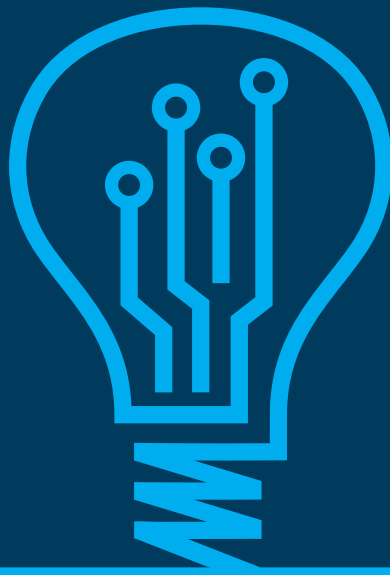




Confederation of Indian Industry



e-Compendium **Innovations**

Journey of Innovative Organizations

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Tel: +91-11-24629994-7, Fax: +91-11-24626149; Email: namita.bahl@cii.in; Web: www.cii.in

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(CII Industrial Innovation Award 2020 winners)”**

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ABSSTEM TECHNOLOGIES LLP

Website: www.absstem.com

Name of Innovative Product/Service
MEDICAL OXYGEN GENERATION PLANT



Sector	Healthcare		
Stage of Start-ups	Generating Revenue		
Problem Addressed by your Start-up	Availability of medical grade oxygen and risks associated with existing oxygen cylinders.		
IP associated with the Product/ Service if applicable	NA		
About the technology/ product/ service/ service delivery	With the help of this equipment, medical grade oxygen is produced directly by purifying and separating the surrounding air on site (hospital). This removes the risk of high pressure as in the case of other oxygen supply systems like cylinders and liq. oxygen. Once Installed, there is a continuous supply of medical grade oxygen for up to 15 years.		
Founders and Co-Founder of the Start-ups	Mohit Sharma, Pradeep Sati		
Address	4644/14, Jai Mata Market, Tri Nagar, Delhi-110035, India		
Email	info@absstem.com	Contact Number	9971535153, 9015040646

Addverb Technologies Pvt. Ltd.

Website: www.addverb.com

Name of Innovative Product/Service

Addverb is the leading company for intralogistics automation solutions. Our products incorporate the latest technologies and vastly improve the efficiency and accuracy of the intralogistics operations. We have an end-to-end product portfolio that helps in complete automation of warehouse, factories and have further expanded to hospitals and Airports. We have unlocked the true potential of automated systems through the synergy of our in-house manufactured hardware and robust software enabling us to charge ahead in the domain of robotics automation. We are a group of passionate individuals who have come together to foster innovation and provide leading solutions in future warehouse and supply chain.

Our In-house state of the art manufacturing capabilities, gives Addverb the flexibility to provide innovative solutions with plug and play approach from its wide-range product portfolio. We operate across four verticals in the Intra-logistic operations sector-

- 1) Robotics: AMRs, AGVs, Sorting Robots, Shuttle bots
- 2) AS/RS: Crane based ASRS, Shuttle based ASRS
- 3) Picking: Pick to light, Pick by voice, Pick by vision
- 4) Software: WMS, WCS, WES, IoT based softwares etc



Sector

Industrial Automation

Stage of Start-ups

Growth Stage

Problem Addressed by your Start-up

Addverb is in the business of making the supply chain more flexible through warehouse automation. Through our products, we intend to improve the space utilization in warehouses and factories. Also, we are working to improve the throughput and accuracy level at which the existing warehouses and factories are operating. Apart from this we are also addressing the issue of workers safety at workplace.

IP associated with the Product/ Service if applicable

We have filed for 6 patent cases (for our embedded, Mechanical, Software and Mobile Robotics Technology) and 8 design cases (Mechanical Designs) recently.

About the technology/ product/ service/ service delivery

Our solution focuses on increasing the storage space and improving the throughput of the warehouses. With the help of intelligent software, our products like "Pick-To-Light", "Mobile Robot", "Carton Shuttle" and "Pallet Shuttle" increase the operational efficiency of the warehouse or factory.

Founders and Co-Founder of the Start-ups

Sangeet Kumar, Prateek Jain, Amit Kumar, Satish Shukla, Neeraj Sharma, Bir Singh

Address

Industrial Plot no. 5, Sector-156, Phase II
Noida-201310, Uttar Pradesh, India

Email

shivani.tak@addverb.in

Contact Number

+91 8007587362



Arna Communication Pvt. Ltd.

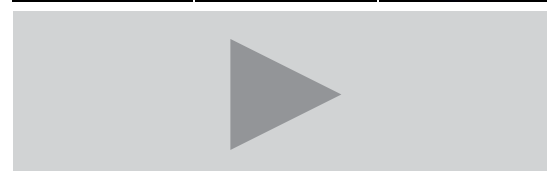
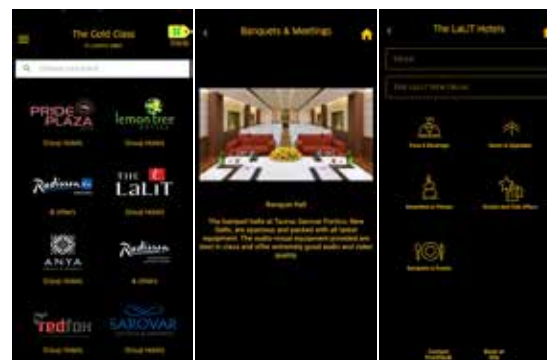
Website: www.thegoldclass.com

Name of Innovative Product/Service

The Gold Class – First Ever Booking app for any Service within a Star Hotel!

Only app which provides the user the facility to book a room, spa, restaurant or even the banquet from a single UI, but for the branded/star category. All this is done in a non-integrated environment which is touchless and even the participation to events is done through a QR code unique to an individual.

It allows the Hotel to keep a headcount and will be used for future check-in/check-outs. All this works with existing Hotel tech, does not require the Hotel to operate outside of their comfort zone. **One of the reasons why we already have Top 4 of the Midscale chains aboard namely – Sarovar, Lemon Tree, Fortune Park, Radisson.**



Sector

Hospitality Tech

Stage of Start-ups

Bootstrapped

Problem Addressed by your Start-up

Mid, Upscale & Luxury Hotels always needed a Premium booking engine which books all their offerings at one place thereby increasing visibility. User segment also has deep pockets. MICE tourism remained a largely ignored business area, we are the first app to cover it.

IP associated with the Product/ Service if applicable

Patent Filed, Trademark secured (Logo G)

About the technology/ product/ service/ service delivery

Single UI for booking multiple services within a Star Hotel, 5 booking apps rolled into one (Rooms, Restaurants, Banquets, Spa & Memberships)

Founders and Co-Founder of the Start-ups

Maulik Sharma, Neha Sharma

Address

15 GF Ashoka Enclave Main, Faridabad-121003, Haryana, India

Email

ms@thegoldclass.com

Contact Number

9716464152, 9654683350



Arsiga Konics Private Limited

Website: www.arsigakonics.org

Name of Innovative Product/Service

We create digital learning content for corporates and students (both K12 and higher education). The high level of innovation that we bring in learning modules sets us apart from other players. Our solutions achieve higher level of learner engagement through simulations, games, quizzes, case studies, real-life examples and so on. These solutions are duly backed by the technology that aides in accessing these courses on multiple devices such as mobile phones, tablets, PC's and ensures increased accomplishment of learning objectives.



Sector

Digital Learning

Stage of Start-ups

Stage 5 - Scaling

Problem Addressed by your Start-up

Technology- enabled learning empowers learner to access the training materials anytime, anywhere. The self-paced learning solutions enable learners can study as per their convenience. This assumes more significance in current times wherein mobility is severely restricted on account of on-going pandemic.

IP associated with the Product/ Service if applicable

NA

About the technology/ product/ service/ service delivery

Simulations: These allow employees to get hand-on experience on various system applications, without risking any interference with the live systems. They can be created as "Try Me" where the learner practices using the application and "Test Me" where the learners test their knowledge about the system application. Immersive merger of AR/VR create more impactful and lively training solutions. They help us create more realistic simulations that are more intuitive and less distracting.

Founders and Co-Founder of the Start-ups

Mr. Abhinav Mayank, Ms. Manisha Mayank, Mr. Ashish Kumar Singh

Address

SCF No. 111, HUDA Market, Sector 28, Faridabad-121008, Haryana India

Email

kapil.jhamb@konics.org

Contact Number

+91 8390909426



Biomoneta Research Pvt Ltd

Website: www.biomoneta.com

Name of Innovative Product/Service

ZeBox: Technology to prevent the spread of infections and reduce product contamination



Sector

Healthcare, Wellness

Stage of Start-ups

Commercialization

Problem Addressed by your Start-up

The Covid-19 situation has made public knowledge the extreme criticality of preventing the spread of infection, particularly where no cure or vaccine exists. Deployment of Biomoneta's ZeBox technology has the potential to arrest the spread of a range of infections, including bacterial, fungal, viral and the likes.

