customers, employees, shareholders and the communities where it operates. There is pride in the company's legacy and its achievements, and there still exists an undeniable passion for the journey that lies ahead.

The company currently operates 50 manufacturing and employs more than 20,000 people. As a trusted partner to most of the world's top vehicle manufacturers, automakers look to Hanon Systems for solutions that address the shift toward electrification and the efficiency needs to support conventional vehicles. The company – with a mindset focused on creating a better tomorrow for future generations – takes pride in its

innovation for automakers supporting the next-generation electrified (electric, hybrid, fuel cell and autonomous vehicles) and conventional vehicles.

About Hanon Systems in India

Hanon Systems operates in India through its subsidiaries, Hanon Automotive Systems India, which has plants at Chennai, Pune and Hanon Climate Systems India, a joint venture with Maruti Suzuki, having manufacturing facility at Bhiwadi, Rajasthan. Hanon Systems in India is a technology partner for climate and powertrain cooling solutions to various OEMs on some of the best-selling cars and SUVs in India.


To learn more, visit hanonsystems.com.

The Innovation

At Hanon Systems we do following projects as part of Innovation

1. Industry 4.0 (Digitalization projects -32 Applications developed & live+ Augmented reality, Virtual reality & Proof of Concept projects completed)
2. Carbon neutrality through Scope 1 to Scope 2 migration and utilization of renewable power (100% Green power, ZLD, MIYAWAKI urban dense forestation)
3. OSH India Excellence in innovation-Fire and Disaster
4. Introduction of Induction brazing for Aluminum joints. Flameless brazing, No increase in ambient temperature, Enhanced Safety.
5. Hassle free switch over to inhouse Fire Hydrant System with remote utility monitoring system.



- 
6. 3.2MWp inhouse solar system to cater 12% of our daily consumption.
 7. I4.0 Short term goal is Paper Less Shop Floor (PLS), All shop floor data available in digital form for quick access and information gathering.
 8. I4.0 Long term goal is Intelligent Information System (IIS). Quick decision making, Data retrieval faster and accurate.

The Approach

Hanon took definitive approaches for implementing innovative projects

- 1) All digitalization concepts were developed by inhouse engineers & 70% coding done by our engineers. This will help in mass scale deployment of projects across the plants
- 2) Hanon Embraced latest technologies like Generative AI, AR, VR, Computer vision and developing inhouse by upskilling our employee skillsets
- 3) Top down driven approach from management enabled a good working environment where failures are considered as steps towards success, which gave full freedom for our employees to work freely and without pressure

Benefits

- 1) PQCDMS benefits were observed. Our quality PPM reduced from 5 to <1 ppm within 3 years' time
- 2) Value addition in each business processes improved to a big extent. E.g.: With latest technologies for e.g.: Report Automation saves lot of time & increases accuracy and transparency
- 3) Excellence in ESG initiatives has helped Hanon Chennai to achieve carbon Neutral by 2030
- 4) Overall System improvements by Industry 4.0 has brought Hanon Closer to Manufacturing Excellence

The Future

- 1) Generative AI will be used in bigger scale to reap more benefits in Automated decisions in business processes
- 2) EHS initiatives to drive towards carbon neutrality
- 3) People Engagement & upskilling will be forefront in Company bright future towards Innovative Journey



Hindalco Industries Limited, Renukoot, Reduction Plant



About the Company

Mahan Aluminum, located in Bargawan, Singrauli district, Madhya Pradesh uses globally proven smelter technology AP36 from Pechiney, France. & Captive power plant uses BHEL of capacity 900 MW.

- This project is initially started with a capacity of 359 KTPA which has been increased to 372 KTPA by innovations and continual improvement in its existing facility.
- Mahan's Aluminium is globally known for producing highest ever high purity grade metal P0202 & is the only Indian smelter running at ever highest amperage of 374 KA. Its products are present in 22 countries across the globe.
- Mahan is also ISO certified and have the BIS certification for its aluminium product.

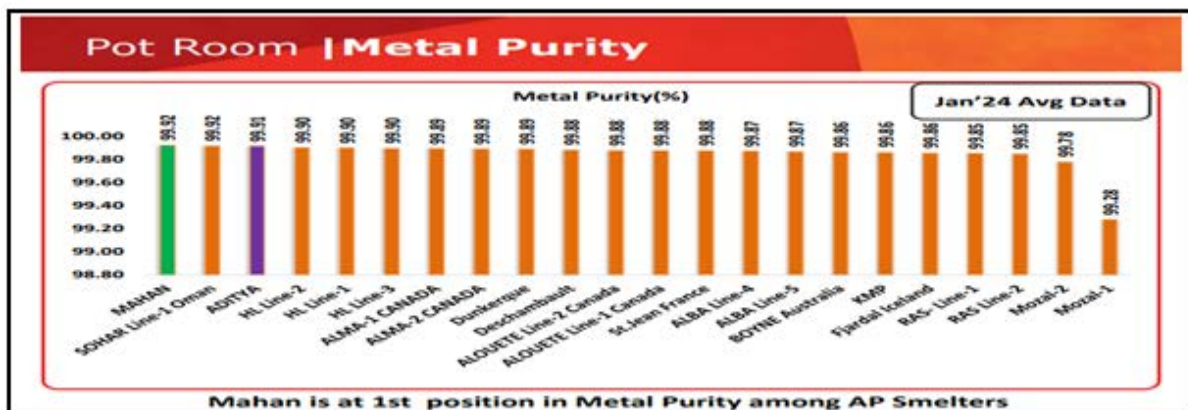
The Innovation

Production of high purity metal grade with innovative techniques:

1. Formulation Green anode recipe formation for high purity Anode production
 - a) New blending philosophy for high purity anode

- b) Installation of magnetic separator for reduction in Fe content.
 - c) SOP developed for segregation of normal anodes to special anodes.
2. Implementation in Pot room
 - a) Selection of 30 pots in two different zone (15 each) from entire pot line of 360 pots for high purity hot metal production .
 - b) Regular tracking of pot parameters through IT-OT connection - helped in achieving desired analysis
 - c) Extracted data used to analyze contribution of various raw materials impurities & pot factors
 - d) Separate automated arrangement
 - e) Development of SOP and relay trainings provided to shopfloor workforce
 3. Implementation in Cast house.
 - a) Dedicated ladle and furnace operation for pouring of high purity metal in continuation with normal purity grade production.
 - b) SOP developed for scrap charging procedure in normal as well as high grade metal production to avoid off grading of product.

Results and benefits:



| Parameter | Result |
|---|--|
| Finance (report both in Cr INR and Mn USD) | |
| CAPEX/OPEX employed* | 0.56 Cr INR/0.07 Mn USD |
| Overall Rupee/Dollar Value Saved* | NIL |
| Increase in Revenue / EBITDA* | 75.84 Cr INR / 0.91 Mn USD |
| Saving in OPEX* | - |
| Operational Efficiency | |
| Increase in Production | Sustained production quantity with high grade metal production. |
| Production volume increased from 19800MT to 47000MT (135%) from FY'23 to FY'24. | |
| Reduction in energy consumption (in kWh) | Not Applicable |
| Reduction in Manpower (hours saved) | Not Applicable |
| Better management of inventory | Yes |
| Reduction in unplanned downtime | Not Applicable |
| Customer | |
| Reduction in Customer Complaints | Customer delighted |
| Value delivered for customer | Competitive pricing with consistent quality for Global Customer |
| Quality cost reduction | Competitiveness in market |
| Have you productized the innovation? | Yes, our marketing team has approached to Global customers |
| Environment | |
| Energy consumption reduction (in kWh) | NIL |
| Waste Reduction | NIL |
| Water Consumption Reduction (in kilolitres) | NIL |
| Recognition from Environmental Bodies, if any. | NIL |
| Learning / Growth | |
| Scalability across units (Y/N) | Yes, can be scalable across different units like in: Hindalco in similar AI smelters |
| Presented at any other forums internally / externally? If yes, please specify | PRIDE cycle in Hindalco |





Environment

Any recognition received (Internal or External) for this Project, please specify

1.Received "Recognition mail from Chairman's office."

2. BIS certification IS 11890:1987 – For high purity primary Aluminium ingots for remelting for special purpose

Have you filed a patent / initiated any IPR related proceedings in any geography? (Please provide details)

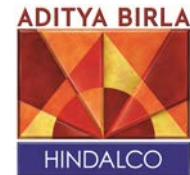
Yes. Patent application no-202121024892; A METHOD FOR HIGH GRADE ALUMINIUM

The Future

Plans for further higher purity grade production.



Hindalco Industries Limited, Muri Works



About the Company

Hindalco Industries Limited, Muri Works is a state-of-the-art alumina refinery facility located at Muri, Ranchi district of Jharkhand, India. It is dedicated to the manufacture of Alumina (both speciality alumina and smelter grade alumina) and Alumina Hydrate. It is a flagship company of Aditya Birla group under Hindalco's Speciality Chemical business. It has a capacity of producing 450 KTPA alumina per annum. It serves a wide range of customers across 32 countries around the world with special alumina and alumina hydrates. Alumina hydrates find use in applications like alum, poly aluminium chloride (PAC), zeolites, aluminium fluoride and as fire retardant filler in polymer composites. The special alumina finds a good suit in applications like refractory, ceramics, polishing compounds, abrasives and glass.

The Innovation

A process innovation was implemented to meet specialized customer demands for alumina with a lower surface area. Calciner operations were changed in such an innovative way to produce a special alumina (SA grade) with upto 0.5% LOI (Loss of ignition) and a specific surface area of 40-50 m²/g. This was achieved by adjusting calcination temperatures and process parameters and implementing inhouse process modification without the need for additional resources. SA (special A) grade alumina, with its distinct properties, caters to high-end industries such as ceramics and refractories, resulting in increased revenue generation. After successful lab trials, bulk trials were conducted at the customers' facilities, yielding satisfactory results. This innovation enables Hindalco Muri to position itself as a specialty alumina producer, maximizing resource efficiency and enhancing energy savings through advanced heat recovery systems.

The Approach

The PDCA (Plan-Do-Check-Act) approach was adopted to develop the process. In the planning phase, market analysis identified the demand for low surface area alumina. Calciner temperatures and process parameters were adjusted in the "Do" phase. During the "Check" phase, successful lab and bulk trials confirmed the process's effectiveness. Finally, the process was standardized and incorporated into regular operations in the "Act" phase. No additional resources were required, making the approach both cost-effective and efficient. Successful lab and bulk trials at customer sites confirmed the efficacy of the innovation. The process was designed to be cost-effective and energy-efficient while meeting specialized customer needs.

Benefits

The innovation allows Hindalco Muri to produce premium-grade SA alumina, catering to niche markets and increasing revenue. The optimized calcination process minimizes resource usage while enhancing product flexibility. Bulk trials confirmed that the product meets customer requirements, further validating its market potential. Additionally, the energy-efficient systems employed in the plant reduce operational costs, making the production process more sustainable and competitive in high-end alumina markets.

The Future

Further value addition is planned by developing more diversified grades from the SA grade alumina. This will generate higher value and expand the range of specialty alumina products. The goal is to become a global leader in the specialty alumina market, offering highly differentiated, high-quality products. Also plan involves refining calciner operations to produce additional specialty grades of alumina.



Hindalco Industries Ltd, Renukoot Alumina Refinery



About the Company

Aditya Birla Group, a global conglomerate, operates across diverse sectors, including metals, cement, textiles, and telecom. Hindalco Industries, one of its flagship companies, is a leading Aluminium and copper producer, with an emphasis on sustainable operations and advanced technologies. The group is committed to innovation and operational excellence, continuously investing in cutting-edge solutions to optimize efficiency and enhance safety. Aditya Birla Group demonstrates its focus on industrial resilience, safety, and sustainability, setting benchmarks for the metals industry in India and globally.

The Innovation

- **Copper Onsert Collector Bar:** Innovative copper onsert bars, replacing less conductive steel, significantly reduce cell voltage and energy consumption by enhancing current distribution. Thermal stability is achieved through improved insulation, low-conductivity firebricks, and modified process controls. A specialized sealing technique protects the copper during cast iron pouring, ensuring it remains unaffected and recoverable.
- **P0610 Premium Aluminium Production:** P0610, is produced at Renukoot by optimizing anode settings, using low impurity covering materials, and monitoring bath levels to minimize contamination. Controlled borax addition prevents metal quality degradation from Ti, V, and B. High-purity alumina, precise feeder management, dedicated tapping, and stringent audits ensure consistent quality and purity for P0610 production

- **CMCE SERTEC 120 Lightning Protection System:** CMCE SERTEC 120 lightning protection on 132 kV towers prevents strikes by dispersing electric charges, reducing field strength to avoid lightning formation. Paired with Storm 7 monitoring, it enables predictive maintenance, enhancing operational safety and reliability in severe conditions

The Approach

- **Copper Onsert Collector Bar:** Our approach integrates precise pot modelling and optimized lining design to achieve thermal balance. An in-house method for cast iron pouring further enhances innovation and process efficiency
- **P0610 Aluminium Production:** Department-wide collaboration and strategic resource adjustments. Innovations in anode scheduling, raw material enhancements, process control and feeder management.
- **Lightning Protection:** The CMCE SERTEC 120 installation on 38 lightning-prone towers integrated solar-powered, GSM-enabled Storm 7 units for continuous monitoring, with advanced grounding technology reducing earth resistance to stabilize power transmission.

Benefits

- **Copper Onsert Collector Bar:** The utilization of Cu Onsert collector bars in the pots holds the potential to decrease the pot voltage by 67mV, leading to a substantial reduction of 213 DC kWh/MT of power.



- **P0610 Aluminium Production:** P0610 production allows Renukoot to capture high-value market segments, especially in aerospace and automotive, by meeting stringent purity standards.
- **Lightning Protection:** Mitigates lightning-related outages, saving INR 40 lakhs per incident, ensuring operational stability, and reducing maintenance costs.

The Future

- **Copper Onsert Collector Bar:** Implementing this across all pots will

enhance energy efficiency and support in increasing production capabilities.

- **P0610 Aluminium Production:** Expanded production of P0610 will cater to high-demand sectors, strengthening Renukoot's presence in aerospace and automotive markets.
- **Lightning Protection:** CMCE Sertec 120 enhances grid resilience in lightning-prone areas, safeguarding assets and ensuring reliable power, supporting industrial growth and economic development in remote regions.



Hindalco Industries Ltd., Unit Birla Copper, Dahej



About the Company

Hindalco's copper division, Birla Copper, operates one of the world's largest single-location custom copper smelters at Dahej, Gujarat. It houses two copper smelters, three refineries, two rod plants, a captive power plant, a precious metal recovery plant, a captive jetty, and other utilities.

Hindalco produces LME-grade copper cathodes, continuous-cast copper rods in various sizes, and precious metals like gold and silver. It is one of the major manufacturers of 19.6-mm-diameter copper rods used for railway electrification.

Our Copper Cathodes and Rods are supplied to Wire and cable, Transformers, Defence, Automobiles, Bus Bars, Housing etc. Larger diameter rods are utilized in transformer strips, profiles, bus bars, and groove conductors on railways. Birla Copper's products are recognized for their high purity and consistent quality in domestic and global markets.

The Innovation

The company's digital transformation strategy is designed to integrate advanced technologies into its core operations, fostering a culture of innovation and continuous improvement.

Operational Excellence:

Streamlining processes, reducing downtime, and enhancing productivity through advanced data analytics and automation.

Technology implemented:

- Semtech OPC System is used to digitalise the PS converter process.

- Digital Twin- Blend advisor for finding the best combination of concentrate for smelting.
- Thermal scanning of ladle & Scrap melting furnace lining lifecycle.
- LIMS implementation for digitalisation
- Metsen EV camera for data analytics/ quality control
- OSI-PI system for complete online data acquisition for Data Analytics

Customer Centricity:

Leveraging digital tools to understand customer needs better, improve service delivery, and create personalised experiences.

Technology Implemented:

- Surface defect identification of CCR for quality.
- Digital Models for Optimising Process efficiency and Rod Quality
- Two crop cycles in Copper electrorefining for cathode quality and production,
- Nodule detection system for cathode quality.
- Monitoring NPS for all customers monthly
- Customer Journey mapping for better service experience

New Product development:

- 19.6mm Copper Silver Alloy Rod
- 21mm, 23mm Silver Copper and ETP Copper

This wire enables higher overcurrent on DC lines without causing an increase in wear on the contact wire. Tailored specifically for high-speed rail applications for Indian Railways.



The Approach

The digital journey of Hindalco is driven by a clear vision to leverage technology to enhance operational efficiency, improve customer experience, and ensure sustainable growth. The strategic objectives include:

- Continuously creating awareness on inhering digital mindset
- Creating Digital ambassadors and Data scientists to assist in manufacturing
- Harnessing data analytics and artificial intelligence (AI) for informed decision-making.
- Implementing automation and robotics to streamline operations.
- Enhancing cybersecurity measures to protect digital assets.
- Empowering employees through digital tools and platforms.
- Fostering collaboration with digital partners and startups.

Hindalco remains committed to its digital transformation journey, investing in research and development with advanced technologies and exploring new avenues for innovation and digital initiatives from supply chain management to customer engagement to enhance its efficiency and competitiveness. Hindalco aims to empower its workforce to contribute to its digital success by fostering a continuous learning and innovation culture.

Benefits

Birla Copper scores over its competitors by specific unique capabilities/features

- Ability to cater to different needs of the customers
- Generating new markets for our core products through line extensions
- Greater integration of Processes and procedures for Quality Productions.
- Collaboration with customers for process and product improvement.

- More efficient & integrated supply chain- Captive Jetty
- Focusing on employees for cultural transformation through the initiative called “Tamrodaya”, which enables enhanced service benefits to all stakeholders

By introducing new products, we are venturing into a new market segment, and the railway sector will exclusively handle 100% of the importation of these products. This initiative aligns with the vision of Atmanirbhar Bharat, promoting self-reliance and indigenous production. This expansion is projected to increase our revenue potential by 25%, tapping into a previously underserved market and positioning us as a critical player in the rail industry.

The Future

Hindalco’s digital journey is a strategic imperative that positions the company for sustained growth and success in the digital age. By embracing advanced technologies, fostering innovation, and prioritizing sustainability, Hindalco will transform its operations and create value for its customers, employees, and stakeholders.

Integrating digital technologies with existing legacy systems is complex. Hindalco will continue to address this challenge by adopting a phased approach, gradually modernising its IT infrastructure while ensuring minimal disruption to ongoing operations.

Ensuring the security and privacy of sensitive data is paramount. Hindalco will implement robust cybersecurity measures, including encryption, access controls, and regular audits, to safeguard data against cyber threats.

Hindalco invests in training and development to upskill employees and attract digital talent for its ongoing digital transformation. This transformation enhances operational efficiency and drives innovation, sustainability, and customer satisfaction.



Hindalco Specialty Alumina Business – Belagavi Works



About the Company

Belagavi works, an integrated specialty Alumina plant having its own refinery to produce specialty Alumina & Hydrate. This facility caters various application segments as well as it provides application & technical support to customers as in when required. Over the years, the plant has expanded its capacity of speciality products with approximately 120 different grades, serving more than 600 customers across 32 countries. In addition to providing technical support to the alumina plants of the Aditya Birla Group on the Bayer process and special products, the R&D centre has been carrying out projects for international clients.

The Innovation

Our domestic market share is 85%. In alignment to our vision of becoming Globally #1 by Profitability Specialty Alumina & Hydrate, innovative customized new product development is a norm in Technically demanding global market with precise quality for application sensitive products.

15 new launches in last two years through research, literature survey application study & precise operational control without incurring substantial additional expenditure. This has catapulted our presence globally & generate volume growth.

Every ton of Alumina generates ~3 ton of red mud. Which is environmental challenge & makes our operation vulnerable. We successfully mitigated this challenge by developing usage of red mud in cement industry solved the age-old problem.

Innovation was extended beyond the new product development to adopt green operations. With a Hybrid power (Wind & Solar), Biomass generated steam & power

Belagavi plant produces specialty alumina products having lowest carbon footprint for global customers.

The Approach

For New Product Development: Extensive Market survey, Literature survey, review of operational practices, precise operational controls, Application studies (Lab & Pilot) insights garnered during participation in various conference & exhibitions across globe.

4"R" approach Reduce/Redesign/Recover/reuse : to explore & execute sustainable red mud management focusing on utilization in Cement plants for higher volume evacuation.

Green energy: Based on geographical conditions, Feed stock availability & Supply chain.

Benefits

Evacuation of red mud is resulting in sustainable life span of Alumina refinery by mitigating the challenge of possible dyke breach. In FY 23 & FY 24 unit clocked with highest ever red mud utilization at 164.4% and 119.3%. Net revenue of Rs 4.25 Cr generated - converting Waste into Wealth & promoting circular economy.

Through New product development and venturing globally we achieved highest ever EBDITA in the business.

The Future

We will continue investing in new products with precision for customized applications. The focus will be on sustainable operations – Carbon neutrality, Water positivity aimed towards becoming Globally #1 by Profitability Specialty Alumina & Hydrate by promoting culture of collaboration, empowerment & mutual respect.

Hindalco Renukoot Refinery



About the Company

Hindalco Renukoot Alumina Refinery is a flagship company of Hindalco Industries Ltd in Aditya Birla Group. Hindalco Industries Ltd is structured into two strategic businesses – Aluminium and Copper and is an Industry Leader in Both. Hindalco is one of India's biggest Aluminium manufacturing company and the world's largest flat-rolled products player and recycler of Aluminium.

Renukoot Alumina Refinery is the oldest refinery of Hindalco industries ltd located at Renukoot. Refinery covers Bayer's Process of refining basic raw materials i.e. Bauxite and Caustic to produce smelter grade Alumina. The Plant was started in 1962 with installed capacity of 40,000 MTPA, which is currently operating at 5,50,000 MTPA with adopting latest technology, inhouse modification and Plant upgradation. The Refinery has constantly reinvented to fulfill the needs of the customer.

The Innovation

For making the Alumina Refinery future ready, we always push boundaries to make plant sustainable and cost competitive. Some of our most innovative works are below:

Innovation 1: Intelligence driven precipitation control to surpass designed liquor productivity by 7% through Machine learning model and unique process strategies. This predictive model utilizing Machine Learning (ML) algorithms, coupled with Bayer process principles to optimize yield in alumina precipitation. This model integrates constraints within each segment of precipitation, ensuring that while optimizing yield, the quality of the resultant alumina remains uncompromised. A transformative

shift towards data-driven precipitation control is anticipated by leveraging the power of ML algorithms to optimize productivity while consistently delivering quality Alumina. This innovative approach not only enhances operational excellence but also underscores the disruptive potential of AI-driven solutions in alumina refining.

Innovation 2: Reduction of overall steam consumption of plant by 12% in last three year by following unique and innovative approach to improve steam economy of Evaporation-3 and Evaporation-4. Renukoot Alumina Refinery is one of the oldest refineries in the world. Being the oldest refinery, various evaporation technologies are installed in Renukoot alumina plant, i.e., Multistage Flash Evaporation, Multistage Falling Film Evaporation and Multistage Rising Film Evaporation. A comprehensive analysis was carried out considering drawbacks in existing system and consequently actionable points were identified for attaining the objective. Methodology adopted was Innovative Process Reengineering, adopting statistical tools, Refinement in process Control, improved operational practices. Which also reflecting in overall energy consumption of plant.

Innovation 3: Achieving complete circularity towards sustainability approach with waste to wealth journey by utilization of 100% red mud generation to Cement industries. Developed total 36 nos of customer for red mud utilization. Developed approx. 5-hectare red mud dumping area to green area by innovative techniques and converted into a beautiful golf course. Achieving Zero Liquid Discharge through Innovative Sustainable Water Management in Alumina Refinery. Over the past five years, these efforts have resulted in a significant reduction in freshwater





consumption by 34 % and a 50% in process effluent through sustainable means. the implementation of various initiatives aimed at reducing river water consumption and effluent load at the complex in Renukoot Alumina has yielded significant impacts

The Approach

The Renukoot Alumina Refinery has continuously pursued technology led excellence through development and deployment of breakthrough technologies. Keeping with its aspiration statement of “making the world Greener, Stronger and Smarter, Renukoot Alumina Refinery undertaken the long-term goal of most safe, sustainable, people oriented and cost competitive. The plant innovation projects being done through FIT (Focus improvement Team, mainly the shop floor team) and MI (Major Initiative) projects, these categories of project are applicable where the problems are known but solution unknown. Different methodologies are adopted for both type of innovative projects approach, FIT follows the standard 7 step problem solving steps i.e. Reason for improvement, current situation, analysis, counter measure, result check, standardization and way forward. Whereas in MI projects follows the 5 step DMAIV approach for innovation work.

Benefits

The development and deployment of an intelligence-driven precipitation control model utilizing machine learning have proven to be a significant advancement in optimizing alumina productivity while maintaining consistent Alumina quality, which resulted in increasing productivity from 73 gpl to 78 gpl on consistent basis. Increase in productivity led to substantial savings in steam and power consumption.

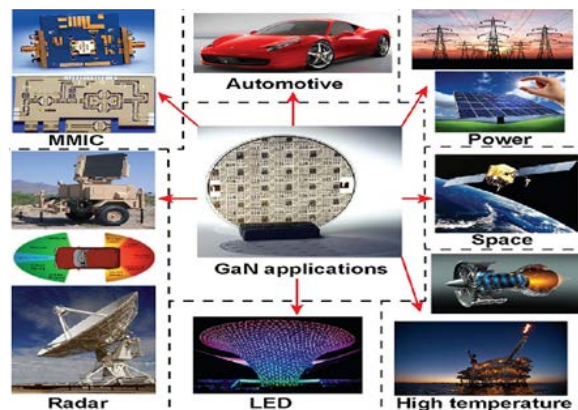
Increasing the steam economy of Evaporation unit impacted in energy efficiency, cost savings, higher throughput and improved process stability. Overall steam economy of evaporation unit increased from 3.0 t/t to 3.8 t/t which majorly impacted the overall steam consumption.

The innovation towards complete circularity resulted in zero waste generation from the plant. Plant start utilizing 100% of its major waste generation (Red Mud). Innovation toward achieving ZLD impacted in substantial savings in fresh river water consumption. The overall water savings achieved approx. 13500 KL/day, resulting in a 34 % reduction in fresh river water consumption on an overall basis including plant as well as colony. These savings not only contribute to sustainable water management but also alleviate the strain on local water resources, promoting environmental stewardship.

The Future

Renukoot Alumina Refinery, in its excellence journey firmly believes in continuous improvement, customer delight and laser-like focus on innovation. To make the future ready, plant is adopting latest technology for caustic recovery by installing deep cone washers in place of conventional washers. Old press filters are replaced with latest technology Diastar filter to produce more purest quality of Alumina.

In customer delight front and listening the voice of customer's customers, Renukoot Alumina refinery is developing the technology to recover gallium from its Bayer liquor. Currently Global gallium market is experiencing robust growth due to its crucial role in electronic substrates, semiconductor and renewable energy sectors. Bayer liquor at Renukoot alumina refinery has significant Gallium content, which after extraction can reduce import of gallium from other countries in India.



Hocco Industries Pvt. Ltd.



About the Company

Hocco Industries Pvt. Ltd. is driven by the belief that ice cream should not only taste great but also create lasting memories. With over 170 SKUs, including cones, sandwiches, tubs, and more, we pride ourselves on constant innovation. Whether it's through new flavours inspired by customer feedback or creative packaging, Hocco is committed to delivering high-quality, delightful products. From reimagining classic ice creams to introducing fresh concepts like the Bix Sandwich and Ball Top Cones, our mission is to elevate the ice cream experience while staying true to our roots.

The Innovation

Our standout innovations—Bix Sandwich Ice Cream and Ball Top Cones—are a testament to our customer-driven approach. Inspired by consumer insights, the Bix Sandwich was created to solve a common issue with traditional ice cream sandwiches: the mess. By using a sponge cake-like bread, we provide a cleaner, more enjoyable eating experience. The Ball Top Cone breaks away from the typical V-shaped cones by introducing a ball-shaped top, adding a unique, playful twist. Both products incorporate premium ingredients like Mahabaleshwar strawberry pulp and high-quality nuts. These innovations not only cater to modern tastes but also offer a superior eating experience that's as fun as it is delicious.

The Approach

Our approach blends tradition with modern insights. We listen closely to customer feedback and use it to guide our product development. By leveraging a strong R&D process and collaboration across teams, we innovate with purpose. Whether through sustainable packaging or creating new flavours, we're committed to maintaining the highest standards of quality and creativity in every product.

Benefits

These innovations have increased customer satisfaction and loyalty, driving significant sales growth. The Bix Sandwich and Ball Top Cones have received overwhelming praise for their fun designs and improved eating experience. Our use of sustainable materials and better ingredients has also enhanced our brand image, making Hocco a trusted name for both indulgence and responsibility.

The Future

Hocco Industries Pvt. Ltd. will continue pushing boundaries with new flavours, innovative formats, and sustainable practices, ensuring we remain at the forefront of the ice cream industry. By embracing technological advancements and listening to consumer feedback, we aim to remain at the forefront of the ice cream industry.



Hyloc Hydrotechnic Pvt. Ltd.



About the Company

Hyloc hydrotechnic Pvt. Ltd located in Belagavi, Karnataka was established in 1974 and engaged in manufacturing of high pressure hydraulic tube fittings, pipe flanges, Hydraulic valves and Diagnostic couplings serving to many industrial sectors.

Apart from Integrated management systems (QMS, EMS and OH&S), we are also TYPE APPROVED supplier for Marine and also certified for ISO/TS 22163 (IRIS).

We have complete infrastructure for manufacturing, which includes series of latest CNC and high productive machines.

Hyloc has in house hot and cold forging facility as well as established fully automatic electro plating plant. Hyloc exports to many countries across the globe.

The Innovation

Due to high market competition, long lead time for manufacturing and assembly, we were unable to cater to the market demand even though the product performance is excellent.

We thought of reducing the cost and lead time by implementing value engineering concept.

We did brainstorming sessions with cross functional team and came up with quite innovative ideas.

We transformed our concepts into drawings and built some prototype samples.

Further these proto samples validated thru different performance tests and successfully passed. Cost analysis was also done and reduced the cost by 30%.

We applied for patent for this new design and

we did receive our first design patent for this valve.



The Approach

Existing design was too old. We started design review of all child parts for its need, quantity and or alternate if any.

We believe in “Quantity of ideas are more important than quality of ideas”

We involved all process owners during this process. Everyone has contributed with their ideas and concepts. Finally we concluded to bring in some major changes in Shut off valve design and consider this as a new design series.

Benefits

New patented design of Shut off valve has some of below benefits, without compromising on its functional and performance requirements.

1. Elimination of TWO child parts.
2. Number of child parts reduced from 11 to 9
3. Improved sealing technology.
4. Reduction in input raw material cost by 30%



5. Reduction in process cycle time by 50%
6. Reduction in product assembly time by 38%

The Future

We continuously strive for operational excellence, by establishing standardized processes and implement the same.

We innovate and promote new solutions and technologies. We learn and grow through challenges.

We are supported by our management and team. Please visit www.hyloc.co.in for detailed information.



About the Company

IBS Software is a global leader in transforming how travel, transportation, and logistics companies operate in the digital world by delivering next-generation products that accelerate growth, drive efficiency, and create differentiated customer experiences through innovation.

With over 25 years of expertise, IBS delivers modular SaaS solutions that automate mission-critical functions for airlines, airports, ground handlers, hotels, cruise lines, and energy companies. Known for our customer-centric approach and strong implementation track record, IBS serves a global clientele of 160+ customers including 14/20-largest airlines, 2/5-largest cruise-lines, 5/15-largest hotel chains, helping them unlock new business models and lead in highly competitive markets.

The Innovation

IBS Software's innovations revolutionize the travel and logistics industry with AI-driven, cloud-native platforms that break down operational silos and enable real-time data sharing across airlines, hotels, logistics companies, and energy sectors. Our solutions optimize resource-allocation, reduce costs, and personalize customer-experiences at scale.

We foster continuous innovation by allocating dedicated budgets for R&D and encouraging employees to collaborate and experiment through hackathons. Our structured process also emphasizes partnerships with industry leaders, academic institutions, and technology pioneers, ensuring we stay at the forefront of advancement.

All our products are full of innovations. Some examples include:

iPartner enhances digital connectivity among airlines, forwarders, and ground-handlers;

iRetail empowers airlines with dynamic-retailing and personalized offers;

ISCP drives supply chain digitalization;

Business Rules Engine boosts efficiency via automation;

iLoyal combats loyalty fraud using machine learning;

iTravel SuperHighway enables seamless land-sea communication, even without internet.

We transform traditional models into data-driven ecosystems, setting a new innovation benchmark.

The Approach

IBS Software's approach centers on customer-centric innovation and strong-partnerships. We collaborate with customers to understand their challenges and deliver tailored solutions. Our culture fosters innovation through continuous improvement initiatives, cross-functional collaboration, and hackathons, encouraging all employees to contribute to strategic goals. Partnerships with industry leaders and academia ensure we stay ahead of emerging trends. Our modular, cloud-native platforms, powered by AI and data analytics, help businesses automate operations, unlock new revenue streams, and drive growth.

Benefits

IBS Software delivers transformative benefits across the travel ecosystem. Our





solutions enhance operational efficiency, drive cost savings, and enable data-driven decision-making. By leveraging automation and AI, businesses can optimize critical processes from flight operations to customer engagement, boosting productivity. Additionally, our platforms unlock new revenue streams and facilitate personalized customer experiences. This blend of technological innovation and industry expertise empowers our customers to improve current operations and future-proof their business models for long-term growth.

The Future

IBS Software aims to empower customers to be agile and nimble, helping them anticipate traveller needs and enhance experiences through innovation. We equip our customers to create personalized, memorable journeys, enabling them to stay ahead of their competition in an increasingly experiential travel landscape where customer expectations continue to evolve.



Indian Immunologicals Limited



About the Company

Indian Immunologicals Limited (IIL), Hyderabad, a wholly owned subsidiary of the National Dairy Development Board (NDDB), Anand, Gujarat, is a ONE HEALTH vaccine manufacturing company. IIL supplies paediatric vaccines to the Government of India under the Universal Immunization Program (UIP) and Anti-Rabies vaccine to various State Governments. Similarly, IIL also supplies Foot & Mouth Disease (FMD) Vaccine and several other animal health vaccines for sustainable livestock health besides improving the milk productivity of India. IIL is the only vaccine manufacturer in India that produces vaccines for Companion Animal Health.

Other focus areas of IIL are Aqua and Feline vaccines.

The Innovation

Hepatitis A caused acute hepatitis, is transmitted mostly through exposure to contaminated food or water, or through personal contact with an infected person. WHO estimates that worldwide, hepatitis A caused approximately 11000 deaths in 2015 (accounting for 0.8% of the mortality from viral hepatitis). Available data suggests that HAV is responsible for 10-30% of acute hepatitis and 5-15% of acute liver failure cases in India.

Against this backdrop, IIL developed a cost-effective Inactivated Hepatitis A vaccine 'Havisure' where drug substance and drug product both were developed in-house, which is a notable innovation as it represents one of the few vaccines developed indigenously in India. By producing this vaccine locally, IIL has been able to significantly reduce costs, making the vaccine more affordable and accessible as until now Hepatitis A

vaccine (HAV) is being imported to India is manufactured by multi-national companies.

The Approach

IIL focuses on providing vaccines at affordable prices, whereby complex manufacturing process of drug substance has been standardized to achieve better yield while meeting all regulatory quality parameters. As IIL manufactures both drug substance and drug product on its own, it has better control on manufacturing cost, quality and availability of vaccine. By controlling the cost of the HAV, IIL has enabled broader access in low- and middle-income regions, where Hepatitis A is endemic.

Benefits

Countries with improving socioeconomic status may rapidly move from high to intermediate HAV endemicity, rendering a larger proportion of the adolescent and/ or young adult population susceptible to HAV infection. Cost and feasibility are considered as major barriers to introducing Hepatitis A vaccine. India and other developing countries, where poor sanitation and unsafe water can facilitate the transmission of Hepatitis A, IIL's innovation in providing a low-cost vaccine directly addresses an urgent public health need.

The Future

Addressing the issues related to various diseases of zoonotic origin, IIL is working constantly on various vaccine candidates that are endemic currently e.g., ZIKA Virus, Kyasanor Forest Disease (KFD) etc., Pain free delivery mechanisms and reduced vaccination cycles are other focus areas for IIL.



About the Company

Integra Software Services is a trusted partner in Business Process Management (BPM), Technology Products & Services for leading organizations worldwide. Integra helps organizations reinvent business operations through intelligent content solutions, leveraging AI/ML and NLP to build future-ready capabilities. From transforming business processes to delivering superior end-user experience, we provide proactive technology solutions anchored by deep industry expertise.

For over 30 years, Integra has been empowering customers of all sizes, including Fortune 1000 companies and global multinationals. With over 2300 talented professionals, Integra operates from four delivery centers across India, UK and US.

The Innovation

Quixl is a no-code/low-code GenAI development platform that revolutionizes AI implementation through a fully hosted SaaS model. This innovative platform accelerates AI development from months to just 3-6 weeks, featuring a comprehensive No-Code Agent Builder with pre-built modules and reusable templates. The platform integrates a sophisticated Prompt Studio offering access to over 10 leading large language models (LLMs) and advanced prompt-engineering techniques.

Quixl's robust architecture includes an efficient data pipeline supporting various data sources, a secure API gateway for seamless integration, and a self-service AI portal for comprehensive management. The platform supports major AI services including OpenAI, Azure AI, Google

AI, and Anthropic Claude, enabling custom model integration and leveraging cutting-edge AI technologies.

Through its user-friendly interface and powerful capabilities, Quixl democratizes access to advanced AI capabilities while maintaining enterprise-grade security and scalability.

The Approach

Quixl adopts a comprehensive approach combining no-code simplicity with low-code flexibility. The platform integrates pre-built modules, customizable code snippets, and ready-to-deploy templates to enable rapid development.

Through its intuitive interface, organizations can leverage advanced AI capabilities, RAG implementation, and efficient data processing systems. The platform's self-service portal ensures easy management and monitoring while maintaining robust security protocols.

Benefits

Quixl delivers significant operational and financial advantages,

- reducing development time-to-market by up to 50% and decreasing development costs by up to 40%
- streamlines data integration, cutting data preparation time by 30%
- additional benefits include rapid prototyping capabilities, enterprise-wide multi-agent AI implementation, and centralized control of AI applications

The cost-effective solution minimizes entry barriers, making advanced AI capabilities accessible to organizations of all sizes.