IP associated with the Product/ Service if applicable

The technology is protected by patent applications made in India and with the PCT. National phase filings have also been made.

About the technology/ product/ service/ service delivery

Biomoneta's ZeBox technology creates zones of low bio-burden in multiple settings. Our devices have demonstrated ability in hospital ICUs to clear microbial contamination. They are easy to deploy and use, produce no ionization or free radicals and are safe for continuous use in the presence of humans.

Founders and Co-Founder of the Start-ups

Janani Venkatraman, Arindam Ghatak, Santanu Datta, Anand Anandkumar

Address

Centre for Cellular and Molecular Platforms (CCAMP), GKV Campus, Bellary Road, Bangalore-560065, Karnataka, India

Email

janani@biomoneta.com

Contact Number

9845523153



BKC AGGREGATORS PVT LTD

Website: <https://bkcaggregators.com/>

Name of Innovative Product/Service

1. FASAL SALAH, a mobile application, provides automated and highly personalized real-time crop advisories to individual farmers for operational decision-making for their fields and crop varieties.
2. FASAL SALAH is powered by our core technology platform, metGIS AGRO, that uses weather forecasting, dynamic crop modeling, near surface remote sensing and artificial intelligence technologies, to automate advisory generation.
3. FASAL SALAH aggregates raw-data on crop and field conditions for market intelligence and crop analytics.
4. FASAL SALAH is also used as a point of sale of insurance policies to farmers and traders.
5. CROP INSURANCE TOOL: Dynamic crop modeling with near surface remote sensing replaces crop-cutting experiments as a method of crop loss assessment. Our technology also offers a clear advantage over satellite data to predict yield and prices well in advance.
6. COMMODITY RESEARCH REPORTS to align commodity business strategies to market dynamics for sound investment decisions.



Sector

Agri business services & consultation

Stage of Start-ups

Early Stage/ Traction/Prototype/Scaling

Problem Addressed by your Start-up

FASAL SALAH Innovative Multi-lingual App is unique delivering highly personalized doctor like personalized prescriptions, tailored to individual farmer's need from sowing to harvest for his soil, seed & based on highly accurate weather forecast, using AI and Big data for increased yields, reduced costs. Winner of Agriculture Grand Challenge 2019 and Best Mobile App for Agriculture by COAI 2020.

IP associated with the Product/ Service if applicable

1. A robust GIS-based IT platform metGIS AGRO™
2. In-house field level weather forecasting and high density of weather data
3. Advanced Dynamic Crop Modelling
4. Artificial Intelligence and Machine Learning
5. A personalized farmer advisory mobile app, FASAL SALAH

About the technology/ product/ service/ service delivery

Our technology combines yield prediction using dynamic crop model, scientifically based on genome characteristics along with real-time weather effect on crop yield. Concurrently, we process crop images received from farmer's fields using our proprietary software. This allows us to derive important parameters from crop pictures to auto generate crop health advisories for farmers, and also crop yield estimates in advance.

Founders and Co-Founder of the Start-ups

Dr. B.K. Singh & Dr. Jaya Singh

Address

109, Kusal Bazar, 32/33 Nehru Place, 110019, New Delhi-110019, India

Email

info@bkcaggregators.com

Contact Number

98110 62673



BMH Transmotion India Private Limited

Website: www.bmhtransmotion.com

Name of Innovative Product/Service

We at BMH started wanting to develop new technology to the areas, in more efficient ways, wherever required. As we researched in the field of food and grain wastage, the huge losses made us empathize with the situation, and made us want to do something in this field. It became our aim to work on reducing post-harvest losses and hence innovated Foldable Bulk Grain Handling Technologies, to look into the massive issue of grain losses. We also want to work in other areas, such as, pulses, vegetables, produce, etc, which also suffer from huge losses - and make a mark in reducing food wastage of all types.



Sector

Agriculture/Post-Harvest

Stage of Start-ups

Pilot successful. We are in the manufacturing and production stage.

Problem Addressed by your Start-up

BMH's focus with Foldable Grain Handling Technologies is to reduce maximum grain losses. Inadequate storage and pests are few major factors. Open and conventional storages have grain loss of 10%, but when we dig deeper, percentage rises significantly. Current systems also don't guarantee protection against pests, due to vast structure.

IP associated with the Product/ Service if applicable

BMH Foldable Bulk Grain Handling Technologies, is a patented technology. We are in the final stage of the patent process.

About the technology/ product/ service/ service delivery

BMH's Grain Handling Technologies, is a foldable & portable grain storage system without any fumigation, which aims to reduce grain losses. It is hermetic, which means it is airtight at all times - which ensures insects cannot enter and insects already present will die due to less oxygen. Hence, fumigation isn't required.

Founders and Co-Founder of the Start-ups

Ravindra Dekate

Address

#104, Jayanti Mansion-3, Manish Nagar, Nagpur-440015, Maharashtra, India

Email

ravindradekate@gmail.com

Contact Number

+917745920004

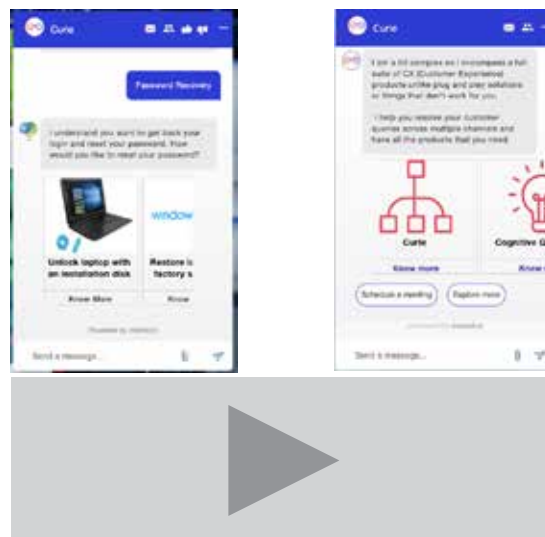
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Byteport Labs Pvt. Ltd.

Website: <https://intentico.ai>

Name of Innovative Product/Service

Have bots in your call centres and digital properties that speak naturally and reduce cost and enhance customer experience. Provided by Intentico's proprietary NLP engine, called Curie. With Curie, we can build a great conversation with customers, just short of having a coffee probably. Interact with customers having a dialogue engine, controlling tonality, language and a bunch of parameters related to Natural Language Understanding (NLU) and Natural Language Generation (NLG) - all integrated into Curie. We prefer to call it machine intelligence when there is an amalgamation of both Machine Learning & Deep Learning Models. We use algorithms for reading, understanding & adding "context" to conversational interfaces that we build. We support around 14+ languages and 20+ channels.



Sector

Artificial Intelligence

Stage of Start-ups

Early Stage with customers and revenues

Problem Addressed by your Start-up

Enterprise Customer interactions are getting automated through conversational AI (artificial intelligence) that enhances experience and reduces costs. Intentico is a cognitive customer experience platform that helps companies solve their customer interaction processes through the use of cognitive speech bots, AI chatbots and other AI products.

IP associated with the Product/ Service if applicable

Curie, Intentico's NLP engine.

About the technology/ product/ service/ service delivery

Intentico owns its Natural language Processing engine, Adaptive flow engine and support AI products like middleware, answer engine, botlytics (unified cross channel dashboard) etc. Products can integrate with any client or third-party software and deployed in a plug & play manner. Intentico's products are all deep tech with proprietary IPR

Founders and Co-Founder of the Start-ups

Satish Medapati

Address

91 Springboard, Bannerghatta Road, Dollars Colony, Bangalore-560076

Email

satish@intentico.ai

Contact Number

99169 59222



Cleanyug Scrap Management Pvt. Ltd.

Website: <http://scrapkarocash.com>

Name of Innovative Product/Service

ScrapKaroCash

Sector

Waste Management

Stage of Start-ups

Scaling

Problem Addressed by your Start-up

India's urban population of 429 million citizens produce a whopping 62 million tonnes of garbage every year. Out of this, only 11.9 million, that accounts to 22-28% is treated, while about 31 million tonnes of waste is left untreated and dumped at the landfill sites.

IP associated with the Product/ Service if applicable

- 1 Magic Powder.
- 2 Trash Roller Bin.
- 3 Food Wastage Calculator.
- 4 Surveillance.

About the technology/ product/ service/ service delivery

Scrap KaroCash is a "Scrap to Wealth and Waste to Energy" service provider working under zero waste management clean technology.