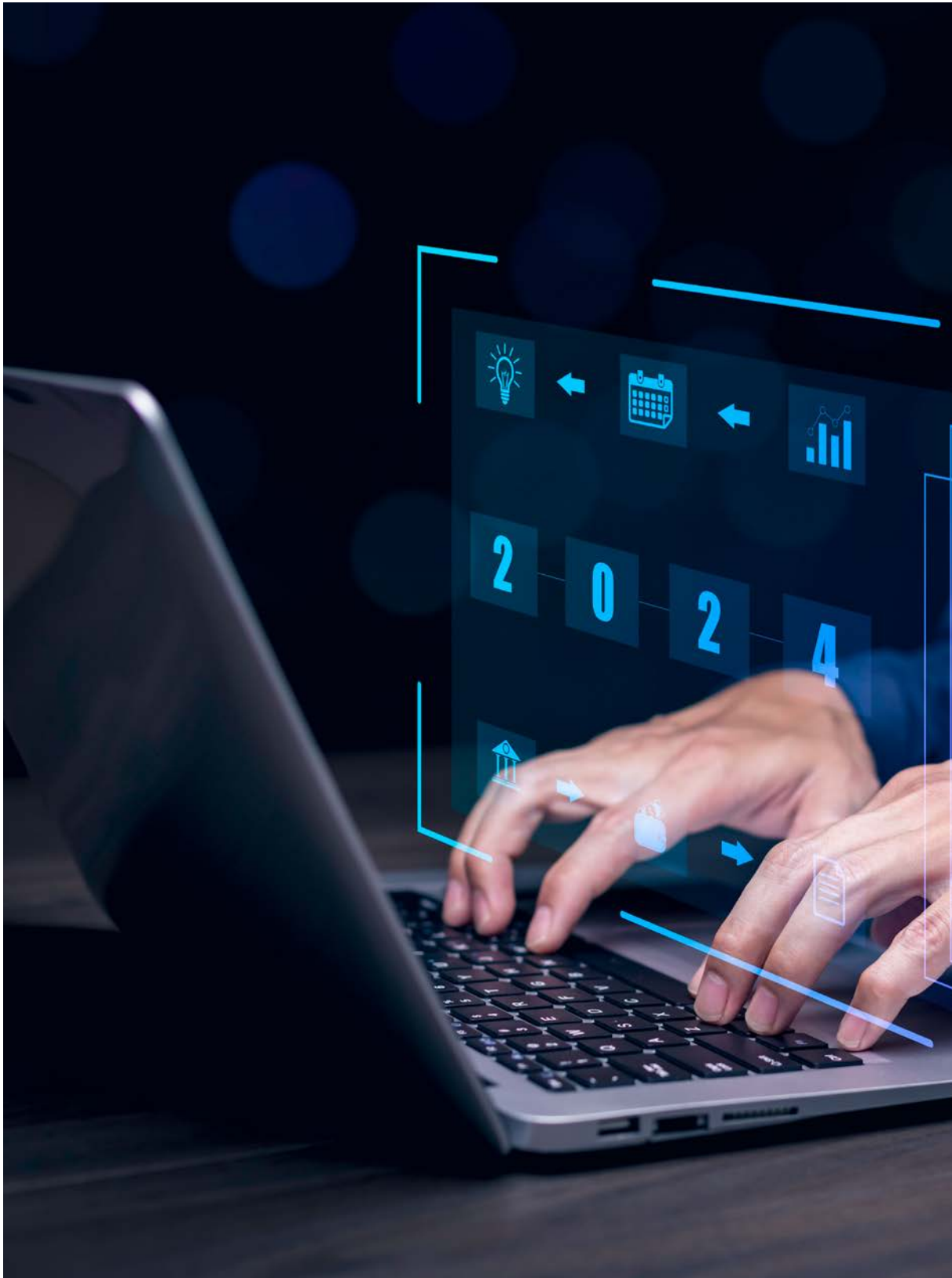




The Future

Quixl is positioned to lead the democratization of AI development, continuously expanding its capabilities and integrations. The platform

will evolve to incorporate emerging AI technologies, enhance automation features, and further simplify AI implementation, enabling organizations to stay competitive in the rapidly advancing AI landscape.



IRIS Business Services Ltd



About the Company

IRIS, a BSE-NSE listed company, is a technology firm that offers RegTech, SupTech, TaxTech, and DataTech solutions to regulators and enterprises worldwide. We support over 30 regulators and more than 6,000 enterprises across more than 54 countries. Established in 2000, IRIS delivers innovative technology solutions that leverage open data standards to simplify supervisory and regulatory reporting and foster trust and transparency within the financial ecosystem.

An authorized GST Suvidha Provider (GSP), a govt-recognized Invoice Registration Portal (IRP) in India and member of several XBRL jurisdictions IRIS is headquartered in Mumbai, with subsidiaries in the USA, Singapore, Malaysia, Italy, and an affiliate in the UAE.

Recognised for its technological innovations, IRIS has received multiple accolades including Best RegTech (Central Banking, 2024), SaaS Customer Success (APPEALIE SaaS 2023), Best Fintech (FE 2022), Best MSME Tech (Jagran 2022) and Best Taxtech – TIOI (Jury-2022, Silver-2021) Awards.

The Innovation

As regulations evolve and grow more intricate, businesses encounter significant challenges in maintaining compliance, resulting in elevated costs and resource allocation issues. Meanwhile, supervisory bodies require effective tools to manage vast amounts of data swiftly, facilitating early detection of anomalies and timely corrective actions.

IRIS addresses these challenges through innovative regtech solutions that automate compliance processes, leveraging cutting-edge technologies such as AI and ML and

open data standards like XBRL, SDMX for enhanced data analysis, faster evaluations, and informed decision-making. Additionally, IRIS SupTech solutions equip regulators with sophisticated tools for improved oversight, enabling real-time data collection and analysis to identify potential risks before they escalate.

IRIS Innovations in Suptech:

- Central banking implementations in several countries including Nepal, Bhutan, and India, transforming how governments collect and use financial data.
- Award-winning Centralised Information Management System (CIMS) implemented for the Reserve Bank of India that enables banks to automate report submissions at the same time lets RBI users to access and analyze data through reports, dashboards, and query facilities
- Bayanat another award-winning analytical portal built by IRIS for Financial Services Authority, Oman provides easy access of both financial and non-financial information of public joint stock companies and investment funds to users

IRIS Innovation in Regtech+Tax Tech+Data Tech

- A GST solution that scans millions of invoices in minutes, saving millions in taxes
- A litigation management solution that auto-reads GST notices and provides contextual summaries and insights
- IRIS Peridot with over 1 million users is country's first app that scans invoice bills to depict tax compliance
- A DM solution that auto-tags disclosure data with near 100% accuracy saving hours of preparation time





- An e-Invoice Registration Portal equivalent to government portal, used by businesses across the nation to generate e-invoices and by software companies to build innovative solutions

At its core, IRIS aims to automate regulatory and supervisory technology ensuring faster, more accurate, and reliable data availability for better decision-making.

The Approach

At IRIS, we are committed to building trust and transparency within the financial ecosystem by leveraging open data standards such as XBRL and SDMX, alongside cutting-edge technologies like artificial intelligence (AI), machine learning (ML), and large language models (LLMs). Our approach to innovation is guided by the Three Cs: Creativity, Collaboration, and Continuous Improvement.

We have established a Tech Council that meets bi-weekly to explore innovative ideas for simplifying regtech and suptech, providing clean, democratized data that enhances decision-making. Collaboration drives our process, with diverse teams working together to develop solutions that bring speed, efficiency and data integrity. With a strong customer-centric focus we refine every proof of concept before market release to ensure alignment with client needs.

Benefits

Organisations worldwide - regulators and enterprises alike - benefit from IRIS's

solutions by streamlining compliance through automated regulatory processes, reducing manual efforts and data duplication by up to 40%, and minimizing the risk of human error.

- With the above innovation and incorporating data standards like XBRL, businesses achieve enhanced data accuracy, transparency, and reduced operational costs, leading to greater efficiency and informed decision-making.
- Using advanced technologies such as AI, cloud computing, and encryption techniques enhances security with higher efficiency,
- Real-time monitoring capabilities and expert support help organizations remain compliant with evolving regulatory environments, allowing them to focus on their core operations.

The Future

IRIS envisions a safe, transparent, and responsible financial ecosystem powered by clean, democratized data. It aims to expand its global leadership in core areas by adapting to newer and innovative technologies leading to advanced automation and analytics. By leveraging open data standards like XBRL and SDMX IRIS will enable businesses, governments, and regulators to make faster, more accurate decisions in an increasingly data-driven world.



About the Company

Ishan Technologies is a leading ICT player, with over 20 years of proven industry experience. We offer a diverse range of services, including Internet Service Provider (ISP) and System Integration (SI) capabilities. Our presence spans 100+ locations across India. Our solutions are built on four core pillars—Network Services, System Integration, Data Center and Cloud Services, and Cybersecurity Services. As a CMMI Level 3 appraised organisation, we prioritise innovation, customer satisfaction, and operational excellence to empower businesses to thrive in a connected world.

The Innovation

Innovation is at the heart of Ishan Technologies. Our pioneering solutions include the first Single Vendor SASE in India, integrating ISP services with security and networking into a unified cloud platform. We've also developed Adaptable FSOC, which brings reliable, high-speed internet to both urban and rural areas without extensive infrastructure. Our Ishan CXConnect platform combines omnichannel support with cloud-based communication for enhanced customer interactions. Each of these innovations is designed to address real-world challenges such as customer service, network complexity, security risks, and connectivity in hard-to-reach locations, ensuring businesses can operate securely and efficiently across all environments.

The Approach

Our approach to innovation is customer-centric and driven by co-creation. We follow an agile and collaborative environment where cross-functional teams—from sales to engineering—work together to deliver tailored solutions. By empowering leaders to make decisions based on project needs and leveraging continuous feedback loops, we ensure our solutions are always aligned with our customers' evolving requirements.

Benefits

Ishan Technologies' solutions enhance operational efficiency, improve security, and reduce costs. Our Single Vendor SASE provides a seamless, secure network with Zero Trust principles, while our FSOC technology ensures reliable connectivity in challenging locations. Ishan CXConnect optimizes customer interactions with cloud-based scalability, reducing operational overhead and improving customer satisfaction.

The Future

Ishan Technologies is committed to advancing connectivity and digital transformation by leveraging innovations like Single Vendor SASE, Ishan DC-1, and CXConnect. Our strategic focus on growth, market expansion, and customer satisfaction with our company vision are aligned to deliver cutting-edge solutions, particularly in underserved areas, and solutions to improve customer experience.



About the Company

JAMIPOL Limited, a joint venture between Tata Steel, SKW, and Tai Industries, was established in 1998 to manufacture and supply Desulphurization Compounds. Over time, the company has evolved into a Total DS solution provider, diversifying into Deoxidization, Dephosphorization, and Metallurgical Cored Wire. JAMIPOL's vision is to cater to 50% of India's steel production and generate 25% revenue from new products and services. With a mission to create value through innovative solutions to meet customers' changing requirements by becoming "Technology Leader" through extensive R&D to achieve sustainable growth, the company aims to become a technology leader through extensive R&D, driving sustainable growth. JAMIPOL has secured 20 patents and 15 trademarks, with 36 patents under evaluation.

The Innovation

AN APPARATUS AND A METHOD FOR TREATING A LIQUID METAL (Nano Desulphurization (DS) Technology) : JAMIPOL has developed a revolutionary Nano Desulphurization (DS) Technology, enabling steel plants to produce high-quality steel. The innovative DS station, also known as the Nano DS Station, offers a cost-effective solution, with a 60% reduction in setup time and cost compared to traditional stations. Additionally, it requires only one-third of the space. JAMIPOL offers these stations on a build, own, operate, and maintain basis, allowing customers to focus on steelmaking and gain a competitive edge. The Nano Station comes in fixed and mobile variants, catering to integrated steelmakers and induction furnace-based steel companies, respectively. This

innovation has been patented, with the patent granted in February 2023.

In last 2-3 years, along with Nano DS Technology, Innovative products for different business segment have been developed which have the potential to disrupt existing products/services

- Desulphurization New Products - 4 no.
- Deoxidation New Products - 4 no.
- Cored Wire -2 no to improve yield 20-30%

The Approach

JAMIPOL drives innovation through a multi-faceted approach, including freedom to fail, experimentation, brainstorming, capability building, joint projects with customers and vendors, consulting external experts, and leveraging digital technologies. The organization also utilizes hackathons, open innovation, and pitch days to foster innovation. A reward and recognition platform creates a positive environment, encouraging employees to drive growth and improvement. This comprehensive strategy enables JAMIPOL to stay competitive and innovative in the industry.

Benefits

The Nano DS station is designed to save space, with a 60% reduction in CAPEX cost and setup time compared to traditional stations, making it more affordable for customers. The innovative Nano DS technology allows small steel manufacturers to produce high-quality steel by reducing Sulphur and Phosphorus levels using JAMIPOL's innovative reagent, leading to increased revenue and profitability. This

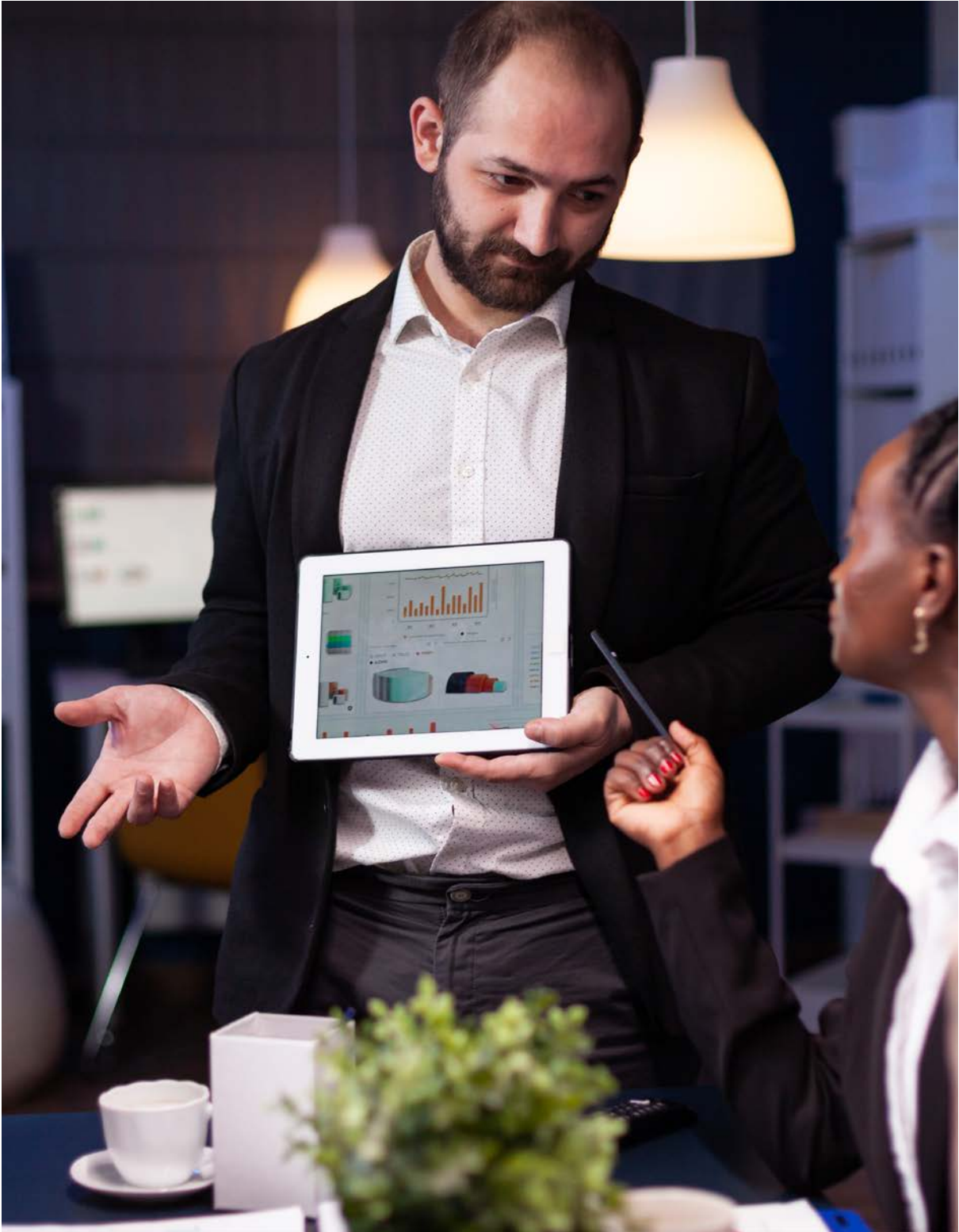


advancement will support India's goal of producing 300 million tons of steel by 2030 and contribute to the growth of the Indian economy.

The Future

The introduction of a Total Desulphurization/

Hot metal treatment solution is expected to boost the company's annual turnover by up to Rs.280 Crores. This strategic shift transforms the company from a DS Compound supplier to a comprehensive solution provider for desulphurization and hot metal treatment, driving significant revenue growth.



Kanchan Metals Private Limited



About the Company

Kanchan Metals Pvt Ltd is a leading name in the food processing machinery industry, offering world-class solutions tailored to diverse food segments. With a strong focus on innovation and quality, we provide cutting-edge equipment that enhances productivity and efficiency. Our commitment to excellence, customer satisfaction, and fostering long-term partnerships sets us apart as a trusted partner in the industry. Established in 1984, we boast a rich history of understanding the evolving needs of the food processing industry. We've built a strong reputation for durability, reliability, and exceptional customer service.

The Innovation

From automation to energy efficiency, our solutions are designed to meet the evolving needs of manufacturers. We develop innovative solutions with a strong focus on sustainability, ensuring our offerings drive progress while minimizing environmental impact. We offer customized solutions tailored to meet the unique needs of our customers, ensuring 100% import substitution with high-quality, locally manufactured products. Our commitment is to provide innovative and reliable alternatives that match global standards, empowering businesses with cost-effective and efficient solutions without the dependency on imported equipment. We understand the importance of food safety, and our machines are designed with hygiene in mind, minimizing contamination risks. We use only the best materials and stringent quality control processes to ensure our machines meet the highest standards. Our state-of-the-art system revolutionizes products are ensuring superior efficiency and consistency. It offers a modern alternative to traditional Methods to compete processing methods, streamlining operations and delivering

exceptional results.

The Approach

Our customer-centric approach focuses on understanding client needs, delivering customized solutions, and providing exceptional after-sales support. Our mission is to be your trusted partner in every step of your food processing journey. We collaborate closely with our clients to understand their unique needs and provide customized equipment solutions that enhance efficiency, productivity, and profitability. We're a passionate team dedicated to empowering food producers with innovative, high-quality equipment that streamlines processes and elevates your bottom line.

Benefits

Our Continuous Namkeen Blending/Mixing System innovative system offers continuous blending and mixing for namkeen production, enhancing efficiency and consistency while challenging traditional batch processing methods. Hydro chiller system yielded improvements in efficiency and productivity of onward process. Our Dryer and Candy Blending was approved by their global engineering team and has provided more than 5 times saving in capital cost to the nearest competitors.

The Future

Our automation technologies promise to redefine manufacturing processes, ensuring higher efficiency, precision, and scalability. Our systems will enable real-time monitoring, predictive maintenance, significantly reducing downtime, wastage, sustainability, and operational transparency. Automated machinery will streamline production, from ingredient handling to packaging, while maintaining consistent quality.



Kent Intelligent Transportation Systems (India) Pvt. Ltd.



About the Company

In the bustling landscape of India's transportation infrastructure, KENT Intelligent Transportation system has always been a pioneering force, bringing innovation to the forefront with its Advanced Traffic Management System, Automated Toll Collection System, and the Parking Management system. With a mission to streamline and modernize the country's toll collection process, KENT ITS has played a pivotal role in enhancing the efficiency and convenience of toll plazas across India.

KENT ITS offers a centralized management system that provides real-time monitoring of toll collection operations. With a customer support team working 24X7 our system facilitates immediate issue resolution, fraud prevention, and data-driven decision-making for toll plaza operators.

By revolutionizing toll collection operations, the company has not only improved the efficiency of toll plazas but also enhanced the overall travel experience for millions of commuters. As India continues to invest in its infrastructure, KENT ITS stands as a shining example of how technology can be leveraged to bring positive change to the nation's highways.

The Innovation

Recognizing the challenges faced by commuters and toll operators alike, the company set out to develop cutting-edge solutions that would simplify the process while enhancing revenue collection and security. In line with this KENT has introduced TL_Booster to perform Vehicle Queue Management smoothly. It is designed for use at the Toll Plazas for vehicle detection, tailgating,

vehicle separation and to identify vehicle directions to perform toll operation quickly and seamlessly. The TL Booster incorporates a Laser Technology and is intended to handle high speed vehicle traffic.

The product is installed at the entry point of a Toll Lane and the RFID Tag reader is shifted behind the pay axis by about 10-15 metres depending upon the space available. The two highly efficient incorporated laser sensors detect the vehicle entry with its respective direction and triggers the RFID Tag reader. The reader in response Validates the Vehicle Tag and puts the vehicle in queue upon successful validation and allow the commuter to exit the lane without any waiting time at the Toll Booth. This avoids congestions of the traffic on the highway and pollution at the Toll Plaza.

Currently the FasTag penetration in India across the National Highways is close to 98%; so in turn, 98% vehicles pass the Toll Plaza without stopping, and 2% vehicles are stopped for enforcement.

The product is in operation at the multiple locations like Rajiv Gandhi Sea Link, Mumbai Pune Expressway, Atal Setu in Mumbai, etc. and has increased the efficiency of the Toll Plaza by almost 3 times. The TL Booster has reduced the carbon footprint for the country and saved the precious time of the commuters. It also helps to reduce installation and maintenance overheads.

The Approach

Our customer-centric approach focuses on understanding client needs, delivering customized solutions, and providing exceptional after-sales support. Our mission is to be your trusted partner in every step of





your food processing journey. We collaborate closely with our clients to understand their unique needs and provide customized equipment solutions that enhance efficiency, productivity, and profitability. We're a passionate team dedicated to empowering food producers with innovative, high-quality equipment that streamlines processes and elevates your bottom line.

Benefits

Our Innovation has offered us a multitude of benefits across various dimensions of the organization and the broader market.

The innovation has granted us a Patent setting us apart from our competitors.

The new features of the product and the improved services has led to higher customer satisfaction and loyalty. The required manpower at the toll plaza had also reduced to almost 50%. We have built the trust and

credibility of our customers by offering them effective solutions to their problems.

The innovation has driven motivation among our employees for improvements in enhancing knowledge sharing & overall quality of life towards community development.

The Future

Kent -ITS will be focusing with innovations aimed at reducing carbon footprints and promoting circular economies for sustainability offering eco-friendly solutions.

At Kent, the future of innovation will be characterized by a convergence of technologies, a focus on sustainability and ethics, and an emphasis on collaboration and human-centric design.

We are committed to Continuous Learning and Adaptability of new technologies to address our customer preferences with greater accuracy.



Kone Elevator India Private Limited



About the Company

At KONE, our purpose is to shape the future of cities. As a global leader in the elevator and escalator industry, KONE provides elevators, escalators, and automatic building doors, as well as solutions for maintenance and modernization to add value to buildings throughout their life cycle. Through more effective People Flow®, we make people's journeys safe, convenient, and reliable, in taller, smarter buildings. In 2023, KONE had annual sales of EUR 11 billion, and at the end of the year over 60,000 employees.

KONE India serves customers all over the country through its 50+ branches and provides sustainable People Flow™ solutions. KONE's production unit in Chennai produces elevators and escalators for the Indian market as well as for export. KONE's global technology and engineering center in Chennai, is one of the largest global R&D centers, which supports the latest technology and development of future solutions.

The Innovation

Kone was awarded 8 times, the world's most innovative companies by FORBES magazine and is the only elevator & escalator company to be featured in it. At KONE, with our strong R&D we hold more than 3,000 patents across our businesses.

Few examples of KONE's breakthrough innovations:

KONE ECODISC® MOTOR

The KONE Eco Disc hoisting motor is the heart of KONE's elevator solution. The machinery was completely renewed in 2012 providing several advantages. The new innovative copper winding system reduces the amount of energy lost as heat, making KONE elevators

even more energy efficient than before. The compact design eliminates the need for machine room in the building, thereby saving construction time and space. This innovation not only changed the elevator industry but also impacted the construction industry.

KONE ULTRAROPÉ®

KONE Ultra Rope®, sets a new benchmark for high-rise buildings. The super-light KONE Ultra Rope technology provides unrivalled elevator eco-efficiency, reliability, and durability, while also improving elevator performance. It eliminates the disadvantages of existing steel ropes – high energy consumption, rope stretch, large moving masses, and downtime caused by building sway. KONE Ultra Rope can enable future elevator travel heights up to 1,000 meters.

KONE DX CLASS ELEVATORS

KONE DX Class elevators, the world's first elevator series with built-in digital connectivity. KONE DX Class elevators bring a new user experience to life through a combination of design, technology, new materials, applications, and services.

REMOTE MONITORING - PROBLEM MANAGEMENT USING MACHINE LEARNING

Problem Management using Machine Learning outlines a comprehensive approach to improve incident management. It can automate the classification and resolution of incidents. This will streamline processes, eliminate repetitive tasks, and enable the team to focus on more strategic activities.

INTEGRATED MAINTENANCE MANAGEMENT USING SERVICE API

KONE Integration as a Service API represents a groundbreaking solution for the elevator maintenance and facility management



sector. Integration as a service focuses on providing seamless, scalable, and intelligent API solutions to revolutionize elevator maintenance.

The Approach

DX Class Elevator

We have adopted customer centric approach to conceptualize, design, and build the DX solution. Our approach with the new technologies like Application Programming Interface (APIs) enabled an adaptable solution to the changing building needs by integrating different smart systems in a building space providing a Seamless People Flow Experience for the users.

Remote Monitoring - Problem Management using Machine Learning

Objective is to use text analysis and visualization tools on incident data to identify patterns and trends. This approach aims to enhance the efficiency and effectiveness of problem management by leveraging advanced technologies.

Integrated Maintenance Management using Service API

This involves developing an API to create callout service orders in the KONE system, reducing manual administrative efforts in reactive processes. The goal is to enhance operational efficiency and customer satisfaction by automating the transfer of information between customer and KONE systems.

Benefits

DX Class Elevator

For buildings that aspire to be intelligent, KONE DX Class elevator provides:

- Customers to activate digital services easily and remotely when they need to, like KONE 24/7 Connected Services, Elevator remote call, Media screens etc.
- Secure APIs for third-party solutions, which create new possibilities to integrate with service providers like robotic systems, access control, visitor management systems and other building applications to

bring new levels of sophistication to the people flow experience.

Remote Monitoring - Problem Management using Machine Learning

- Reduced manual efforts and downtime: Reduced manual efforts and downtime through the integration of machine learning into problem management processes.
- Proactive Incident Resolution: Predicting system failures and guiding preventative maintenance to reduce the likelihood of incident.

Integrated Maintenance Management using Service API

- Enhanced operational efficiency and improved customer satisfaction: By automating the transfer of information between customer and KONE systems, the API reduces manual administrative efforts and ensures a better user experience.
- Real-time data publishing and streamlined work order creation: The KONE API publishes data to customer application and back forth. This ensures that customers have access to up-to-date information and reduced chances of missed SLAs from KONE side as well.

The Future

DX Class Elevator

At KONE, we are merging the technologies of tomorrow with the buildings of today thereby future proofing it.

Remote Monitoring - Problem Management using Machine Learning

Adoption of machine learning will not only reduce incident response times but also enhance overall productivity and service quality, providing significant long-term value.

Integrated Maintenance Management using Service API

It demonstrates KONE's commitment to innovation in the elevator and building maintenance sector, aiming to drive efficiency, sustainability, and competitiveness in the global market.

KPI Green Energy Limited



About the Company

KPI Green Energy Limited, a key division of the KP Group, specializes in solar and hybrid power generation. Established in February 2008 and based in Gujarat, the company leads the renewable energy sector with innovative and sustainable solutions. Operating under the brand name 'Solarism,' KPI Green develops, constructs, owns, operates, and maintains solar and hybrid power plants. It serves as an Independent Power Producer (IPP) and a service provider for Captive Power Producers (CPP), offering comprehensive end-to-end energy solutions. With a steadfast commitment to clean energy, KPI Green plays a pivotal role in India's transition toward sustainable power.

The Innovation

Solar Panel Cleaning Robots:

Solar Panel Cleaning Robots: These smart autonomous solar panel cleaning robots are more efficient and effective as compared to the traditional manual method of cleaning. It is 22x faster (2400 modules/hour/robot), consumes 66% less water and reduces the overall cleaning cost by 77%.

These can be controlled and monitored remotely. It is safer as it requires minimum human intervention, minimizing the risk of accidents (specially solar panels installed at heights or at complex locations).

Network Operations Centre:

Our Network Operations Centre (NOC) and Centralized Monitoring System (CMS) revolutionize O&M for solar, wind, and hybrid assets, ensuring longevity, efficiency, and sustainability. Key benefits include real-time

monitoring to prevent failures, predictive maintenance to reduce downtime, and 24/7 operations for continuous support. CMS optimizes resource allocation, enables swift remote troubleshooting, and provides automated reports for data-driven decisions. Insights from CMS drive ongoing improvements, enhancing asset performance and setting benchmarks in renewable energy management.

The Approach

At KP Group, innovation is driven by two core objectives: enhancing the efficiency of existing operations and exploring advanced renewable energy solutions. With sustainability at the forefront, we integrate cutting-edge technologies and adopt progressive strategies to optimize performance and reduce environmental impact. This dual focus ensures that KP Group remains a leader in renewable energy, consistently advancing its capabilities while championing a greener, more sustainable future for the industry.

Benefits

- a) Solar Panel Cleaning Robot:
 - i. Waterless
 - ii. Fast & Hassle free (2400 Modules/Hr/ Robot)
 - iii. Reduced the Cleaning cost by 80%
- b) Network Operations Centre: Designed to optimize solar and wind asset performance. Our advanced operations ensure efficiency, sustainability, and peak performance of renewable energy installations, setting new benchmarks





in asset management and operational excellence.

- i. Reduced the downtime with real-time alerts
- ii. Improved the generation of the plants
- iii. Predictive Maintenance for optimal performance

The Future

Innovation at KP Group focuses on two key objectives: maximizing the efficiency of existing operations and embracing new forms of renewable energy, with sustainability at its core. By integrating cutting-edge technologies and exploring advanced energy solutions, KP Group is shaping a future defined by efficiency, resilience, and environmental responsibility.



L&T Construction: Water & Effluent Treatment IC



About the Company

L&T's Water & Effluent Treatment business is engaged in building comprehensive water management Infrastructure company with capabilities covering Engineering and Design, Procurement, Construction, Operation and Maintenance and caters to the entire business chain. The business has a proven track record of executing a multitude of projects in the areas of water supply, water transmission and distribution, water treatment, desalination, municipal and industrial wastewater network, wastewater treatment, integrated urban utilities, irrigation, canal rehabilitation and riverfront development.

The Water & Effluent Treatment business has been verticalized into two SBGs & one BU:

- Water & Wastewater SBG (Water Supply & Treatment – Rural & Urban, 24x7 Water Management, Wastewater Collection & Treatment, Sludge Management)
- Industrial, Irrigation & Infrastructure SBG (Irrigation, Industrial Water Supply and Treatment, Desalination, Canal Rehabilitation, Riverfront Development, Smart Water Infrastructure)
- Water International BU (Water & Wastewater Supply and Treatment in Middle East, ASEAN & East Africa)

The Innovation

- WATER INFRASTRUCTURE OPTIMIZATION THROUGH INHOUSE GIS SOLUTIONS: Utilizing LiDAR and drone surveys, it cuts surveying time by up to 75%. In irrigation projects, GIS automates chak planning, reducing engineering manhours by 50%. Least Cost Path Analysis (LCPA) optimizes pipeline routing, reducing material costs by 15%. Integration of Zonal statistics tools in GIS ensure optimal outlet placement

and effective water distribution. GIS-based dashboards streamline execution with real-time design and operational data, facilitating informed decision-making. The inhouse GIS application- Gaps Information Monitoring System (GIMS) helps in optimizing resource allocation by increasing the gap identification speed by 40%, minimizing delays. Integrating GIS with BIM enhances asset interaction understanding and lifecycle management, for improved project outcomes.

- DIGITAL TWIN TECHNOLOGY FOR REDUCING NON-REVENUE WATER The innovation in water infrastructure leverages advanced technologies to ensure efficient, reliable, and safe water distribution, it includes:
 - i) AI-based leak detection through Digital Twin technology, which predicts and identifies leaks accurately, reducing water loss.
 - ii) Automated Metering Infrastructure (AMI) and IoT-assisted hydraulic flow control.
 - iii) SCADA systems and Integrated Management Information Systems (IMIS) provide comprehensive control and data analysis capabilities.
 - iv) Technologies like robotic pipeline inspection, endoscopic cameras for contamination control, and jetting machines for cleaning pipelines.
 - v) Geographical Event Management (GEM) and fully automated DMA actuation streamline operations.
 - vi) Collaborative initiatives, such as the India-Denmark Green Strategic Partnership, aim to reduce Non-Revenue Water (NRW) and promote sustainability
- UNIFIED COMMAND CONTROL CENTRE (UCCC) FOR JAL JEEVAN MISSION:



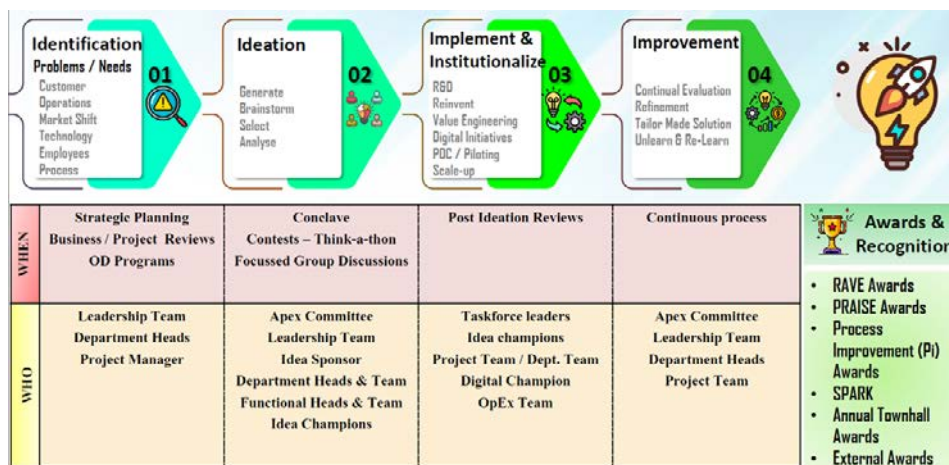


The UP Tubewell Project, part of the Jal Jeevan Mission (JJM), pioneers an advanced automation solution for the efficient monitoring and management of over 3300+ gram panchayats in Uttar Pradesh. By transitioning from GPRS to VSAT communication and integrating RTU-based control systems, the project ensures reliable data transmission and seamless

operation across diverse geographical terrains. Key innovations include the implementation of sensorization for real-time water quality monitoring, solar-powered borewell pumps managed through RTUs, and a centralized Unified Command Control Centre (UCCC) equipped with AI-based analytics for predictive maintenance and optimization.

The Approach

At WET IC, for any innovation, we follow a well-defined approach from understanding the need of innovation till its maturity, following flow explains the same:



Benefits

- WATER INFRASTRUCTURE OPTIMIZATION THROUGH INHOUSE GIS SOLUTIONS
 1. Engineering Hours Saving > 90% for Pipe Routing & > 60% for Chak Planning; Accurate & Aesthetics Layouts; Reducing project timelines.
 2. Enhanced Efficiency for gap identification by 40%
- AI/AM FOR LEAK DETECTION
 1. Solution brings down the NRW/UFW levels to less than 15% in just 4 months' timeline.
 2. Identifies Water leakages, Additional connections and Pipe burst on a real time networks.
 3. NRW Mobile application to manage the intervention tasks (Real loss & Apparent loss)
- UNIFIED COMMAND CONTROL CENTRE FOR JAL JEEVAN MISSION PROJECTS IN UP

1. Real-time monitoring, leading lower operational costs and higher efficiency.
2. Predictive maintenance & reducing downtime.
3. High scalability

The Future

- GIS Solutions leverage cutting-edge geospatial technologies and automation to revolutionize irrigation design and management, ensuring sustainable and efficient water resource utilization.
- The Digital Twin Solution is getting implemented in 663 DMAs (presently in L&T's Scope) across various states and further scalability are quite proven.
- UCCC leverages AI, VSAT, IIoT, and Industry 5.0 for cutting-edge innovation, enabling real-time insights and sustainable groundwater management.



Laurus Labs Limited



About the Company

Founded in 2005, Laurus Labs is a research-driven pharmaceutical and biotechnology company dedicated to improving the quality of life for millions around the world. Laurus has established a global leadership position in the development and manufacturing of select Active Pharmaceutical Ingredients (APIs) & Finished Dosage Form (FDF), including those for anti-retroviral (ARV), oncology (including high-potency APIs), cardiovascular, and gastro therapeutics. This expertise, paired with backward-integration capabilities and rigorous quality standards, has enabled Laurus to build a solid reputation across the pharmaceutical industry for high-quality, innovative products.

Laurus Labs also offers comprehensive Contract Development and Manufacturing Organization (CDMO) services, supporting global innovators from early clinical-phase drug development to large-scale commercial manufacturing. With around 7000 employees, including around 2586 scientists, Laurus Labs operates more than 15 facilities that are approved by top regulatory agencies, such as the USFDA, WHO-Geneva, Japan-PDMA, UK-MHRA, EMA, and TGA. Through its commitment to "Smart and Green" chemistry, Laurus continually invests in sustainable manufacturing technologies to improve efficiency and minimize environmental impact, aligning with its goal to drive both scientific and operational advancements.

The company's commitment to high standards of transparency, integrity, and environmental

stewardship has earned it significant recognition. Laurus generated ₹5,041 crore in revenue in FY2024 and is listed on the Bombay Stock Exchange (BSE) and National Stock Exchange (NSE) in India. Laurus has also consistently ranked as a certified Great Place to Work and holds a "BBB" rating from MSCI ESG Ratings, underscoring its dedication to Environmental, Social, and Governance (ESG) principles and ethical business practices.

In addition to small-molecule expertise, Laurus Labs is advancing its capabilities in biotechnology, large molecules, cell therapies, and gene therapies. This expansion reflects Laurus Labs' commitment to harnessing the power of both chemistry and biotechnology to meet evolving global health needs. Its diverse offerings include human and animal health APIs, intermediates, crop science ingredients, and specialty ingredients for dietary and cosmetic industries, all driven by a deep commitment to patient health and safety.

At Laurus Labs, the guiding principle, "Chemistry for Better Living," reflects the company's passion for making a tangible difference in people's lives. From cutting-edge research to collaborative partnerships, Laurus is dedicated to exploring new possibilities in pharmaceutical and biotechnology innovations. This philosophy motivates the organization to push the boundaries of scientific discovery, consistently advancing in ways that enhance global health and well-being.



About the Company

Lohum stands as India's leading producer and processor of sustainable critical minerals and one of the world's largest outside of China. The company's products include lithium, cobalt, nickel, CAM (India's only NMC CAM manufacturer), across 5 GWh of end-to-end battery recycling capacity. Profitable with a current run rate of US\$ 100 Million, the company is set to grow tenfold over the next three years. Lohum also maximizes battery value through repurposing, building cost-effective second-life applications. The company operates eight facilities in India, with two more in development, and is expanding globally with joint ventures in the UAE and the US.

The Innovation

Lohum's proprietary NEETM® technology recycles and extracts lithium-ion battery materials, producing high-quality critical materials with ZERO waste. This innovative process handles diverse feedstock, including end-of-life batteries, production scrap, black mass, ore concentrates, and waste from industries like petrochemical refining.

The output includes battery-grade metals, salts, cathode precursors, and cathode active materials (NMC, LFP, LMFP). Lohum works with 200+ partners, 1000+ employees including nearly 100 full-time PhDs and researchers and 400+ engineers, to establish ways of attaining a just and sustainable shared future. With 10% of its workforce and 5% of its annual budget committed to R&D at a dedicated 40,000 sq. ft. Innovation Centre hosting 100+ scientists, Lohum has achieved groundbreaking results, becoming the world's

first producer of recycled pure metallic lithium. Industry partners include some of the leading brands in the world - from Mercedes Benz, MG, and Stellantis, to Ola, Tata, Mahindra, Samsung, and insurance players like Kotak; we work with every touchpoint of the cell, battery, and critical minerals manufacturing ecosystem. Given the impact of our work, we have also been nominated to be a part of several working groups under the aegis of various central government bodies including NITI Aayog, Bureau of Indian Standards, among others, where we actively contribute to critical national discussions on India's energy transition, energy security and materials security.

By mid-2024, the company had offset over 126,000 MT of CO₂e and aims to offset 4 Million tonnes of CO₂e by 2026. Lohum's comprehensive R&D spans materials development, chemical process optimization, lithium-ion cell lifecycle analysis, second-life battery solutions, software development, data science, and commodities market analysis for future price predictions.

The Approach

Lohum's vertically integrated approach covers the entire battery and critical material value chain with zero waste, high yield, full chemical separation, and direct recycling for LFP molecule recovery. The company utilizes its own 100% made-in-India equipment and machinery. By seamlessly integrating R&D, quality control, sampling, and commercialization, Lohum accelerates innovations from lab to market with unparalleled efficiency, supported by its celebrated team, refined processes, and cutting-edge technology.



Benefits

Lohum addresses critical material depletion, rising battery waste, and geographical disparities in raw material availability. The company creates a circular ecosystem with safe reverse logistics and transparent refining & recycling processes. Achieving a circular yield of 99.8 critical materials,

Lohum offers comprehensive solutions across the value chain. These include real-time weighted buyback prices for market stability, EV fleet and BESS management, cost-effective second-life batteries, and EV charging stations.

The Future

LOHUM aims to expand globally and scale operations tenfold within three years. The company is developing technologies to process an increasing variety of feedstock, beyond production scrap, industrial waste, mining waste. (Niobium, Samarium, etc.), and other sources (Zirconium, Titanium) Lohum's R&D team is also developing processes for graphite/graphene, platinum group metals, rare earth elements and other critical minerals.



About the Company

Lucas TVS, established in 1962, is a leading provider of mechatronic solutions for automotive, consumer and industrial goods applications, with over 50 years' experience in design, manufacturing and supply of products to OEMs in India and abroad. With a work force of over 6,000 people and state of the art engineering and manufacturing facilities integrating TQM, TPM, 6 sigma and lean manufacturing principles. Lucas TVS has end to product design, development, manufacturing and supply capabilities.

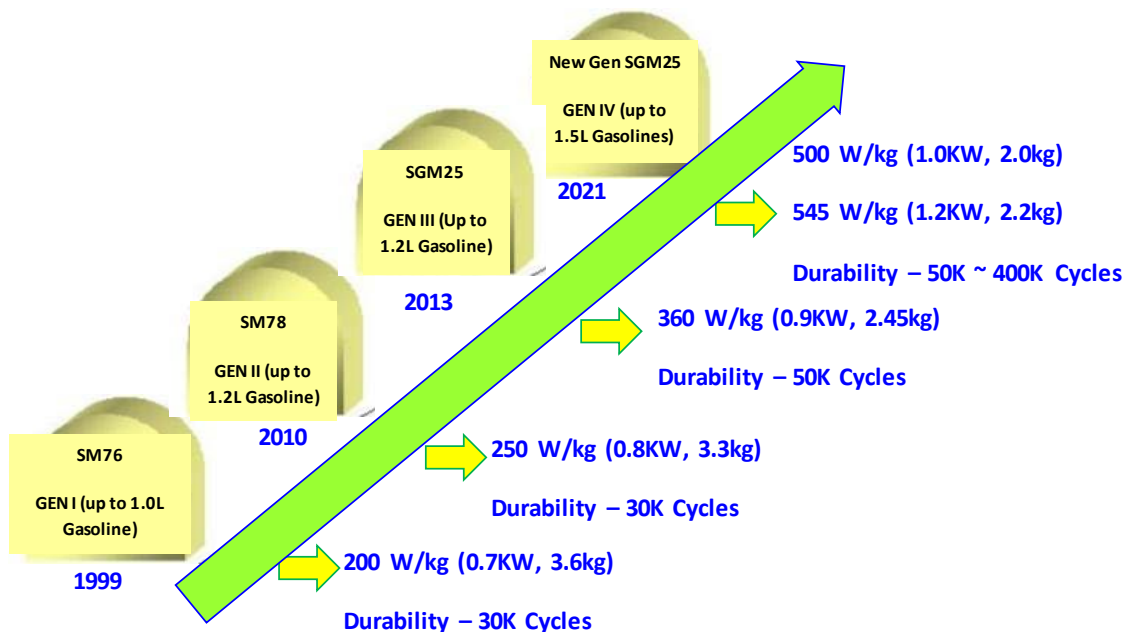
New product development by Engineering Research and Development is the backbone of Lucas TVS to meet customer requirements

for their new vehicle / vehicle upgradation programs. Over 85% of the current sales turnover is realised from products developed by in-house R&D.

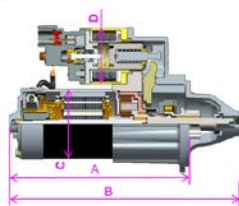
Lucas-TVS has 7 plants in India and a global network with sales and sourcing offices in USA, China, South Korea, Japan and Germany

The Innovation

Pioneering introduction of light weight starter motor and start stop capabilities to emerging passenger car / SUV segment through design and development, supply chain management and establishment of manufacturing capability / Facility ensuring >95% localization to promote "make in India".



New Gen SGM25 comparison

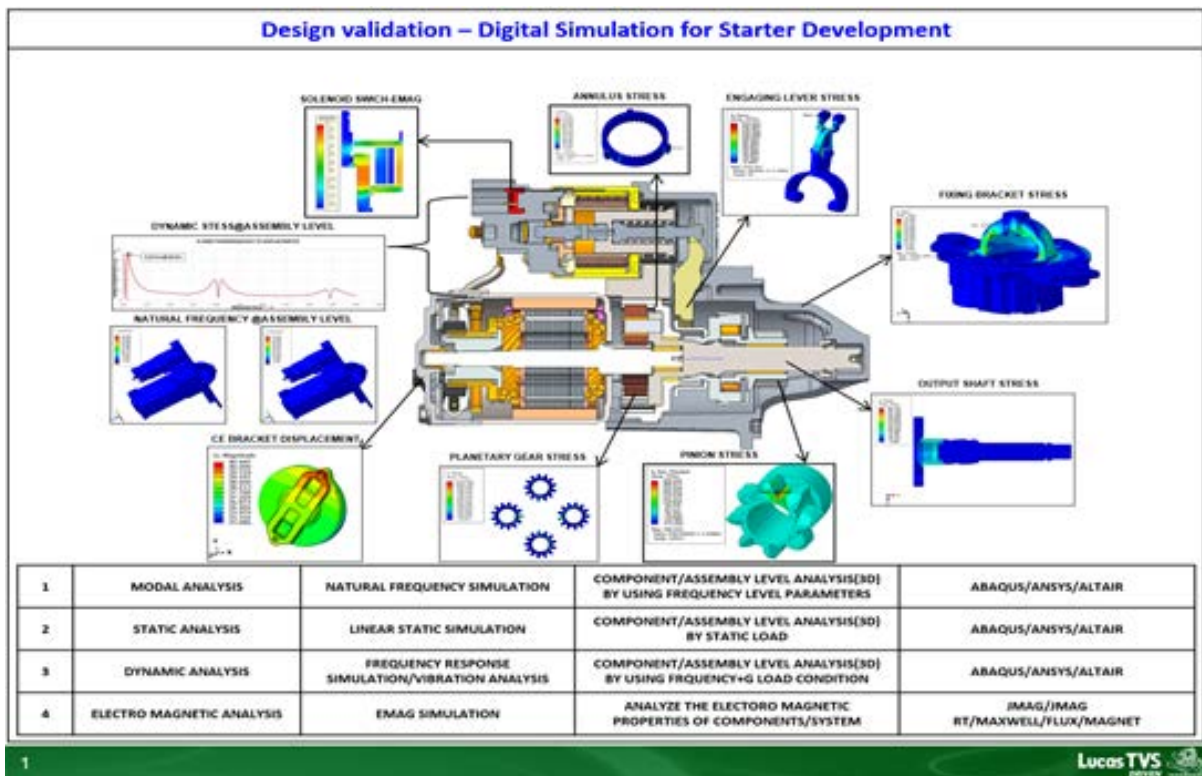


| Parameter | SGM25 | New Gen SGM25 | Remarks |
|-------------------------------------|-------|---------------|-----------|
| Power output - kW | 1.0 | 1.0 | ← |
| Weight - kg | 2.45 | 2.0 | Lighter ↓ |
| Flange to C.E. Bracket end - mm (A) | 155.8 | 139.1 | Shorter ↓ |
| Overall Length - mm (B) | 204.6 | 186 | Shorter ↓ |
| Yoke OD - mm (C) | 60 | 60 | ← |
| Solenoid OD - mm (D) | 50 | 43 | Smaller ↓ |

New Gen SGM25 is 20% Lighter / 10% Shorter

The Approach

- LTVS has a structured innovative process through CFT approach. It results of which are reviewed and monitored by Senior Management.
- Through product tear down analysis and benchmarking, ideas are generated.
- CFT comprises experts in product engineering, process engineering, purchase and quality functions.
- LTVS uses various analysis software for digital validation to optimize the design.





R&D Infrastructure for Validation

R&D INFRASTRUCTURE FOR VALIDATION

Material testing



Atomic Absorption Spectrometer



Carbon - Sulfur Analyzer
(for Chemical composition analysis of materials)



Optical Emission Spectrometer



Differential Scanning Calorimetry
(for Thermal analysis)

Environmental factors Simulation testing



Combined bi-axial vibration and environmental test equipment



3 zone thermal shock chamber



Climatic Chamber



Combined Vibration and Environmental Testing Equipment



NVH Test Lab



Benefits

- Compact in size and lesser weight
- Snout and snoutless type D.E bracket designs to suit varying packaging requirements
- Higher reliability (150K ~ 400K Cycles) – For start-stop applications to achieve required emission norms
- Wider operating Temperature range up to -30°C – to cater to export applications of our customers

- Higher power to weight ratio
- Less Noise – better user experience

The Future

- To develop Change of mind technology feature as part of start-stop solution to enhance end customer experience
- To further enhance the power of Light Duty starter to cater to meeting evolving application requirements including export.



Mahindra & Mahindra Ltd.



About the Company

Founded in 1945, the Mahindra Group is one of the largest and most admired multinational federations of companies with 260,000 employees in over 100 countries. It enjoys a leadership position in farm equipment, utility vehicles, information technology and financial services in India and is the world's largest tractor company by volume. It has a strong presence in renewable energy, agriculture, logistics, hospitality, and real estate.

The Mahindra Group has a clear focus on leading ESG globally, enabling rural prosperity and enhancing urban living, with a goal to drive positive change in the lives of communities and stakeholders to enable them to Rise.

The Innovation



The latest product from Mahindra's stable Thar ROXX – 'THE' SUV, is a category disruptor set to break norms and redefine the SUV landscape in the country. The Thar ROXX is designed and engineered to turn heads and deliver a refined drive and powerful yet safe performance, the Thar ROXX conquers all terrains while offering an array of luxurious features.

Built on Mahindra's All-New M_GLYDE platform, the Thar ROXX delivers an exceptionally smooth ride with crisp handling and class leading dynamics. With standout features such as India's first crawl smart assist, Intelligent turn assist, WATT's Link suspension, advanced shock absorbers with MTV-CL, frequency dependent damping, panoramic Skyroof, advanced Level 2 ADAS, a first-in-category hydraulic rebound stopper, adventure statistics display and Adrenox connectivity with 80+ features, the Thar ROXX redefines the ownership experience, setting new benchmarks in luxury and safety. It effortlessly blends Thar's outdoor DNA with modern sophistication, offering a premium SUV experience that caters to those who demand the finest in every aspect of their lives.



Mahindra Tractors, India's leading tractor brand, showcased its first CBG (Compressed Biogas) powered tractor. By using compressed natural gas, the Mahindra CBG powered tractor represents a significant advancement in tractor technology, reducing pollutants and carbon emissions. Compared to CNG, which is dependent on fossil fuels, compressed biogas is a green, renewable fuel that is sustainable and ensures reduced reliance on fossil fuels. It is produced when biodegradable materials, such as farm food and other waste is broken





down. Mahindra's mono fuel CBG tractor also ensures operational power and performance comparable to conventional diesel tractor technology with the capability of handling farming and haulage tasks, while delivering robust power and performance. The new CBG tractor by Mahindra is based on stringent norms fulfilling all Indian standards. Based on the company's vision towards promoting eco-friendly sustainable technology solutions, CBG tractor technology aims to benefit both the farming community and the environment. Mahindra continues to lead the way in driving positive change within the agricultural sector through the introduction of innovative and sustainable products, having also showcased alternate fuel tractor technologies like a CNG tractor, an LPG tractor and dual-fuel tractor technology over the last few years.

The Approach

Intellectual Property (IP) Policy

At M&M, IP policy is built on 3 pillars – Being vigilant and IP aware; Create, Protect and Enforce our IP; Respecting others' IP. Policies are based on the following principles of ethics, transparency, and accountability:

- To recognize and respect the rights of the people who may be owners of traditional knowledge, and other forms of intellectual property.
- To respect the interests of, and be responsive towards its stakeholders, especially those who are disadvantaged, vulnerable and marginalized.

Team Strength

The Intellectual Property & Knowledge Management is a 20+ strong team supporting both Auto and Farm Sectors of M&M.

Best Practices

- IP check point at every stage gate of product life cycle through appropriate IPR protection & risk mitigation strategies.
- Improving Innovation through Knowledge Management Index,
- Mahindra Inventors Academy – Inventors come forward, share their experiences, best practices, and guide budding engineers become inventors.
- Strong Rewards & Recognition program
- Extensive Partnership with Academia

The Future

Customer Focus - Our Innovation purpose is to drive positive change in the lives of communities, stakeholders and enable them to Rise.

Innovation & Growth Focus - We strive to build an Innovation and growth mindset within the organization by practicing collaboration, agility and boldness.

Future Focus - We are building Born Electric Vehicles which is a game changer in Global Auto Industry. We are democratizing technology for farmers with small land holdings through our lightweight tractors, smart implements & precision farming.



Matrix Comsec Private Limited



About the Company

Established in 1991, Matrix is a leader in Security and Telecom solutions for modern organizations. Matrix offers a comprehensive range of solutions for IP Video Surveillance, Access Control, Time-Attendance, and Telecom applications.

As an innovative, technology-driven, and customer-focused organization, Matrix is committed to keeping pace with the revolutions in the Security and Telecom industries. With around 40% of its human resources dedicated to developing new products, Matrix has launched over 60 cutting-edge products and solutions.

In the domain of video surveillance, Matrix provides solutions such as Video Management Systems, Network Video Recorders, and Network Cameras. Access Control and Time-Attendance solutions include Visitor Management Solutions, Elevator Access Control, Panels, Door Controllers, and Readers. Telecom solutions include Unified Communications, IP-PBX, Universal Media Gateways, VoIP and GSM Gateways, and Communication Endpoints.

The Innovation

Matrix Ruggedized Network Camera was innovated to address critical safety, security, and operational challenges within transportation systems, particularly in the demanding environments of rolling stock and mobile surveillance. With rising incidents of theft and threats to passenger safety, there was a clear need for robust, intelligent surveillance solution capable of withstanding harsh conditions while providing reliable, real-time monitoring.

There was a need to develop a camera that could easily fit into space-constrained areas and endure the constant shocks of trains and buses, which often operate in remote locations with limited network bandwidth, unreliable power, and harsh environmental conditions. Standard IP cameras couldn't handle the dust, moisture, and extreme weather, necessitating a more resilient solution.

As transportation infrastructure evolves, ensuring passenger safety and asset protection has become increasingly complex. Traditional surveillance systems often fail to endure the extreme environments of vehicles, which face constant vibration, temperature fluctuations, and exposure to dust and water. To overcome these limitations, Matrix developed a network camera that meets rigorous standards such as EN50155, ensuring it can withstand the physical demands of mobile deployments.

Furthermore, the growing integration of Intelligent Transport Systems (ITS) called for advanced surveillance technology that goes beyond simple monitoring. Matrix Ruggedized Camera addresses this need by incorporating intelligent features such as video analytics for motion detection, tripwire detection, tamper detection, and intrusion detection, enabling proactive safety measures and improving operational decision-making.

With India's ambitious plans to install surveillance systems across railways and public transportation, Matrix Ruggedized Network Camera is purpose-built to meet these strategic goals. This innovation provides a versatile solution that aligns with both national and international standards, ensuring compatibility and reliability





across diverse transportation networks. By developing a robust surveillance solution, Matrix fulfills the need for resilient security in mobile environments, helping to safeguard passengers, assets, and operational integrity.

The Approach

Matrix Ruggedized Network Camera followed a rigorous, iterative approach to address mobile surveillance challenges. We conducted extensive market research to understand user needs, followed by continuous hardware and software refinement based on feedback. We utilized image stabilization techniques to ensure the camera can withstand shocks and vibrations. The camera underwent continuous testing, leading to an upgrade from IP67 to IP68 for enhanced resilience against dust and moisture. We replaced standard PoE connectors with M12 connectors for improved durability in high-vibration environments. Prioritizing cybersecurity, the camera complies with OWASP ASVS 4.0 L2 norms and is certified by STQC.

Benefits

- **Passenger Safety:** Ensures a secure environment for passengers and assets
- **Continuous Operation:** Designed for reliable performance in extreme conditions with 512GB SD Card slot capabilities for edge Recording
- **Superior Image Quality:** Features 120dB True WDR) to balance lighting and prevent overexposure and underexposure in image.
- **Rugged Construction:** Aluminum die-cast enclosure offers superior durability over plastic alternatives

- **Space-Efficient Design:** Compact size allows installation in tight areas within trains and buses
- **Remote Monitoring:** Enables operators to monitor conditions and incidents in real-time from a distance
- **Regulatory Compliance:** Adheres to BIS, EN50155, NEMA 4X standards, ensuring versatility for deployment across diverse transport systems

The Future

- New AI-based IVAs such as face detection and face recognition, object tracking/classification, and behavior analysis will increase the camera's effectiveness in identifying potential security threats and ensuring passenger safety.
- Development of 5G and satellite communication options will provide seamless data transmission, in remote areas.
- Leveraging cloud technology for data storage and processing will allow for flexible monitoring and analysis, enabling operators to access footage and insights from anywhere.
- Incorporating energy-efficient components and solar power options will enhance operational sustainability, in areas with unreliable electricity.
- Establishing take-back or recycling initiatives for end-of-life cameras will promote responsible disposal and resource recovery.



Mercedes-Benz Research & Development India



About the Company

Mercedes-Benz Research and Development India (MBRDI) is the largest research and development centre for Mercedes-Benz Group AG outside of Germany. Established in 1996, MBRDI plays a prominent role in the development of technologies like connected, autonomous, and electric in the world of mobility. With offices in Bengaluru and Pune, MBRDI currently employs over 8500 professionals engaged in digital product development, interior component design, IT engineering and services.

The Innovation

Building Impactful Innovations in India for the World.

Innovation is a key priority for Mercedes-Benz, driving the development of sustainable and competitive products. Mercedes-Benz Research and Development India (MBRDI) addresses global mobility challenges through advanced technologies and collaboration with the external ecosystem.

Key areas of innovation include:

- **Technology Innovation:** MBRDI utilises the latest technologies to enhance products and processes. Some of our tech innovations developed in collaboration with our global team include MBUX, support for Drive Pilot for autonomous driving, and sustainable material development for car interiors, among others.
- **Intrapreneurship:** MBRDI supports entrepreneurial initiatives, leading to the launch of evnnovator in 2022, focused on accelerating EV adoption in emerging markets.
- **Co-Creation:** Collaborations with start-ups and academia aim to resolve mobility challenges using the latest technology (including AI, quantum, and neuromorphic) and advanced research.
- **Social Innovation:** With our strong engineering research capabilities, we have supported social enterprises in developing unique products, which have a significant impact on priority needs.
- **MBRDI's contributions to the Mercedes-Benz Group** have expanded into connected, autonomous, and electric powertrain technologies, redefining the future of mobility

The Approach

At MBRDI, innovation is central to our mission. We prioritise developing sustainable, industry-leading products and services, supported by a global innovation management network.

- Our strategy is agile, streamlining initiatives under a unified governance framework.
- Innovation champions at the departmental level drive our culture and connect with the central innovation management team.
- A dedicated Strategic Intelligence team monitors trends, while our ecosystem fosters diverse avenues for idea maturation, including co-creation with startups.
- We also encourage collaboration through a centralised innovation platform and host regular ideation events.





Benefits

By establishing a comprehensive network, we harness a diverse range of skillsets, perspectives, and capabilities. This collaborative approach enables us to tackle various aspects of multi-job assignments effectively.

By integrating expertise from different domains, we foster innovative solutions and enhance problem-solving capabilities. This depth and breadth of collaboration not only drive efficiency but also promote a culture of creativity and continuous improvement, equipping us to address the evolving challenges in the automotive industry.

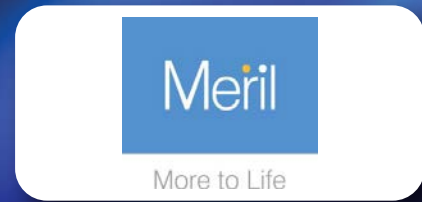
The Future

MBRDI takes pride in being a digital-led organisation that has effectively attracted a diverse talent pool with progressive skillsets. As our global strategy increasingly emphasises digital innovation, we are well-positioned to design and develop the next generation of products.

Our focus on digital technologies enables us to harness the latest tools and methodologies, fostering an environment of creativity and agility. This forward-looking approach ensures that we not only meet current demands but also anticipate future trends in the automotive industry.



Meril Life Sciences Pvt. Ltd.



About the Company

Medical Devices is relatively emerging field in India where 75 – 80 % has import dependency. Meril studied this Gap thereby initiated steps from its in-house DSIR Approved R & D, right from beginning through innovation. Our Initial developments to exclusive stents to the latest TAVR heart valve have our own IP track record.

Meril, a global leader in medical devices, excels in Cardiology, Orthopedics, Endosurgery, Neurology, and Medical robotics. With 150+ products, 23 subsidiaries across the Globe, and 8 global academies having state-of-the-art facilities, Meril drives innovation & training and emerged as a true multinational, proudly born in India.

The Innovation

Meril's innovation culture is deeply rooted in its commitment to pioneering advancements in healthcare. This is exemplified by unique devices like the TAVI (Transcatheter Aortic Valve Implantation) heart valve, renowned for its superior features like best size matrix to ensure optimal performance with lowest Permanent Pace Maker requirement with single delivery systems. Similarly Meril has provided unmet needs for Complex Angioplasty with long arteries having tapered tubular design up to 60 mm long, stents for blockage in bifurcation of artery and thinnest stents for diabetic and old patients having weak arteries.

With innovations in AI-driven medical robots, Meril is setting new benchmarks in precision surgery. A robust R&D, stringent quality assurance and regulatory-approved devices, consistently drives innovation. Over the past 3-4 years, Meril has been recognized for its groundbreaking work providing various National and Global patent awards, having more than 120 globally granted

156 | CII Innovation Excellence Compendium 2024

patents evidencing its leadership in medical technology.

The Approach

Meril's innovation approach involves close collaboration with physicians, surgeons, and key opinion leaders to identify unmet clinical needs and address gaps in existing devices. By understanding anatomical differences across Asian, European, and U.S. populations, Meril tailors them and designs with precision to fill such gaps, offering incremental sizes and enhanced features for global applicability. Continuous feedback from healthcare experts ensures that Meril's revolutionary therapies and products meet diverse clinical demands, advancing patient care worldwide.

Benefits

The growth of cardiac stent usage in India highlights the potential for Meril's Myval transcatheter aortic valve. Drug-eluting stents (DES) saw rapid growth from 1.25 lakh in 2007 to over a million by 2017, supported by clinical data and price controls. Similarly, Myval is gradually replacing open-heart surgery, with a 40-45% growth over the past three years. With expanding clinical data and doctor expertise, Myval's future looks promising, enhancing patient outcomes and potentially mirroring DES's success.

The Future

India's vast population offers immense potential for critical devices like Myval, though current usage is limited. With rising awareness and economic growth, usage is growing 40 -45 % annually. As numbers increase, manufacturing becomes more efficient thus brings the cost down and high affordability. Future of such innovations is bright, poised to improve patient outcomes significantly.



Micelio Mobility Pvt. Ltd.



About the Company

Micelio is a Clean Mobility ecosystem entity, founded to accelerate India's transition to sustainable transportation. Over time, Micelio has launched several initiatives, each addressing a specific gap in the ecosystem. The \$30M Micelio Fund supports Clean Mobility startups across the value chain. To further support innovation, Micelio established the Micelio Discovery Studio, a cutting-edge testing facility aimed at democratizing access to technology for startups and MSMEs, empowering them to innovate for India and meet global standards. In collaboration with ARAI, Micelio offers digital twin technologies to help innovators push boundaries. Additionally, Micelio Pulse focuses on knowledge sharing and public policy advocacy. Meanwhile, the Micelio Community fosters collaboration and dialogue among stakeholders, driving joint projects forward in the clean mobility space.

The Innovation

The clean mobility space in India faces unique challenges, particularly the lack of dedicated infrastructure for affordable and comprehensive testing and validation. With electric vehicles and related technologies evolving rapidly, ensuring the safety, efficiency, and reliability of these innovations is critical.

The absence of accessible facilities at a reasonable cost for rigorous testing inspired Micelio to establish the Micelio Discovery Studio (MDS)—a testing facility specifically designed to address the validation requirements of the evolving startups and OEMs in the clean mobility sector. We also collaborated with ARAI to establish the Digital

Twin Facility, an initiative backed by MHI to democratize the access of Digital Twin technologies to startups and MSMEs.

Our facility specializes in simulating real-world conditions through our equipment and infrastructure, enabling us to validate various components and systems thoroughly. We differentiate ourselves by offering technologies such as Hardware-in-the-Loop (HIL) systems, battery testing rigs, motor testing, environmental testing chambers, durability analysis, and advanced digital twin technologies. These services allow us to test vehicles in various operational conditions, providing data that enhances safety, efficiency, and innovation.

Our innovative business model, featuring requirement-based time slots, competitive pricing, and technical consultancy, empowers small innovators to conduct testing and accelerate their market entry, significantly reducing costs and time.

The Approach

At Micelio Discovery Studio, we prioritize accessibility and approachability for startups, and MSMEs, ensuring our services are not only affordable but also customized to meet specific needs. We empower our clients by allowing them to tailor their testing requirements, fostering a collaborative environment that addresses their unique challenges. Alongside our testing services, we provide dedicated technical mentoring to guide clients through project complexities.

By combining testing support with capital, community, and knowledge from other initiatives, our approach is to support innovators end-to-end to enable innovations in India's Clean Mobility ecosystem.



Benefits

Micelio Discovery Studio offers certain benefits to new and small innovators in India's growing clean mobility landscape:

- **Accessibility:** We bridge the gap by making advanced technologies accessible to smaller players, leveling the playing field with large corporations that typically have in-house capabilities.
- **Affordability:** Our flexible service model offers tailored, need-based solutions, ensuring quality testing services remain accessible without compromising value.
- **Customization:** We enable the tailored use of technology, coupled with expert

consultation from our team, to address the unique challenges faced by our customers.

- **Technical Mentoring:** Our dedicated experts guide innovators through project complexities, helping them achieve the desired outcomes.

The Future

Our future strategy includes expanding our facilities to support more testing requirements, integrating more robust software and hardware solutions. We aim to be the go-to testing and validation partner for both established OEMs and startups in the clean mobility space. We also aim to provide industry readiness technical training for industry leaders and students.



Micron Technology Operations India



About the Company

- We are a world leader in innovative memory solutions that transform how the world uses information. For over 45 years, our company has been instrumental to the world's most significant technology advancements, delivering optimal memory and storage systems for a broad range of applications.
- Through our global brands — Micron and Crucial — we offer the industry's broadest portfolio. We are the only company manufacturing today's major memory and storage technologies: DRAM, NAND, and NOR technology.
- By providing foundational capability for innovations like AI and 5G across data center, the intelligent edge, and consumer devices, we unlock innovation across industries including healthcare, automotive and communications. Our technology and expertise are central to maximizing value from cutting-edge computing applications and new business models which disrupt and advance the industry.

The Innovation

- HBM3 is the industry's first 8-high 24GB HBM3 Gen2 memory with bandwidth greater than 1.2TB/s and pin speed over 9.2Gb/s, which is up to a 50% improvement over currently shipping HBM3 solutions.
- Specific innovations contributing to the success of HBM
 - o Design: Noise tolerant data alignment with best in class read and write performance, Advanced signal and power integrity

design and an ultra-low power energy-efficient data path & five-time increase in metal density that reduce thermal impedance

- o Performance: With advanced CMOS innovations and industry-leading 1 β process technology. Micron HBM3E provides higher memory bandwidth that exceeds 1.2 TB/s. The design enables and enables greater than 2.5X improvement in performance/watt compared to the previous generation.

- o Packaging: With 24Gb DRAM die assembled into an 8-high cube within an industry-standard package dimension, doubling of through-silicon vias (TSVs), Micron provides 50% more capacity for a given stack height compared to existing competitive solutions.

- Impact: For an installation of 10 million GPUs, every five watts of power savings per HBM cube is estimated to save operational expenses of up to \$550 million over five years.

- With 24GB of capacity per cube and more than 9.2Gb/s of pin speed, the training time for large language models like GPT4 is reduced by more than 30% and results in lower TCO (Total cost of ownership).

The Approach

- Our product innovation starts with Technical Leadership Program defining pathfinding with Ideas from Competitive Intelligence, Micron India Research Centre and University Alliance.

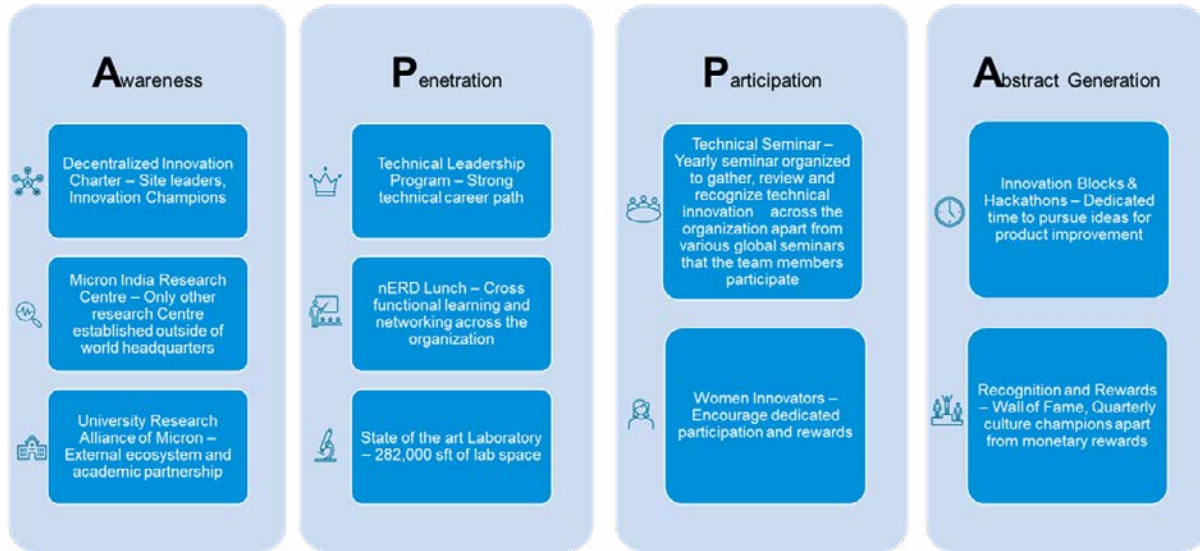


- Team members participate in nERD lunch, Technical sessions organized by employee resource groups for cross-functional learning, Innovation blocks for Ideas and action.
- Participate in Global and Local Technical Seminars / Innovation forums organized

by functions such as Research, Systems, Operations etc .. to present, learn, connect and apply in product development.

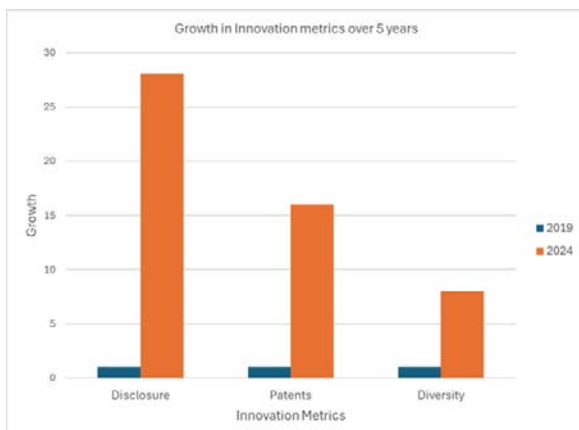
- Strong rewards and recognition program encouraging TM's by celebrating both trade secrets and patents equally.

Innovation Framework – APPA 2.0



Benefits

- Increased our Patent count by 16x and Disclosure count by 28x over the last 5 years
- 8x increase in Diversity participation in innovation
- 21 % of current NCGs (new college graduates) have contributed to at least one disclosure.



- Through these different innovation levers in place, Micron India has delivered to key memory products with major business impact.

- o 12GB LPDDR4, LPDDR5, LPDDR5X,
- o 2450 SSD (Industry's first 176 layer NAND), 2550 SSD (232 Layer NAND), T700,
- o HBM3, HBM3 Gen2

apart from external products, Micron India is delivering AI based Decision Accelerators for development and operations.





The Future

- Micron's world-leading technology has been foundational to innovations that continue to transform the world. Our memory and storage solutions are integral to delivering greater insight, experiences and accelerated opportunity across
 - o Artificial Intelligence
 - o Server & data center
 - o Mobile
 - o Consumer
 - o Client PC
 - o Network Infrastructure
 - o Automotive
 - o Industrial IOT



About the Company

Moglix is one of Asia's largest and fastest-growing B2B commerce companies. We empower manufacturing and infrastructure enterprises to transform their supply chains, covering everything from procurement to distribution. Through our digital platform, extensive network of suppliers and buyers, and advanced logistics solutions, we help businesses reduce costs, increase sales, improve operational efficiency, and achieve a seamless, touchless supply chain experience. As the first Indian B2B commerce unicorn in the manufacturing sector, Moglix is valued at \$2.6 billion. We offer more than 700,000 industrial products, serve over 19,000 PIN codes across India, and support 1,000+ large manufacturers and 3,000+ factories.

The Innovation

India didn't have a catalogue of indirect materials. Moglix has created "Catalogue for the country" with 1 million SKUs with rich descriptions and detailed specifications. Moglix has utilized generative AI for generating 30% of the descriptions

Using technology for B2B commerce. Moglix has brought in significant optimizations by leveraging technology. These areas include

- a. Data Cleansing: Many organizations struggle with the poor quality of data e.g. duplicate records, incomplete or missing information.
- b. Inventory optimization: Moglix has brought reductions to inventory and cut down non-moving and slow-moving items.
- c. ECommerce experience in B2B: Moglix has transformed the way companies place an order or check order status.

d. Supply chain optimization: Moglix is achieving OTIFs of ~90% for deliveries managed by them

e. Vending machine for spare parts

The Approach

We encourage innovation through various initiatives. One of the most effective ones is hackathons. While this concept was applicable only to the software/technology industry, we have extended the definition to Manufacturing and supply chain. Our teams engage in a 2-3-day problem solving session where they use frameworks like Time and motion study and Fishbone analysis to identify problems and design solutions for the same. We have been able to generate 2-3 innovative ideas from these hackathons every 6 months.

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Benefits

Moglix has delivered significant benefits by leveraging technology and fostering innovation. The creation of a national catalog with 1 million SKUs, 30% enhanced by generative AI, improves data accuracy and streamlines procurement. Inventory optimization reduces excess stock, while a transformed B2B eCommerce experience





simplifies order management. Achieving ~90% OTIF in supply chain operations enhances customer satisfaction. Additionally, hackathons generate 2-3 innovative ideas every six months, driving continuous process improvements and operational efficiency, including vending machines for seamless spare parts availability.

The Future

The future of Moglix is centered on

diversifying and building a sustainable manufacturing ecosystem in India. Moglix will continue to harness the power of next gen technologies like IoT and AI, Moglix aims to shape excellence in these sectors, driving innovation and operational efficiency. This strategic focus will not only enhance the manufacturing landscape but also contribute to India's self-reliance in critical industries, fostering a resilient and sustainable future.



Muthoot FinCorp ONE



About the Company

Muthoot FinCorp ONE is an all-in-one comprehensive financial app from Muthoot FinCorp Ltd. (MFL), revolutionizing the way people manage their finances online. Across lending, investing, saving, or making payments, the platform makes it seamless and convenient for its customers to access the right products and services required through various life stages. Thereby building a holistic financial ecosystem using the latest digital products.