Founders and Co-Founder of the Start-ups

Manvendra Pratap Singh

Address

219, Murain Tola, Fatehpur-212601, Uttar Pradesh, India

Email

manvendra@scrapkarocash.com

Contact Number

+91 9480494001



ELVICTO Technologies Private Limited

Website: <http://elvicto.in>

Name of Innovative Product/Service

ELPARK is a contact less digital parking sensor and solution for smart parking management with a wireless long-range, low-power geomagnetic surface mounting sensor-based parking system for Smart Cities, Urban areas and public or private parking spaces. This has been developed using the latest FASTag, IoT based technologies. ELPARK ensures highest level of precision and life in parking sensor with its unique product, hence the customers can find, reserve and pay for parking service in advance from their own mobile application. It can alert real time parking availability to prospective commuters.



Sector

IoT and Smart Cities

Stage of Start-ups

Early Revenue

Problem Addressed by your Start-up

There are thousands of passenger vehicles deployed into the roads every day. The vehicle population increases the unnecessary traffic, accidents and fuel loss. There is a huge need to optimize the traffic congestions in the cities. There don't have a stable and sustainable solution for open on road parking.

IP associated with the Product/ Service if applicable

N/A,
We are a deep tech start-up under continuous innovation on IoT Technology

About the technology/ product/ service/ service delivery

ELPARK is designed as 100 percent contact less and inter operable parking, leveraging the state of art digital technologies such as FASTag parking sensors, IoT, Artificial Intelligence, Mobile applications, Social Media, Cloud and Big data analytics as part of its Platform.

Founders and Co-Founder of the Start-ups

Ajaya Jose, Managing Director; Saji Joseph, Director

Address

Swatantra, ICFOSS, South Pavilion, Sports Hub, Trivandrum-695581, Kerala, India

Email

ajayaj@elvicto.in

Contact Number

9895333466



Eziere Technologies Private Limited

Website: <https://www.kiubrand.com/>

Name of Innovative Product/Service

Make Your Own, Bag / Footwear / Watch



Sector

Fashion Accessories

Stage of Start-ups

Scaling Up

Problem Addressed by your Start-up

Every woman loves bags and we are solving problems related to it: (1) **CHOOSE** each and every part such as Body, Inner Bag, Handles, Accessories which go in making a bag; (2) **CHANGE** the look of the bag after you bought it by merely changing any part in seconds (3) Make Your Own Bag at the COMFORT of your home that too in less than 1 minute; (4) Make CHOICE from more than 100 Bodies, 50 Handles, 50 Inner Bags etc.; (5) Do all the above at starting COST of just Rs. 4,000

IP associated with the Product/ Service if applicable

Trademarks + Wordmarks

About the technology/ product/ service/ service delivery

We are selling offline through Exhibitions and online through our Website / Instagram / WhatsApp

Founders and Co-Founder of the Start-ups

Mr. Vijaykumar Harchandani, Mrs. Gunjan Vijaykumar Harchandani

Address

216, Hubtown Viva, Shankarwadi, Western Express Highway, Jogeshwari East, Mumbai-400060, Maharashtra, India

Email

contact@kiubrand.com

Contact Number

9029018888

Greenovative Energy Pvt. Ltd.

Website: greenovative.com

Name of Innovative Product/Service

We, at Greenovative, focus on empowering organizations to achieve digital transformation for efficient operations to thrive sustainability & truncate OPEX.

Greenovative uncovers Energy Intelligence through data analytics platform, enabling customers to improve system utilisation, increase reliability, and generate insights to help optimise resources, achieve energy efficiency & improved sustainability.

Our in-house developed product 'GreenErgy' acts as a facilitator for organizations to implement systems deep down in their operations and legacy practices. 'GreenErgy' assists organizations to achieve resource optimization through our cutting-edge technologically advanced solutions which identify and diagnose various data points by making use of sector specific complex algorithms and customisable modules perfect fit for organizations. This ultimately leads to enhanced productivity and amplified profitability.

We are proudly serving 200+ satisfied customers across diversified sectors. Our offerings are reducing energy consumption by 10-15%, enhancing productivity by 8% while diagnosing 1 Billion+ energy units every hour.



Sector

All Manufacturing Industries, Utility Companies

Stage of Start-ups

Growth

Problem Addressed by your Start-up

Organizations are digitizing essential functions within internal vertical operations processes, as well as with their horizontal partners along the value chain. This needs organizational framework for amalgamation of advanced machines, analytics, and people. Greenovative provides much needed digital transformation solutions for energy optimization, predictive analytics & improved equipment efficiency.

IP associated with the Product/ Service if applicable

Not Applicable

About the technology/ product/ service/ service delivery

Our solutions aligned with Industry 4.0 comprise of Energy Management System, Asset Performance Management and Overall Equipment Efficiency are designed with use of IIOT, AI and ML. These solutions integrable with existing systems to collect, monitor, analyse data and provide actionable insights in compliance with ISO & IEEE standards.

Founders and Co-Founder of the Start-ups

Vinit Kulkarni, Harshal Maheshwari

Address

Plot no. 20, Bhagwati Nagar, Behind Croma Store, Baner
Pune-411045, Maharashtra, India

Email

vinit.kulkarni@greenovative.com

Contact Number

9890639013



GVB Geomatics Private Limited

Website: www.gvbgeomatics.com

Name of Innovative Product/Service

Nebula Cloud Platform is world's first vendor agnostic, industry agnostic software, data and cloud marketplace platform with over 250+ open source and commercial IT software products across 50+ industry categories.

Nebula Cloud has a vertical focused approach that provides software, data and cloud solutions to various Small and Big Enterprises, Corporations, SMEs, MSMEs, Start-ups, Academia etc.

Our other Industry agnostic cloud products include Nebula Marketplace Platform as a Service (Nebula PaaS), Nebula Enterprise Cloud Brokerage Platform, Nebula Data as a Service (DaaS)2 Platform and Nebula Cloud Management Platform are available for enterprises to move from On-Premise IT to cloud based digital commerce platform and service the customers globally.



Sector

IT & Cloud Computing

Stage of Start-ups

Early Customer Acquisition

Problem Addressed by your Start-up

Nebula Cloud Platform provides highly powerful simulation platforms that empower the world's engineers, scientists, developers, and CIO and IT professionals to design innovative products, develop robust applications, and transform IT into unified, agile environments.

IP associated with the Product/ Service if applicable

We have launched World's first vendor agnostic, industry agnostic multi-cloud enabled on-demand High Performance Computing (HPC) Cloud Platform with over 250+ open source and commercial ISV vendor enterprise software products across 50+ industries.

About the technology/ product/ service/ service delivery

Nebula Cloud is a digital transformation and collaborations platform for Engineers, Researchers, Data Scientists and IT professionals. Nebula Cloud helps enterprises deploy fast, secure, and high-performance CAD, CAM, CAE, CFD, Big Data, GIS and PLM Solutions on cloud and provides a seamless experience to the engineering community.

Founders and Co-Founder of the Start-ups

Venkata B Ganugula

Address

S31A/ 27, 28, DLF Phase 3, Gurgaon-122002, Haryana, India

Email

Venkata.ganugula@gvbgeomatics.com

Contact Number

9953240019

InnoDI Water Technologies Pvt. Ltd

Website: www.innodi.in

Name of Innovative Product/Service

Decentralized desalination systems using Capacitive de-ionization (CDI) technology



Sector

Water treatment

Stage of Start-ups

Early Growth Stage

Problem Addressed by your Start-up

Reduction of water wastage during treatment and retention of adequate minerals for delivering healthy drinking water

IP associated with the Product/ Service if applicable

Product is governed by 8 patents that include the process and the technique involved in water treatment

About the technology/ product/ service/ service delivery

InnoDI has developed an innovative water treatment technology that can treat ground or surface water containing high dissolved salts to produce drinkable water meeting WHO standards. This is a high recovery system where wastage is less than 20%. It does not use chemicals, consumes less energy and has a low operating cost.

Founders and Co-Founder of the Start-ups

Mr. Vijay Sampath, Founder and CEO; Mr. Pradeep T, Co-founder and advisor; Mr. Tullio Servida, Co-founder and CTO

Address

316/44, 40th Cross, 8th Block, Jayanagar
Bengaluru-560070, Karnataka, India

Email

vijay@innodi.in

Contact Number

9731174200



Inqube Innoventures Pvt Ltd

Website: www.inqube.biz
www.mygreenqube.com

Name of Innovative Product/Service

InQube offers a full stack Agri ERP platform for improving efficiency of farmers and agri value chain stakeholders.

It is a cloud based, open source, scalable and multi-lingual platform for aggregating farm level data, and utilising the data available from other sources - to create a 360 degree solution cover for all stakeholders across farm value chain.