An SBU of Muthoot FinCorp Limited, Muthoot FinCorp ONE is backed by a legacy of Muthoot Pappachan Group, stretching back over 135 years, and the trust of more than 1 crore customers.

The Innovation

At Muthoot FinCorp ONE, we are driven by innovation, emphasizing smarter, digital-first solutions combined with appropriate physical touchpoints to empower our customers—common man and small businesses.

Our Digital MSME loans product exemplifies this approach. It arose from identifying gaps in the credit system and MSMEs' dependencies on informal credit. We automated the collections and loan underwriting based on transaction values from QR codes. This enabled our MSME consumers to secure credit for growth and make daily payments against QR-based collections.

As highlighted by our finance minister in her budget speech, to consider the digital footprint of small businesses for essential financing, our product achieves this by assessing collections via QR codes, providing quick financing through a seamless digital setup.

Additionally, our Gold Loan From Home service allows customers to book appointments via the app, track loan status, and manage accounts easily, enhancing convenience and accessibility.

The Approach

We prioritise customer convenience, transparency, and safety to enable a seamless and phygital experience that enhances customer satisfaction.

Our expert leadership sets clear goals for the team, conducting hackathons, market discovery, customer need gap analyses and incorporating feedbacks. Also, we conduct regular internal and external benchmarking to ensure we stay ahead of industry trends and remain 100% compliant.

Benefits

At Muthoot FinCorp ONE, all our financial products for lending, investments, savings, payments and forex are crafted to transform the life of the common man by improving their financial well-being. With industry best practices, being 100% compliant and cutting-edge technology efforts, we enable streamlined operations and quick adaptation to changes. Our strategic partnerships open new opportunities, ensuring customers stay at the forefront of the financial landscape.

The Future

At Muthoot FinCorp ONE we are democratising fintech revolution through: innovation, collaboration, and customer-centric solutions. We look forward to new growth opportunities, products that solve customer issues, while adopting a strategy that delivers value for our customers and employees alike.



Muthoot Microfin Limited



Muthoot Microfin's Innovative Loan Products

Muthoot Microfin has consistently demonstrated its commitment to providing innovative products that address the diverse needs of its customers. Through its unique loan products, Muthoot Microfin has empowered individuals and contributed significantly to the overall development of communities nationwide.

Natural Calamity Insurance Cover (Nat Cat)

Natural Calamity Insurance Cover (Nat Cat) is a comprehensive insurance policy that provides financial protection to borrowers in the event of natural disasters such as floods, earthquakes, and cyclones. By mitigating the financial impact of these unforeseen events, Nat Cat ensures that borrowers can recover and rebuild their lives without undue hardship.

E-clinics

Recognizing the critical importance of healthcare access, Muthoot Microfin has pioneered e-clinics in areas where hospitals are scarce. Muthoot Microfin has collaborated with M-SWASTH to set up 681 e-clinics till date at its branches to offer accessible and affordable healthcare facilities. These

virtual clinics connect our customers with qualified doctors through online consultations, providing timely medical advice and reducing the need for long and costly journeys to seek healthcare services.

Sanitation Improvement loans

Muthoot Microfin has taken a proactive approach to improving sanitation and hygiene through its Sanitation Improvement loans. These loans are to renovate customers' existing toilet, or to add new facilities like improved water connection/ running water motor etc. Customers based on their loan cycles can avail up to ₹60,000 loan.

Mahila Mitra App

To enhance convenience and efficiency, Muthoot Microfin has introduced the Digitalisation of loan repayment through Mahila Mitra App. This mobile application empowers borrowers to make loan repayments seamlessly and securely, saving them time and effort. The app is available in vernacular languages and can give a local language experience to all users. In addition, the Mahila Mitra app is integrated with all popular payment modes like BBPS, Netbanking, Debit Card, UPI etc, which would be immediately reflected in customer account. The App also incorporates robust security measures to safeguard transactions.



National Aluminium Company Limited Smelter Plant



About the Company

Established on January 7, 1981, NALCO (National Aluminium Company Limited) is a leading Navratna CPSE under the Ministry of Mines, headquartered in Bhubaneswar, Odisha. With significant operations in mining, refining, and smelting, NALCO boasts a comprehensive product portfolio, including aluminium and alumina products. Committed to sustainable practices, the company operates wind and solar power facilities and emphasizes environmental management, receiving numerous awards for its eco-friendly initiatives. NALCO aims to be a premier player in the aluminium value chain, enhancing stakeholder value through efficiency and innovation while maintaining the highest standards of quality and sustainability.

The Innovation

In a global first, NALCO partnered with Essavyasa Research Ltd to introduce nano-based defluoridation technology. Unlike conventional reverse osmosis or ion exchange methods, this breakthrough enables the direct reuse of defluorinated water in cooling towers, conserving natural water resources. The process is automated, chemical-free, and generates minimal waste—addressing concerns of scalability and byproduct disposal.

NALCO's in-house teams have also devised solutions for hazardous waste, specifically spent pot lining (SPL). Collaborating with M/s Green Energy and JNARDC Nagpur, NALCO detoxifies SPL and transforms it into Carbon Mineral Fuel, used in cement and steel industries. This innovation ensures safe, efficient disposal of hazardous materials.

Energy savings remain a priority, with modifications in pot insulation, jointly developed with Rio Tinto Alcan, showing great promise. The new design improves heat retention, resulting in significant DC energy savings. NALCO's commitment to advanced alloy production and market-specific solutions further cements its role as an industry leader.

The Approach

At NALCO, our vision is to be a premier player in the aluminum sector, driven by our mission to sustainably grow while enhancing quality and efficiency through employee involvement. We promote R&D as essential to production, with our Smelter R&D Department recognized by the DSIR for indigenous technology development. Collaborations with institutions like NIT Rourkela foster innovation and entrepreneurship. Our culture emphasizes safety, learning, and recognition, with initiatives like Sarjana and Kaizen promoting ownership and continuous improvement across all levels.

Benefits

- Increased Efficiency: Graphitization of Cathode block resulted in 55 kW/ton energy saving.
- Product Quality Improvement through projects such as Grain refinement of wire rods for improving strength, Strontium modified billet for better extrusion & less homogenization time, modifier in Al-Si Alloy for improvement of Thermal Conductivity
- R&D initiative for treatment of Hazardous Cyanide based Spent Pot lining improved our sustainability.



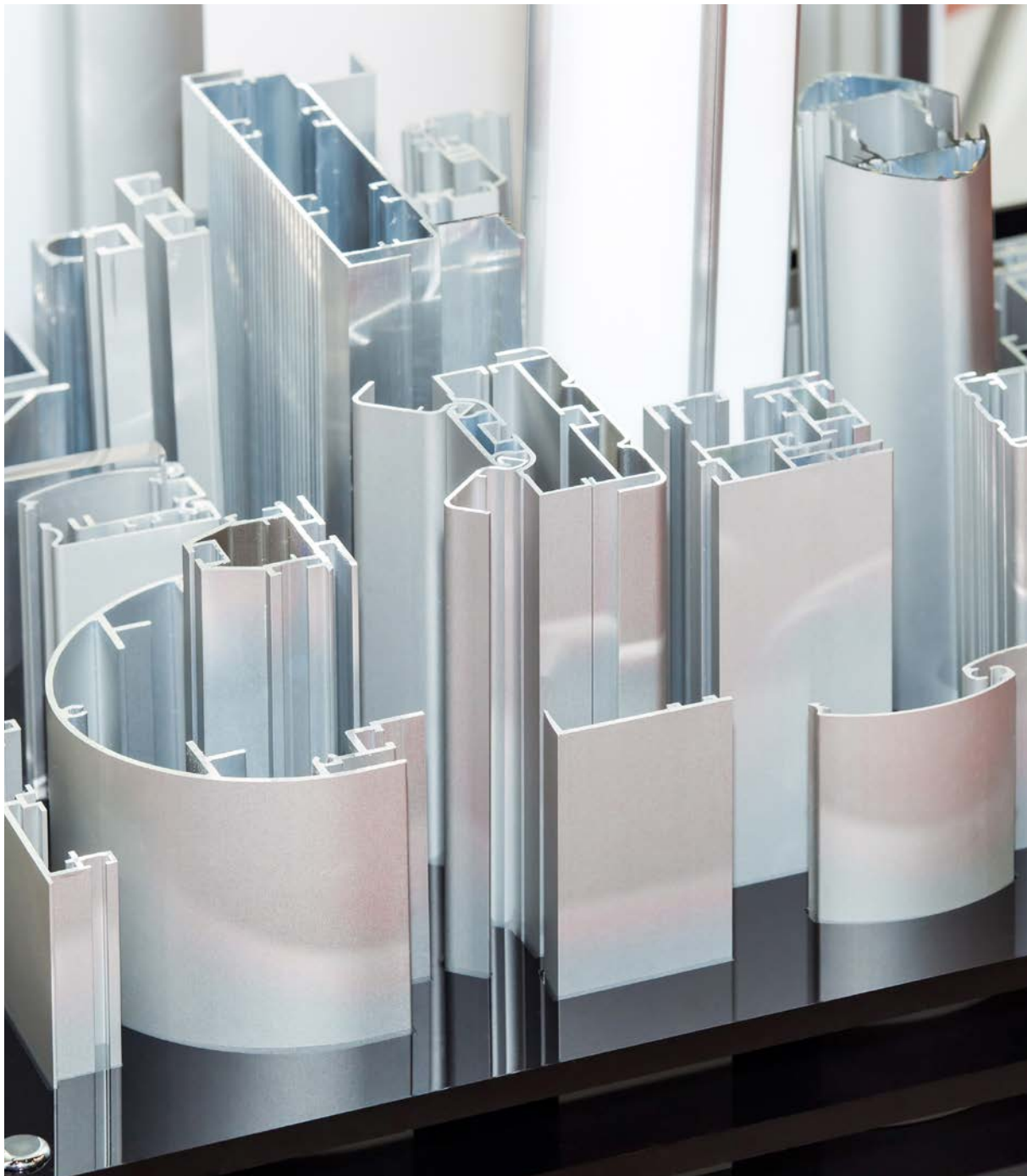


- d) Employee Engagement and Morale: Various reward schemes under Small group Activities such as Quality Circle schemes, Sarjana schemes, Kaizen Schemes, Best Performer schemes etc have increased employee participation towards creative solutions.
- e) 15 patents have been granted in last 5 years to NALCO
- f) NALCO Smelter Plant is awarded Gold Plus

recognition in CII Exim Bank Award two times in last 3 years.

The Future

Considering the older technology of AP France adopted in 1981 and time based expansion plan of Pot technology. Smelter in-house team has jointly partnered with RIO Tinto Alcan for upgradation of existing 960 pot cell from 180 KA to 220 KA thus improving productivity & efficiency.



Nestle India Limited



About the Company

NESTLÉ India Limited is a food & beverage company headquartered in Gurgaon, Haryana. The company has a strong product portfolio across categories such as food, beverage, chocolates & confectionaries, nutrition, dairy etc. The company has 11 factories and 4 branch offices in India.

The Company continuously focuses its efforts to better understand the changing lifestyles of consumers and anticipate consumer needs in order to provide Taste, Nutrition, Health and Wellness through its product offerings. The Company strives to create value that can be sustained over the long term by offering consumers a wide variety of high quality, safe food products at affordable prices.

NESTLÉ India manufactures products of truly international quality under internationally famous brand names such as NESCAFÉ, MAGGI, MILKYBAR, KIT KAT, BAR-ONE, MILKMAID.

The Innovation

Product Innovation:

- At Nestle with a mindset of continuous improvement, aiming to enhance our products through a science-based approach. As part of this effort, we have recently introduced two Human Milk Oligosaccharides (HMO) in our infant products designed for infants aged 0-6 months. (NAN EXCELLA PRO1). This addition brings the products closer to the composition of human milk. These are scientifically proven ingredients which are known to provide immunity and promote gut health in infants.

- Introduced Millet based product aligning with Govt. PLI scheme. It is a Breakfast solution with goodness of Indian millet, wholesome veggies and delicious masalas. It is sold in a convenient single serve pack and product is ready to eat with 2 min. of cooking.

The Approach

- Process analytical Tools in Noodles manufacturing process introduced in 2021 and since then evolved till 2024. This digital tools have brought in substantial consistencies in process and minimized the human interventions.
- Commissioning of Ball mill technology which is economical, efficient and can match the rheology of the Choco mass manufactured from the traditional refining process.

Packaging Innovation:

- First ever edible fork in cup noodles, fork made with flour can be consumed while usage. An Ownable, KC & sustainable Edible fork solution novel design specifically developed for cup noodle Sustainable Fork made from Wheat flour and salt “.

Benefits

Organic sales growth is key to our growth ambition. Our portfolio is geared to deliver sustained organic sales growth based on investment in attractive categories and regions, impactful innovation and execution discipline. Our knowledge of local consumers coupled with our scientific and technological expertise help us deliver innovations that





support business growth, while meeting consumer needs. Our innovation capabilities ensure we deliver products that meet consumer needs and preferences, and are good for the planet. Through digital technologies, we are able to be more agile and make better and faster decisions. Innovation and Renovation pipeline of products continues to be a thrust area across all categories.

The Future

Overall innovation drive is helping us to increase our portfolio to as what matters

the most. This is leading us towards organic foods, vegan concepts, ancient grains usage and more healthy portfolios.

Steps are continuously being taken for innovation and renovation of products including new product development, faster introduction of new products in the market, improvement of packaging and enhancement of product quality, to offer better products at relatively affordable prices to the consumers. Digitalization is a growth accelerator for your Company and will continue to be so in the future.



Netlink Software Private Limited



About the Company

Netlink, headquartered in Detroit, Michigan, with offices in Canada, UAE, and India, delivers global IT solutions through a 2200+ team with 26+ years of expertise. Its flagship BI product, Lumenore, has transformed decision-making across industries. Netlink's digital solutions span BI & Analytics, App Development, Low Code, Automation, ERP, AI/ML, Cloud, Mobility, BPO, and ESG Management. With a unique "Software Factory as a Service" delivery model, top certifications, and seasoned professionals, Netlink offers unmatched cost and productivity benefits. Leading brands rely on Netlink for effective, innovative IT solutions and proven expertise.

The Innovation

Netlink's client, one of the largest vegetable seed sales organizations in the country segmented its operations into over 70 territories, each managed by a Territory Manager. Traditionally, these managers relied on their market experience and relationships with distributors and retailers to drive sales. However, their reporting process was cumbersome, relying on data extracted manually from various applications and entered by different users across multiple functions.

Netlink's flagship AI based Business Intelligence product Lumenore introduced a solution that streamlined this process by integrating data from diverse sources such as SAP, custom applications, and manually maintained Excel sheets. This integration allowed the application of business rules

across the data, providing Territory Managers with intuitive visualizations. The geo-visualization feature mapped out stock levels at retail outlets and specific seed demands by the village for upcoming planting seasons, addressing the issue of unorganized data sources that previously hindered farmers' productivity and awareness levels.

The Approach

Lumenore's technical team conducted field visits during the conceptualization stage to understand the daily challenges faced by field staff and farmers, ensuring a solution tailored to their needs. Direct engagement provided insights into seed choices, yield ratios, and awareness levels, shaping an effective response to real-world issues. Multiple reviews pre- and post-deployment ensured the solution's alignment with user needs, fostering trust and adaptability among Territory Managers and farmers alike.

Benefits

The new solution eliminated the need for manual data, providing a single source of truth that was always up-to-date.

- Eliminated inefficient data processes with accurate, real-time seed and crop information for improved decision-making for the field staff of the client
- Enhanced farmer's awareness and productivity through seed-to-yield ratios for improved agricultural outcomes
- Empowered farmers with access to insights, optimizing seed choices and their economic sustainability





The Future

The innovation holds significant potential for the future of agricultural technology and farmer empowerment. Productivity enhancement and market awareness will be achieved through

- Strengthening predictive analytics, and weather forecasts through AI and feedbacks
- Training and support to improve farmers' technological literacy access.
- Increasing the reach of solution in newer geographies



NeuroEquilibrium Dignostic Systems Pvt Ltd



About the Company

NeuroEquilibrium is a Deep-Tech Remote Diagnosis Platform for super-specialty healthcare. NeuroEquilibrium is the world's largest chain of clinics for Vertigo, Dizziness, and Balance disorders, with over 200 clinics in 13 countries and 60 cities in India. The super-specialty Dizziness clinics are based on patented proprietary technology developed in-house.

The Innovation

NeuroEquilibrium has developed a proprietary deep-tech remote diagnosis platform for super-specialty healthcare that integrates cloud technology, a clinical decision support system, a digital history-taking module, virtual reality & augmented reality, wearable devices, electroceuticals, AI, and computer vision. All these technologies have been developed in-house. The company has applied for eight patents, of which six patents have already been granted. We are doing cutting-edge research, collaborating with leading institutes worldwide, including Johns Hopkins, Harvard Medical School, Maastricht University Netherlands, and jointly publishing in top-rated international journals, including Frontiers in Neurology, European Journal of Neurology, etc. We have also developed the world's first digital twin for the disease BPPV.

The Approach

NeuroEquilibrium has set up super-specialty clinics with an asset-light, Clinic-in-Hospital revenue share business model leveraging its remote-diagnostic cloud platform and proprietary diagnostic lab. NeuroEquilibrium has clinics in top hospitals, including Apollo, Fortis, Max, Medanta, Manipal Hospitals, NH Hospital, Wockhardt Hospital, etc, and installations in prestigious government institutes like AIIMS Delhi, AIIMS Raipur, AIIMS Bhopal, AIIMS Kalyani, AIIMS Mangalgi, RML hospital, AFMC Pune, etc.

Benefits

With proprietary diagnostic equipment and the remote diagnostic platform, NeuroEquilibrium is able to differentially diagnose over 40 diseases of the ear & brain that cause Vertigo, Dizziness, and Balance disorders and thus provide permanent cure to chronic patients. We have successfully treated over 100000 patients.

The Future

NeuroEquilibrium plans to expand to 500 clinics in India and 1000 clinics globally to treat a million patients in next 3 years



About the Company

Over 40 years ago, in the heartland of Uttar Pradesh, Mr. K.K. Jhunjunwala, a visionary, laid the foundation of an Institution that had the potential to change the way we think about food packaging. That is when the parent company of what is now 'Pakka Limited' was founded as 'Yash Papers,' turning sugarcane waste, 'bagasse', into useful paper. Today, the mantle has taken over by the next generation's visionary leader, Mr. Ved Krishna, has propelled the organization geometrically towards a vision of 'CLEANER PLANET' and giving back to nature. The single most important objective of the organization now is to make food packaging more sustainable, circular, and regenerative.

The Innovation

When we look around us, we find that in the last century, we have created a serious challenge by prioritizing convenience through production, dissemination, and consumption products with no clear end-of-use solution. Nearly everything we consume today comes with a packaging component consisting of petroleum-based substrates, which have complex chemistry and no clarity on circularity and disposal. This needs to shift! At Pakka, we have set out on a journey to leave our planet cleaner, driven by deep exploration and innovation. We are building an organisation that stretches the imagination and enables ideas to bear fruit, so we create regenerative solutions for the future of humankind.

The Approach

At Pakka, we will be investing a significant part of our revenue, resources, and energy towards furthering material science and continuing to evolve regenerative packaging solutions

in collaboration with various partners across the world. We have identified 8 domains to be worked on by focused teams. We will build talent density, create culture that enables 'risk-taking', establish unparalleled infrastructure, enable global collaborations, strengthen customer and converter connections, and focus both on the present and the future.

Benefits

We, as an organization, find ourselves deeply immersed in the materials world, and we choose to build towards a positive impact, which means shifting how packaging is created and utilised. There is a broadly held belief that sustainable materials perform poorly in performance and cost more. We need to change this mindset to unlock our creative potential. Therefore, we must work towards more effective, circular, and regenerative materials that are lower in cost and scalable to meet demand.

The Future

The quest we are on is greater than our business and jobs. We are here to do our very best to fulfil our purpose and make the contributions we have been entrusted with. Our business serves the goals we pursue, not the other way around. We seek like-minded people and organisations to collaborate with. We aim to bring about change by openly sharing the work that we do and encouraging others to create beyond our knowledge, so we can witness change, and our future generations benefit from the work we do today.

Come join us, and let's work together to make a difference!



Panache Green Tech Solutions Pvt. Ltd.



About the Company

Panache GreenTech Solutions excels in energy-efficient and protective building envelopes, offering innovative products and services that enable “Cool without AC Buildings.” Founded by Mrs. Neetu Jain, the company specializes in eco-friendly solutions, including Eco Label, Green Pro, GRIHA, and LEED-rated products for heat reflection, thermal insulation, and water protection. These solutions help to reduce environmental impact, combat urban heat island effects, and promote sustainability in construction. As an industry leader, Panache collaborates with government bodies to advance sustainable development and global energy conservation efforts. With a commitment to creating a “COOL CLEAN GREEN INDIA,” Panache strives to ensure a livable world for future generations.

The Innovation

Panache Greentech Solutions Pvt. Ltd. drives innovation in the coatings industry through its development of environmentally sustainable, energy-efficient, thermal insulation, and water protective products.

With a dedicated product development team and a state-of-the-art quality assurance lab, Panache’s standout innovation lies in its advanced reflective coatings, designed to reduce urban heat island (UHI) effects and significantly lower building surface temperatures. This, in turn, cuts cooling needs and energy consumption. Key products like Cool Top and Transeal deliver enhanced thermal performance, durability, and aesthetic appeal, tailored to withstand diverse Indian climatic conditions.

Emphasizing green chemistry, Panache utilizes non-toxic, low-VOC formulations to reduce environmental and health impacts. Through cutting-edge technology and sustainable practices, Panache is not only advancing eco-friendly solutions but also playing a crucial role in global climate change mitigation. Its innovations are helping meet the rising demand for green building materials while promoting long-term environmental sustainability.

The Approach

Panache Greentech Solutions Pvt. Ltd. adopts a holistic approach, integrating innovation, sustainability, and customer-centricity. By focusing on eco-friendly product development, such as reflective and energy-efficient coatings, the company addresses environmental challenges like the urban heat island (UHI) effect. Our approach includes identifying the market gaps, close collaboration with clients, government bodies, and industry experts to deliver tailored solutions that reduce energy consumption and promote green building practices, all while maintaining the highest standards of quality and performance.

Benefits

Panache Greentech Solutions offers significant benefits, including reduced energy consumption through innovative reflective coatings & thermal insulation screed, plasters that help mitigate the urban heat island (UHI) effect.

Our eco-friendly, low-VOC and non-toxic products portfolio & systems saves on energy cost on cooling & maintenance,





provides thermal comfort without AC, increases construction life, promotes health benefits, Offsets CO2 emissions, increases Solar panel efficiency & promotes healthier living environments while ensuring superior durability and performance.

Besides Clients benefits Panache contributes to reducing Urban Heat Island impacts by reducing the city air temperatures thus contributing for global sustainability efforts.

The Future

Panache Greentech Solutions envisions a future where innovative, sustainable performance and energy-efficient products become industry standards. The company aims to expand its innovative carbon neutral product portfolio, foster stronger collaborations, and lead the way in addressing global environmental challenges through cutting-edge, eco-friendly solutions that contribute to a greener, cooler planet.



Paques Environment Technology



About the Company

Paques leads the global biotech revolution in wastewater treatment and biogas production, with over 3,300 successful installations across 60+ countries. Since 1981, Paques has been pioneering sustainable solutions, helping industries like brewing, chemicals, pulp & paper, and food manage resources more efficiently. Our team of scientists and specialists are dedicated to preserving the planet by developing innovative technologies that extract valuable resources from waste, enabling clients to meet sustainability goals. With R&D centers in the Netherlands and China, Paques continues to push the boundaries of biotech to protect the environment and create a greener future.

The Innovation

- **Innovative Application:** Successfully commissioned the BIOPAQ® UBOX for the sugar industry, expanding its use beyond sewage applications.
- **Advanced Technology:** The UBOX features hybrid anaerobic-aerobic technology with a high-efficiency sedimentation system, ensuring hassle-free operations.
- **Water Resource Management:** With sugarcane containing 65% water, our system effectively reuses this resource on-site after treatment.
- **Efficient Treatment Process:** A high-performance effluent treatment plant (ETP) is crucial for removing COD/BOD, enabling treated water to be reused.
- **Integrated Solution:** UBOX is seamlessly integrated with downstream filtration and

UV systems, enhancing its suitability for water reuse in the sugar industry.

- **Local Manufacturing:** All reactor internals are proudly manufactured at our Paques India facility, underscoring our commitment to local innovation and quality.

The Approach

Embrace a transformative approach to wastewater treatment with BIOPAQ® UBOX, designed for optimal performance in restricted footprints. This cutting-edge solution offers low sludge generation and an odor-free environment, significantly reducing civil volumes. By effectively integrating UBOX with post-anoxic chambers for enhanced nitrogen removal, we unlock extended applications and elevate operational efficiency. Choose BIOPAQ® UBOX for a sustainable, high-impact solution that maximizes resource utilization while ensuring compliance with stringent environmental standards. Transform your wastewater management strategy today!

Benefits

BIOPAQ® UBOX delivers an innovative, modular solution that minimizes footprint and cuts civil costs. Enjoy significant reductions in operational expenses while generating green energy biogas and ensuring zero odor emissions. The technology enables rapid startup and eliminates yearly maintenance, making it perfect for seasonal industries like sugar production. Clients consistently choose UBOX over conventional aeration due to its efficient civil volumes and lower sludge generation, solidifying its position as the superior wastewater treatment solution.





The Future

Future-Ready with BIOPAQ® UBOX:

As sugar process plants embrace sustainability, BIOPAQ® UBOX transforms 65% water content from cane into reusable

resources for cogeneration power, eliminating fresh water consumption. With stringent regulations from the Central Ground Water Authority, UBOX offers an efficient solution to reduce COD and BOD in compact, low-civil-volume systems.



Philips Innovation Campus



About the Company

Royal Philips (NYSE: PHG, AEX: PHIA) is a leading health technology company focused on improving people's health and well-being through meaningful innovation. Philips' patient- and people-centric innovation leverages advanced technology and deep clinical and consumer insights to deliver personal health solutions for consumers and professional health solutions for healthcare providers and their patients in the hospital and the home. Headquartered in the Netherlands, the company is a leader in diagnostic imaging, ultrasound, image-guided therapy, monitoring and enterprise informatics, as well as in personal health. In India, the company is headquartered in Gurgaon where the commercial team operates from. The company also has Philips Innovation Campus – Bengaluru, the biggest innovation hub globally that is a software powerhouse with deep Artificial Intelligence and healthcare domain expertise. Further, the Healthcare Innovation Center (HIC), located in Pune has the unique advantage of developing and delivering end-to-end products for multiple businesses. Global Business Services in Chennai is the company's in-house organization for centralized execution of business processes.

The Innovation

Throughout Philips, we strive to maximize the impact of innovation, always looking further ahead and considering the future while staying firmly rooted in what matters now. Our innovations are driven by consumer and customer needs. Helping people to live healthily and prevent disease. Giving clinicians the tools they need to make precision diagnosis and deliver personalized treatment. Aiding the patient's recovery at home in the

community. All supported by a seamless flow of data. With personalized treatment for complex diseases such as cancer increasing the need for high-confidence precision diagnoses, coupled with soaring caseloads due to aging populations and high levels of clinician burnout, radiology departments are under increasing pressure to improve performance, productivity, and profitability. One of our innovations, Philips Smartspeed, an AI-powered MR software increases resolution up to 65% and achieves up to 3 times faster scanning times compared to conventional MR scans. Coupled with its support for 97% of current clinical protocols – including advanced contrasts and diffusion weighted imaging, and even quantitative imaging such as T1 or T2 mapping for brain, liver, heart or musculoskeletal imaging – Philips SmartSpeed helps increase diagnostic confidence in a wide range of patients, including the most complex cases. Yet another innovation is Ultrasound Compact 5000. Globally, clinicians face increasing pressure for higher patient throughput, and they're being asked to perform more inpatient ultrasound exams portably. Many portable ultrasound machines force clinicians to trade performance for portability, and this compromise can mean lower image quality. The reality is that clinicians need portability and also premium ultrasound image quality to support accurate diagnosis at first scan. Philips Compact Ultrasound System 5000 series offers both performance and portability. It facilitates first-time-right ultrasound exams for more patients. The product can be leveraged for shared service capabilities across specialties including cardiovascular, obstetrics and gynecology, point of care, and general imaging. It can be made quickly available at the patient's side when every second counts.





Our Approach

Effective innovation calls for a collaborative design approach that puts people at the center from the very start. Our multidisciplinary teams work closely with clinicians, patients and consumers to gain a deeper understanding of the challenges they face. We use these insights to create new and unexpected solutions that are explored from three perspectives: user experience, technical feasibility and business viability.

The Future

In recent years, Artificial Intelligence (AI) has burst onto the scene in healthcare, propelling new innovations that promise to improve patient care and outcomes while reducing costs. From diagnostics to acute patient monitoring and self-management of chronic disease, AI has shown strong potential to support healthcare providers and patients at every stage of the care continuum. We envision three ways in which AI can enhance the human experience in healthcare:

- AI can augment the expertise of healthcare providers and support their decision-making, allowing them to do what they do best: detect, diagnose, treat, and monitor disease.
- AI can improve operational efficiency to help healthcare providers focus on patient care. For example, workflow automation in radiology can alleviate the burden on time-pressured imaging technologists, allowing them to focus on obtaining optimal image quality.
- AI can empower people to take better care of their health and well-being by offering personalized and actionable insights that help them develop and maintain healthy habits. For example, in oral healthcare, AI can analyze an individual's brushing behavior through sensors embedded into a smart toothbrush, and – through a mobile app – offer personalized recommendations for improving one's oral hygiene.



Phoenix Medical Systems Private Limited

PHOENIX
enabling life

About the Company

Phoenix Medical Systems is a pioneering leader in the design and manufacture of neonatal and maternal care medical devices. Founded in 1989, Phoenix is dedicated to improving healthcare outcomes by providing innovative and affordable solutions tailored for infants and mothers, with a strong focus on enhancing Intact survival and Quality of care. Our product range includes incubators, radiant warmers, phototherapy units, and assistive technologies for babies born prematurely or with health challenges. With an unwavering commitment to quality, Phoenix serves both national and international markets, partnering with healthcare providers globally to ensure every newborn receives the best possible start in life. Our mission is to provide accessible and equitable Maternal and Neonatal care through innovative solutions and fostering partnerships with healthcare providers. We strive to meet the unique challenges in neonatal care and are devoted to continuous research, development, and impactful innovation that makes a real difference in the world.

Our Values that drive our success:

1. **Innovating with Purpose:** We thrive on innovation that is rooted in purpose-driven research and development, guided by the conviction that every advancement should directly contribute to improving the lives of mothers and newborns.
2. **Holistic Well-being as Priority:** Our commitment to compassionate care goes beyond medical efficacy, creating an environment where families find comfort, support, and empowerment throughout their journey.

3. **Collaborative Commitment:** Setting ourselves apart, we cultivate a collaborative ecosystem where healthcare professionals, researchers, and communities join hands to shape the future of maternal and neonatal care.

The Innovation

Phoenix Medical Systems has developed several groundbreaking products aimed at improving neonatal and respiratory care:

Brammi - Therapeutic Hypothermia

Brammi is a therapeutic hypothermia device designed to treat Hypoxic-Ischemic Encephalopathy (HIE) in newborns. This condition, caused by insufficient oxygen or blood flow to the brain during birth, can result in severe neurological disabilities or even mortality if untreated. Brammi provides precise and controlled therapeutic hypothermia, lowering the infant's body temperature to reduce brain injury and improve neurological outcomes. The design prioritizes ease of use, enabling healthcare professionals to effectively administer cooling therapy with minimal complexity. With international market adaptability in mind, Brammi addresses global healthcare inequities by providing a high-quality yet cost-effective solution to an urgent medical need.

Numo - COVID Care Ventilator

Numo is an Adult ICU Ventilator developed in just 100 days during the COVID-19 pandemic and has successfully received CE Marking in remarkable 6 months. Numo was designed to support COVID-19 care, providing critical respiratory assistance to patients with severe symptoms. Designed for ease of use, Numo can be rapidly deployed in emergency





settings, making it ideal for healthcare facilities facing surges in patient numbers. It features multiple ventilation modes, ensuring adaptability to patient needs while maintaining a focus on reliability and safety.

Nymphaea - Bottom Phototherapy

Nymphaea is a phototherapy device designed to treat neonatal jaundice effectively in a clinical setting outside of the NICU. This compact and user-friendly device

allows healthcare providers to administer phototherapy without requiring prolonged NICU stays. Nymphaea is designed to be supportive of Kangaroo Mother Care (KMC), providing mother-child bonding with effective jaundice treatment. This ensures the delivery of consistent, safe phototherapy while offering the convenience of treatment in less intensive clinical environments, significantly reducing healthcare costs and improving mother-child bonding.



Svaas - Integrated Respiratory Care System for Newborns

Svaas is an integrated respiratory care system designed to provide comprehensive support for patients with chronic respiratory conditions. It combines oxygen therapy, airway clearance, CPAP and Pulse oximetry into a single, compact unit. Svaas is designed to be user-friendly and portable, making it suitable for both hospital and home use, thereby enhancing the quality of life for patients with respiratory challenges.

Alloy (SMA) based braille cells suitable for commercialization. TacRead meets NLS braille specifications with a high-speed refresh rate, ingress protection, low power consumption, and quiet operation. TacRead is portable, affordable, and user-friendly, making it an ideal solution for education and daily activities. By focusing on affordability and functionality, TacRead aims to bridge the gap in accessibility technology, empowering visually impaired individuals with greater independence and access to information. This was developed in collaboration with IIT Delhi and Saksham trust, an NGO serving for Visually Impaired.


TacRead - Refreshable Braille Display

TacRead is an innovative refreshable braille display designed to enhance accessibility for visually impaired individuals. It features compact and affordable Shape Memory

Lotus - Intact Cord Resuscitation Trolley

Lotus is an intact cord resuscitation trolley designed to support delayed umbilical cord





clamping during neonatal resuscitation. The trolley allows for immediate stabilization of newborns while maintaining the connection to the placenta, which provides critical blood flow and oxygen. Lotus is easy to manoeuvre and height-adjustable, ensuring that healthcare professionals can provide optimal care while adhering to best practices in neonatal resuscitation. By promoting intact cord resuscitation, Lotus helps improve neonatal outcomes, supporting smoother transitions for newborns in their first moments of life. The product is evaluated by Doctors from AIIMS and has been published in multiple journals and conferences

Arise - Standing Wheelchair

Arise is a standing wheelchair designed to improve the mobility and independence of individuals with physical disabilities. It allows users to transition from a seated to a standing position with ease, offering numerous health benefits such as improved circulation, reduced pressure sores, and enhanced psychological well-being. Arise is designed with user comfort and safety in mind, featuring intuitive controls, sturdy construction, and an ergonomic design. By enabling mobility in both seated and standing positions, Arise empowers users to participate more actively in daily activities, fostering a greater sense of independence and dignity. The Product is developed in Collaboration with IIT Madras.

The Approach

Our approach centers on combining advanced engineering with user-centric design to develop effective healthcare solutions. Phoenix Medical Systems collaborates closely with neonatologists, biomedical experts, and healthcare professionals to understand clinical needs and operational challenges. We actively collaborate with academic

institutions to leverage cutting-edge research and foster innovation, ensuring our products meet the highest standards and address real-world healthcare challenges. Rigorous R&D, clinical trials, and a commitment to international standards guide the development process. We emphasize affordability without compromising quality, ensuring that our devices can be deployed in a range of healthcare environments, particularly where resources are limited. We follow a tollgate-based approach to systematically realize our projects, ensuring that each development phase meets specific quality and performance benchmarks before progressing to the next stage aligning to ISO 13485 requirements.

Benefits

Our innovations significantly improve neonatal, maternal, and respiratory care, ensuring better health outcomes and intact survival. Brammi reduces the risk of long-term neurological damage in newborns, while Numo delivers critical respiratory support during emergencies. Nymphaea provides effective jaundice treatment in clinical settings while fostering mother-child bonding through Kangaroo Mother Care. Svaas offers integrated respiratory therapies for chronic conditions, and TacRead empowers visually impaired individuals with greater accessibility. Our customer support ensures that these solutions are accessible worldwide, bridging critical healthcare gaps and enhancing quality of life for patients and families.

The Future

Phoenix aims to scale the adoption of these innovations globally, focusing on partnerships with healthcare providers in underserved regions. Future iterations will incorporate AI-driven insights to further enhance treatment precision and outcomes.



Poly Medicure Limited



About the Company

We touch millions of patients daily around the world with the products manufactured in our facilities. We have been serving the patients and healthcare providers for over two decades. We are one of the leading Medical Devices company and exporter in India. We have been recognized as the “Medical Devices Leader of the Year 2021” by the Department of Pharmaceuticals Ministry of Chemicals & Fertilizers, Government of India. We have been also recognized as the Largest Exporter of Medical Devices from India for eight years in a row.

We, at Polymed have a strong track record of manufacturing high quality medical devices (more than 200 products) in 12 state-of-the-art manufacturing facilities across the world. We stand for Innovation, Safety and Quality.

We believe in making high quality, safe and innovative medical devices that not only believe in empowering the medical fraternity in being effective and efficient in their work but also provide the highest quality of healthcare to the patients.

The Innovation

To keep pace with the ever-changing market requirements, Polymed has a fully staffed and highly equipped R&D / Innovation section approved by Ministry of Science & Technology, Government of India to design & develop new and innovative products. We have developed several Innovative products since inception and the zeal will continue to serve mankind in all possible ways.

Few of the innovative products developed and made available commercially in the recent past are as follows: -

- Safety Huber Needle
- Polysafety BC
- VTM Kit
- Dialyzer
- Pre-Filled Syringe
- Diagnostic Kit (Covid 19 Test Kit, Dengue, HBV,HCV,HIV Kit)
- AD Syringe

Snapshot of two of the most innovative products in terms of satisfaction as exemplary service to mankind are described below:

- **Safety Huber Needle:** Safety Huber Needles are designed for safe and easy insertion into vascular access devices and may be used to administer continuous and/or bolus infusion of pain control medications, deliver chemotherapy, antibiotic therapy or parenteral nutrition. The key characteristic of this product is the safety feature which ensures the safety of nurses and other staff.

Compatible with chemotherapeutic drugs

Ergonomically designed wings facilitate secure fixation

Y-site for intermittent

- **Poly Flush Syringe:** It is used for flushing of indwelling Vascular Access Devices.