Main functions of our platform:

- Farmer decision support system
- Farm Credit management system
- Value chain traceability

Potential users of the platform:

- Agri input companies and plantation companies
- Agri output companies, food and fruit processing companies
- Banking and insurance companies in agri space
- Government
- Multi-lateral funding agencies
- Farmer welfare organizations (FPO / NGO / Farmer Co-op)



Sector

Agritech

Stage of Start-ups

MVP ready, have got paying clients, in a scale-up stage

Problem Addressed by your Start-up

Agriculture drives livelihood of more than 55% workforce in India and other developing countries. However, the farm value chain is saddled with problems and inefficiencies at each node. With an experience of handling more than 7 million farmers in India, InQube believes that only an appropriate digital inclusion of farmer community can give the necessary real time support and guidance to farmers, minimise risks and increase productivity.

IP associated with the Product/ Service if applicable

We use a number of AI tools for prediction of fertiliser, pesticide and micronutrient recommendation, based on the ground level data, and geo-climatic secondary data sources.

About the technology/ product/ service/ service delivery

The Agri ERP platform is a cloud based platform, built of open source. It is built on React Native, with PostgreSQL as database backend. The blockchain part of the solution is built on Ethereum platform. We use ML as a predictive tool for fertiliser, pesticide and micronutrient recommendation, based on the ground level data, and geo-climatic secondary data sources.

Founders and Co-Founder of the Start-ups

Tridibesh Bandyopadhyay, Subhankar Pandey, Kalyan Kumar Kar

Address

FD 70B, Salt Lake, Sector III, Kolkata-700106, West Bengal, India

Email

Tridibesh.b@inqube.biz

Contact Number

+919830094595



Keshiha Services Private Limited

Website: <https://toptech.news>

<https://www.myeasyride.com>

www.gizmofashion.com <https://artanddecors.com>

Name of Innovative Product/Service

Keshiha Services is a consumer technology startup with interests in the ecommerce, digital media & mobility-as-a-service (MaaS) space.

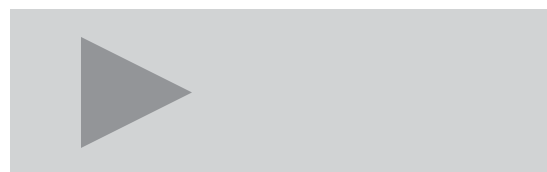
In the digital media space, Keshiha's brand, [Top Tech News](#) is the world's largest technology news site while in MaaS, their brand [Move](#), is the world's largest search app for shared bikes and parking slots.

Under ecommerce, Keshiha owns and operates two curated brands – **Gizmofashion** for electronic products & accessories from global brands and [Art and Decors](#) for global home décor products.

The company has been recognized as an 'Innovative Startup' by the Government of India under their flagship Startup India program.



GIZMOFASHION



Sector

Digital Media, Mobility-as-a-Service (MaaS) and Ecommerce.

Stage of Start-ups

Live Products/Services

Problem Addressed by your Start-up

Top Tech News: Access to curated global technology news. Zero noise. Only news. **Move:** Helping urban transportation be smarter, accessible and help city planners in efficiently planning transportation services for people. Providing urban travellers a cleaner and fitter mode of transport. And helping create a greener environment for our communities.

IP associated with the Product/ Service if applicable

Top Tech News: AI driven publication platform. **Move:** World's largest search engine. Bigger than Google as Move covers 620+ cities versus 24 cities covered by Google. **Gizmofashion:** GFSI, world's first smartphone ranking system that helps people buy smartphones intelligently. **Art and Decors:** World's most comprehensive Wedding Budget Planner.

About the technology/ product/ service/ service delivery

All products/services are internet enabled and delivered to end consumers either through web browser or as a downloadable application. For our Ecommerce brands, product fulfilment is via physical products delivered to the end consumer.

Founders and Co-Founder of the Start-ups

Divyan Gupta – Founder & CEO

Address

319, RBCA, Plot# 3, Sector 10,
Dwarka, New Delhi-110075, India

Email

divyan@keshiha.com

Contact Number

+91-9971105600



LVL Alpha Private Limited

Website: www.lvialpha.com

Name of Innovative Product/Service

Chemical Biological Radiological and Nuclear Disaster (CBRN) Response Patient Isolation Capsule™



Sector

Defence, HealthTech

Stage of Start-ups

Startup: Pre Seed (Early Stage); Product: Field Testing and Compliance TRL Stage 6

Problem Addressed by your Start-up

CBRN Emergency Response to Isolate Suspected Patients from frontline Health professionals during transportation, hospitalisation and isolation. The device is capable of addressing the current Pandemic Disaster Response.

IP associated with the Product/ Service if applicable

Patent Application No. 202021028485 Filed with support from NRDC, Hyderabad

About the technology/ product/ service/ service delivery

PIC is a Portable, Lightweight, Foldable Isolation Device, with OSHA Grade Air-Circulation and CDC Grade Air-Filtration system, Remote Patient Monitoring, Environmental Monitoring and Sterile Access to Patient for Medical Procedures. It has customisable ports and bags for Ventilator Intubation, External Medical Devices, IV lines and Decontamination Devices.

Founders and Co-Founder of the Start-ups

Aditya Mishra, Founder

Address

A-3, Ground Floor, TDS Colony, Camp
Pune-411001, Maharashtra, India

Email

contact@lvialpha.com

Contact Number

+91-9379098595

MediAsha Technologies Pvt. Ltd., Pune

Website: www.mediasha.com

Name of Innovative Product/Service

FractoAid – Early and Instant immobilization of fractured limbs



Sector

Healthcare

Stage of Start-ups

Early Traction

Problem Addressed by your Start-up

Worldwide around 200 Million people suffer from fractures. Fatal fracture injuries may be prevented or their severity reduced by adequate prehospital care in first 4-6 hours while the patient waits for medical attendance. Lack of pre-hospital care causes injury to neurovascular structures, muscle spasms & pain which lead to disability/amputation/death.

IP associated with the Product/ Service if applicable

PATENT: Title "ORTHOPAEDIC HYBRID PLASTER SPLINT" (Application number: 1464/MUM2014). Freedom to Operate is also verified. Patent license agreement is made between College of Engineering Pune and MediAsha Technologies Pvt. Ltd., Pune. **TRADEMARK:** MediAsha and FractoAid; **Status:** Granted

About the technology/ product/ service/ service delivery

FractoAid- An orthopaedic splint for early & instant immobilization of fractured limbs until patient receives medical treatment. FractoAid restricts motion of injured limb to allow injured area to heal properly, accommodates muscle swelling, provides relief to patient, protects neurovascular structures, prevents further injuries thus reducing the risk of permanent disabilities.

Founders and Co-Founder of the Start-ups

Mayur Sanas, Director; Amol Sanas, Co-Founder

Address

Sr. No. 36/2/5/2, Shop no. 3, Second Floor, Khedekar Industrial Area, Sai Hospital Lane, Narhe, Tal. Haweli, Dist. Pune, Maharashtra-411041, India

Email

mayur@mediasha.com

Contact Number

8087221044



Nreach Online Services Private Limited

Website: www.xoxoday.com

Name of Innovative Product/Service

Xoxoday (pronounced “zo-zo-day”) is a one-of-a-kind all-in-one engagement and motivation platform that has been empowering organisations across the globe to improve business efficiency, productivity, performance while optimising costs in employees, sales, channel and consumer engagement. Founded in the year 2012, Xoxoday offers a powerful platform for organisations to align their users with motivation triggers – both extrinsic and intrinsic – and achieve tangible business outcomes.

Xoxoday’s robust technology platform includes three highly scalable, easy to use, plug-n-play products. These platforms help organisations to motivate and engage their employees, distributors, dealers, contractors, freelancers, sales teams, survey panellists and more.

A quick look into our products:

Xoxoday Plum: A digital rewards automation platform

Xoxoday Empuls: Helps companies to build a winning culture with engaged employees

Xoxoday Compass: Helps companies to engage & motivate sales, blue-collar workers & channel partners



Sector	IT
Stage of Start-ups	Traction
Problem Addressed by your Start-up	The existing engagement, rewarding and incentive solutions are scattered. Businesses often look for different solutions to engage different business personas. HR, marketers, sales leaders and CXOs struggle to effectively engage and motivate employees, sales, channel partners. Xoxoday offers a unified platform to engage employees, channel and sales partners, and consumers.
IP associated with the Product/ Service if applicable	Copyright Xoxoday has the sole copyright of the software and platforms developed by it.
About the technology/ product/ service/ service delivery	Xoxoday offers a complete toolkit for motivation & engagement of employees, sales, channel and consumer engagement. The all-in-one rewards, incentives, commissions & benefits technology helps improve business efficiency, productivity, performance and optimize costs.
Founders and Co-Founder of the Start-ups	Sumit Khandelwal, Manoj Agarwal, Abhishek Kumar, Kushal Agrawal
Address	#17, Bhagyalaxmi Square, 2nd Floor ,3rd Sector, HSR Layout Bangalore - 560102, Karnataka, India
Email	manoj@xoxoday.com
Contact Number	9686575878



Proklean Technologies Pvt Ltd

Website: www.proklean.in

Name of Innovative Product/Service

Proklean develops, manufactures and markets non toxic and biodegradable biochemicals that replace and/or reduce toxic chemicals used in various manufacturing processes or household applications. Proklean has developed proprietary technologies using Probiotic Bacteria or from Bio-based materials to make products that are safe and green but deliver excellent results. Proklean's current range of products are for the Leather, Textile, Paper & Pulp processing industries and for Cleaning products for Industrial and Home.

Sector

BioChemicals

Stage of Start-ups

Growth

Problem Addressed by your Start-up

With increasing consumer awareness and regulatory pressures, the industry is looking for green chemistry solutions to control pollution and conserve natural resources. Typically green solutions are not deployed by the industry due to either performance, cost or compatibility issues. We offer solutions which do not have these challenges and are truly sustainable for the industry.

IP associated with the Product/ Service if applicable

We have filed patents across various countries worldwide. The patents are already granted in a few countries and are in process for the others.

About the technology/ product/ service/ service delivery

We have developed proprietary **Biobased and Eco-friendly Technologies** to make products that provide solutions to many vexatious problems such as pollution caused by multiple industries and depletion of renewable resources.

Founders and Co-Founder of the Start-ups

S. Sivaramakrishna Pillai, B. Chandrasekhar, Vishwadeep Kuila

Address

108/109, Perumal Nagar, Thirumudivakkam, Chennai-600044, Tamil Nadu, India

Email

contact@proklean.in

Contact Number

+91 44 22541997



Podrones Logistics Private Limited

Website: www.podrones.com

Name of Innovative Product/Service

- 1) HomePods™ and BizPods™ are electronically operated, individual lockers that are placed outside the home or office to collect any delivery, even when the recipient is away. The owner may operate the HomePod or OfficePod remotely (via an app) or may provide a code to the delivery person to open it.
- 2) PodBanks contain multiple lockers (Pods), allowing operation of each Pod in the same way as the HomePods and OfficePods. They include a touch screen, that allows users to log in to deliver or collect parcels plus, also enables other revenue streams such as advertising. A robust backend manages the authentication, messaging and payment services. Delivery companies and consignees pay for each Parcel Delivery.



Sector	Logistics
Stage of Start-ups	Earning Revenue
Problem Addressed by your Start-up	Our key focus is to solve the problem of synchronous delivery, which requires two humans to meet for Delivery of Packages & Documents which is a no-no in present contagion environment of Corona Virus. We are changing this process, which apart from being unable to solve the present requirement of Contactless Delivery, is neither efficient nor cost-effective.
IP associated with the Product/ Service if applicable	In addition to a complete Backend, Frontend and IoT stack, Podrones has substantial Intellectual Property in Drone Delivery which will be deployed for its last-mile operations once government regulations allow. The Patent has been approved in US.
About the technology/ product/ service/ service delivery	Our products are manufactured in Pune, India under our supervision and then shipped to various cities for deployment. All management is done remotely.
Founders and Co-Founder of the Start-ups	Aniruddha Rajendra Gupte; Navin Kumar Choudhary
Address	E-8/3, Salunkhe Vihar Society, Kondhwa, Pune-4110022, Maharashtra, India
Email	sales@podrones.com
Contact Number	7028900521



School of Fish Technologies Pvt Ltd

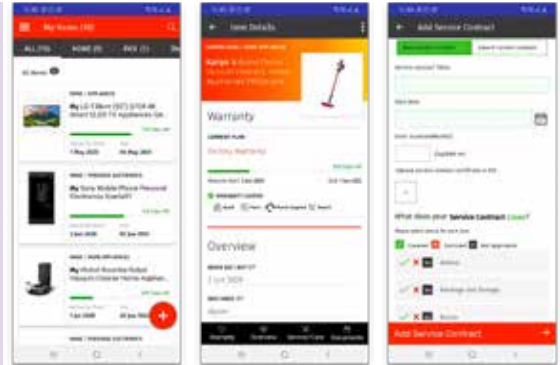
Website: www.schooloffishtech.com

Name of Innovative Product/Service

SCAMP II – Is a mobile app for consumers to manage the warranty and service contract on devices and appliances. It helps the consumer first scan the product invoice by capturing an image through the smartphone camera. The product can be either selected either from a curated database of consumer durables or an own product.

The product added can now be tagged to a location. It could be the consumer's home, office, parents' home or more. The added product can be shared with the consumer's spouse, parents or colleagues separately.

The app allows the consumer to add multiple warranties and service contracts for the product selected. For instance, if a mobile phone is the chosen product, the consumer can add and manage its standard factory warranty, an extended warranty that comes into effect once the factory warranty ends, and screen guard insurance effective for six months post-purchase.



Sector

B2C

Stage of Start-ups

Product Launched

Problem Addressed by your Start-up

There is a demand for high quality and reliable post-purchase service. Inevitably, the focus has been on product warranties and service contracts. Consumers are now keen that they take control of these without hassles.

IP associated with the Product/ Service if applicable

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About the technology/ product/ service/ service delivery

SCAMP II is built on industry leading technology and hosted on AWS cloud

Founders and Co-Founder of the Start-ups

Thanmaya Bekkalale and TR Ravisankar

Address

No. 40/1, 14th Cross, 3rd Main, Vyalikaval, Bengaluru-560003, Karnataka, India

Email

thanmaya.bekkalale@schooloffishtech.com

Contact Number

9845009310

Transcell Oncologics

Website: www.transtoxbio.com

Name of Innovative Product/Service

In vitro human surrogate system for testing safety related to potency of COVID-19 vaccine



Sector

Biotech/Life Sciences

Stage of Start-ups

Successfully established proof of concept of the productized offering from the Company

Problem Addressed by your Start-up

Problem addressed by the specific product line: COVID-19 is known to cause Neurovirulence and other pathological conditions while testing Vaccines on animals for safety is not relevant anymore

IP associated with the Product/ Service if applicable

The composition and the product of cell based platforms used for testing is proprietary to the Company

About the technology/ product/ service/ service delivery

The productized service offering is to all the Vaccine producers (research, pre-clinical, clinical trials, and manufacturers) in the country. The productized service is offered to the client at the client's facilities

Founders and Co-Founder of the Start-ups

Dr S Dravida Founder CEO; Dr Leela Krishna Operating Lead

Address

Technology Business Incubator, BioNest Aspire, Hyderabad Central University, Hyderabad-500046, Telangana, India

Email

suba.dravida@tran-scell.com

Contact Number

91-8297256755



Tvasta Manufacturing Solutions Pvt. Ltd.

Website: <https://tvasta.construction/>

Name of Innovative Product/Service

Tvasta has successfully built a 3D printing solution that has the capacity to automate 80% of the construction industry. The technology of Concrete 3D Printing (C3DP) provides a platform to build quick, affordable and customized structures, houses and basic amenities such as toilets.

The current construction method heavily lacks automation, is economically constrained for lower construction needs, and does not promote customisation. These issues fail to satisfy the rapidly growing demand for infrastructure in India, whereas Tvasta's C3DP technology - India's First Concrete Printing System - can almost completely overcome these shortcomings. The technology is constantly being revised and fine-proofed, and is currently being used by large scale construction companies in India.



Sector

Construction Automation

Stage of Start-ups

Seed Funded

Problem Addressed by your Start-up

Rural India, that houses 65% of the Indian population today, is estimated to house 800 million Indians by 2030 will grossly need quality infrastructure, housing, and basic amenities on high demand. Tvasta's C3DP technology can help build a 500sqft house in 3 days, and a toilet pod in just 6 hours at any remote location.

IP associated with the Product/ Service if applicable

- 3D Printing System for Construction of Building
- Test Bed 3D Printer for Material Testing and 3D Printing Process Development
- Specially Designed Extrusion and Crafting System
- Integration of Building Information Modeling with 3D Printing
- Concrete Mixtures for 3D Printing in Construction

About the technology/ product/ service/ service delivery

C3DP is built on the principles of layer-on-layer manufacturing to build large scale structures. The 3D Printer automates the process of strategically laying raw material; engineered concrete developed by Tvasta, in the desired shape of the structure. Tvasta's printer is guided by proprietary software that takes the 3D model of the structure as input and splits it into multiple layers to make the model 'print-able'.