It reduces the risk of CR-BSI as compared to conventional syringe preparation involving multiple steps.

It improves workflow efficiency as it is ready to use, limits the number of steps, less chances of error and saves time.

It eliminates the risk of Needle Stick Injuries as it provides safety to the



healthcare professionals by reducing the risk of needle stick injuries.

The Approach

A lot of research and data collection was done to begin with to understand the need of product precisely. Following steps ensured rest of the proceedings goes as needed and planned:

- Collecting appropriate data / inputs and selection of core team
- Selecting right partners / suppliers and providing them right inputs / insight
- Design conceptualization and review with Cross Functional Team
- Simple yet concise project planning and scheduling
- Focus of unknown territory first i.e. parallel / early working on them to avoid last minute surprises
- Prototyping, wherever possible. Instead of going with large cavity production moulds, Proto / Bridge mould were made to have early outcome and once the design is validated, large production moulds were kicked off.

- Parallel process was targeted to minimize development time.

Benefits

Innovation culture leads to numerous benefits like:

- Existing processes like Quality, Production gets improved significantly
- Innovation created new knowledge about filling and capping of intricate devices demanding high level of accuracy
- Overall market share increased
- Profitability increased considerably
- Brand equity increased
- Collaboration with stake holders increased sharply
- Had positive social impact

The Future

Prime focus is to upscale R&D and Operations thereby accelerating growth in developed countries.

Aim is to become a Globally recognized solution provider of infection reduction technologies and fluid management products.





About the Company

Pricol Limited is a leading automotive technology and precision engineered Products and solutions Company, headquartered in Coimbatore, India. Commencing operations in 1975 and the Company has evolved into a reputed brand in the global automotive industry. By being customer centric and pushing the boundaries on product and process technology and innovation. The Company's operations classified into two verticals, Driver Information and Connected Vehicle Solution (DICVS) and Actuation, Control and Fluid Management System (ACFMS).

More than 2,000+ product variants are supplied to leading automotive OEMs in the Two-/Three-Wheelers, Passenger, Commercial & Off Highway Vehicles space across worldwide. Today, the Company has 9 manufacturing plants globally, and 3 international offices.

The Innovation

- Cost effective Driver Information System (DIS) with Hybrid Display (TFT+LCD) for Premium segment Scooters
- 7" Touch TFT DIS integrated with IOT Features (self FOTA) for Premium segment Scooters
- DIS with advanced features like Smart helmet connectivity, Voice assistance, Cruise control, Go Pro Camera connectivity, Dynamic head lamp brightness control, etc. for Premium segment Bikes
- Downstream ECU flashing in MCU platform

- 4G Telematics Live Link for Off Road Vehicle segment
- Ultrasonic welding for fixing Visor with Back cover

The Approach

New Technology Development: Customer Requirement/Ideation >> System Engineering, Design and Development >> Product Validation >> Production

Customer Requirement/Ideation: Identify market needs or customer challenges / requirements to generate new ideas.

System Engineering, Design and Development: Convert ideas into technical requirements, prototypes, and detailed designs.

Product Validation: Test the product to ensure it meets functional, safety, and performance standards.

Production: Manufacture the product at scale with quality control and process optimization for market delivery.

Continuous Improvement Post Production: Continuously improve based on market and Customer feedback, and evolution of technology.

Benefits

The organization's innovation efforts have resulted in significant advancements, including the creation of new technologies and knowledge. These innovations enhance product capabilities, improve operational efficiency, and elevate customer satisfaction. By fostering a culture of creativity and continuous improvement, the organization



remains agile and competitive, consistently delivering value and driving growth.

Rider benefits

- Cost effective Solution by using Hybrid Display
- Firmware Over Through Air (FOTA) supports updating SW / Graphics contents such as User Configurable Themes, Widgets, etc.
- Remote Diagnostics helps to diagnose the Vehicle & Guide the Rider to go to the nearest Service Centre for Critical Maintenance
- Music/Album Info – Displays current music information with Play / Pause indication
- Music Control – Supports for track change, Play / Pause while riding
- Screen Mirroring – Displays contents of the Smartphone screen on the DIS
- Weather updates – Enables drivers to take decisions based on weather forecast
- Smart Helmet Connectivity – Both driver and rider can be connected on the go
- Go-Pro Camera – Controls capture of drive-time videos
- TPMS [Tire Pressure Monitoring System] – Informs driver about status of tires
- Voice Assistance – Hands-free interface for calling and vehicle control

- Ultrasonic welding for fixing Visor & Back cover – Screwless design, good aesthetic
- Turn By Turn Navigation – Hassle-free driving without looking at phone for map directions

The Future

- Android experience: Brings Smartphone like experience on the DIS
- Dual Processor architecture: Enhanced performance, data security, reduced cost
- AR Integration: Display navigation and alerts on the windshield.
- Voice Commands: Hands-free control of key vehicle functions.
- AI Assistance: Predictive driving insights.
- Customizable Displays: Personal dashboard themes.
- Gesture Controls: Contactless dashboard control.
- Enhanced Connectivity: Smart home integration.
- Intercom between driver and co-rider in case of two-wheeler DIS
- Radio and USB playback integration
- Integration of apps such as Android Auto and CarPlay.



Proxgy (Everywhere As A Service)



About the Company

Proxgy is a cutting-edge deep tech startup leading the Industrial IoT space with solutions that enhance safety and efficiency for blue-collar workers. With over 25 patents across India, the US, and EU, Proxgy develops innovative hardware such as SmartHat, Sleaf, Lockator, AudioPod integrated with custom SaaS ecosystems. Recognized at Shark Tank India, GITEX Africa, CES Las Vegas, and Nasscom, Proxgy drives industrial transformation through smart technology. Its products, like the satellite-connected Lockator and the AudioCube series, improve worker connectivity, security, and collaboration, setting new standards for industrial safety and IoT integration.

The Innovation

The Innovation at Proxgy lies in its ability to seamlessly integrate hardware and software solutions for Industrial IoT, addressing safety, connectivity, and efficiency for non-desk industrial workers. Proxgy has developed proprietary products like the SmartHat (smart safety helmet), Sleaf (smart body camera), Lockator (satellite-connected smart lock), and AudioCube (QR payment sound box). These devices connect through Proxgy's patented UVCI framework, allowing interoperability with existing systems. At the heart of Proxgy's innovation is its modular, patented technology, backed by a portfolio of over 25 patents across India, the US, and the EU. This approach, combined with constant market research and technological upgrades, enables Proxgy to stay ahead of global competitors, offering cost-effective and scalable solutions. With its AI-driven SaaS insights and a central dashboard, Proxgy empowers industries to make data-driven decisions, fostering growth and enhancing operational safety.

The Approach

Proxgy's research-driven approach focuses on continuous innovation and staying ahead of industry trends. This involves in-depth market and technology research to identify emerging challenges faced by industrial workers and gaps in existing solutions. Proxgy leverages its strong R&D capabilities to develop new features and products, validated through extensive field testing with end users. Additionally, Proxgy's research ensures that its modular products remain adaptable, compliant with industry regulations, and ready for seamless integration with evolving technologies and industrial needs.

Benefits

The Proxgy ecosystem enhances safety, productivity, and connectivity for industrial workers through real-time monitoring and advanced data integration. Its innovative products, like SmartHat and Sleaf, address critical pain points, ensuring efficient operations in challenging environments. By providing seamless interoperability among devices and AI-driven insights, Proxgy empowers organizations to make informed decisions, streamline processes, and improve worker well-being, ultimately leading to a safer and more efficient industrial landscape.

The Future

The future of Proxgy involves launching innovative products like Birdbox and Airhat while enhancing our SaaS solutions. We will continuously upgrade existing products with new features and establish an incubation platform to support startups and young entrepreneurs in transforming their ideas into successful products, fostering innovation and growth.



RACL Geartech Limited



About the Company

Headquartered in Noida (Delhi-NCR), RACL Geartech Limited is a professionally-managed automotive components manufacturer. Offering engine and transmission components to diverse customers across the globe since 1987, RACL Geartech has always leveraged the power of both men and machines to carve a niche for itself in the field of gears and allied solutions manufacturing. We have constantly been upgrading our infrastructure, improving our processes, and adopting ultramodern manufacturing methodologies to keep pace with the ever-evolving automotive needs. We specialise in complex engineering solutions in the field of Transmission Gears & Shafts for Motorcycles & Scooters, 3 & 4 Wheeler Passenger & Light Cargo Vehicles, Tractors, Electric Cars, Agricultural Machinery, Off-Road Vehicles, Medium & Heavy Commercial Vehicles, and varied other crucial Industrial Applications. We have 2 state-of-the-art manufacturing facilities located in the industrial hub of Gajraula, and Noida (U.P), India.

RACL Geartech GmbH, Austria (Subsidiary) We have established an office in Austria that is equipped with all the basic measuring instruments. It acts as a last-mile support to our customers in the European Union. In the times to come, we also aim at extending the services through our owned and managed warehouses.

Our plants are ISO and IATF certified and spread over a sprawling area of 57,000 square meters. We employ 800+ people who enable us to produce more than 5 million gears per annum.

The Innovation

Few of the Innovation projects are listed as:

- Clutch Gears- Productivity improvement and capital cost reduction. We have developed Weight reduction Holes via laser cutting instead of machining which requires lot of machines for the same given volume.
- Actuator Shaft- Part was impossible to make through the conventional processes because of design and size constraints, it requires Blind Broaching. Our team came up with revolutionary idea of making part in 2 pcs joining with Friction welding, hence we successfully developed the so-called impossible part to manufacture and generated revenue for company.
- Crank Shaft Timing gear: There is one Crank Shaft Timing Gear Component where in customer wanted to develop localized Friction area (Rz10-Rz20) on Hardened & Ground surface not by Machining. Our CFT Team came with idea of Controlled Blasting of SiC Shots and Granules. This idea was Highly successful and very cost effective.

The Approach

Our Approach for innovation is always collaborative, we have Quality Circle CFT which includes inter departmental reviews & cross-learning at all levels. For communication we use regular daily meetings. We also have an employee HRMS portal where departments can post data to be shared with other departments/verticals. Main key approach points towards all innovation projects are:

- Collaborative approach





- Staying adaptive
- Leverage in Technology

Benefits

- Clutch Gears- Reduction of major capital investment requirement and increased productivity at the same time gaining more business and customer confidence in our capabilities.
- Actuator Shaft- successfully developed the so-called impossible part to manufacture generated revenue for company and customer confidence.
- Crank Shaft Timing gear: There is one Crank Shaft Timing Gear Component where in customer wanted to develop localized Friction area (Rz10-Rz20) on Hardened & Ground surface not by

Machining. Our CFT Team came with idea of Controlled Blasting of SiC Shots and Granules. This idea was Highly successful and very cost effective.

The Future

The Future which we are working now is Artificial Intelligence (AI) in to our manufacturing by making our machines smart with several Hard and soft sensors for Data collection and Analysis.

First step towards this is to have machine readiness for Industry 4.0, which we are already achieving by having the machines ready for Ind 4.0 interfaces.

Further we are now working towards Data Collection and Data analysis to improve OEE and Productivity.



Reliance Industries Limited



About the Company

Reliance Industries Limited (RIL), stands as a beacon of innovation and excellence in India's corporate landscape. Founded by Mr Dhirubhai H. Ambani, RIL is a global conglomerate with a global footprint across various sectors. Under the leadership of Mr Mukesh Ambani, the company has transformed from being an aggregator of technologies to a net producer of new technologies across all sectors such as energy exploration, petroleum refining, petrochemicals, renewable energy, retail, digital services, and media & entertainment. In FY 2023-24, RIL achieved consolidated revenue of ₹10,00,122 crore (\$119.9 billion) with a net profit of ₹79,020 crore (\$9.5 billion). Ranked 86th on the Fortune Global 500 list, it is India's largest private-sector company. RIL also ranks 45th in Forbes' Global 2000 and has been recognized twice on Time's 100 Most Influential Companies list. It is India's top company in Forbes' 'World's Best Employers 2023' and LinkedIn's 'Top Companies 2023' lists.

The Innovation

Reliance views technology and innovation as the core foundation of its 'Vikas Mantra' for sustainable value creation. This mantra is driving Reliance's transformation into a Deep-Tech company with advanced manufacturing capabilities in three seminal ways. First, RIL is embedding innovative technologies in every single business to generate ever-greater value for customers. Second, RIL's R&D teams are incubating several critical technological innovations in-house to enhance product and service offerings. Third, it has built an AI-native

digital infrastructure for all Reliance businesses, and have built its own software stack, integrating end-to-end workflows and real-time dashboards. Reliance's current innovation goals lie in areas of critical importance such as Circular Economy, Climate Change, Affordable and Clean Energy, Bio-innovations and Digital Services. RIL is converting pyrolysis oil to circular polymer, recycling waste plastic to make value-added products, recycling of waste tyres and polyester recycling etc. In clean energy, RIL is focusing on Bio-CBM, bio-gas, Catalytic Hydrothermal Liquefaction and catalytic gasification of Biomass to Hydrogen (B2H), electrolyzer membrane and purification catalysts. RIL is also developing most efficient solar panels and innovative energy storage systems for lowest cost round-the-clock green energy. Algae-based food alternatives, high-strength biomaterial spider silk protein, Bioderived biodegradable plastics are a few other innovations RIL team is working on. Further, Jio is spearheading India's digital revolution and creating essential infrastructure and digital innovation. During the year, Jio launched the 'JioBharat' phone, the lowest priced, made-in-India internet-enabled phone with affordable and competitive monthly service plans. In pursuit of its mission to make AI accessible for everyone, everywhere, Jio launched the 'Jio Brain', which is the world's first 5G integrated, industry-agnostic, machine learning (ML) platform that lets any enterprise institutionalize ML in day-to-day operations. The above initiatives are the true reflection of our commitment towards democratizing digital services and accelerating innovative sustainable solutions.





The Approach

RIL has systematically imbibed a culture of innovation throughout entire organization where new ideas are encouraged and failure is accepted. A robust innovation management system ensures no new ideas get discarded without careful evaluation by senior cross-functional teams. A dedicated R&D team of over 1,000 scientists is working on critical research projects while a robust IP governance framework ensures alignment with strategic business goals. RIL is one of India's biggest spender on research having spent over ₹11,000 crore in last four years. Last year Reliance filed over 2,555 patents, in the areas of bio-energy, green energy, high-value chemicals and digital technologies.

Benefits

With the success of 'Atmanirbhar' efforts, Reliance is accelerating India's transformation into a Deep-Tech Nation. RIL's unwavering commitment to innovation has led to

significant benefits to the society at large. Reliance Jio's fully homegrown 4G/5G network, transformed India's digital landscape with world's most affordable mobile internet, making India the world's largest data market. This spurred massive spike in India's start-up ecosystem. JioBharat, the ultra-affordable, entry-level 4G phone, is helping poorest people use internet. Reliance is innovating in the field of sustainability and Carbon Neutrality. It is pioneer in India to chemically recycle pyrolysis oil into ISCC Plus certified circular polymers.

The Future

RIL envisions a future centered on sustainability and carbon neutrality and is focusing its innovation efforts on New Energy solutions, innovative materials, decarbonizing processes, and sustainable material development. Reliance is committed to become Net Carbon Zero by 2035, driving innovation and research at every step of this journey.



About the Company

RICO has earned a reputation of being a reliable source for the most complex components and assemblies supplier to Global Automotive OEMs. Our commitment to uncompromising quality and the highest standards of excellence is matched by our ability to engineer the most demanding products as well as our capability to deliver global volumes across the world to cater the increasing demand of Electrification. The result of this exemplary service is the strong customer relationships we share with the most prestigious names in the National and International automotive industry. We have continued to remain a preferred supplier to these valued brands.

The Innovation

Paper based Friction material Research & Development project comes to under category "New to Firm" products. This is Unique and "Make in India project". Probably First Indian company to develop inhouse. This product earlier was being imported by us as well as our competitors.

This Paper type Friction Material is used in Clutch Assy. And preferred by OEMs due to high Thermal and durability Characteristics.

RICO developed this friction material in time stipulated by Management. This special grade friction paper developed considering

- Clutch Tribology and its mechanism
- Effective Torque transmission
- NVH and Drag characteristics

The Approach

- Benchmarking and competitor analysis
- Setting up, Quality and reliability Targets
- Research analysis of Friction Materials in

ingredients

- Establish prototype Lab as per TAPPI standards.
- Establish base line formulation by doing DOEs / Trials
- Established formulation for Paper type Friction Material and Manufacturing Process
- Bench and Vehicle Tests Qualification
- Sample submission to OEMs for testing and approval
- Start of Mass Production at Rico.

Benefits

- Make in India, resulting in cost reduction w.r.t. existing purchase from Overseas.
- Backward integration (All processes are inhouse)
- De-risking supply base
- Creation of new technology / knowledge bank
- Establishment of Paper making and customized of processes to meet customer requirements.
- Pave way to develop Paper type Based Friction Material for 4 wheelers application also

The Future

- Rico is continuously working on improvement in the existing Paper Making Process. E.g., Automation, optimization, etc.
- Rico is working on new projects which are Eco-friendly and meeting Global directions for EHS.
- Projects under Development :
 - o 2-wheelers: Brake Shoes, Pads & Caliper Assy.
 - o Clutch Shoe Friction Material for CVTs.



RSB Transmission (I) Ltd.



About the Company

Establishing in 1975, RSB A leading engineering conglomerate in India having comprehensive product design testing and Manufacturing of Capability of technology product for automobile construction and farm equipment. RSB manufactures and delivers Quality Products such as “Propeller Shafts, Gears, Gearbox, Axles, 5th Wheel Coupling & Machined Products for Engine Component and Construction Equipment Aggregates”. RSB has a global reach with manufacturing location in USA and Mexico. RSB has a strong presence of 12 state of the art manufacturing plants in India, spreads across all the major Auto Cluster. RSB has a strong design capability through I-Design (wholly own subsidiary).

The Innovation

To stay ahead of competition and to address the internal and external challenges RSB focused on the following:

- Process Innovation and implementing a robust process by introducing Low-Cost Automation (LCA)
- Giving a Quality Product with optimal cost to customer
- Optimizing cost by VAVE and continual design improvement (Weight Reduction and efficiency improvement of product)
- Minimizing the development time and making 1st shot Ok product
- Improve manufacturing capacity by improving availability of machines

RSB focuses on continuous improvement through Loss Analysis, Cost Analysis, Departmental Problems, Individual KPI's and RSB Group Strategy.

As a RSB Group Strategy we selected “Theme of the year as “Lesser the Weight, Better the

Health of Product”. The project focused on Weight Reduction of Gearbox by VAVE and Continual Design Improvement. Took a target of 10% reduction in weight of “Gearbox” from 40.5 Kg to 36.5 Kg

The Approach

The Innovation Project follows a structured process of “D-M-A-I-C”. i.e. Define Measure Analyze Improve and Control

It started with proper definition of the issue and setting the Target.

This followed by understanding and analyzing the current situation, identifying and validating the Root cause, Action implemented after Proper Project risk analysis and upon successfully passing the criteria of Project Risk Analysis Action is implemented and Effectiveness and result is monitored

Benefits

As a result, we got below benefits

Tangible: -

- Weight reduced by 3 Kgs
- Input material cost reduced by 2%
- SOB increased from 67% to 70% as we have passed 50% of the saving to the customer

Intangible Benefits: -

- Machining cycle time reduced
- Machining rejection reduced
- Capacity increased

Future Plan: -

Going one step Ahead, we want to work on following as Future Plan.

- To Increase Factor of safety of gears and other structural parts by changing the design and thus reducing weight
- Introduction of New Technology parts in synchronization system and bearing



About the Company

Founded in 2014, Saviant is among the most-awarded Digital Consulting firms for Industrial Machinery manufacturers & engineering enterprises across the US, Europe, UK & India.

Greenfield solutions architected & implemented by Saviant are running across millions of instruments, machines & equipment in Water Utilities, Gas Analyzers, Oceanography, Air pollution testing, Space vehicles testing, wind turbines, induction furnaces, et al.

Headquartered in Pune/India, our team of 150+ experts across Business Consulting, Industrial Products design, Hardware data Analytics, Digital Engineering & Automation, is on the way to creating a Rs 100 Crore industrial solutions enterprise by 2025.

Few industry awards that recognized Saviant for its Innovation & expertise:

- Economic Times Future Ready Organisations 2022
- IoT World Congress 2023, Barcelona - Best Solution Award 2023
- Nasscom Digital Skills Award 2017
- Deloitte Fastest 50 companies, 2018
- Economic Times Human Capital Awards 2021
- Great Place to Work, 2018, 2021, 2023

The Innovation

Most Machinery Manufacturers are focused on selling hardware, not creating value for customer. Further, customer's operations run by historical data, descriptive analysis & retrospective decisions. Statistically, 2 out of 3

“digital implementations” fail due to complexity of hardware, software, data and Operations integrations. And “High-cost, Time-taking, Low-success” image doesn't allow “them” to utilize AI, ML, Cloud, Data, Mobile & Edge capabilities available since many years.

To address this, we have created a Digital Capability Maturity Model that is uniquely focused on driving value and ROI. This model benchmarks the digital maturity of machinery manufacturers and sets them on a path of success, guiding them through the complexities of integrating hardware, software, data, and operations.

Designed for mid-size industrial equipment manufacturers after 12-18 months of intensive research with customers, prospects and industry advisors across US & EU, this capability maturity model helps machinery manufacturers benchmark and advance their digital capabilities, driven by customer value & Rol.

Internally, at Saviant, our vision has always been to build a highly respected consulting company from India. In 2019, we recognized the challenges of creating a consulting startup here compared to IT outsourcing firms. To sustain our vision, we needed a culture focused on solving business problems, customer-centricity, agile innovation, and fostering a fearless environment that empowers every Saviant member to make the right decisions for customers. Instead of relying on third-party ERP, CRM, HRMS, and other systems, we chose to codify our values and culture into our own in-house platform, “eaglvu,” to drive Saviant our own way.

“eaglvu” integrates over 40 process frameworks to streamline communication and decision-making at all levels—





individual, project, program, business unit, and organization. The platform provides a 360-degree view of the business, aligning individual contributions with company goals and fostering transparency, self-organization, accountability, and proactive performance management.

The Approach

At Saviant, innovation stems from a relentless customer-first mindset and hands-on problem-solving. Recognizing that conventional solutions often fall short in addressing our clients' unique challenges, we deeply understand their needs, collaborating with industry leaders to ensure our solutions are both theoretically sound and practically validated.

We believe fostering a unique consulting culture is essential for exceptional value. By integrating our core values into all aspects of our operations, we create a culture that drives innovation and aligns our team with client needs. This holistic approach enables us to tackle complex challenges with agility, delivering impactful and sustainable solutions.

Benefits

Using our Digital Capability Maturity Model, we increased our ICP1 revenue by 40% in FY2023, generated referral pipeline with 100% conversion, converted 50% of leads into 8 new clients within six months, secured 5 strategic partners, and began penetrating the ICP2 market, setting the stage for long-term growth.

Using "eaglvu", customer satisfaction scores rose from 7.8+ to 9+, retention increased to 95%, and upsell success reached 80%. Project efficiency improved from 68% to over 90%, deliverable quality to 9.8/10. We delivered 27% more work with the same team and reduced client escalations from 2 in 10 projects to zero.

The Future

We aim to introduce and scale innovations that enhance transparency, decision-making, and operational efficiency while aligning with customer needs and business objectives. Our future efforts will empower both customers and employees to drive value, operational excellence, and sustainable growth in the industrial products space.



Schutzen Care Pvt Ltd



About the Company

SCHUTZEN is laser focused on innovating, quantifying & launching Biobased & Biodegradable Specialty chemical solutions for Every industry. Today, SCHUTZEN is a global leader in developing innovative Sustainable, Safe, Scalable, End-2-End bio-based & biodegradable chemistries for every textile process cycle to enable simple plug-and-play chemical transition and foster innovation. This allows us to create value for all stakeholders, including customers, partners and distributors. Our technology is quantified & certified - easy to use and integrate, Low COD/BOD, high biodegradability, and better performance compared to obsolete fossil carbon-petroleum based chemicals.

The Innovation

After 100+ Years ,Our innovation is based on Valorising biowaste from the seeds of the fruits of the Tamarind Tree. Aka Tamarind gum, using our patented Reaction technology as a building block polymer technology, our products and formulations are proven & Certified to be Biobased, Biodegradable & Biodiverse This scientific rigor sets the foundation for future success. Our chemistries are Carbon Negative, Cost Neutral & Capital Expenditure neutral and do not contain any Synthetic Nitrogen Or phosphorous nor any known carcinogen. This Re-balances the Biogeochemical flows and Eliminates toxicity risks associated with having such toxic moieties in chemicals. The products are co-existentially built with other novel biomaterial additives which allows for perpetual Permutation & Combinations having desirable end functionalities for each application.

The Approach

Using our patented Reaction technology

as a building block polymer technology, The products are refined to the appropriate Molecular Weight Distribution, carbohydrate, protein & fat % as well as desirable carbon, Hydrogen, Nitrogen and Sulphur. (CHNS).

The biggest innovation is our ability to build products without using obsolete and toxic reaction technologies such as Ethoxylation , Propoxylation & Quat Reactions. The end point formulations & reactions are built keeping in mind a clean design, We Ensure that our start materials , are largely Biobased & Biodegradable preferably Biodiverse & not Restricted by ZDHC MRSL.

Benefits

Our Technology mitigates ~1038 Kg of CO₂e of Fossil Carbon emission from Textile Processing with Resin, If 25 Million MT Of Cotton Was processed using SCHUTZEN's Technology, 5Bn MT of CO₂e would be mitigated from Textile Processing Alone. SCHUTZEN's Biobased & Biodegradable Textile processing has proved for ~290% Reduction in Water pollution that is BOD & COD Values. Further, The technology is built using Biodiverse Chemical feedstock which adheres to Nagoya Protocol and Confers with the National Biodiversity Act of India. The Clean design is good for Workers, Customers & Planet.

The Future

Our Technology sets the foundation for future research on various biodiverse Seeds as well as expand the Tamarind Based Technology to every industry including Electronics, Semi Conductors, Home Care, Personal Care and more. Which means SCHUTZEN's Technology can provide solutions to a US\$1Trillion Market Size Eventually allowing to address SDG goals which is a US\$12 Trillion Market Opportunity



Sieger Spintech Equipments Pvt Ltd



About the Company

Sieger Spintech Equipments Private Limited (SIEGER) is an ISO certified, focussed and innovative engineering company to offer cost effective solutions in Industrial Automation, Textile Machinery, Automatic Storage & Retrieval Systems and Car Parking Systems. Having three decades of experience, futuristic vision and hard zeal SIEGER strives to be a reliable global supplier. The state of art manufacturing facility located in Coimbatore is with campus area of about 40,000 Sq. Mtrs. The manufacturing facility includes CNC Laser Cutting, CNC Sheet metal process equipment, online surface treatment and CNC machining centres. The manufacturing process goes through stringent quality check right from the time the design is conceived. Quality charts and control procedures for individual components, assemblies and machines are meticulously laid out.

Dynamic engineers qualified in various areas like product and process development continuously carry out research at the in-house R&D Centre, approved by DSIR. Systematic approach in every aspect of the business process from design to installation has been the backbone of the organization. SIEGER products are marketing by professionals with years of experience and have pan India marketing and service network.

The Innovation

Innovation in simplifying the requirement of automation solutions for various customers, using the right combination of pneumatic elements, electro-mechanical actuators, to perform a desired task, combining process automation as well as intra logistics transportation. The production process of a

product is automated by using robots and the same robots loads the product to conveying systems. The conveying system can be enclosed in an ambient atmosphere to cure or thermally condition the product to derive the desired mechanical properties and at the end unloaded, packed and palletized. The pallets effectively stored in automated stores and delivered to the cargo delivery point. The innovation also encompasses high levels of modularity to simplify the architecture of the entire solution. In depth, designing of the control system with respect to hardware architecture as well as software, delivers the results clinically. Software algorithms use simple techniques to predict possible process inconsistency during the flow and throws out the foundation for digital data analysis and IOT. Care is always taken to conserve energy within the system.

Use of data analysis, FEA to optimize design, design concepts to create an extremely efficient manufacturing of the end product is vital part of the innovation.

Data moves along with the material seamlessly through the innovative automation system installed, resulting in a fantastic control mechanism for the end use enterprise.

The Approach

SIEGER is focused in simplifying automation and offering such solutions to address the continuing needs of various industries and facilities. Effective integration of control systems, mechanical systems along with optimized kinematics achieves desired end results. Modularizing the concepts and eliminating superfluous elements creates a cost effective and affordable solution. A highly motivated team of mechanical





designers, control system architects and automation programmers delivers clinical results for the company. Supported by a digitally enabled manufacturing facility and operations team ensure a quality product is delivered. Solution architects in the front end sales conceptualizes the right solution for customers and final installation and services by trained professionals closes the loop, to deliver the promise.

Management team continually focus on absorbing the latest technological developments and factor them in the offerings. An ethical business practice of the company wraps up the credibility for the entire partnership chain from suppliers to customers and service providers. A sense of divine accomplishment for everyone connected by work at SIEGER.

Benefits

Customers get a simple, modular and cost effective automation solutions, flexible and scalable to make modifications as and when required in future. Process data is captured and analysed to throw out the exceptions. This results in better and timely process

control. Energy savings is ensured by kinematics optimization, combining various processes and eliminating or reducing in process inventory. Space savings, using vertical space, reduction of repetitive movements of human manpower so that operations can do more value added work than simple material handling which is tiresome and unsustainable. All round benefits of the end user and progress of the end user organization in ensured.

The Future

The future lies in deeper collaboration of a production process and allied automation. Newer solutions to be designed should have extreme optimization of time and material. Very deep analysis of data, prediction of positive and negative end results, automatic process control through IOT and AI. Future automation should consider higher levels of flexibility to take care of disruptions from external factors, changes in ambience, changes in climate, changes in volumes of business and form factors. Sustainability by drastic reduction of waste, non-recyclable materials and energy should be incorporated in automated solutions.



SMC Medical Manufacturing Pvt Ltd



About the Company

SMC Medical Manufacturing Pvt Ltd, a subsidiary of SMC Ltd, US founded in 2006 in Bangalore, operates a 35,000 sq.ft. export-oriented facility. We are a leader in producing complex products for the medical device, drug delivery, and diagnostics markets. Most of our sales are to mature markets such as the US, Europe, and Japan, with some from Asian markets. Our customers include global leaders in the pharmaceutical, medical device, and diagnostics industries. Our facility is ISO 13485 certified, US FDA registered, accredited by the Japan Health Ministry and Korean FDA, MedAccred certified, and recognized by CDSCO India. We manufacture complex medical devices and components using cutting-edge technologies, some of which are the first of its kind devices and components used in robotic surgeries.

The Innovation

Bilirubin measurement is essential for assessing jaundice, a common condition in newborns that can lead to serious health issues if not properly managed. Traditionally, measuring bilirubin levels required laboratory testing, which could delay diagnosis and treatment. Additionally, point-of-care devices do not currently measure bilirubin levels.

To address this challenge, SMC co-developed a point-of-care diagnostic device with a European OEM customer. This innovative device provides rapid, accurate results within minutes, directly at the bedside. It is the first of its kind, comprising a handheld reader with an optical engine and a disposable cartridge for bilirubin measurement.

A drop of blood collected from the baby's heel passes through heparin-coated channels to prevent coagulation, with a special filter separating the plasma. Plasma flow is aided to a collection pot by a suction pump, and optical

readings of the plasma determine the extent of bilirubinemia.

The Approach

The device consists of three parts: the Docking Station, Reader, and Cartridge. The Docking Station has 10 sub-assemblies, while the Reader has 19, including components like an optical engine, LCD display, and controller board. The Cartridge consists of 5 parts, including a plasma filter and collector. Assembly involves layering adhesive, hydrophilic film, and filters, followed by snapping components together. After assembly, optical clarity is tested. Cartridges are sealed in Tyvek pouches, packed in retail boxes, and sterilized.

Benefits

This ground-breaking device is the first of its kind to measure bilirubin levels at the point of care within minutes. It assesses hyperbilirubinemia in newborns through a mildly invasive procedure, requiring just a drop of blood from the baby's heel. Results are available rapidly, and trained nurses can perform the test. The device uses heparin-coated channels to prevent coagulation, with a special filter that separates plasma, which is then analysed optically to determine bilirubin levels.

The Future

This device significantly advances the assessment of hyperbilirubinemia in newborns, offering rapid, accurate results from a minimally invasive blood sample. It empowers trained nurses, facilitates timely interventions, and may integrate with electronic health records for better monitoring. Ultimately, it enhances neonatal care and improves health outcomes for infants and families.



SML Limited (formerly known as Sulphur Mills Ltd.)



About the Company

SML Limited, founded in 1971 by Mr. Deepak Shah, is a global leader in agricultural innovation, serving customers in over 80 countries. Committed to sustainable agriculture, SML specializes in advanced solutions for crop protection, crop nutrition, soil health, and biologicals. Our significant investment in extensive R&D facilities enables us to develop efficient, differentiated, and eco-friendly formulations. SML's products enhance efficacy by improving pest and disease control, nutrient uptake, and overall quality and yield while reducing environmental impact. This commitment supports balanced, nutritious food production and improves both soil and human health. SML collaborates with local and multinational companies to meet the evolving demands of agriculture, positioning itself as a leader in sustainable practices. Over the last 50 years, SML Limited has focused on sustainable agriculture and farmer welfare.

The Innovation

We lead the agrochemical industry with cutting-edge Agri boosters and highly efficient low-dose environmentally friendly formulations that reduce residue and resistance while maintaining efficacy. With advanced manufacturing facilities, including Water Dispersible Granules and Capsule Suspension technologies, SML continuously pioneers new patented agrochemical products that provide complete crop protection solutions while building natural immunity in crops. R&D and Discovery centers support our global innovation efforts, developing solutions that address crops' nutritional needs, minimize environmental impact, and reduce input usage, all while enhancing the nutrient content of food. By focusing on innovations that minimize greenhouse gas emissions and improve soil health, SML's commitment to research and development drives our mission to support farmers worldwide and contribute

to a healthier, nutrient-rich food supply. Continuous innovation has enabled us to implement sustainable agricultural solutions that promote a paradigm shift in fertilization practices, ultimately improving soil health, increasing yield and quality, and reducing carbon emissions.

The Approach

We employ a customer-first approach, offering customized soil nutrition & crop protection sustainable solutions worldwide. We have launched two pilot advisory centers, named Krishinovva, to help farmers quickly test soil & adopt balanced nutrition practices. SML's innovations enhance nutrient use efficiency (NUE), offer balanced nutrients to crops and increase yield maximizing farmers' profits while addressing environmental concerns. These sustainable solutions benefit both farmers & consumers, supporting responsible agriculture & promoting long-term soil & crop health.

Benefits

SML Limited empowers farmers to achieve "More from Less" through innovative, low-dose, high-efficiency solutions. Our technologies improve nutrient use efficiency and crop protection effectiveness, reducing the need for excess fertilizers and pesticides. This approach not only lowers input costs for farmers but also boosts yields, enhances soil health, and reduces greenhouse gas emissions by up to 84%. Through sustainable practices and smarter resource use, we enable farmers to increase profitability while protecting the environment.

The Future

We are poised to become a globally recognized customer-centric provider of agricultural solutions. Looking at global perspectives, we are devising future-ready innovations and technologies.



Spark Minda - Minda Corporation Limited



About the Company

Strategi Automation Solutions Pvt.Ltd. was established in the year 1996 and is in the business of Factory Automation. The vision of our company is to eliminate monotony and drudgery in our manufacturing shopfloors. In order to fulfil our vision, we have indigenously designed, manufactured, sold and installed Machine Tending Robots (MTRs) with our brand name of GRIPX25, GRIPX35, GRIPX12 and GRIPX22 all over India. We are committed to continuous improvement and we have several innovative products to our credit including Press Tending Robots for Cold Forge Presses, Electric Shakers for Stamping Presses; Semi Automatic Cartoners and Case Packers.

The Innovation

Our current Front Load MTR (FLMTR) used to load and unload a component from a CNC Turning Centre in 8 seconds including automatic door open and close. The FLMTR used to occupy a floorspace of 900 mm * 1200 mm outside the CNC machine. Since floorspace is a premium in any manufacturing shopfloor, we received customer requests to reduce the floorspace occupied. Through innovative design and out of the box thinking, we came out with a completely new design in the form of a slim FLMTR which occupies a floorspace of only 400 mm * 1430 mm. The floorspace has been reduced by a whopping 50%!!! The other innovations for the Slim FL MTR include faster load and unload time of 7 seconds through better arm design, increased hopper capacity with better ergonomics, auto inspection and auto correction and extended life through timely and periodic lubrication.

The Approach

Customer needs are translated into better products in our company through innovative "Design Thinking". We involve customers in the co-creation of our products so that customer wants and needs are met. We form cross functional teams that meet regularly to discuss customer feedback that can be incorporated into new products. We invest in new technologies and employee training to so that we can engage in New Product Development to stay ahead of our competition.

Benefits

Benefits include lesser floor space utilization which enhances capital efficiency; higher productivity due to faster load and unload times; higher periods of unmanned running due to larger hopper capacities; enhanced employee satisfaction and morale since repetitive jobs are automated; 100% quality through auto inspection and auto correction; longer Robot life with periodic lubrication prompts; affordable pricing due to indigenous development; design for sustainability through optimization; better ergonomics through ease of component loading.

The Future

We will continue to innovate to eliminate monotony and drudgery in our workplaces. We will launch new products that will delight our customers. We are actively looking for export markets for our products. We will continue to allocate sufficient financial and human resources for the development of innovative products.



Strategi Automation Solutions Pvt Ltd



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About the Company

Subros Limited, founded in 1985 as a joint venture public limited company with 36.79% ownership by the Indian promoters and 20% ownership by Denso Corporation, Japan & 11.96% ownership by Suzuki Motor Corporation, Japan, is the leading manufacturer of thermal products for automotive applications in India.

Subros manufactures compressors, heat exchangers and connecting elements required to complete thermal systems and caters to all segments viz. passenger vehicles, buses, trucks, reefer, off-roaders, residential & railways. Subros has manufacturing plants at multiple locations across India with an annual capacity of ~2 Million kits per annum beside a well-equipped Technical Centre at Noida.

The Innovation

Subros designed and developed a first-of-a-kind system for an H2 fuel cell electric bus that caters to the heating and cooling needs of the vehicle cabin and battery packs. The solution ensures stable and reliable control of all key elements of the vehicle thermal system thereby ensuring safe and optimal performance under all climatic conditions. The unique features of our solution are

1. First-of-a-kind system that supervises the control and management of the heating and cooling needs of the Cabin and battery packs
2. Customized in-house CAN-based control software fully calibrated to meet safety and powertrain-specific requirements with seamless vehicle control unit integration.
3. Embedded software and control hardware development compliant with applicable

standards like AUTOSAR, ISO26262, etc.