Founders and Co-Founder of the Start-ups

Adithya VS, Vidyashankar C & Parivarthan Reddy

Address

Plot No. 10, Sri Devi Karumari Amman Nagar 5th cross, Vijaya Nagar, Velachery, Chennai-600042, Tamil Nadu, India

Email

pranjali@tvastagroup.in

Contact Number

9902588780



Tycheejuno Speciality Tyres Private Limited

Website: tjtyres.com

Name of Innovative Product/Service

Tycheejuno (TJ) Tyres is an innovation and technology-driven Startup working on rider's and passenger's safety and fuel economy consistent with Eco-friendly solutions. TJ Tyres has the Vision to create an ecosystem on mobility & logistics, focusing on innovation, safety, efficiency & decreased carbon-footprint. Tycheejuno has R & D centers in India and the USA, which are developing state-of-the-art products to ensure compatibility and adaptability by our customer base in the Automobile and Allied Industries. We are to save thousands of life by our technology not just to make revenue.



Sector	Automotive
Stage of Start-ups	Operating
Problem Addressed by your Start-up	Puncture repairs shops charge a lot of money in case of emergencies, and if there are multiple punctures, the bill can burn a big hole in your pocket and create a lot of safety issues while traveling.
IP associated with the Product/ Service if applicable	The patented tyre technology with many trade secrets is a Multi-Chambered Tubeless tyre with sealant, coolant, and balancers inside it; to take care of punctures and prevent blowouts. The sealant seals the puncture and auto heals the tyre, the coolant inside the chamber keeps the temperature of the tyre at an optimal level preventing localized overheating and thus preventing blowouts and the balancer inside the chamber balances the tyres in run time
About the technology/ product/ service/ service delivery	Multi-Chambered Tubeless tyre with sealant, coolant, and balancers inside it; to take care of punctures and prevent blowouts
Founders and Co-Founder of the Start-ups	Sameer Panda, Founder; Premananda Nanda, COO; Smitiparna Satpath, Co-Founder; Tushar Sahu, Co Founder
Address	2/114 Sadar Bazar Delhi Cantt Delhi, East Delhi, Delhi-110010, Delhi India
Email	contact@tjtyres.com
Contact Number	8800731371

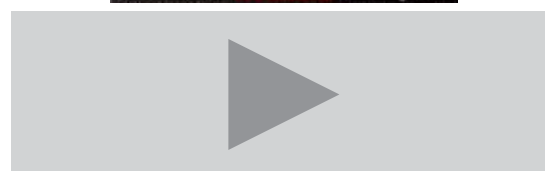
Name of Innovative Product/Service

ToolKart is an Application Oriented B2B Marketplace, that specializes in Metal Cutting Tools. (For Manufacturing Industry)

ToolKart will bridge the gap between Tool Manufacturers and Industrial Buyers, by bringing them together on this Marketplace.

The Buyers avail online tool recommendation, and will get to choose from a wide range of tools, with due Technical / Application support from ToolKart.

The Tool Manufacturers will have a wider coverage of the market, be able to reach to those customers who even their distributors cant reach.


Sector

E-Commerce / Marketplace (For Manufacturing Industry)

Stage of Start-ups

Launched – Initial Traction Stage

Problem Addressed by your Start-up

ToolKart empowers the engineering industry to untangle their procurement processes and attain better efficiency and productivity, By offering the Right Tool Recommendation and providing expert application support to use the tools more efficiently, ToolKart enables the industry (Especially MSMEs) to increase their overall profitability.

IP associated with the Product/ Service if applicable

ToolKart has an Unique inbuilt ONLINE Tool Recommendation Engine, that consumes the user inputs, and provides them with a recommendation of the Right tool to be used. This is indigenously designed and developed by ToolKart

About the technology/ product/ service/ service delivery

ToolKart is a first of its kind B2B Marketplace that offers an Online procurement option, with immense Application and Technical Focus. ToolKart's ONLINE Tool Recommendation Engine and a Unique Technical RFQ process, simplifies the purchase process and are key to changing the way a Company procures cutting Tools.

Founders and Co-Founder of the Start-ups

S.Vijay Shankar, Co founder; S. Ravishankar, Co founder

Address

309, 1st Cross, BHCS Layout, Uttarahalli Road, Bangalore-560061, Karnataka, India

Email
vijay@toolkart.co
Contact Number

9686745555

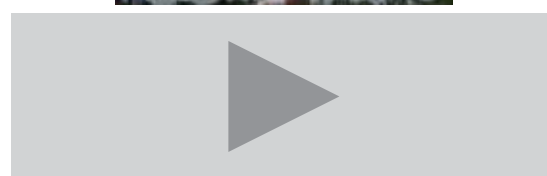


Uncanny Vision Solutions Pvt Ltd

Website: www.uncannyvision.com

Name of Innovative Product/Service

Uncanny ANPR - Uncanny Vision's Realtime AI-based Automatic Number Plate Recognition (ANPR) system



Sector

Smart Cities, Smart Transportation, Mobility, Logistics

Stage of Start-ups

Growth stage

Problem Addressed by your Start-up

Over 50,000 crores of imported petroleum is wasted every year with vehicles slowing down at Toll Plazas. Uncanny Vision is working with NHAI to implement free-flow tolling using high accuracy ANPR. After GST introduction & removal of inter-state checkpoints, Tax authorities need high accuracy ANPR to check if all trucks are filing e-Way Bills.

IP associated with the Product/ Service if applicable

Using unique patent-pending end-to-end AI techniques, Uncanny ANPR provides the highest accuracy ANPR in the industry with 10 times fewer missed vehicles than competing solutions. With a customized IR camera to handle different types of License Plate types, Uncanny ANPR is able to capture vehicles traveling at upto 160 Kmph with high accuracy during the day or night.

About the technology/ product/ service/ service delivery

Uncanny ANPR is India's highest accuracy ANPR system and is already adopted for advanced monitoring solutions by NHAI, GST department and various state Police departments. In addition, Uncanny Vision's Gate ANPR is used as automatic gate access control for Commercial and Residential complexes around India, South East Asia and the USA.

Founders and Co-Founder of the Start-ups

Ranjith Parakkal, Founder & CEO; Navaneethan Sundaramoorthy, Co-founder & CMO

Address

#19 Ginserv, Behind Leela Palace, Kodihalli, Bengaluru-560008, Karnataka, India

Email

surabhi@uncannyvision.com

Contact Number

+91-8310282690

University Living

Website: www.universityliving.com

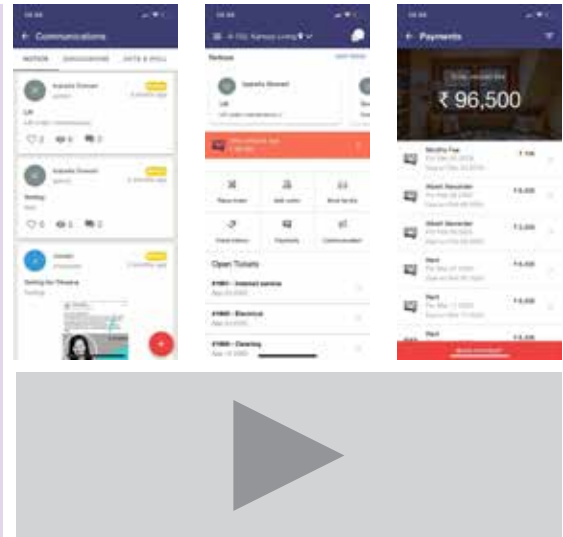
Name of Innovative Product/Service

University Living - Property Management Solution

Having started off as an AI and tech-enabled platform that helps students pursuing higher education abroad find accommodation near universities, we have recently strengthened our technical capabilities with the launch of a cutting-edge SaaS-based solution for student housing operators across the globe.

With the launch of our SaaS product, we have begun tapping our B2B base, giving us the flexibility to cater to our existing as well as new accommodation partners. Our innovative product allows us to accommodate all our stakeholders – from students to housing operators.

Our property management system connects providers with students residing in the property through the same platform. It includes a white-labeled mobile app and a web + mobile ERP automated management system aimed at simplifying the post-booking process on every front.



Sector

Ed-tech, Prop Tech/Real Estate, and SaaS

Stage of Start-ups

Expansion

Problem Addressed by your Start-up

Our subscription-based SaaS product offers innovative and comprehensive property and inventory management solution to our accommodation partners by helping them streamline their internal processes, from managing day-to-day operations and data to finances. It also allows residents to build a community wherein they are offered self-service options, creating a more personalized experience, and increasing their engagement.

IP associated with the Product/ Service if applicable

About the technology/ product/ service/ service delivery

Our product caters to small- to mid-sized (500 to 2500 beds) as well as large-scale operators who own a significant share of the unorganised student housing market supply but lack the technological expertise to track their operations optimally. The solution includes a dashboard for operators to manage accounts and finance, data, and reports. It will also allow residents to make payments, raise complaints, invite visitors.

Founders and Co-Founder of the Start-ups

Saurabh Arora, Founder and CEO; Mayank Maheshwari, Co-founder and COO

Address

Plot No. A 14, Eco Towers, Sector 125, Noida-201301, Uttar Pradesh, India

Email

s.arora@universityliving.com

Contact Number

+91 9891866491



vPhrase Analytics Solutions

Website: <https://phrazor.ai/>

Name of Innovative Product/Service

Phrazor, a self-service BI platform writes AI-powered stories from data in human language. Using Natural Language Generation technology, it summarizes complex data into a few bullet points, highlighting key actionable insights for data-driven decision making.

With Phrazor, you don't have to spend time analyzing numbers or interpreting dashboard, instead, you get automated, data-driven actionables in real-time.



Sector

Business Intelligence

Stage of Start-ups

Growth Stage

Problem Addressed by your Start-up

Enterprises today invest heavily in Business Intelligence (BI) and Analytics tools, yet they are unable to take full advantage of the opportunities hidden in their data. Phrazor provides insights in simple language that anyone can understand, empowering teams and organizations to get access to intelligent insights, regardless of their level or skill-set, at a tap of their finger.

IP associated with the Product/ Service if applicable

Patent Name - A Method and System for Content Creation and Management
Indian Patent No - 800/MUM/2015 A
US Patent No - 15759067
Patent Name - System and Method for Generating Dynamic Visualizations and Narrations of Digital Data
Indian Patent No - 201921038881 A
US Patent No - 16676449

About the technology/ product/ service/ service delivery

Phrazor, a self-service BI platform, provides insights from data in simple human language. While popular BI platforms use visualizations, Phrazor uses language because inter-relationships between data-points and deep insights are difficult to communicate without using language. Phrazor can also create personalized reports, at scale, in seconds.

Founders and Co-Founder of the Start-ups

Neerav Parekh

Address

301, T-Square, Saki Vihar Road, Andheri (E), Mumbai-400072, Maharashtra, India

Email

melissa.rodriques@vphrase.com

Contact Number

9769065002

Name of Innovative Product/Service

Terafil Water Purifier is a natural water purifier without need for electricity to run, does not waste water and has minimal maintenance.

We also have developed ready to fit toilets made out of waste glass fibre dumped by windmill blade manufacturers.



Stand alone water filter



Sector	Water & Sanitation
Stage of Start-ups	Growth
Problem Addressed by your Start-up	Reaching out to the unreached last mile rural villages, urban slums, middle class and salaried class with affordable water purifiers and for making toilets avoiding the usage of sand, water and cement, which are detrimental to environment.
IP associated with the Product/ Service if applicable	For making Terafil we have license from CSIR (IMMT), have filed further patents for both products
About the technology/ product/ service/ service delivery	Nano-filtration using clay as a medium. For toilets it is hand lay up using waste glass reinforced fibres to build toilets.
Founders and Co-Founder of the Start-ups	Mr. Chandrasekaran-J and Mr. Subramanian P N
Address	92/98, Nithyanandam St, Vasudevan Nagar, Ashok Nagar, Chennai-600083, Tamil Nadu, India
Email	watsanenvirotech@gmail.com
Contact Number	9444441181/ 9445104576



WEGoT Utility Solutions Pvt Ltd

Website: www.wegot.in

Name of Innovative Product/Service

WEGoT aqua, is a low cost, high precision, data driven IoT water management solution that solves the impending water crisis by reducing water consumption by up to 50%.



Sector

Utilities

Stage of Start-ups

Growth Stage

Problem Addressed by your Start-up

The urban issue we are solving is one of the most critical and life crippling issue in modern times, Water Shortage! There is no accountability when it comes to usage of water. Our aim is to provide the user with their usage patterns and other critical data to help make informed decisions and thereby leading to reduction in consumption of water.

IP associated with the Product/ Service if applicable

About the technology/ product/ service/ service delivery

WEGoT aqua enables real time, data driven & automated decision making to reduce the water demand & increase the efficiency of water infrastructure in buildings. WEGoT aqua tracks the usage at all consumption points & generates bills as per water usage.

Founders and Co-Founder of the Start-ups

Vijay Krishna, Abilash Haridass, Mohideen Haja, and Sundeep Donthamshetty

Address

Plot No 45, Raju Nagar, II Street, Metukuppam, Okkiyam, Thoraipakkam, Chennai-600097, Tamil Nadu, India

Email

abilash@egot.in

Contact Number

9884332714

**Top 25 Innovative
Companies of the year 2020**



Access Healthcare Services Pvt Ltd

About the Company

Established in 2011, Access Healthcare is an industry leader in healthcare revenue cycle management (RCM), serving physician practices, hospitals, intermediaries, and payers in the United States. Their global presence includes 19 delivery centres - India (Chennai, Noida, Pune, Coimbatore, Mumbai, Trivandrum), Philippines (Manila), and USA (Dallas, TX and Teaneck, NJ).

As a key enabler in a complicated and critical sector for the world's largest economy, the company focuses on delivering results, supplementing in-depth domain knowledge with continuous innovation and intelligent technology adoption. Application development and maintenance, robotic process automation services, and Finance and Accounting business process services are value additions for their clientele.

Access Healthcare is PCI DSS and HITRUST certified. The company was recognized as a Leader in Everest Group's Healthcare Provider BPO – Service Provider Landscape with Services PEAK Matrix™ Assessment 2020 and placed on the IAOP Global Outsourcing 100 and Dallas Business Journal Middle Market 50 lists 2020.

The Innovation

Innovation at Access Healthcare impacts three distinct aspects of their business - Workflow Management, Workforce Management and strategic deployment of Machine Learning and Artificial Intelligence. Technology is applied for end to end governance of operations, automation of key operational workflows and to enhance service delivery through increased productivity, efficiency and quality.

- echo C3 is a solution enabling higher productivity and quality in call centre service delivery. It seamlessly integrates into their service delivery management workflow (arc.flow), and is cloud-enabled, scalable and completely secure for handling sensitive customer data. It includes a smart dialer with single sign on enabled "Click to Call" facility, with dynamic switch between service providers based on the connectivity. Live dashboard provides detailed CDR data for analytics.
- echolock is a proprietary application which enables productivity management through intelligent resource tracking and system monitoring. It provides rich reports for operational decision-making, based on system usage and events. echolock+ is an enhanced version that tracks user behaviour and provides productivity reports. echolock++ provides more advanced real time monitoring of system updates and tracking of assets for security in infrastructure management.
- arc.in mobile was deployed for providing remote access (in work from home mode) to their in-house workflow management platform arc.in. During the COVID-19 pandemic, when Access Healthcare's workforce moved into work from home as a business continuity strategy, the mobile application provided highly effective remote access and management and acted as a key enabler for continued business success. Value drivers include live monitoring of operational status and productivity metrics of all business units, real-time technical support for associates, lean apps for streamlining remote working, geolocation and containment zone status tracking, efficient asset tracking and management and most importantly, continuous real-time communication and engagement of associates in WFH mode.

The Approach

At Access Healthcare, a two-pronged approach is followed for innovation. A dedicated Business Transformation group takes active involvement in the operations, collaborating with their clients and the service delivery organization. By closely analysing the processes in each unit, the group identifies opportunities for improvement in productivity and efficiency, especially through technology and automation.

This is supported by a crowdsourcing model of innovation, where every member of their workforce is given the opportunity to submit their ideas on a centralized platform. Ideas are evaluated with the respective stakeholders and rewards are given based on the value derived from the implementation.

Benefits

The arc.in mobile application was a crucial cog in their successful BCP during the COVID-19 lockdown, enabling live tech support for associates, facilitation of a Pod structure for communication and realtime tracking of asset movement. The workforce was able to achieve 85% of normal productivity in just one week after migration to Work From Home mode.

echoC3 brought in-depth transparency in process metrics, improving talk time by 15% and this is slated to improve further with the AI/ML system delivering insights into payer behaviour and ideal time-to-call data. echolock+ has facilitated a 12% improvement in productivity.

The Future

Access Healthcare prioritizes value-centric innovation, continuously driving improvement in KPIs while saving effort and costs. Technology is leveraged to enable social progress, eliminating gender-specific, social and geographic barriers, promoting equitable and sustainable development. A permanent WFH model is being introduced for select groups, with secure controls for governance and monitoring.



Aditya Birla Capital Limited

About the Company

Aditya Birla Capital Limited (ABCL) is the holding company for the financial services businesses of the Aditya Birla Group, a US\$ 48.3 billion Indian multinational, in the league of Fortune 500.