4. Use of high efficiency & low Noise BLDC motors for blower and condenser fans.
5. Battery heating by Liquid PTC heater for safer, reliable and better control.
6. Use of air PTC heater for cabin heating for safer, reliable, and efficient functions.
7. Customized diagnostics functions, fault codes and safety mechanisms that ensure faster diagnosis, troubleshooting and system fixations.

The Approach

The approach involved the integration of various components/systems into one single standalone unit to cater to both the cooling & heating requirements of the Cabin & Battery Pack. We utilised advanced thermal control technologies for precise temperature control & regulation in both the cabin & battery to maintain optimal battery performance and passenger comfort in varying environmental conditions.

This system ensures use of state-of-the-art materials and energy-efficient designs, which are lightweight and scalable for commercial bus applications.

Benefits

The major & primary benefit of this integrated thermal management system is the significant improvement in energy efficiency, leading to extended vehicle range and reduced power consumption. By integrating the cabin and battery pack thermal management, we have reduced the load on the powertrain, ensuring the optimal fuel cell operation.





This system not only enhances the performance and durability of the hydrogen fuel cell but also improves passenger comfort by maintaining optimum cabin temperatures. Moreover, the compact system design allows for easier implementation in various vehicle platforms, while reducing the system complexity, serviceability & maintenance cost.

The Future

Integrated system will serve as a foundation

for future innovations in electric and hydrogen fuel cell vehicles. We aim to enhance the system's capabilities by incorporating smart technologies, such as predictive maintenance and AI-driven thermal control, to further optimize performance.

The innovation would provide an opportunity to extend the concepts to similar applications under one roof and thereby become self-reliant in such technologies.



Sumax Engineering Private Limited



About the Company

Sumax Engineering Limited, a cornerstone of the Indian automotive market for over three decades, operates with two manufacturing plants and five offices across India. With a workforce of 240 employees, including 50 skilled techno-commercial specialists, the company maintains an extensive distribution network of 700 distributors and 21,000 sub-dealers nationwide. Their commitment to quality is evidenced by prestigious certifications including ISO 9001:2015, IATF 16949:2016, ISO 14001:2015, and ISO 45001:2018, along with a notable 20-year “Best Customer Support Award” from Hyundai India.

The Innovation

Sumax’s innovative approach centers on introducing global automotive solutions tailored to Indian market needs and competitive prices. Our groundbreaking Dry Foam Wash System exemplifies their commitment to sustainable practices, helping save water during Car and Bike washing in automotive dealerships that saves over 500 million gallons of water annually. The company has built a product portfolio from 2,900 SKUs, encompassing comprehensive solutions from pre-paint to post-paint products, spot repair systems, die-cuts and dual-tone solutions for OEM painting, and premium car care products. Their innovation strategy focuses on merging technology with cost-effectiveness, particularly evident in their advanced solutions for car transit protection and dual-tone masking solutions. These developments have set new industry benchmarks while maintaining environmental responsibility and employee welfare as core priorities.

The Approach

Sumax’s strategy combines rigorous quality control with cost-effective manufacturing. Their ISO-certified facilities in Chennai and Manesar demonstrate their commitment to global standards while leveraging India’s competitive advantages. The company positions itself as a one-stop solution provider, offering products across 14 verticals, ensuring comprehensive coverage for both OEMs and aftermarket clients while maintaining close to zero defects in supplies.

Benefits

Sumax’s extensive distribution network ensures quick and efficient product availability nationwide. Their approach delivers premium quality products at Indian prices, benefiting both Automotive OEMs and aftermarket customers. The company’s sustainable practices, exemplified by water-saving innovations, create environmental benefits while maintaining high-quality standards. Their comprehensive product range simplifies procurement for clients, offering solutions from assembly plants to DIY enthusiasts.

The Future

As a pivotal force in India’s automotive sector, Sumax is set to expand global partnerships while revolutionizing its portfolio with end-to-end paint body shop solutions and nano surface technology. Through strategic optimization and investments in cutting-edge technology, Sumax will continue setting new industry benchmarks for excellence



About the Company

Svaya Robotics, empowers businesses to turn their manufacturing adaptive, scalable and resilient powered by robotic automation. By harnessing the power of human-robot collaboration, Svaya is pioneering a unique approach to human-scale automation, marrying flexibility with productivity so businesses can innovate inside-out from manufacturing to drive profitable new business models. Founded in 2018, Svaya Robotics with its multi-disciplinary team of passionate engineers has developed India's first fully-integrated collaborative robots with pioneering advances in hardware, software and perception paving way for its journey to embodied AI robots.

The Innovation

To make human-scale automation frictionless, Svaya Robotics is pioneering innovations across robot design, interaction, digital-twin and perception to connect people, process and systems in intuitive ways in any setup, existing or new.

Robot Design – compelling design, safe to work alongside humans and IP67 engineered to resist splash, fluids and dust for worry-free deployment in any industrial environment.

Interaction – intuitive no-code interface made for line-workers, enables fluid interaction with robots to drive flexible automation and a gateway for robots to learn from tacit human experience.

Digital-Twin – bridge real and virtual worlds, providing foresight for adaptive robot motion and also a powerful sandbox to digitalize the real-world and drive robot autonomy.

Perception – built-in tactile sensing both as a means for robots to adapt to process variations and also drive AI-powered

applications and unlimited analytics with real-time actionable data.

The Approach

From inception, Svaya Robotics developed hardware and software in-house. At Svaya, it's a means to an end. We do it because it gives us the strategic advantage of responsive and short development cycles of highly interdependent hardware, software, safety and algorithmic stacks with unmatched freedom. For Svaya, this interdependence has been the key to build powerful high performance collaborative robots that are truly software-enabled with unprecedented versatility and ease of use.

Benefits

Svaya collaborative robots strip barriers to automation, marrying flexibility with productivity, for setups to innovate with profitable new business models for changing markets. They are:

Simple to integrate into any setup without retrofitting or integration and driven by line-workers on-the-job.

Convenient to quickly changeover between tasks with little or no downtime based on demand changes.

Reliable to work day-in and day-out with zero maintenance for the life of the robots

The Future

To thrive in the new economy, manufacturing has to become adaptive and agile and we believe only an interplay of robots and humans will enable it. Svaya with its AI-powered human-centered robots will empower these setups to shape “your work your way” to define their unique competitive edge from manufacturing-to-market.



Synthesis Winding Technologies Pvt. Ltd.

Synthesis
Winding Technologies Pvt. Ltd.

About the Company

We specialize in designing and manufacturing winding machines such as Automatic Coil Winding Machines, Transformer Winding Machines, Capacitor Winding Machines, New generation motor winding machine (EV, BLDC, Drone) and Custom-built machines. With over 30 years of experience in the field and having strong in-house design team with high level of domain expertise and capabilities, we build some of the world's most technologically advanced winding solutions addressing Auto components, Electrical Power, Military & Aerospace, Medical and Engineering equipments. We have designed more than 150 types of winding machines catering to critical requirements of leading MNCs spanning around 40 countries.

The Innovation

Developed CVT winding machines with following features

- Automatic insertion of Pre-stitched TABs.
- Dry-element tester with automatic transfer and sorting.
- Closed-loop tension control with AC servo motors to facilitate very high acceleration and line speed.
- Material exhaust sensing and Smart-detect system to detect adequacy of material available. Developed Automatic HV Grading Capacitor Winding Machine with following features
- Automatic Ultrasonic welding of Aluminium foils of adjacent elements and they get stacked.

- Fully automatic line with zero manual intervention. Developed Automatic Winding Machine for Distribution Transformer HV Coil with following features
- Grading of insulation for lowest material consumption.
- Enhances productivity by a novel, on-the-fly mechanical sealing technique that avoids foreign material requirement and machine does not stop for sealing.
- Precise & high dynamic tension control + forming roller gives compact winding.

The Approach

Enhances productivity by more than 15% to 25% intervention which is critical for the end product.

- Better quality and consistency.
- Lower material consumption and lower maintenance.
- Best Value-for-money considering lifecycle costs.
- State-of-Art : IoT, Industry 4.0
- Interactive based user interface to enhance quality & productivity.
- Easy programming & Full auto mode permits operation with minimal skill – providing jobs for people with low formal education.

Benefits

- Automatic Operation – minimal operator skill & intervention – manual intervention



required only to replenish raw material - less than 5% of production time.

- High level operator safety – safety compliant with IEC, CE, CSA, BIS.
- Structured, menu based programming with auto validation and interlocks.
- Ergonomics for fatigue-free operation.

The Future

- Moving Towards Smart Machines.
- Future Ready – Open architecture, can receive AI/ML upgrades Best-in-class energy efficiency using regenerative drives.
- OEE parameters with vision systems.



TATA Autocomp Systems Ltd. (Composites Division)



About the Company

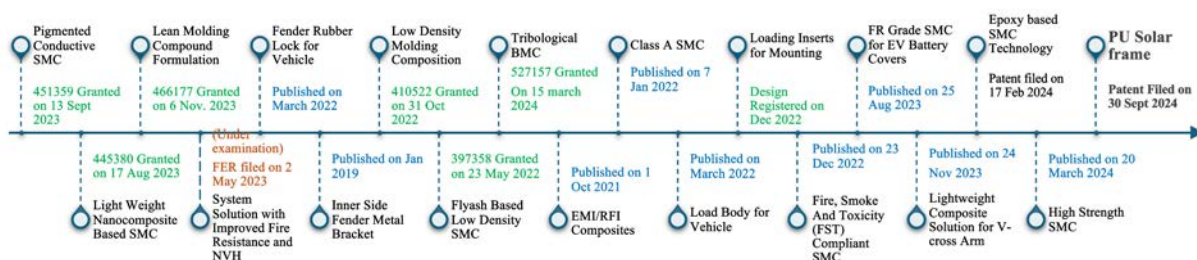
TATA AutoComp Systems Limited's - Composites Division (CD) is India's leading company in the design, development, manufacturing and supply of composite materials, parts and systems. The company offers innovative replacement for conventional materials such as steel, aluminium, thermoplastics for a wide range of applications. It has in house compound manufacturing and molding facilities – for sheet molding compound (SMC) and bulk molding compound (BMC), material formulation R&D, engineering and design capabilities. The company supplies its products to automotive, farm equipment and to niche applications in construction and industrial segments and can supply Full System Solutions to its customers.

The Innovation

Some of the key innovations of the company from recent past include:

- Lightweight and fire-safe SMC covers for electric vehicles (EV) battery packs,
- Fire, smoke, toxicity (FST) compliant SMC parts for Metro applications,
- Lighter weight composite parts based on industrial byproduct waste extract,
- UV resistant and 5VA fire rated SMC for outdoor enclosures and
- Sustainable SMC based on recycle of composite parts waste.

The key drivers for R&D efforts are light weight customized application development and sustainability. New formulations, applications and innovative designs are protected through patent applications. Till date the company has filed 19 patents (image below) of these 7 are granted by the Indian patent office. These innovations have immensely benefited CD to provide better value to its customers and maintain its leadership position.



The Approach

: CD has a set methodology to develop and update its Technology roadmap that is aligned to its growth plan. Team creates a hopper of technology projects through technology scouting, taking learnings from past projects and anticipating effects of external factors.

Few of these projects (seed based) are undertaken by considering customer's future needs. The projects are further prioritized based on their technology readiness level and potential paybacks. The company promotes innovations by driving internal Innovista competition.



Benefits

Innovations help CD in offering different value propositions to its customers and grow its business. Its technical capabilities are recognized by global customers like Paccar Group, John Deere, Case New Holland, NIDEC as major differentiator, helping CD win business successfully competing at global level. The company also collaborates with other group companies like TATA Chemicals (for new materials), TATA Motors (for automotive innovations), TATA Steel NMB and

TATA Power (for industrial applications) to develop new products and technologies.

The Future

CD aims to be amongst top 10 global companies in composite business in terms of revenue. To realize this, the company will continue providing its customers with innovative SMC and BMC products and is exploring opportunities for offering composite parts and systems based on other technologies as well.



About the Company

A part of the US\$ 128 billion Tata Group, Tata Chemicals Limited, is a leading supplier of choice to glass, detergent, industrial and chemical sectors. The company has a strong position in the crop protection business through its subsidiary company Rallis India Ltd. Tata Chemicals has world-class R&D facilities in Pune and Bangalore.

High Dispersible Silica:

Tata Chemicals' Specialty Silica products reflect our leadership in technology and innovation. We have innovated a novel method of synthesis and customisation of structure, morphology, particle size, surface area and particle porosity, which gives our silica greater advantage in industrial applications. Our products come with the assurance of consistent quality along with quick and assured supply.



FOSSENCE®

The prebiotics and dietary fiber:

Fructo Oligosaccharide

FOSSENCE® is a 100% soluble, potent prebiotic and dietary fiber made from fermented cane sugar, clinically studied, for its impact on the gut microbiome. Healthy

microbiome is known to improve immunity, nutrient absorption, lipid transport and overall digestive and bowel health.



Bio-based surfactant

Tata Chemicals has developed the Biobased Surfactant which is a Replacement of dominant petroleum-based surfactant. Part of its sustainability objectives Tata Chemicals has established UK's 1st Industrial scale Carbon Capture and utilization plant (liquid CO₂) to manufacture Food and Pharma Bicarbonate to be exported to 80 countries worldwide. Tata Chemicals shall continue to develop sustainable technologies based on the principles of green chemistry.

Harnessing Green Chemistry for High Performance Silanes

Tata Chemical's Innovation Centre has used green chemistry principles to develop a cutting-edge, solvent-free manufacturing process for tyre grade organo silanes. Tyre grade silanes are important for the tyre and rubber industry as coupling agent ingredients which bind inorganic fillers to rubber matrix.

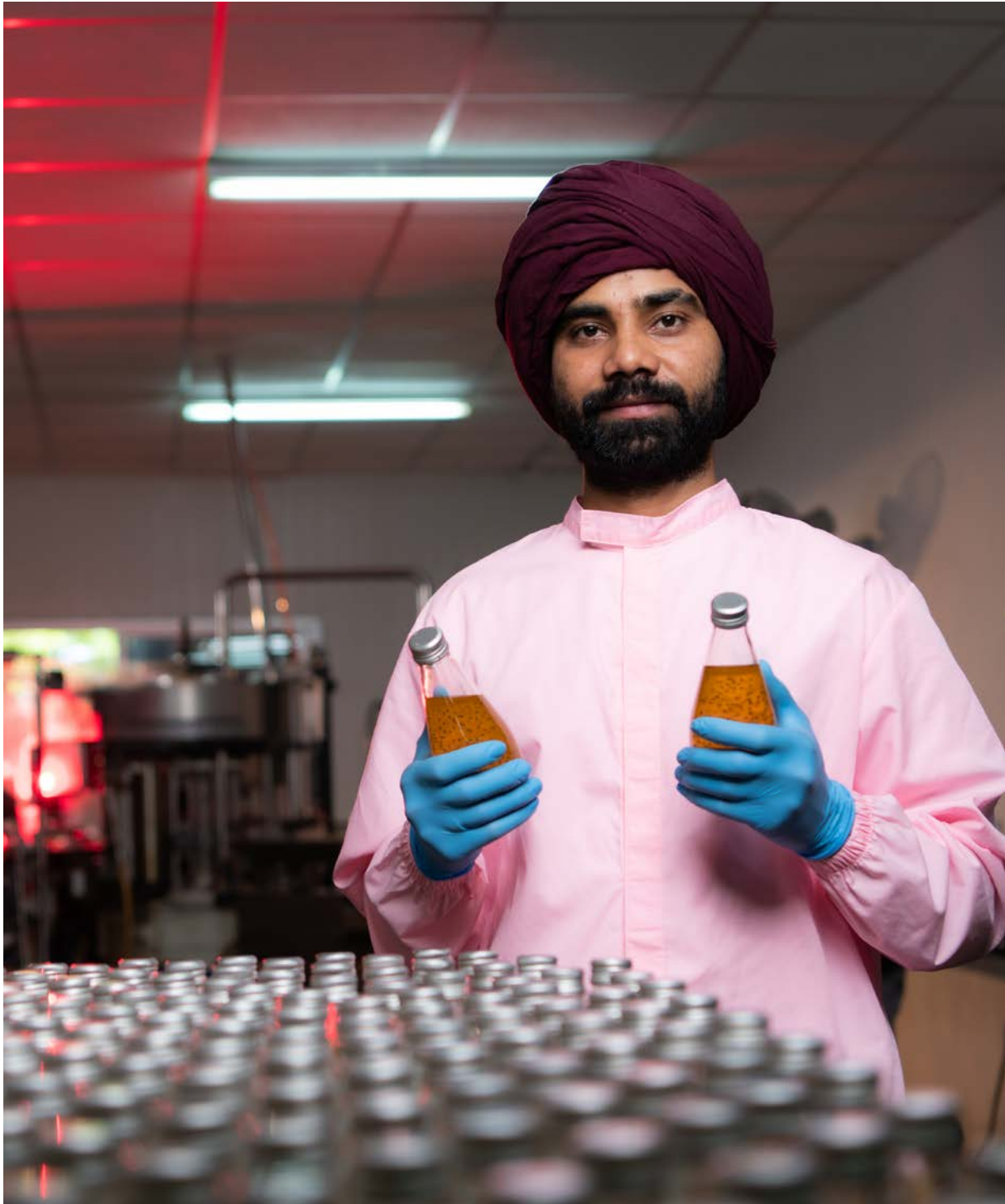
- Benefits: It eliminates the need for organic solvents in the process of extraction and purification & helps in recycling and reusing the aqueous and solid effluents to make other value-added products
- Impact: Resulted in improved product yield and helped achieve benchmark

specifications & product has attracted attention from leading tyre and rubber customers

Quote from Dr. Richard Lobo – Head - Innovation, R&D, CQH and, Chief Ethics Counsellor at Tata Chemicals:

We remain dedicated to creating sustainable,

science-differentiated Innovations, rooted in green chemistry, in keeping with our mission of Serving Society through Science. CII Innovation maturity frameworks aids us tremendously to examine our Innovation methodologies, including Industry-Academia and Open Innovation.



About the Company

Tata Elxsi, part of the Tata Group, is a leading global engineering service provider in Automotive, Media, Broadcast, Communications, and Healthcare industries. We combine top-notch technology and user-centric design to deliver innovative solutions and exceptional consumer experiences. Our integrated Design and Technology teams support enterprises from strategy and consumer research to service design, technology implementation, and beyond. We collaborate closely with customers on advanced R&D, system architecture, development, validation, and deployment, leveraging emerging technologies like IoT, cloud, smart mobility, and AI to enhance operational efficiency, reduce costs, and offer new services.

The Innovation

The details of innovations highlighted in the CII application are as below:

Neuron Dark NOC

“Neuron Dark NOC” is a fully autonomous network operations center, minimizing manual labor and costs. It boosts efficiency, service delivery, and uptime, transforming into a revenue center. It provides data-driven insights, proactive management, and upselling opportunities. Focused on revenue and profitability, it enhances security with automated threat detection and response.

LEXI Connected Digital Twin Platform

The LEXI Digital Twin Platform revolutionizes the creation, adoption, and management of Digital Twins with extensions like Analytics, AI, and Modelling. Primarily for Automotive,

Telecom, and Network industries, it's domain-neutral and self-service. LEXI simplifies Digital Twin adoption, enabling advanced analytics use cases like predictive maintenance and prognosis.

Crew Module Recovery Model for Gaganyaan

The Gaganyaan project by ISRO aims to demonstrate human spaceflight by launching astronauts into orbit and safely returning them to Indian sea waters. Crew recovery is crucial, requiring extensive practice. Tata Elxsi was tasked with designing and fabricating two full-scale Crew Module Recovery Models, for recovery team training, marking ISRO's first outsourcing of critical mechanical design.

The Approach

Our mission is to be the preferred partner in design, technology, and innovation, creating unique products and services that delight customers and drive business growth. Tata Elxsi's 'Innov@TE' framework fosters a culture of innovation through a structured process involving nudging, social proofing, hackathons, customer validation, and mentoring, transforming ideas into business-relevant solutions. We continuously strive to innovate across all chosen industry segments. Embracing the value of 'thinking big and taking risks,' Tata Elxsi is a “Home to a billion possibilities”, dedicated to driving operational efficiency and delivering new services to consumers.

Benefits

Neuron Dark NOC

Operator reduced workforce by 30-40%, potentially 70-80% with a closed-loop system.





Mean Time to Response cut by 70%. 100% decrease in tickets. Single Pane of Glass, proactive issue resolution, and improved uptime.

LEXI Connected Digital Twin Platform

Operational costs reduced by 30-40%. Clients see benefits in under 12 weeks. Digital twin predictions highly accurate. LEXI users achieve 200% ROI within the first year.

Crew Module Recovery Model for Gaganyaan

TATA Elxsi's brand enhancement is a key KPI. Successful execution and press releases positively impacted TATA Elxsi's share prices

The Future

Innovation will continue to be critical to the success of Tata Elxsi in serving its customers. With a focus on Patents and IP development, the company aims to double its revenue from IP lead business fostering customer-led innovation.

Tata Elxsi is enhancing its current collaboration with research and academic institutions and is building a multi-channel idea crowdsourcing platform to accelerate innovation to create a greater impact on business and society.



About the Company

Tata Motors (TML) is a leading global automobile manufacturing company. Its diverse portfolio includes an extensive range of cars, sports utility vehicles, trucks, buses, defence vehicles, and e-mobility solutions.

With 'Connecting Aspirations' at the core of its brand promise, TML is India's market leader in commercial vehicles and among the top three in the passenger vehicle market.

Innovation is deeply embedded in our DNA and is demonstrated through our innovative & pioneering solutions that help industries to become more efficient and effective in turn serving as catalysts for the progress of our nation.

The Innovation

- Design and development of India's first indigenous fuel cell bus.

Hydrogen fuel cell-powered vehicles are an attractive option in our nation's search for cleaner and more sustainable automotive technologies because of their ease of maintenance and faster refuelling. The fuel cell bus innovation is a zero-emission solution that benefits the transportation sector as well as steady state power generation, it will also lead to reductions in fuel imports, savings in foreign exchange, and improved energy security for the country. The additional infrastructure created for hydrogen generation, storage, and dispensing can help generate new sustainable business and employment opportunities.

Our first customer of Fuel Cell Bus is IOCL.

- Altroz - first premium hatchback to achieve

the prestigious Global NCAP 5-star rating for adult occupant protection

Road safety has been the top priority for both the Government and the industry, and TML is known for making elegant and safe cars. Through its approach of frugal engineering and democratizing safety, TML dedicated itself to the mission of 'Safe Bharat' by developing innovative mobility solutions for both personal and mass transportation. After the success of Nexon which became the country's first GNCAP 5-star rated car in 2018, the approach was extended to other products like Tiago & Tigor and newer models also.

- Country's first HCV (Prima 5530.S) with Advanced Driver Assistance ADAS features:

Autonomous driving technologies have been experienced in the passenger vehicle segment in different parts of the world, but specific solutions were required for the commercial vehicle industry in India. ADAS creates an environment that is conducive to stress-free driving for active safety. With ADAS, TML attempted to enable and empower drivers and help transporters attract and retain skilled drivers. In addition to dealing with road safety, ADAS features also increase the Total Cost of Ownership and enhance ROI for fleet owners.

The Approach

- It all begins with strategic inputs that include environment scanning, disruption radar, situational analysis, emerging regulations, consumer behaviour, and unstated needs of the nation. This is





followed by robust processes supported by a culture that promotes experimentation. Some of the key steps in the processes include–

- o Innovative validation methodology for ensuring robustness - testing beyond the regulatory mandate and simulating actual use cases for all ADAS features.
- o Choosing innovation over high-cost technologies.
- o Focus on digitalisation across the value chain in the organisation.
- Projects, even those that didn't succeed, are felicitated by senior leadership.

Benefits

TML takes pride in actively propelling the progress of our nation through its pioneering and innovative products, aiming to meet stakeholders' aspirations.

India's first Indigenised Fuel-Cell Bus is a cutting-edge design that ensures zero-emission and noiseless operations – a modern, practical, and state-of-the-art mass mobility solution tailored to the growing urban transport needs of India.

Our nation's infrastructure revolutions and the vision of 'Atmanirbhar Baharat' are reflected in the revolutionary Tata Prima 55T ADAS truck. India's road safety goal of reducing accident fatalities by 50% is greatly aided by the Altroz, a Global-NCAP-5 star product, and Tata Prima 55T ADAS truck.

The Future

TML will continue to contribute to nation-building through its innovative product portfolio with aggressive targets in customer-centricity, safety, and sustainability (with Net Zero targets in PV business by 2040 and in CV business by 2045 and Circular Economy).



TATA Power Delhi Distribution Limited



About the Company

Tata Power Delhi Distribution Limited (earlier name NDPL) took over the license to distribute electricity to the North & North West part of Delhi through a competitive bidding process initiated to reform the distribution sector. The organization was incorporated in July 2002 as a JV of Tata Power (51%) and Delhi Government (49%) on the Public-Private Partnership (PPP) model.

Tata Power-DDL supplies electricity through its distribution network at tariffs regulated by DERC to approx. 2 million customers with a peak demand of 2218 MW & energy demand of 10983 MUs (as on 31-Mar-24) in its licensed area. The company has achieved unprecedented reduction in AT&C losses since inception bringing it down from 53.1% in July 2002 (during takeover) to 5.9% at the end of FY 24.

The Innovation

1. Self-Regenerating Breather

Tata Power Delhi Distribution Limited, a leading power utility supplying electricity to over 2 million customers in North Delhi, has

been granted the patent for its unique “Self-regenerating Transformer Breather” for a term of 20 years. The ‘Self-Regenerating Breather’ is a device that protects a transformer from moisture ingress and thus, increases the longevity of electric transformers. The moisture in the air can cause outages and shorten the life of a transformer.

In Conventional Breathing methodology, Silica gel Breather is mounted on the Conservator and the colour of the silica Gel is in Blue colour. When the moisture air enters into the Breather it gradually turns into Pink and also moisture absorbing property will be lost. In such cases Moisture will be passed to the oil in the conservator and gradually deteriorate the dielectric/insulation property of Mineral oil inside the Transformer.

Our innovation is designing and development of self-regenerating breather which utilizes waste heat from the top plate of the transformer to minimize moisture content in the air inlet to the Distribution Transformer (DT) Breather. The moisture absorbent Silica gel also gets recharged, thereby increasing the life of Silica gel by up to 2 years in outdoor applications.

Oil quality analysis was done on sample taken from about 3000 no's of DT's in TPDDL.
 In 187 cases the quality of oil was found degraded due to moisture ingress reason.
 The new developed self regenerative breather was installed on all such DT's (187 cases) in place of conventional Breather



The oil sample from all those 187 DT with Self regenerative Breather was analyzed after 1 year, the observed Dielectric breakdown value of oil was improved with no moisture ingress found in Oil.

| Zone | Feeder / DT Name |
|--------------|------------------------|
| Z-506 | TR,111 B |
| Z-531 | 5A S/STN, DT-2 |
| Z-531 | 1B Substation, DT-1 |
| Z-531 | 1B Substation, DT-2 |
| Z-1302 | NARAINA VILLAGE,WZ-572 |
| Z-532 | Arora Farm DT-1 |
| Z-532 | Arora Farm DT-2 |
| Z-1301 | 10 DLF DT-1 |
| Z-1301 | 10 DLF DT-2 |
| Z-571 | vaidandara apartments |
| BUJ(402+415) | B-105 |
| BUJ(412+413) | Mukherje nagar-4 |
| BUJ(411+418) | Bela Road |
| Z-416 | polo road |
| BUJ(417+424) | E block MCD School |
| BUJ(422+425) | Shazadabagh s/stn |

Total implementation: 187

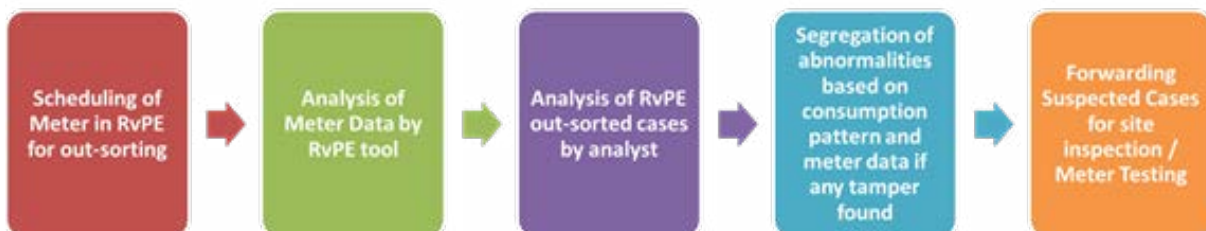




2. Revenue Protection Engine

To improve Billing Efficiency (BE) from 92.49% in Feb '20 to 94% by FY24, the organization identified 9 zones responsible for 66.67% of its commercial losses. Targeting these zones will have a significant impact on overall BE improvement. The primary factor contributing to losses was theft load booking. To address this, the organization implemented a business intelligence tool with 18 custom logics to automatically detect tampered or suspected

meters. This system, developed by cross-functional teams and refined over two years, identified 11.61 MW of theft load in FY22 from 3502 leads in the 9 zones. Leads increased by 50.1% with a strike rate of 73.52%. The logics are regularly reviewed and updated annually, with integration across platforms like SAP/CRM. The solution has been scaled to all districts, with analysts trained and standardized procedures implemented. It has also been deployed in other utilities, such as Orissa DISCOMS, to identify revenue leakages.



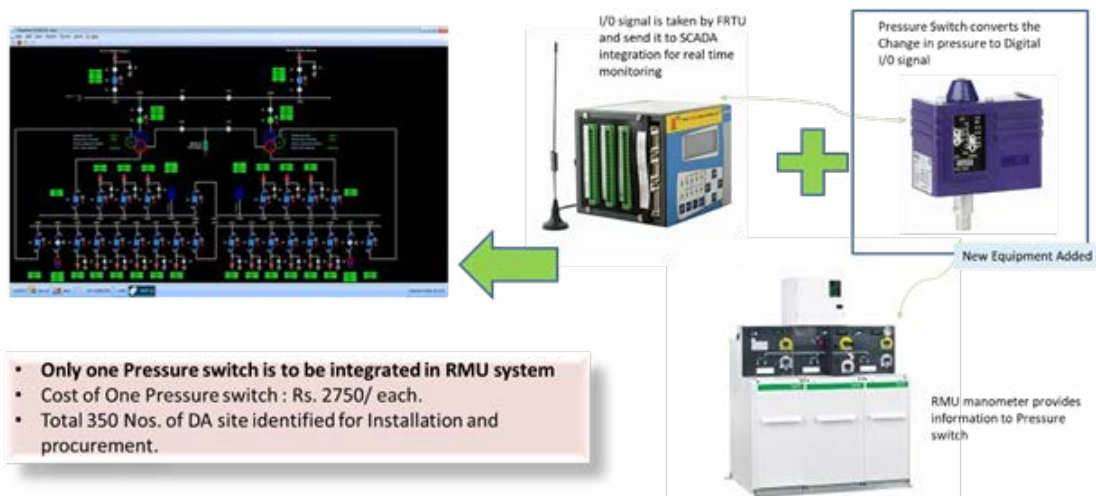
| Actions | Solution Developed | |
|--|--------------------|---------------------------|
| | Analysis of RvPE | At Genba (Theft Captured) |
| <p>Proposed Actions : Lead generated RvPE Inhouse analysis Tools</p> <p>Objective: To develop a data analytics module for out sorting of electricity theft cases</p> | | |



3. Gas Eye: A real time Gas monitoring solution

The Gas Eye project addresses the critical issue of managing SF6 gas leaks in Ring Main Units (RMUs). Rising SF6 consumption, largely due to gas leaks, has been a concern, exacerbated by the absence of real-time monitoring. Currently, leaks are only detected through manual inspections at substations, and there is no system for recovering leaked SF6, leading to increased emissions and waste. To resolve this, the project introduces a real-time monitoring system for remote RMUs.

The implementation involves connecting a pressure switch to the existing manometer, integrating it with the FRTU, and visualizing the data in the SCADA system for continuous monitoring. This solution significantly reduces the time between leak occurrence and detection, enabling immediate gas recovery and cutting down unnecessary emissions. The system improves operational efficiency and reliability, with plans to expand coverage across more RMUs and enhance input/output operations to further strengthen environmental management practices.



The Approach

The goal is to partner with technology, research, academic, and funding organizations to design, develop, and deliver innovative products, processes, business models, and services throughout the organization. This collaboration aims to create a valuable brand

with robust technology and R&D capabilities. Tata Power-DDL is working with national and international technology partners, academic institutions, and funding agencies to enhance efficiencies within its licensed area while also focusing on sector sustainability and building a resilient industry for the future.



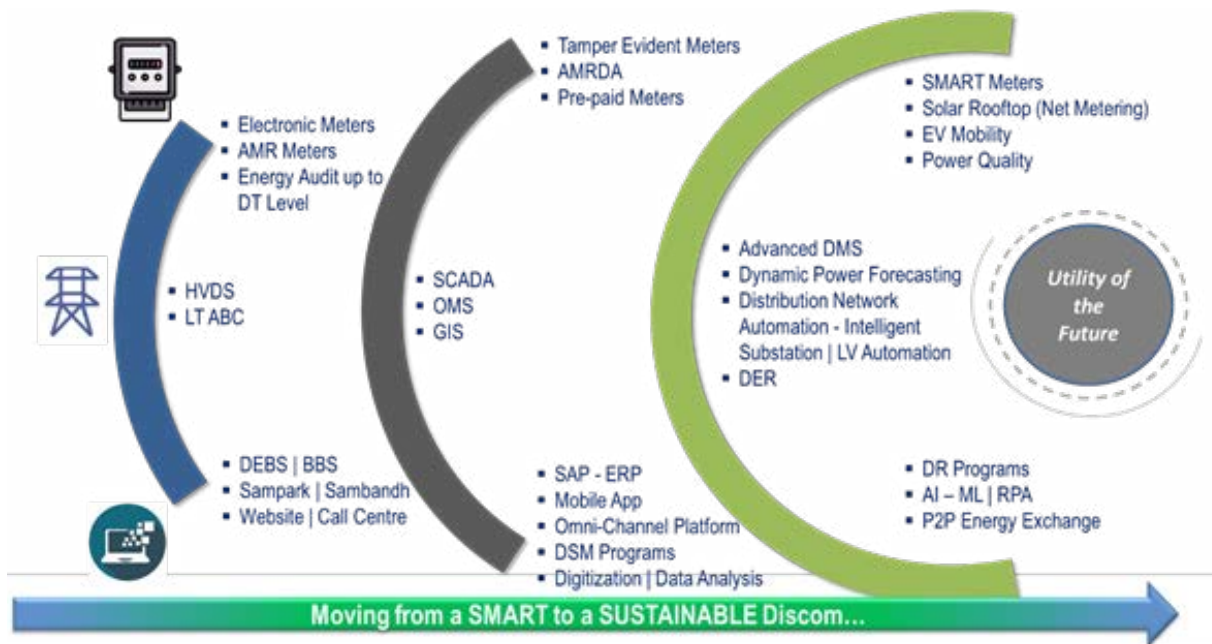
Benefits

- **AT&C Losses:** Reduced by 30% over 5 years, consistently surpassing DERC targets; advanced analytics and quality control tools helped reduce theft and increase revenue.
- **Power supply reliability factor SAIFI & SAIDI:** Improved by 70% over 5 years through focused network improvement and maintenance.
- **Customer Satisfaction Index (CSI):** Based on learnings from Total Quality Management, only Top box score in the survey was considered from FY22 onwards & CSI score of 90% achieved in FY24.
- **Total Employee Involvement:** Employee Participation of ~90% has been achieved in improvement / innovation projects over the period and enhanced participation & recognition at National & International competitions.

The Future

Tata Power-DDL, in its excellence journey, firmly believes in continuous improvement. Tata Power-DDL's change management experience, distributed leadership system, adoption of latest technology; robust competence development process and innovative & open work culture are the key strategic boosters which helps in building and sustaining competitive advantage in the changing business scenario. A journey which began a decade ago for empowering the consumers in Delhi now holds the potential to transform the distribution sector in India and similarly help utilities across the globe.

Tata Power-DDL has also collaborated with leading international and national Institutions to carry out research activities in energy space.



About the Company

Tata Steel is one of the most diversified integrated steel producers in the world, with an annual crude steel production capacity of 35 MTPA. The Company's manufacturing assets are spread across India, the Netherlands, the UK, and Thailand.

Tata Steel aims to become the most respected and valuable steel company globally by achieving leadership in value creation and corporate citizenship. From setting up Asia's first integrated steel manufacturing unit in India over a century ago, to becoming one of the leading global steel companies, Tata Steel's journey has been nothing short of inspiring.

Tata Steel is proud of its pioneering spirit, commitment to community, and contribution to economic prosperity while also being conscious of its impact on the environment. Pursuing the ambitious target of achieving Net Zero by 2045, Tata Steel has embarked on a journey of transformation with growth and sustainability at the core of its strategy.

The Innovation

Aspects of the sinter making process with potential effects on quality, stability, and environmental performance have long been obscured. Sinter size and quality have an impact on blast furnace productivity, and a decline in size has a negative impact. An inhouse developed image processing-based size measurement system was envisioned first time in steel sector to provide real-time feedback of sinter size to the operator for effective control of the size of sinter being sent to the blast furnace to generate proactive actions in process control to improve sinter size. After this system's implementation, there has been a notable improvement in production, with 100% quality compliance

and a decrease in coke rate made possible by prompt process control.

The Approach

We employed high-speed machine vision cameras with 100 fps frame rates to record sinter moving along the conveyor belt. The uncompressed raw images that machine vision cameras offer make them special. To determine the size fraction, a cutting-edge imaging algorithm is employed. In order to identify the conveyor belt ends, the algorithm first processes photos that have been collected. Following that, the illumination system is developed for this specific application to provide a consistently lighted image. The operators immediately control the settings to take corrective action once the distribution is given.

Benefits

In the six months since May 2022, the advantage from this innovation is worth 22.5 crores of rupees. This explains the higher sinter plant productivity, lower rejection rates, lower sinter plant fuel consumption, and rising costs of raw materials that could be avoided if the right size of sinter was supplied into the blast furnace. This also involves the decrease of carbon dioxide, which yields carbon points. After this, a recurring savings of Rs 45 Crores have been accrued every year from a single sinter plant.

The Future

Currently we have implemented this system in 2 out of 8 sinter plants (SP) of Tata Steel India. We are horizontally deploying in 3rd SP and plan to complete 8 SPs by FY-27. Also, we would improve the software by directly controlling the setpoints of the sinter plants without manual intervention.



About the Company

Temenos India Pvt Ltd, established in 1993, is a global leader in banking software solutions. Our pure-play, open platform revolutionizes the way banks and businesses collaborate, create, and innovate. With over 3,000 clients worldwide, we empower financial institutions to deliver exceptional customer experiences and drive growth. Our commitment to excellence and innovation has positioned Temenos as a transformative force in the financial services industry.

The Innovation

Temenos has pioneered several groundbreaking initiatives, including Temenos explainable AI for finance (XAI), Temenos Digital, Payments, ESG, SaaS 2.0, and Retail Enterprise Services (RES).

- Our Explainable AI (XAI) and Generative AI (GenAI) solutions lead the industry with their ability to provide transparent and interpretable AI-driven insights. T
- Temenos Digital offers a seamless, omnichannel banking experience, enabling banks to engage customers in ways that are personal, sustainable and fair, at scale.
- SaaS 2.0 enhances banking infrastructure scalability, performance and security, accelerating the evolution of the banking industry from legacy to a modern technology stack and business operations.

The Approach

At Temenos, we invest an industry-leading 20% of our sales in R&D/innovation-related activities, and we have an innovation strategy that is horizontal across the company, and which covers three key areas:

- Innovation in Distribution Channels: Enhancing how customers access our software through flexible deployment options.
- Product Innovation: Integrating cutting-edge technologies to solve customer problems in novel ways.
- Internal Business Innovation: Optimizing our operations with agile methodologies, continuous learning, and collaborative tools.

We look to balance customer-centricity with innovation, and culturally we have a strategy and processes to make innovation part of everyone's job, beyond dedicated innovation teams.

Benefits

Our innovations enhance quality, productivity, and cost reduction. As a result, Temenos leads the market with 393 new deals in 2020-22, surpassing all traditional and neo-vendors. From our 3,000 customers, 700 have successfully transitioned to SaaS. Revenue from SaaS grew from 27% in 2021 to 47% in 2023, with on-prem reducing from 73% to 53%. We aim for on-prem to drop to 20% in the mid-term.

The Future

Temenos envisions a future where AI and digital solutions drive the next wave of banking innovation. We aim to expand our GenAI capabilities, develop new ESG-focused products, and enhance our SaaS offerings. Our goal is to create more opportunities and deliver unparalleled value to our clients, ensuring they remain at the forefront of the financial services industry.



About the Company

TMS TECHNOV M SYSTEMS (P) LIMITED, Incorporated in 2007, is professionally managed, with its core objectives to innovate, commercialise technologies, and institutionalise the innovations.

Our sustained focus on business driven field research, in collaboration with our customers has motivated us to innovate, patent and manufacture affordable technologies, yielding quick payback, to mitigate greenhouse gas emissions. Our purpose driven journey of innovating climate action technologies has enabled us to successfully implement 6500 technology installations, country wide.

Establishing our strengths in the domestic market, has provided us the gateway to make forays in countries of Europe, in Vietnam, Thailand & Japan to implement similar strategic mechanisms.

The Innovation

Background of innovation: Improving Process value of the manufacturing system improves business process. Process value analysis yields that hydrocarbon fuel is the major cost driver of combustion driven process. Increasing combustion efficiency leads to burning less fuel, along with reducing harmful emissions. Improving heat rate of the utilities by enhancing combustion efficiency is an application specific solution supporting strategic cost management mechanism.

Value proposition: Affordable, scalable through mass customization, quick payback, non-invasive, non-inflammable, light weight, miniature in size, easy to install, durable, robust, combustion improvement mechanism for utilities like Gas turbines, Boilers, Ovens

and Furnaces fired by Gaseous or Liquid hydrocarbons.

Technology & Engineering: Computational fluid dynamic algorithm in conjunction with RF engineering using special rare earth metallurgy and strontium Ferrite, are used to polarize the fuel, improving the specific area of contact between the AIR and FUEL during combustion. Improved combustion efficiency improves specific fuel consumption also reducing the emission levels.

The Approach

Prioritized to quantify value generation and to commercialise our patented innovation. Sustained business operation supported its intersectoral wide institutionalisation, benchmarking the commercialisation. Application of standard engineering metrics and data analytics, aided value proposition measurement.

Technology scaling and matching application specific requirements through its mass customization formed the basis of market segmentation. Business driven research, documentation, engineering quick replication peer reviewed publications and improving client's learning curve were other key determinants for creating a niche market.

Benefits

Manufacturing sectors reap dual benefit of saving the input costs and reducing emissions on Implementation of our technology. Improved Combustion Efficiency, Reduced Fuel Consumption, Lower Emissions, Extended Equipment Lifespan, Enhanced Heat Transfer. OEMs giving them leverage to take advantage of filing the SCOPE 1 emissions norms in the sustainability annual report, also giving them



an opportunity to file for SCOPE 3 emissions report as well.

Case study: Bharat forge published benefits of installing magnetic resonators in their recent sustainability report,

Energy Savings = 1,020 GJ/Annum

Emission reduction of 56.5 Tons CO2 Emissions, Fuel used Natural Gas

The Future

- Our focus for the future involves replicating our established business paradigm for our exports to build a globally sustainable ecosystem
- Collaboate with Japanese companies in similar space
- Consulting in sustainability and reporting



Treeni Sustainability Solutions Pvt Ltd



About the Company

Treeni, a pioneer in sustainability technology, has empowered organizations for over a decade to navigate ESG and supply chain sustainability complexities. We enable businesses to achieve sustainable growth by integrating ESG performance across the value chain. Leading with deep domain expertise, Treeni delivers tailor-made technology solutions by combining consulting and managed services with our resustain™ SaaS platform. This approach delivers key business outcomes including compliance & reporting, strategy & roadmap to net-zero, excellence in supply chain sustainability, and ESG Risk & Performance Management.

The Innovation

At its core Treeni is a technology company, Treeni harnesses rapid technological advancement to innovate and deliver compelling client value. Unlike traditional SaaS companies, Treeni leads with consulting, managed services, and deep domain expertise while leveraging the resustain™ platform to deliver business outcomes. Through automation, predictive analytics, and AI-powered insights, Treeni's technology empowers clients to develop effective sustainability strategies aligned with business objectives.

Innovation is critical across multiple dimensions:

- AI/ML use cases delivering high value at low costs, such as using Open Meteo for Supply Chain ESG Risk Assessment
- Automating compliance & reporting cycles by combining historical data with language models

- Developing a pioneering Supply Chain Sustainability Management platform, piloted with 30 Wipro SMB suppliers

Our innovation ecosystem includes:

- University of Texas at Arlington collaboration through research internships
- Strategic partnership with Sonata & Microsoft, integrating sustainability reporting with Microsoft's tools and platforms

The Approach

Treeni's approach delivers key client benefits:

- Comprehensive Compliance & Reporting: Engage stakeholders to communicate ESG KPIs, goals, and net-zero targets
- Supply Chain Excellence: Partner with suppliers to assess ESG risks, improve performance, and build resilience while advancing Scope 3 net-zero goals
- Enhanced Stakeholder Trust: Build confidence with customers, investors, and communities through sustainability commitment
- Cost-Efficient Scaling: Optimize operations while expanding solutions across supplier networks

Benefits

Treeni's solutions deliver key client benefits:

- Compliance & Reporting: Engage stakeholders to communicate ESG progress and net-zero targets
- Supply Chain Sustainability Excellence:





Assess supplier ESG performance, manage risks, and define Scope 3 net-zero roadmaps

- Enhanced Stakeholder Engagement: Build trust through demonstrated sustainability commitment
- Scale with Cost Efficiency: Reduce operational expenses while expanding solutions across supplier networks

The Future

As the world faces environmental and social challenges, Treeni stays at the forefront of sustainability innovation. By expanding AI/ML use cases on the resustain™ platform and fostering strategic partnerships, Treeni drives the net-zero roadmap, helping clients thrive while mitigating ESG risks and achieving sustainability goals.



About the Company

Uflex is Public limited company. Over the last three decades, UFlex has earned an irreproachable reputation defining the contours of the 'Packaging Industry' in India and overseas. Since its inception in 1985, it has turned into an over 1.75 billion dollar turnover company with 10000+ workforce focusing on trust, value creation for customers, quality innovation and customer satisfaction. UFlex has grown from strength to strength with large manufacturing capacities of packaging films and packaging products providing end-to-end solutions to clients across 150 countries spanning USA, Canada, South America, UK, Europe, CIS countries, South Africa and other African countries, Middle East and the South Asian countries. Uflex has market presence across the globe and today India's largest flexible packaging materials and Solutions Company.

The Innovation

Innovative technology for the recycling of Aseptic packaging Uflex had developed innovative technology for the recycling of aseptic packaging, which is in combination of Paper, Foil and Paper. The combination of aseptic packing can be referred to as "difficult to recycle multi-layer plastic packaging" consisting of paper, polyethylene and aluminum. The demand of the aseptic packaging is growing by 8-10% annually (CAGR) 2022 -2030. However much of aseptic packaging is currently disposed of through landfill or embedded in disposable consumer goods, which results in resource waste and environmental pollution.

Uflex recycling technology is more environment friendly as it is delaminating the paper/foil/polyethylene. For this purpose the extracellular enzymes of white rot fungi were

used to hydrolyze the paper portion of the paper/foil/polyethylene structure and thus releasing the polyethylene /foil composite separately. With the help of this technology the paper part of the aseptic packaging is fully recovered and the same pulp is being used back in paper industry. The recovered pulp can also be used in different paper molded items like egg trays etc.

The Approach

At present there is no known eco-friendly technology for recycling of multi-layered Aseptic packaging and country needs ecofriendly recycling technology with end of life approach. The above said reason inspired Uflex to innovate and provide a ecofriendly recycling technology for multilayer aseptic packaging. The evaluated technology herein is based on a "biotechnology enzymatic solution" which is environment friendly.

Benefits

The recovered paper pulp, closely allied to paperboard, is used in molded pulp products such as egg cartons, designed for packaging and transporting eggs. Similarly, Polyethylene/ aluminum laminate is often viewed as an eco-friendly alternative because it utilizes waste materials and reduces the demand for new resources. By incorporating shredded polyethylene/ aluminum-foil into the production of plastic aluminum composite boards, it enhances their properties and contributes to sustainable practices in various industries

The Future

Since the technology for recycling of aseptic packaging is now implemented on commercial level so this will help across the country to deal with post-consumer waste and achieve circular economy.



UNO Technology Pvt Ltd



About the Company

M/s. UNO Technology PVT Ltd involved in Design & Construction of High Vision Air Traffic Control Towers. The Company has successfully executed more than 35 international projects including Control Towers in Dubai, Abu Dhabi, Fujairah, Sharjah & Salalah etc. The Company started operation in India during the year 2010 and signed its first project with Tatas for Noida International Airport, Jewar, Uttar Pradesh. Company is actively involved in Design & Construction of Air Traffic Control Towers in the MENA Region and India. Currently involved in ATC Projects in India, Mauritius and Jordan.

The Innovation

The Company holds a design patent for high vision air traffic visual control cabins. This innovative design features mullion free construction of VCR wherein there are no vertical mullions between the glass panels. Hence this provides obstruction free vision for the Controllers which is a major improvement from the conventional designs. Our unique intelligent glazing system has the capability to sense condensation and prevent humidification at all times. This also improves the visibility for controllers during adverse weather conditions thereby reducing fatigue.

The Approach

Company's approach has always been to specify are innovative and patented design with Airport Operators and Aviation Consultants. Though the price is an important aspect in such projects in India, Airport operators now realise the importance of this technical advantage which can improve visibility and operational efficiency.

Benefits

This design has been in use over the last 25 years and hence it is a proven and tested design. Controllers have been extremely satisfied with this advanced design as the entire cabin is designed on end user requirements in mind. This design can reduce the fatigue level of the operating controllers.

The Future

UNO TECHNOLOGY is currently working on a fast track Air Traffic Control Tower solution with High Vision Visual Control Room. This is being currently implemented at Bangalore Airport. The complete Tower is to be designed and built within four months. There is ample scope for renovating existing Towers which are quite old and dilapidated in India and abroad.



Utkal Alumina International Limited



About the Company

Utkal Alumina International Limited, a 100% subsidiary of Aditya Birla Group Company Hindalco, is engaged in alumina Refining. The Utkal Alumina Refinery project in the Rayagada District of Odisha comprises of a 2.47 MTPA alumina refinery, Bauxite mines (Baphimali) with reserves lasting for over 25 yrs, and a captive co-generation power plant of 90 MW.

Utkal Alumina is a world class refinery with state of art technology from the worlds acclaimed- technology supplier, Rio Tinto Alcan. With the best quality bauxite as input, and tightly integrated logistic between mines and refinery, the operating cost per ton of alumina is amongthe lowest in the world.

The bauxite for Utkal Alumina is sourced from Baphimali mines, and travels over 18.2 KM on long distance conveyor, which is one of a kind in the world. UAIL feeds Hindalco's new age Smelter at Aditya (Odisha), Mahan (Madhya Pradesh), Renukoot (Uttar Pradesh), Hirakud (Odisha) & balance exports to 3rd party.

The Innovation

A peer-to-peer compressor optimization system was implemented to reduce energy wastage and improve the efficiency of the refinery's compressed air system. The previous setup had compressors operating at 8.0 bar instead of the required 7.5 bar, leading to higher energy consumption and

significant air losses through blow off valves. The new optimizer system enabled real-time communication between compressors, allowing them to balance their loads and modulate Inlet Guide Vanes (IGVs) before activating the blow off valves. This reduced unnecessary energy loss and helped stabilize the entire system.

The Approach

The optimizer system was installed to facilitate communication among compressors, allowing them to automatically adjust their operations. By modulating IGVs and balancing compressor loads, the system minimized blow off air losses and ensured more efficient and stable performance.

Benefits

The implementation of the optimizer system saved 345 KW of energy, resulting in annual savings of ₹1.42 crore. It also reduced the risk of sudden plant shutdowns by maintaining consistent air pressure and improving the overall operational efficiency of the compressed air system.

The Future

Future plans include integrating predictive maintenance tools to monitor compressor health and expanding the optimization system to other critical processes to further enhance energy efficiency and savings.



Vara Technology Pvt. Ltd.



About the Company

Vara Technology is in the business of providing high impact solutions leveraging cutting-edge technologies such as Blockchain, RFID, cyber security, tolling platforms, 3D printing, IoT and data science. With a decade of experience, Vara excels in deploying these technologies to deliver innovative solutions that generate tangible results.

Vara's expertise is to drive business and operational benefits to Enterprise and Government customers using innovative solutions. We help customers to unlock new opportunities and stay ahead of their competition.

The Innovation

TubesNxt Platform - A Blockchain based Automation Platform built to streamline the Boiler Test Certificates (TC) issuance and distribution process. This platform prevents issuance of Counterfeit TCs and provides visibility of the product across the value chain to the manufacturer. Elimination of counterfeit and enhanced visibility helps to curb revenue loss and erosion of brand value.

Trade Finance - First Indian Company to develop a Blockchain platform for handling issuance and amendments of Import Letters of Credit (LC). The platform not only guarantees authenticity of the trade documents but also simplifies and automates the complex workflows between Corporate and Banks. The platform is also integrated to SWIFT India and is widely used to exchange transactions with all the major Indian banks. The platform has substantially reduced the LC issuance time from several hours to minutes. This solution was even mentioned in the client's Annual report as a major Innovation.

The Approach

The approach is simple: Analyse a business problem and use technology to solve it. In both the cases of prevention of fake TCs and automated issuance of LCs, we found that Blockchain technology is best suited with its properties of smart contract, immutability, data integrity, auditability and transparency. We analyzed the processes and custom built the platform to run the processes. The platform is also replicable in similar industry and also customizable to specific requirements.

Benefits

- Elimination of counterfeit certificates from the value chain. Genuine test certificates attached to fake tubes increased the possibility of accidents / failures making the Boiler manufacturer vulnerable to accidents and even hazardous events liable for damages leading to loss of brand reputation and even revenue.
- Reduction of Lead time in generation of LCs and faster unlocking of value
- Data Accuracy- There is 100% accuracy in Issuing certificates and LCs

The Future

Vara Technology strives to deliver maximum business value to its customers by leveraging emerging technologies. Customer centricity is the key defining factor of Vara's business strategy. We analyze our Customer's business processes and build solutions to enhance process efficiency. As we hone our Blockchain skills, we are already working on advanced AI technology including Machine Learning to be used to harness further benefits for our clients. We intend to make the Blockchain based solutions an industry standard and will actively engage with the relevant authorities for the same.



VE Commercial Vehicles Limited



About the Company

VE Commercial Vehicles Limited (VECV), earlier known as Eicher Motors Limited (A 40+ years old company) is a leading Indian commercial vehicle manufacturer, established in 2008 as a joint venture between the Volvo Group and Eicher Motors. In addition to distributing Volvo trucks in India and manufacturing engines for use in both automotive and non-automotive applications, VECV provides a broad selection of Eicher trucks, buses, and Volvo buses. VECV, which has won multiple awards for its leadership and customer-focused approach. With more than eight production facilities, eight hundred dealerships, and exports to more than thirty-four countries, VECV is dedicated to innovation, sustainability, and modernization in the commercial vehicle market.

The Innovation

VECV's commitment to innovation has driven advancements in product development, manufacturing, customer service, and employee engagement. By organizing customer clinics and collaborating with industries and research institutions, VECV delivers cutting-edge commercial vehicles known for fuel efficiency, safety, and sustainability. The company integrates Industry 4.0 principles—automation, robotics, and data analytics—improving productivity and quality. VECV also focuses on sustainability by developing cleaner powertrains and leading electric mobility initiatives. Its innovation culture, including employee recognition and engagement programs, not only enhances financial performance but also fosters a motivated and collaborative work environment.

Some of the examples of innovations/patents filed by VECV:

1. Common chassis platform architecture for various vehicle variants in CNG/LNG/Hydrogen/Diesel/EV.
2. 100% connected vehicles, AI-model based predictive maintenance, and faster online issue resolution support.
3. Unique virtual sensors: BS6 products introduced with less number of physical sensors, first in global industry.
4. 40% reduction in part variants: vehicle uptime increased by 25%.
5. 7-speed transmission, it has at least 4-5% more fuel efficiency.

The cumulative effect of VECV's innovation culture drives constant evolution and adaptation in the commercial vehicle industry, ensuring our position as a leader in sustainable mobility solutions and navigating the ever-changing transportation landscape.

The Approach

VECV's innovation approach follows a structured process:

1. Idea Generation: Ideas are submitted through the company's innovation portal, open to all employees.
2. Gap Analysis: Ideas are self-assessed with managerial input to determine their potential to solve specific challenges before being registered for further review.
3. Benefit Assessment: Proof of concept (POC) is conducted, and short- and long-term benefits for customers and the organization are evaluated using QDFC parameters.



4. Prioritization: High-impact ideas are monitored by a steering committee and developed with the CFT and SPID approach, progressing to production upon successful trials.

Benefits

VECV's innovation culture has driven improved customer satisfaction (CSI India No.1 – in both LMD & HD trucks segment & No.2 in Bus segment), market share growth, enhanced productivity, reduced emissions, and increased profitability. This culture has also attracted top talent, motivated employees,

and fostered creativity and problem-solving. As a result, VECV consistently develops cutting-edge products and services that meet evolving customer and societal needs, solidifying its leadership in the commercial vehicle industry.

The Future

VECV is poised for future success with a focus on innovation, sustainability, and Industry 5.0. Backed by a strong brand, skilled staff, and a 10×10Y growth target, VECV will continue to lead in electromobility and alternative fuels, shaping the future of transportation.



Vikas Ecotech Limited



About the Company

Founded in 1984, Vikas Ecotech's history is rooted in transformation through science and innovation. Evolving from trading to manufacturing of high-end specialty chemicals, the company has grown more than 500% in the past few years. Today, the company is a leading player in specialty chemicals exporting products to over 20 countries. Our company vision is to contribute to a safe and sustainable future by creating innovative chemical solutions and driving long-term growth and to be a global leader in specialty chemicals and polymers by providing premier-quality products responsibly whilst leveraging science to create maximum value for all stakeholders.

The Innovation

Methyl tin mercaptide -Vikas Ecotech is the first and only Indian company with an integrated in-house facility to produce FDA-approved Organotin Mercaptan (Methyl Tin Mercaptide) PVC heat stabilizers from tin metal ingots. These stabilizers are 100% toxin-free and used widely in rigid and flexible PVC articles. Organotin stabilizers are suitable for non-toxic and food-grade PVC articles requiring FDA approval and high heat stability coupled with very low odour. Supported by our dedicated R&D team, Vikas Ecotech is committed to offering a superior product for diverse end applications. These are used for agriculture & infrastructure pipes & fittings, healthcare & pharmaceuticals and medical devices & components. Smart Intelligent Coatings for corrosion protection using conjugated polymer nanocomposites where a patent has been granted by Indian Patent Office, Govt of India. Department of Scientific

& Industrial Research, Govt. of India has recognized our industry as recognized R & D centre.

The Approach

Through knowledge of the product and testing of the trials in R & D laboratory had given us confidence to achieve better probability of success. Supported by our dedicated R&D team, company is committed to offering a superior product for diverse end applications. Our VEEPRENE range of products offers the properties of elite quality rubber compounds with the easy processability of plastics which are used in niche applications like orthopaedic soles, sports goods, footwear etc.

Benefits

Final products are tested multiple times before the product is brought in the manufacturing stage. That's why VEL is an ISO 9001:2015 certified company and is leading supplier of TPR, TPE and ATH to various industries. Our products are well tested as per the benchmark set up by SATARA, a technical authority for footwear and leather. A novel flame retardant V-ECOFLAMEX provide best-in-class performance and contribute to the safety & sustainability efforts of our customers.

The Future

Bio-degradable plastics, my pad my right project and designing polymer nanocomposites for EMI shielding applications are the future projects of the company. With a strong focus on environment and sustainability, we plan to make non-phthalate plasticizers, such as DOTP, DOA, TOTM, DINCH, for serving diverse industrial applications in India & global markets.



About the Company

Welspun Living Limited is a global leader in home solutions, offering an extensive portfolio of home textiles, Advanced textiles, and innovative flooring solutions. With over 35 years of experience, we drive the industry through a differentiation strategy rooted in Innovation, Branding, and Sustainability. Our 360° capabilities, combined with consumer wellbeing at the core, enable us to provide smart, sustainable solutions for a healthier world. Ranked 42nd among India's Great Places to Work and recognized as the Best Workplace in Textiles & Textile Products, we continue to redefine the home solutions sector.

The Innovation

At Welspun, we constantly push boundaries to stay ahead and deliver unmatched value to our customers. We envision Welspun products enhancing homes worldwide. Innovation is at the heart of our operations, enabling us to develop cutting-edge solutions for global markets. Our commitment to sustainability drives us to incorporate recycling, upcycling, and reducing carbon and water footprints, while also prioritizing product quality and consumer health. As a leader in sustainable textiles, we hold 45 innovations and 200+ patents—the highest in the industry. With 25% of our sales from innovative products, we collaborate globally with universities, technology partners, and industry associations to pioneer new innovations.

The Approach

As the textile industry shifts to smart fabrics, sustainable materials, and digital technologies, our R&D investments keep us leading in innovation. Central to our approach is making data-driven decisions based on deep consumer research. We focus on understanding customer needs and preferences by gathering real-time feedback through tools like BrainTrust and web scraping. This valuable data guides us in creating solutions that truly meet customer expectations and stay aligned with market trends.

Benefits

With customer centricity and innovation at its core, Welspun stands out as a global leader in home solutions and a trusted partner for major retailers. In FY24, our brand equity reached an all-time high of ₹1,685 crores, about one-sixth of our revenue. Innovation sales grew by over 60% from FY23, setting a new benchmark. Brand recall also surged, with Spaces at 80% and Welspun at 50%, reflecting our strong market presence.

The Future

As we transition to Welspun 2.0, driven by our Growth Drivers and Value Enablers, we remain committed to industry leadership and ethical practices. To meet evolving global consumer preferences, we continually expand our home and innovation portfolio through strong partnerships with globally licensed and owned brands.



About the Company

Wrench Solutions Pvt. Ltd., headquartered in Bangalore, India, is a global leader in digital project management and control solutions, offering products and services to the EPC sector under the 'SmartProject' brand. With over two decades of experience and a longstanding partnership with Microsoft, Wrench Solutions uses cutting-edge technologies like AI and cloud platforms to serve major enterprises across energy, infrastructure, transportation, marine, AEC, and manufacturing sectors. Their solutions have supported over 10,000 projects in 37 countries, spanning industries like oil and gas, power, water treatment, construction, rail, roads, pipelines, and industrial manufacturing.

The Innovation

Wrench AI Advisor (WAA), part of the latest SmartProject upgrade, is an AI-powered tool built to transform how engineering and EPC organizations handle project data. Using Adaptive AI and machine learning (Random Forest ML), WAA analyses past issues and solutions to help users proactively plan, course-correct, and prevent delays. It predicts task completion dates, flags potential delays, suggests corrective actions, and identifies project risks with mitigation strategies. From optimizing resource utilization to pinpointing specific document details, WAA provides real-time, actionable insights, making it an essential asset for data-driven project success.

The Approach

The Wrench AI Advisor (WAA) development process involves data collection, cleaning, and the creation of machine learning models to identify patterns, predict risks, and forecast outcomes. Algorithms are trained on large datasets to ensure accuracy and reliability. Integrated with Wrench SmartProject, WAA provides real-time insights and automated recommendations. Continuous testing ensures adaptability to changing project variables, helping users anticipate challenges, optimize resources, and enhance decision-making for more efficient project delivery.

Benefits

Wrench AI Advisor (WAA) offers predictive insights, automates task prioritization, and forecasts potential delays, enabling proactive course corrections and risk mitigation. It enhances resource utilization and decision-making by providing detailed project insights. WAA improves efficiency by guiding users to precise document locations and operating procedures. Overall, it streamlines project execution, minimizes risks, and ensures timely project completion, making it invaluable for engineering and EPC organizations.

The Future

Future advancements of Wrench Solutions' AI will focus on enhancing predictive capabilities, integrating advanced NLP for seamless communication, and leveraging deeper AI analytics to further optimize project outcomes. The AI will evolve to offer even more intuitive, real-time insights, and automation for increased efficiency in project execution.





About the Company

Valued at \$2.8 billion, Zetwerk is a managed marketplace for contract manufacturing. It partners with leading industrial and consumer enterprises to manufacture products through a global network of small manufacturers, assisting with supplier selection, pricing, and order fulfilment. Zetwerk's solutions span Precision Manufacturing, Aerospace & Defence, Renewables, Consumer Electronics, Oil & Gas, and Infrastructure. Its in-house Manufacturing Operating System offers digital supplier selection, real-time tracking, visual updates, seamless communication, and quality assurance. Zetwerk also supports manufacturing partners by increasing capacity utilization and providing logistics, raw material procurement, and working capital access to drive growth and optimize costs.

The Innovation

Zetwerk has revolutionized manufacturing with its cloud-based Manufacturing Operating system (ZOS), an interconnected network of applications that introduces new-to market features:

- **ZOS - Unified Platform:** ZOS integrates traditionally separate systems into one, Surpassing standard ERP solutions. It consolidates Enquiry Management/CRM, Supplier Database, procurement, Order Management, Accounting, Production Tracking, Inventory, and Quality management into a single platform. This eliminates the need for multiple software tools, streamline the workflows, reduce the errors and enhance the data visibility.
- **Data-Driven Decisions with ZATA:** Zetwerk's ZATA, an advanced BI platform, aggregates data from ZOS, delivering

real-time insights. This enables data-driven decision-making, offering reports on product performance, supplier analysis, and key metrics for proactive optimization.

- **Transparency & Collaboration:** Customers & supplier portals provide self service features and project visibility. Customers track orders and access reports, while suppliers receive updates, fostering transparency and improving collaboration.

The Approach

Zetwerk's approach offers unmatched speed, quality, visibility, and value, setting it apart from competitors. With 50% shorter lead times, our streamlined quoting and sourcing processes, along with a network of pre-vetted manufacturers, ensure swift production. Quality is prioritized through 100% pre-dispatch Quality Control, eliminating rework and guaranteeing zero defects. Our platform also provides 100% supply chain visibility, offering real-time updates for complete clarity. By enhancing efficiency and minimizing waste, Zetwerk delivers 5% overall supply chain cost savings through optimized operations and flexibility.

Benefits

Zetwerk transforms ideas into tangible products, making manufacturing reliably predictable through full transparency and visibility at every production stage. Customers benefit from real-time insights and quality assurance, allowing them to track progress confidently. This seamless communication ensures they receive products that meet their standards on time, enhancing their ability to manage manufacturing needs effectively and reducing uncertainties throughout the process.

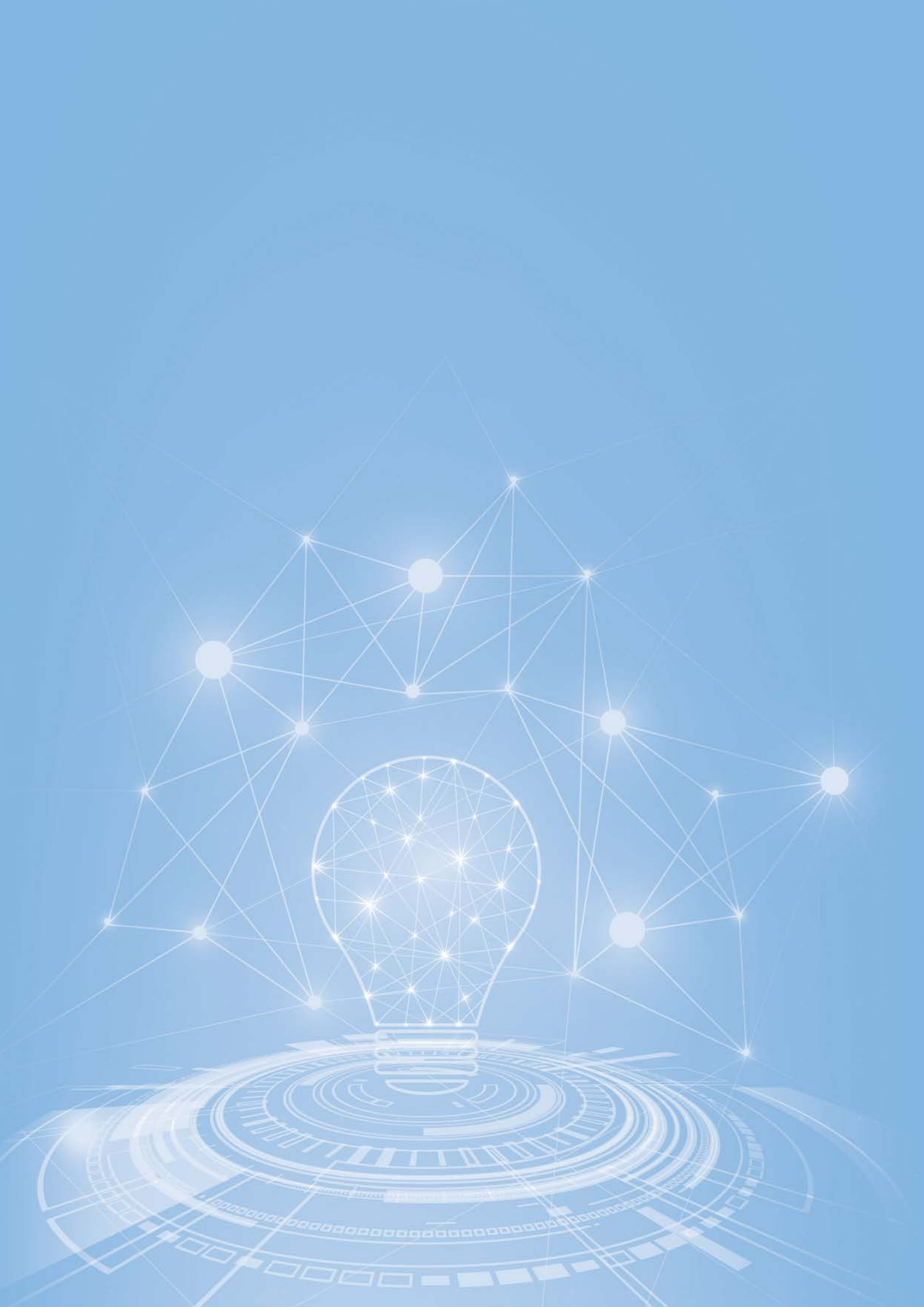




The Future

At Zetwerk, we envision a future where manufacturing feels effortless and intuitive. By harnessing advanced technology and data-driven insights, we aim to empower our customers and partners, creating a collaborative environment that fosters innovation. Together, we'll reduce costs and deliver high-quality products, making the manufacturing journey smoother and more rewarding for everyone involved.





02

Case studies from
Leading Innovative
Institutes



Birla Institute of Technology and Science, Pilani



About the Institute

A pathashala started in 1901, grew into three colleges after the World War II. The Institute became a 'Deemed to be University' in 1964 through an Act of Parliament. During the 1970s, BITS forged linkage with MIT, USA to bring several innovative features into the Indian Education system.

BITS Pilani is a registered not-for-profit Society under Rajasthan Societies Registration Act, 1958. A General body and a Board of Governors manage it, and its sole objective is to run the Institution BITS Pilani. BITS Pilani was declared institution of eminence by Ministry of Education, Ministry of Education, Govt. of India. It has 5 campuses at Pilani, Dubai, Goa, Hyderabad, and Mumbai.

BITS Pilani strives to be one of the leading universities in the world known for its excellence in teaching, research, industry engagement and quality of education.

The Innovation

BacTreat: Vertical flow constructed wetlands

Bactreat is a technology utilizing decentralised systems for wastewater treatment and solid organic waste treatment. It offers a unique vertical wetland based wastewater treatment system that incorporates phosphate solubilizing bacteria.

Constructed wetlands (CWs) are engineered water treatment systems that optimize the treatment processes found in natural environments. Constructed wetlands are generally made of an impermeabilized hole, filled with a growing media (sand/gravel) and planted with rooted macrophytes (Canna indica in our case.) CWs are popular systems which efficiently treat different kinds of

polluted water and are therefore sustainable environmentally friendly solutions. A large number of physical, chemical and biological processes are active in parallel and mutually influence each other. The technology is based on French type Vertical flow constructed wetlands (VFCWs). The investment costs, land surface (compared to Waste Stabilization Ponds) and low maintenance are the main strengths of the VFCWs system. Another very important aspect is the possibility to treat raw wastewaters, after a quick pre-screening directly on the system. In addition, the modified VFCW can address nitrogen removal wherein first stage is Nitrification and second stage is for denitrification.

The Approach

- To set up Vertical flow constructed wetlands (VFCWs) as nature based Micro STPs so that there is no or minimum Operation and maintenance costs.
- Several VFCWs can be implemented wherever land is available to address treatment of open nullahs with wastewater.
- These nature-based solutions not only treat wastewater but also will increase biodiversity.

Benefits

Vertical Flow Constructed Wetlands (VFCWs) offer numerous benefits, making them an effective and sustainable solution for wastewater treatment. These systems provide high removal efficiencies for pollutants, including organic matter, nitrogen, and pathogens, due to the combination of physical, chemical, and biological processes. VFCWs require minimal land area, making them ideal for urban or space-constrained





areas. They also promote oxygenation, aeration, and insulation, reducing odors and mosquito breeding. Additionally, VFCWs support biodiversity, providing habitat for various plant and animal species. Their low operational and maintenance costs, coupled with minimal energy requirements, make them a cost-effective option. Furthermore, VFCWs can tolerate variable hydraulic loads, making them suitable for areas with fluctuating water flows. Overall, VFCWs offer a reliable, eco-friendly, and aesthetically pleasing solution for wastewater treatment, suitable for a wide range of applications, from small-scale domestic systems to large-scale municipal treatment plants.

The Future

The future of Vertical Flow Constructed Wetlands (VFCWs) promises improved efficiency and sustainability. Hybrid systems and circular economy approaches will produce valuable by-products (bioenergy, fertilizers). VFCWs will address global challenges (climate change, water scarcity, urbanization) and become a cornerstone of nature-based water management solutions, particularly in densely populated cities and vulnerable communities. Sustainability and resilience will drive VFCW innovation.



The Innovation

Sharda University is committed to build an ecosystem to promote innovation and has been selected to establish Inclusive Technology Business Incubator (i-TBI) under the NIDHI Scheme of Department of Science and Technology Govt. of India, with a grant of Rs. 2.58 cr. It has also established Innovation Hub (iHUB Sharda) which is supported by iHUB Divyasampark, a joint initiative of IIT Roorkee and DST. Under iHUB, a grant of Rs. 1.37 cr. has been received to establish a central lab facility and to provide seed funds to the faculty and student innovators. The university has 14 innovations funded under MSME Idea Hackathon for a total of 1.88 cr. More than 70% startups incubated with us have reached the revenue generation stage, the highest having a turnover of Rs. 3.00 Crores expanding innovation facility in 10,000 sq. ft Innovation Center with state-of-the-art infrastructure.

The University has set up several specialised centres of research, namely, Centres for Cyber Security & Cryptology, A.I. in Medicine, Imaging & Forensic, Molecular Biology of Stress Tolerance and Solar Cells and Renewable Energy, Virology and Immunology, besides a Central Instrumentation Facilities (CIF) for providing cutting-edge technologies and high-end analytical equipment for the faculty and students. The University also proposes to establish some high-end labs such as Food Testing Lab, 5G/6G Testbed, Semiconductor Lab, Biomedical Device Centre with a view to contributing significantly towards fostering technological advancement and industry collaboration.

The University has so far received sponsored research projects worth over 20.00 Crores. The University has published 660 patents;

162 patents have been granted and two of them are in the process of commercialisation. The faculty has registered over 237 designs and 80 copyrights. During the year, Sharda University has established NextGen Cyber & Quantum Systems Facility with an nVidia DGX H100 system, fourth generation of the most powerful supercomputer for machine learning and artificial intelligence.

The Approach

The University has taken special measures towards implementing National Education Policy-2020. Bhartiya Sanskriti Vaishvik Kendra has been set up in the Campus for revitalizing and propagating Bharat's rich knowledge and cultural legacy globally. The curriculum of all programs of university have been revisited and revised as per National Credit Framework. The University has adopted an innovative and flexible approach of Choice-Based Credit System (CBCS) with the components of extensive elective, open-electives in multidisciplinary domain (major & minor), internship, projects, entrepreneurship, ethics, values, liberal arts, community engagement and Indian Knowledge System environmental education in the curriculum. Emphasis has also been laid on project-based, application-based, product-based learning and industry internship so as to provide real-time experience. All courses have also been designed with learning outcomes and relevant pedagogy & assessment methods. It has adopted policy on multiple entry/exit, with certificate after one year and it University has established a Teaching Learning Centre. The entire efforts of the university are geared towards attaining the national goal of 'Vikshit Bharat @ 2027'. The University promotes cultural tolerance and harmonious existence in tune with Indian philosophy of Vasudhaiva Kutumbakam.



Benefits

The University has a state-of-the-art library fully automated with 1,52,000+ volumes and 18000+ titles, 8.50 lacs e-books/journals, besides e-resources and digitization of some rare publications and manuscripts. It has set up a 1.72 MW roof-top Solar Power Station. The University has been ranked 23rd in Green Institutional Rankings across the country. Sharda University has been identified as a Mentor Institute for the year 2023-24 by Institution's Innovation Council (IIC), Ministry of Education under which the University has mentored IICs of five other institutes, strengthening their innovation and entrepreneurship ecosystem. In the academic year 2023-24, the University has extended students' scholarships of Rs. 22.32 crore. The University is leveraging IT in Student Care Management, LMS and state-of-the-art ERP PeopleSoft, as well as MOOCs under 'SWAYAM' initiative of the Ministry of Education. . The Sharda Hospital's journey, co-located on the University campus, has been marked by milestones of success with its 1200+ beds, including 125 critical care beds,

high quality patient care and specialty-specific OPD blocks, catering to the diverse healthcare needs of the community. Recently, a new chapter in healthcare excellence has been added with the launch of an ultra-modern 600+ bedded super-speciality hospital, Sharda Care – Healthcity. It offers world class medical care in wide range of specialities like cardiac care, neurology, oncology and other advanced specialities, requiring highest level of expertise and treatment options.

The Future

The University proposes to establish some high-end labs such as Food Testing Lab, 5G/6G Testbed, Semiconductor Lab, Biomedical Device Centre with a view to contributing significantly towards fostering technological advancement and industry collaboration. A dedicated 15,500 Sq. ft Hackathon Center is also in the making to promote innovation among students. The university aspires to strengthen its international collaborations and standings in the international rankings to become a global institute of repute.



About the Institute

Chitkara University, spread over 120 acres, offers a vibrant, innovative, and inclusive environment with modern facilities. It has achieved an A+ grade from NAAC and UGC 12(B) status, reflecting its educational and research excellence. In the National Institutional Ranking Framework (NIRF)-2024 rankings, it ranked 19th in Pharmacy, 35th in Architecture, 54th in Management, 94th in Engineering, and 90th among universities. Chitkara University secured 1st place in research quality by Times Higher Education in India. It ranks 399th in the QS World University Rankings 2025 and 105th in Southern Asia, showcasing its global and regional impact. Additionally, it is ranked 12th in India and 101-200 globally in the Times Higher Education Impact Rankings 2024 for SDG 7 and 6th for SDG 9. The university also holds the 113th spot in the Global Top 300 Innovative Universities by WURI, and ranks 12th in India, 328th globally in the 2023 UI Green Metric World University Rankings. Chitkara University received the 3rd Water Sustainability Award for 'Innovation in Water Technology' from TERI, UNDP, and the Ministry of Jal Shakti. It continues to lead to providing a holistic educational experience, fostering research, and emphasizing sustainability initiatives.

The Innovation

Chitkara University, Punjab, stands at the forefront of innovation in higher education, fostering a culture of creativity, research, and entrepreneurship. The university's ecosystem encourages startups through incubation centers such as the CIIF and Chitkara University CEED. Recognized for its innovative spirit, Chitkara University has consistently ranked in the 11-50 band for innovation

by NIRF in 2023 and 2024. It earned the distinction of being No. 1 in Design-Patent Applications from Indian applicants in 2023, as per the Government of India. The university was ranked 2nd among private universities by the ARIIA Ranking-2021, Ministry of Education. Its vibrant startup ecosystem boasts 288 startups, with 76 students, 29 faculty, and 27 alumni launching ventures. CEED supports 53 companies, with more in the pipeline. The university also received accolades, including the Best Design Portfolio (2018-23) at the CII Industrial Intellectual Property Awards 2023 and recognition as one of the Top 5 Innovative Institutes at the CII Industrial Innovation Awards 2023 in New Delhi.

The Approach

Chitkara University adopts a strategic and holistic approach to research and innovation, emphasizing research-driven learning and interdisciplinary collaboration. University is approved by SIRO-DSIR for its research endeavors, supported by SEED, DST, GoI, on-campus incubator, TBI, recognized by DST and MSME and has a MeitY TIDE 2.0 Centre. IP Policy, Research Promotion and Incentive Policy (for rewarding Faculty through cash incentives) and a Start-up Policy (to enable Faculty and students to establish their on-campus start-ups), are in place.

Benefits

Innovations and research at Chitkara University yield numerous benefits that enhance academic excellence and societal impact. Collaborative research initiatives with industry partners facilitate knowledge transfer, ensuring that academic advancements align with market needs. Chitkara University has 11,000+ Scopus-indexed research articles, 80,000+ citations, and an h-index of 100. The emphasis on innovation encourages



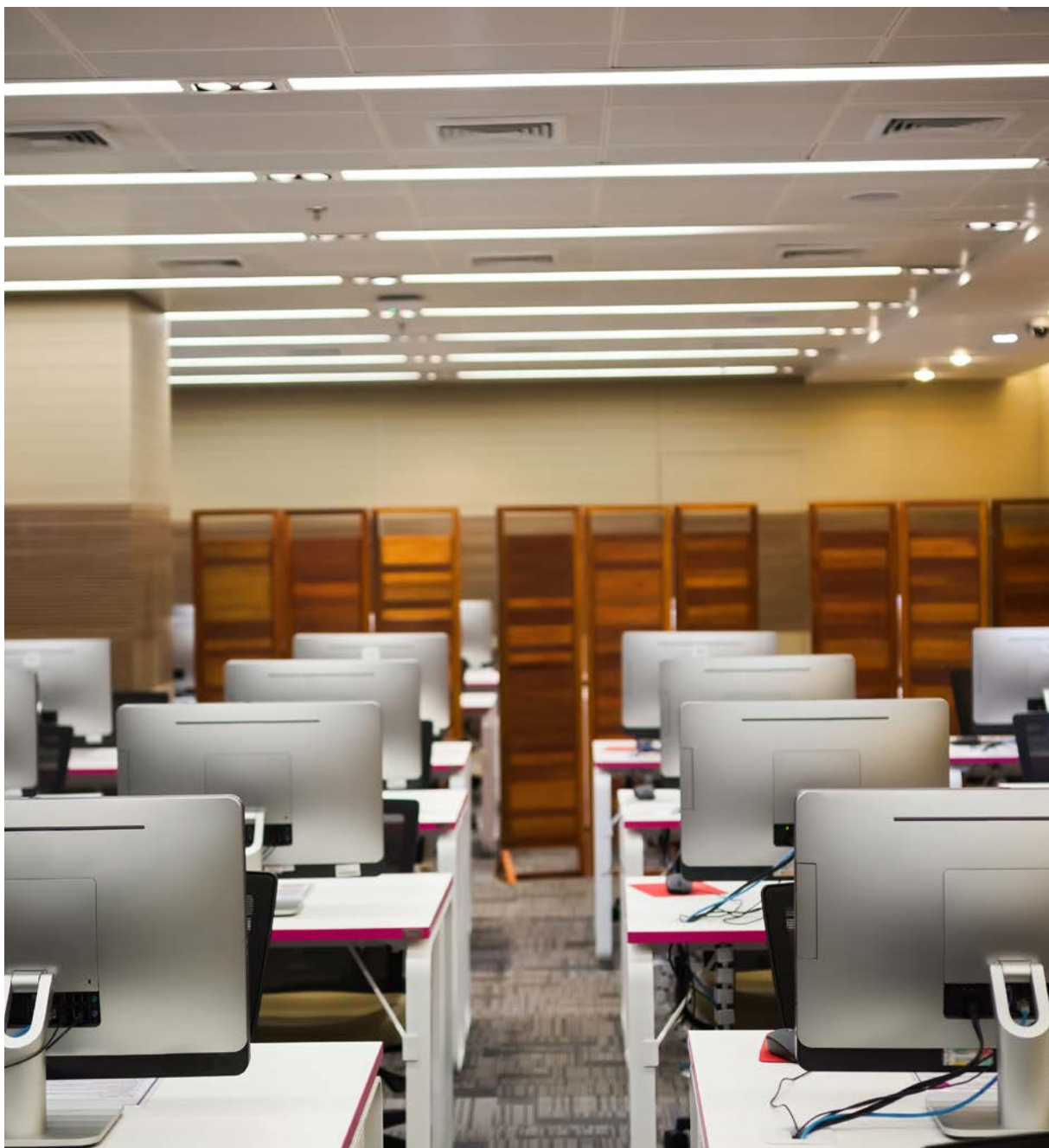


entrepreneurship, empowering students to develop viable solutions and contribute to economic growth. Additionally, the university's commitment towards innovations 1279 patents are granted, 2408 are published and 3640 are filed.

The Future

Chitkara University envisions an innovative future as a leading research institution with international recognition and top rankings across all disciplines. Internationalization is a key focus area for Chitkara University,

aiming to provide global exposure and opportunities for Indian students. As a cutting-edge research institution, the university is committed to advancing knowledge and technology through innovative research initiatives. Chitkara University remains dedicated to creating employment opportunities for its students, equipping them with the skills and knowledge needed to thrive in a competitive global job market. Additionally, the university offers technological support to industry partners, fostering collaborations that drive mutual growth and innovation in various sectors.



Electrical Research and Development Association



About the Institute

Electrical Research and Development Association is a not-for-profit professional organization registered under societies act and Public Trust formed under the Charity Commissioner of Maharashtra. ERDA was promoted by the Electrical industries and some Utilities with support from Government of India through CSIR and grant given by the Government of Gujarat. ERDA operates from its state-of-the-art 25 acre head office located at Makarpura, Vadodara having 24 State of Art Testing laboratories to test 135+ electrical products to cater the industry and utility requirement.

ERDA's services are provided under three business verticals namely

- R&D and Expert Services
- Testing & Evaluation
- Field Services

R&D Division undertakes research projects and expert service in following domains:

- Advanced materials,
- Renewable Energy,
- Diagnostics,
- Power Systems,
- Smart Grid and New Product Technologies

The Innovation

- "Voltage Presence Indicator for safety application of electrical panel", World Intellectual Property Organization (WIPO) PCT Patent published, Publication number: WO 2023/195017 A1, publication date: 12/10/2023

- "Absence of voltage tester for getting positive response for absence of hazardous voltage", WIPO PCT Patent published, Publication number: WO 2024/023828 A1, publication date: 01/02/2024
- "Nano composites of silver and carbon nanotubes for switchgear contact tips" Patent granted. Patent No: 519775, grant date: 05/03/2024
- "Automatic solar panel cleaning system", Patent granted. Patent No: 504963, grant date: 30/01/2024
- "Thermal Loading Monitoring of Distribution Transformer using Hotspot Temperature Evaluation", Technology transferred in 2024-25.
- "DC fast charger for Electric vehicle application" technology developed in collaboration with NTPC Energy Transmission Research Alliance (NETRA). EV charger installed at NTPC, Greater Noida office.
- "Corrosion resistant nano-paint" technology developed in collaboration with NETRA. Paint trials undertaken at power plants located near sea shore. Patent granted. Patent No: 422128, grant date: 17/02/2023
- "Rechargeable Sodium-Ion battery with higher operating voltage" indigenous technology
- "Reversible Aluminum ion battery for energy storage application" GUJCOST sponsored project.
- "Smart energy monitoring device", technology retrofit with the electrical switch board to monitor and control the



appliance remotely and also to obtain the electrical signature of the appliance

- Anti-dust coating for solar panel
- Epoxy nanocomposites with enhanced dielectric properties
- Smart solar inverter with reactive power compensation feature
- Self-powered wireless thermal sensor
- BLDC controller for E-bike application

The Approach

ERDA's R&D projects are guided by a rigorous and systematic approach that prioritizes innovation, collaboration, and real-world impact. Through a comprehensive needs assessment and feasibility analysis, potential projects are carefully evaluated for their alignment with strategic objectives and their potential to address critical challenges in electrical sector. A multidisciplinary team of domain experts including R&D and testing laboratories is then assembled to develop a comprehensive project plan, outlining the research methodology, timeline, and resource allocation. Throughout the project lifecycle, ERDA fosters collaboration with industry partners, academic institutions, and government agencies to ensure that research findings are translated into practical applications that benefit society.

Benefits

ERDA R&D endeavours are strategically aligned to deliver tangible benefits to the community, environment and industry. By prioritizing efficiency, indigenization and cost-effectiveness, ERDA addresses critical societal and environmental challenges. ERDA actively collaborates with industry partners to address pressing industrial challenges and drive local product development. Through strategic partnerships and knowledge sharing, ERDA provides technical expertise, research facilities, and innovative solutions to support the growth and competitiveness of local industries. By working closely with businesses, ERDA contributes to the development of new products, processes, and technologies that meet market demands while fostering economic growth and sustainability.

The Future

ERDA envisions in driving sustainable technological advancements within the energy sector. Through strategic collaborations with industry partners and academic institutions, ERDA seeks to foster the development of innovative solutions that address the evolving needs of a sustainable energy landscape. Key areas of focus include the development of EV chargers and EV drives as well as chemical energy storage solutions for renewable energy integration.



Best innovation's impact filed in your application:

1. Development of molten metal splash resistant unique jute blend work-wear for steel industry workers

The idea was to use biodegradable natural jute fibres in high performance technical textiles so that use of non-biodegradable synthetic fibres are reduced drastically, thereby enhancing sustainability. The developed jute blended fabrics were also tested for radiant heat, contact heat, convective heat, FR and comfort properties. It also passed molten metal splash of iron as per ISO 9185 (ISO 11612).

2. Development of Jute composite for automotive acoustic insulation and other uses

Use of jute fibres as composite for automotive acoustic insulation may reduce use of non-biodegradable synthetic fibres. Even a small reduction in use of synthetic fibres may have huge impact on environment and sustainability. Roof liners have been developed for M/s Volvo India and M/s Sonalika Tractor using Jute & Polypropylene fibres. Parcel trays are also developed for Maruti swifts Passenger Vehicles.

3. Development of regenerated cellulosic fibres from Indian bamboo

Till date, this technology is not available in India, except with NITRA because development was done by NITRA only. NITRA has extracted silica free dissolvable fibre grade pulp from Indigenous bamboo and developed eco-friendly NMMO process (known as Lyocell process) to convert it into fibre. Regenerated bamboo fibres produced

from Indian bamboo by NITRA's developed technology is ecofriendly and NMMO used is recoverable to the extent of 99.9%. Bamboo is considered as grass so problem of deforestation will not be there. Re-generated Bamboo fibre is imported to meet out the demands in India.

4. Extraction of fibre from pine needle waste

NITRA has developed extraction process for extracting textile grade fibre from pine-needles waste of Indian Himalayan region. The extracted pine needle fibres can be blended with other fibres to develop yarns and fabrics. Pine needles prevent germination of other vegetations and cause forest fires. Patent granted.

5. Flash fire resistance hood:

On request from Indian Navy, NITRA has developed a flash fire resistance hood of 100% cotton for them. The fire-retardant property of this hood remains intact even after washing in boiling water. The technology of this development has already transferred. Patent filed.

6. Development of Multilayered Flame and Thermal Resistance Fabric for the Fire Fighting Clothing

NITRA has always been there to serve the forces and paramilitary forces in one way or the other. Firefighters are always at risk while performing their duties. They not only play a pivotal role to rescue human lives during fire accidents but also save properties from extensive damage by extinguishing hazardous fires. It is one of the life-threatening occupations that require intensive physical work in a hazardous environment. No significant work was done to develop





firefighter suits for firefighters indigenously. NITRA has developed an indigenous lightweight firefighter suits per the standard IS 16890 and EN 469.

7. Development of Air Cleaner Home Textile to reduce Indoor Air Pollution:

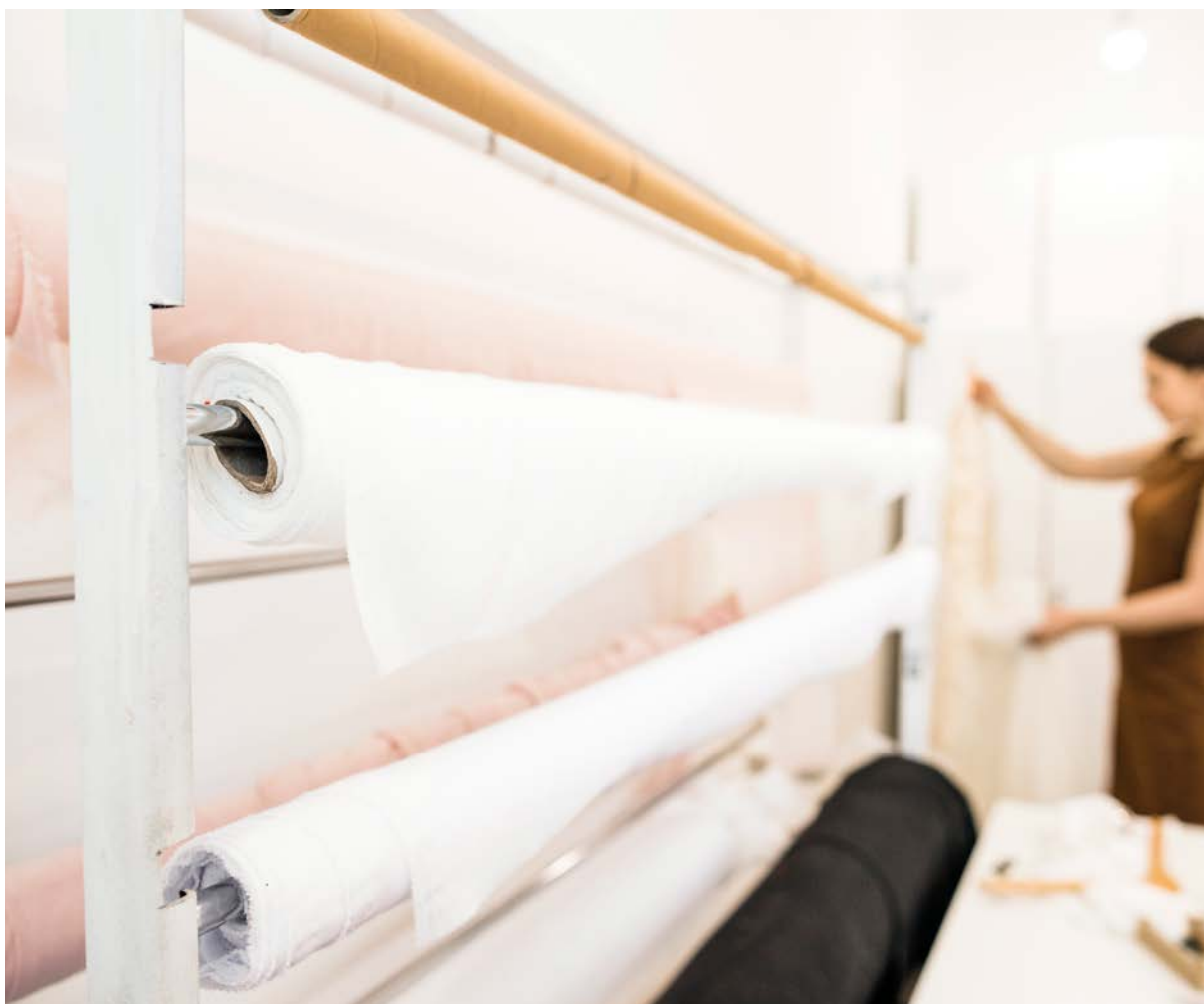
In society people expect to breathe clean air. However, they are living in environment where level of air quality index (AQI) reaches to category of very poor (301-400) and severe (401-500). The indoor air pollution which may be more than 2 to 5 times of outdoor air pollution. Many gadgets and devices are available to reduce indoor air pollution like HEPA Purifiers, Electrostatic Purifiers, Ozone Generators etc. But most of the devices are either expensive, energy intensive, short operational life. Even some of the devices are contributing in other form of contaminants. Looking to these problems, under this project, invention of Air Cleaner Home Textiles was

done which will help people to reduce indoor air pollution where they live and stay. This does not consume electricity.

8. Development of New Approaches to Reduce Water Consumption in Textile Wet Processing

One of the foremost requirements of sustainability is to reduce use of scarce natural resources and water is one of them. NITRA has developed four New Approaches to Reduce Water Consumption in Textile Wet Processing where water consumption has been drastically which is one of the major works in today's sustainability initiatives. It was found that the newly developed approaches not only helps in reduction of water consumption but also reduce consumption of energy, chemicals & time.

Institute image/2 images pertaining to the said innovations:



Central Manufacturing Technology Institute (CMTI)



About the Institute

The Central Manufacturing Technology Institute (CMTI) is a national R&D institute operating under the administrative control of the Ministry of Heavy Industries, Government of India. CMTI is dedicated to devising Science and Technology (S&T) driven solutions aimed at addressing the four crucial facets of manufacturing industries: Product, Process, People, and Production.

In line with this mission, CMTI's activities can be categorized into four key areas:

- **Emerging Technologies and Machines:** CMTI's primary objective is to pioneer emerging technologies and machines, not only for India but often for global applicability.
- **Specialized and Customized Machines:** The institute specializes in designing and developing specialized and customized machines (SPMs), process technologies, and automation systems tailored to meet the unique requirements of its customers.
- **High-Value Technical Services and Training:** CMTI is committed to providing high-value technical services and training, encompassing testing, calibration, and skill development, thus contributing to the capacity building and enhanced productivity of industry and academic personnel.
- **Promotion of Advanced Technologies and Innovation:** CMTI's key focus is promoting advanced technology interventions, technology licensing, entrepreneurship, and inclusive innovation in specific domains related to machines, processes, and allied areas.

The Innovation

CMTI stands out as an applied research institute dedicated to fostering innovation, enhancing productivity, and advancing technological capabilities in manufacturing, which significantly contributes to India's industrial landscape.

The focused areas of research at CMTI encompass a wide spectrum, including:

- Ultra-precision machine tools
- Special purpose machines
- Sensors and machine controls
- Textile machinery
- Smart Manufacturing and Industry 4.0-enabled technologies
- Additive and other special manufacturing processes
- Precision Metrology
- Development and qualification of Aircraft LRUs (Line Replaceable Units) and associated test rigs
- Skilling and re-skilling programs, focusing on experiential learning.

CMTI Undertakes Research, Develops Technologies and Machines, Provide TIC services, Train Manpower and Deploy technological solutions into Industrial Applications

CMTI's R&D Focus is Applied Research (TRL-3 to TRL-8)

Focused Areas

- Ultra Precision Machine Tools
- Special Purpose Machines
- Sensors and Controllers
- Textile Machinery
- Aircraft LRUs and Test Rigs
- Precision Metrology
- Smart Manufacturing and Industry 4.0
- Additive Manufacturing
- Micro-Nano Manufacturing-Machines and Devices
- Industry Employable Manpower (Skilling & Reskilling)
- Technology Transfer and Incubation

MADE – IN – INDIA

Atmanirbhar Bharath



The Approach

- CMTI develops new machines and processes through two primary approaches. The first is based on customers' requirements (sponsored projects) and the second involves filling technology gaps (grant-in-aid projects) through R&D supported by government initiatives. Additionally, CMTI supports innovative ideas with internal grants. SoP is in place, along with several committees RAB, PRMC, and PERC to oversee.
- CMTI has developed into a Center of Excellence in Machine Tool and Manufacturing Process Development, successfully implementing over 500 machines and solutions in over six decades. It authored the CMTI Hand Databook, the primary reference for industry information.
- CMTI's approach ensures that the technological solutions it develops are often first-time in India, and every machine developed at CMTI is typically unique, produced in limited numbers.
- Each year, CMTI provides Testing, Inspection, and Calibration (TIC) services to around 3000 industries in ten manufacturing sectors, significantly aiding Micro, Small, and Medium Enterprises (MSMEs) in improving productivity and quality.
- The institute offers practice-based training with around 50 short-term programs and 20-25 corporate sessions annually, benefiting about 2000 trainees. CMTI also supports students through internships, project-based training, and finishing schools.
- Additionally, CMTI has established strong partnerships with leading R&D institutes and industry associations, earning recognition as a comprehensive solution provider across all stages of product development, from ideation to integration

Benefits

CMTI has made significant contributions across various sectors, necessitating financial support and recognition:

- **Space Program Support:** CMTI has developed machines and provided manufacturing services to ISRO, including the essential design of planetary mixers for solid propellants.
- **Defense Collaboration:** Collaborating with 15 DRDO laboratories, CMTI aids in indigenizing machines and subsystems, contributing test rigs for Aerospace LRUs and solid propellant mixers for HEMRL and Ordnance Factories.
- **High-End Technology Development:** In partnership with several strategic institutions like BARC and ISRO, CMTI has created high-end machines for manufacturing ultra-precision devices that are challenging to import.
- **PSU Engagement:** CMTI supports Public Sector Undertakings (PSUs) by designing special-purpose machines. HAL has particularly benefitted from assembly tools and test rigs.
- **Support for Private Industries:** Offering approximately 3,000 testing inspection and calibration services annually. CMTI serves a range of industries, including major clients like LMW, Rolls-Royce, and TATA Power, focusing on Special Purpose Machines and automation systems.
- **Technological Advancements:** CMTI has around 65 new technologies ready for adoption, recently transferring five impactful innovations.
- **Cost-Efficiency and Savings:** CMTI delivers significant cost reductions of up to 40-50% with Indigenous development of machines and equipments. For instance, a 10-ton mixing machine for ISRO-SHAR saved Rs. 140 crores, while ultra-precision diamond turning machines have reduced costs by Rs. 1.25-1.50 crores each

The Future

Today, we honour the strong commitments of our colleagues who have worked to transform CMTI from a service provider into a technology-development institute. Our goal is to integrate knowledge and create wealth for financial self-sustainability.

CMTI is launching new research initiatives focused on inclusive technology development. We prioritize original technology to provide innovative and cost-effective solutions in manufacturing science, process technologies, and related fields. Emphasizing cooperation and collaboration, we are aligning our activities with outcome-based research.

Additionally, CMTI plans to initiate several emerging research projects that are relevant and aligned with future manufacturing trends. These projects include advanced machines, metrology equipment, and the engineering of production line equipment for Li-Ion battery cell manufacturing. Other initiatives involve the development of indigenous CNC and open-source controllers, as well as advanced subsystems and machine components like precision ball screws and LM guideways. The Indigenous development of additive manufacturing machines with larger build volumes is also among our key focus areas.



Indian Institute of Technology Roorkee



Indian Institute of Technology - Roorkee is among the foremost institutes of national importance in higher technological education and in Engineering, Basic and Applied Science Research. With 23 departments and 19 specialized centres, the Institute provides a broad spectrum of academic opportunities. Specialized centres like the Centre for Space Science and Technology, Mehta Family School of Data Science & Artificial Intelligence, Centre of Sustainable Energy, Centre of Indian Knowledge System, DRDO Industry-Academia Center of Excellence, Centre for Drone Research, International Centre of Excellence for Dams, National Centre for Honey Authentication and Food Safety, Integrated Centre for Adaptation, Disaster Risk-Resilience and Sustainability, Centre of Excellence for Petrochemicals and Centre for Semiconductor Design and Technology epitomize our commitment to cutting-edge research and interdisciplinary collaboration. The Institute ranks amongst the best technological institutions in the world and has contributed to the development of all technological domains. IIT Roorkee has completed 176 glorious years since its foundation in 1847. The institute has a strong innovation and incubation system consisting of IPR Cell, Technology Innovation Hub, Technology Incubation and Entrepreneurship Development Society and Automotive & Allied Research and Technology Innovation to translate the outcomes of research into products and technologies useful to society. Institute provides research and consultancy services to industries and provides educational training to working professionals through its E-learning and continuing education centers.

Following are some notable contributions by IIT Roorkee:

1. RuTAGE Smart Village Centre: The RuTAGE Smart Village Centre (RSVC) model, conceptualized by the Office of the Principal Scientific Advisor (PSA), Government of India, and led by IIT Roorkee, was honoured with the first prize at the NSE's Social Stock Exchange event in Varanasi on August 31, 2024. The RSVC model operates on a 'Hub and Spoke' structure, with the hub at IIT Roorkee and spokes established in rural areas. The centres are designed to conduct baseline studies, provide feedback, and deploy technologies through demonstrations in local languages. These centres will be managed by local entrepreneurs and follow a sustainable revenue model, ensuring long-term growth and community development. The first RSVC has been established in Khoont, Almora, paying homage to Bharat Ratna Shri G.B. Pant, a pioneer of rural development and an advocate for empowering rural communities.

The key technologies transferred to the RSVC are Variable Speed Solar Based Bageshwari Wool Charkha, Air Cooled Based Vegetable Vending Machine, Pico-Hydro (Water Mill) Based Cold Storage and Mechanised Roller (Felt Making Machine).

Benefits: The RSVC has been conceptualized to enhance technology access for rural communities which in turn will contribute in reverse migration by providing employment opportunities.

Future: Development of technologies based on the necessities of villages where these RSVCs are set up and increase the



employment in remote areas eventually promoting reverse migration and sustainable livelihoods.



Figure 1: from left a) Air cooled vegetable vending machine b) Variable Speed Solar Based Bageshwari Wool Charkha c) Mechanised Roller (Felt Making Machine)

2. A real-time, wireless crowd alert and management system and a method thereof:

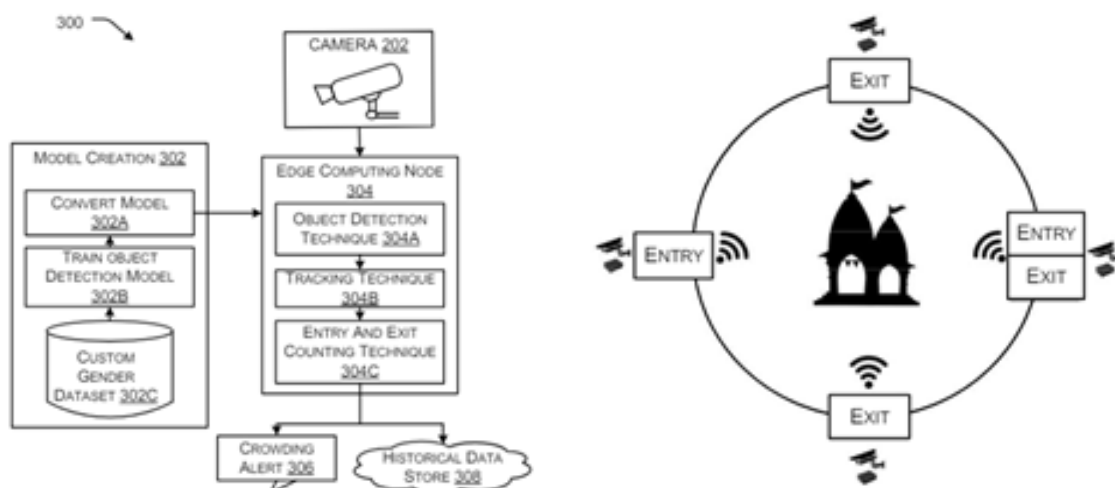
The present invention involves an innovative wireless system designed for real-time monitoring and management of crowds during events. This system utilizes advanced communication technologies to provide timely alerts about crowd density, potential hazards, and emergency situations, thereby enhancing public safety. The technology was transferred to PARIMITRA, Roorkee, on 18th July 2024, and offers a scalable solution for various public gatherings, ensuring effective crowd control and management.

Approach: CrowdEye utilizes state-of-the-art computer vision algorithms embedded into an edge computing system connected to cameras at entries and exits of potentially crowded areas, thereby tracking the mobility patterns of the crowd. The system as a whole is completely wireless and connects with other devices around through the cloud to

estimate the occupancy of the entire region of interest.

Benefits: With the use of advanced AI algorithms, the device is able to accurately detect the occupancy and the mobility of the population. Having the data processed in real-time, the device helps authorities make decisions in real-time, avoiding potential stampedes and other crowd disasters. The device alerts the stakeholders when the occupancy threshold is crossed or if device failures occur.

Future: CrowdEye can be installed at locations, like political rallies, temples during festivals, etc. The system can be enhanced to predict the crowding/stampeded location through time series analysis where the historical data is present. Being wireless, portable, and easy to install, the device could be easily installed at different locations on a temporary basis, too, which would enable the utility in the rental/ subscription mode.





3. A Strong Ground Motion Sensor

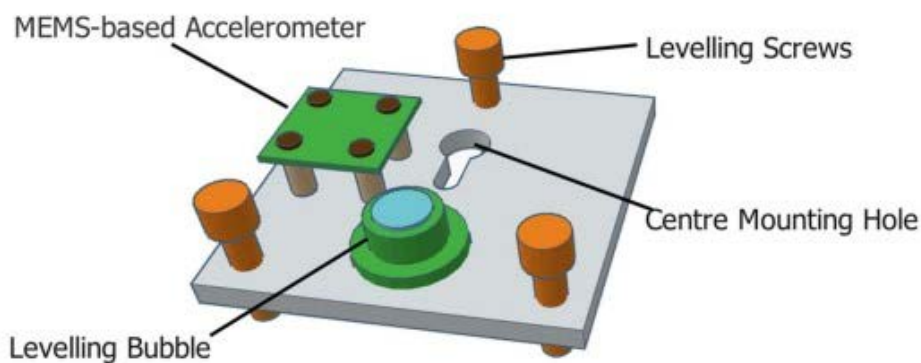
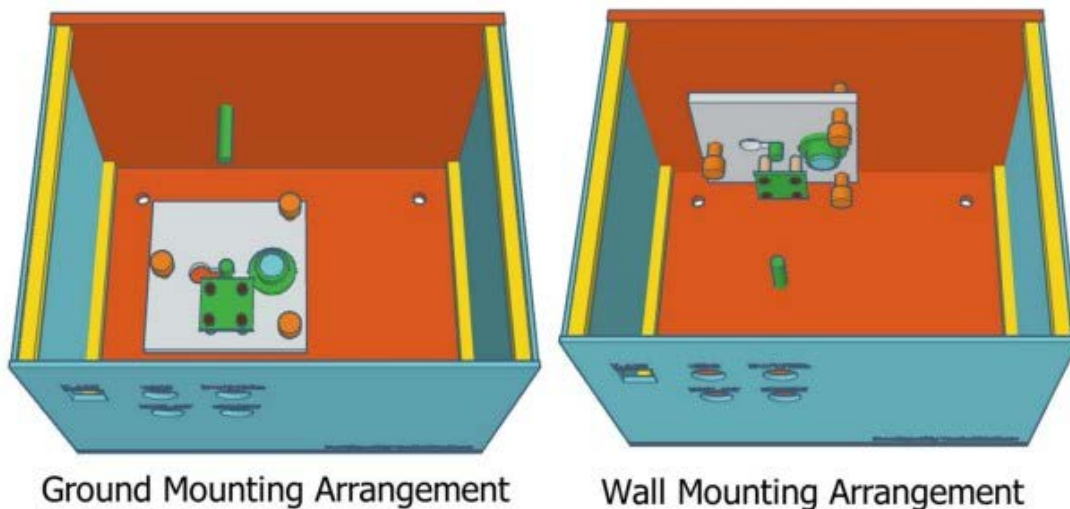
The present invention relates to a highly sensitive ground motion sensor designed to detect and analyze seismic activities. This sensor is crucial for assessing seismic hazards and risks, providing essential data for earthquake preparedness and mitigation strategies. Its advanced capabilities enable real-time monitoring of ground movements, thereby improving response measures in earthquake-prone areas. The technology was transferred to Seismic Hazard and Risk Investigations Pvt Ltd on 19th February 2024, contributing significantly to disaster risk management efforts.

Approach: The approach consist of developing a MEMS based accelrograph to reduce the cost of the system as well as external noise. It has a built-in 20-bit ADC and is compatible with I2C and SPI protocols.

Along with 3 LEDs the information is displayed on LCD and it uses a 12volt battery.

Benefits: The benefits of such development matches with MAKE IN INDIA initiative where such units were never developed and manufactured in India despite the country having much more seismic hazard and risk than USA, Taiwan, Mexico and Japan etc. Being low cost and better specifications this development will save lot of foreign currency.

Future: The development of Strong motion accelrograph will be used by Government and non-government organization to study earthquakes, to have inputs for earthquake resistant designs, earthquake early warning systems and seismic switches at large which IS beneficial for the society and considered as best disaster mitigation and management tools.





Confederation of Indian Industry

The Confederation of Indian Industry (CII) works to create and sustain an environment conducive to the development of India, partnering Industry, Government and civil society, through advisory and consultative processes.

CII is a non-government, not-for-profit, industry-led and industry-managed organization, with around 9,000 members from the private as well as public sectors, including SMEs and MNCs, and an indirect membership of over 365,000 enterprises from 294 national and regional sectoral industry bodies.

For more than 125 years, CII has been engaged in shaping India's development journey and works proactively on transforming Indian Industry's engagement in national development. CII charts change by working closely with Government on policy issues, interfacing with thought leaders, and enhancing efficiency, competitiveness, and business opportunities for industry through a range of specialized services and strategic global linkages. It also provides a platform for consensus-building and networking on key issues.

Through its dedicated Centres of Excellence and Industry competitiveness initiatives, promotion of innovation and technology adoption, and partnerships for sustainability, CII plays a transformative part in shaping the future of the nation. Extending its agenda beyond business, CII assists industry to identify and execute corporate citizenship programmes across diverse domains including affirmative action, livelihoods, diversity management, skill development, empowerment of women, and sustainable development, to name a few.

For 2024-25, CII has identified "Globally Competitive India: Partnerships for Sustainable and Inclusive Growth" as its Theme, prioritizing 5 key pillars. During the year, it would align its initiatives and activities to facilitate strategic actions for driving India's global competitiveness and growth through a robust and resilient Indian industry.

With 70 offices, including 12 Centres of Excellence, in India, and 8 overseas offices in Australia, Egypt, Germany, Indonesia, Singapore, UAE, UK, and USA, as well as institutional partnerships with about 300 counterpart organizations in almost 100 countries, CII serves as a reference point for Indian industry and the international business community.

Confederation of Indian Industry

The Mantosh Sondhi Centre
23, Institutional Area, Lodi Road, New Delhi – 110 003 (India)
T: 91 11 45771000
E: info@cii.in • W: www.cii.in

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