ABCL's subsidiaries have a strong presence across Protecting, Investing and Financing solutions, ABCL is a universal financial solutions group catering to diverse needs of its customers across their life stages.

Powered by more than 21,000 employees, the subsidiaries of ABCL have a nationwide reach with 800+ branches and more than 2,00,000 agents / channel partners & several bank partners.

As of September 30th, 2020, Aditya Birla Capital Limited manages aggregate assets under management around Rs.3000 billion, has a consolidated lending book of over Rs. 575 billion, and an active customer base of over 20 million, through its subsidiaries & joint ventures.

The Innovation

Business Innovation – Aditya Birla Capital is the first Brand in the country which has successfully gone to market as an integrated player with Customer-Centric Proposition of ONE BRAND for ALL MONEY SOLUTIONS, the consumer may need throughout his/her life through golden ID with 360-degree customer view creation which led to increasing in Brand Consideration & 10Mn customers additions since launch.

Market Innovation – Their Mutual fund business is accoladed for its zeal to tap uncharted territory through deeper penetration in Emerging Markets with unique Built-Operate-Transfer model & acclaimed as “Industry leader” with AUM growth of 13.7 times as against industry growth of 8 times in last 3 years.

With data being the fuel for analytics, they have developed industry-best Next Best Offer Machine-Learning model recommending product which suits to customer needs. Their Pre-approved sum assured products (PASA) in Life insurance business developed using analytics model today contributes 11% of First-Year Premium target.

Product Innovation –Aditya Birla Health insurance is known for “Health First Model” in India with several industry best products & initiatives such 1Crore health insurance product at affordable price, disease-specific Siche health insurance products , innovative wellness & lifestyle reward program.

Regulatory Innovation- Their NBFC & Business fund business have deployed “Industry first video KYC “solution thus enabling paperless, digital onboarding of customers within minutes.

Service Innovation- They have introduced many “Industry first” Service innovations such as WhatsApp for servicing, 24x7-OnDemand Google assistant & NLP-based eBot for auto handling /response of customer mail instantly. Today 200+ services are available digitally with over 5+million customer interactions on new-age digital assets.

Operation Innovation- They have leveraged 20+ cutting edge technologies in last 2 years such as intelligent OCR, Face-Match, Aadhar-XML, geotag, Video PD, eSign & eOTM for end-to-end digitisation of onboarding journey for their lending & insurance customers thus created complete paperless & industry best onboarding experience.

The Approach

Over the past 2-years, Aditya Birla Capital has made a significant progress towards Vision realisation & built leadership positions in key businesses. These have been achieved with a clear strategy (ABC 2.0)-A digital transformation drive wherein cross-business teams led by CXO's made accountable to drive 4 strategic focus areas ranging from developing eco system to digital transformation etc

At ABC, they have well laid set of processes to collect inputs to innovation which includes Global benchmarking immersion, brand track etc whereas Fintech Drive-A structured innovation program was initiated in FY20 to identify fintech's which can partner with them in driving innovative next-generation solutions in different businesses.

Benefits

Customer NPS & Brand Consideration Score

- Increase in Net Promoter Score by at least 15 points across all their businesses from FY20 to FY21.
- Increase in Brand Consideration Score by at least 35 points across all their businesses from FY17 to FY20.

Digital Adoption/automation

- Increase in % Services offered under the self-service channel from 71% (FY19) to 94% (FY21).
- Increase in % onboarding of 90% customers digitally from 72%(Q4-19) to 90%(Q2-21)

New Customers Acquisition & Growth

- Increase in customer base from 10Mn+(FY18) to 20Mn+(FY20).
- Leadership positions-Top 5 Mutual Fund, private diversified NBFC, General Insurance broker and fastest-growing health insurance business for last 3 FY's

The Future

They believe focus on Digitalisation, Customer Centricity & building reach through ecosystem & partnerships will be key driver for sustainable growth in post COVID era. They continue to invest in new technologies to develop innovative industry first tech-solutions to gain competitive advantages and create deeper relationship with customers, distributors & ecosystem partners.





Biocon Biologics Ltd

About the Company

Biocon Biologics Limited, a subsidiary of Biocon Limited, is uniquely positioned as a fully integrated 'pure play' biosimilars organization in the world. Building on the four pillars of Patients, People, Partners and Business, Biocon Biologics is committed to transforming healthcare and transforming lives. Biocon Biologics is leveraging cutting-edge science, innovative tech platforms and advanced research & development capabilities to lower treatment costs while improving healthcare outcomes. It has a platform of 28 biosimilar molecules across diabetes, oncology, immunology, dermatology, ophthalmology, neurology, rheumatology and inflammatory diseases. Five molecules from Biocon Biologics' portfolio have been taken from lab to market, of which three have been commercialized in developed markets like United States, EU, Australia, Canada and Japan. It aspires to benefit 5 million patient lives with its biosimilars and attain a revenue milestone of USD 1 billion in FY22.

The Innovation

Itolizumab is an approved and in-market drug that has been available in India under the trade name ALZUMAb® for the treatment of chronic plaque psoriasis since 2013 and has been used safely in thousands of patients.

As the COVID-19 pandemic swept through India, Biocon responded to the need of the hour and repurposed its novel biologic ALZUMAb® (Itolizumab), for COVID-19 patients. It is a 'first-in-class,' anti-CD-6 IgG1 monoclonal antibody, which has shown promising results in treating cytokine release syndrome (CRS) in COVID-19 patients experiencing acute respiratory distress syndrome (ARDS).

After receiving permission from the Drugs Controller General of India (DCGI) in April 2020, they conducted a multi-centre, open label, two-arm, randomised Phase 2 clinical trial in 30 eligible patients, to study the efficacy and safety of Itolizumab in COVID-19 complications.

Twenty patients received Itolizumab plus best supportive care in the test arm, while 10 patients received best supportive care alone in the control arm. At the end of the treatment period, Itolizumab demonstrated statistically significant advantage over the control arm in one-month mortality rate. Key efficacy parameters of lung function such as PaO₂ and SpO₂ (oxygen saturation) improvement without increasing FiO₂ (oxygen flow) also showed statistically significant advantage for the Itolizumab arm over the control arm. All patients on the Itolizumab arm were weaned off oxygen by Day 30, and none needed ventilator support unlike the control arm.

Itolizumab was overall well tolerated and found to be safe and the drug received restricted emergency use authorization from the DCGI based on results of the Phase II randomized control trial in July 2020.

A clinical trial in 10 Cuban hospitals by their partner there showed timely administration of Itolizumab, guided by biomarkers, can interrupt the hyperinflammatory cascade and might prevent morbidity and mortality related to CRS in COVID-19 patients.

The Approach

Itolizumab's unique mechanism of action of immunomodulation involves binding to the CD6 receptor and

blocking the activation of T lymphocytes, which in turn suppresses the pro-inflammatory cytokines, thus reducing inflammation.

COVID-19 patients who develop serious complications experience a 'cytokine storm,' which leads to excessive inflammation, organ failure and death. Itolizumab reduces cytokine storm and the deadly inflammatory response.

To bring Itolizumab to patients they used all appropriate evidence types and built on the existing evidence base using proven best practices in response to the need to save lives during this critical public health emergency as a result of COVID-19.

Benefits

Hospitalized patients who progress rapidly to severe ARDS, organ damage, and coagulation disorders due to systemic hyper-inflammation currently have no approved treatments. Biocon Biologics is proud to present a repurposed Itolizumab to address an area of unmet need and provide doctors with a safe, effective treatment option that has contributed to reducing the mortality rate in our country.

Biocon Biologics' repurposed novel biologic drug has contributed to successfully treating over 1,500 patients in India.

The Future

As a part of their commitment to the DCGI, they have commenced enrolment for a 300-patient, Phase IV clinical study across 15 centres in India in order to generate a larger body of scientific evidence to support the safety, efficacy and usefulness of Itolizumab in prevention and treatment of CRS in COVID-19 patients with moderate to severe ARDS.





Collins Aerospace

About the Company

Collins Aerospace, a Raytheon Technologies subsidiary is one of the world's largest suppliers of aerospace and defense products with 186 customer countries across the globe and headquartered in Charlotte, North Carolina.

In India, Collins Aerospace has presence since 1997 as Goodrich Aerospace, an integrated manufacturing, engineering and sourcing hub. Products manufactured in Bangalore facility include aircraft evacuation systems, aircraft interior and exterior lighting, cargo systems, pilot and cabin attendant seats, flight control motors, actuation systems and avionics.

Collins Aerospace, India employs over 5000 people of which 2500 constitute an engineering work force. The engineering centers in Hyderabad and Bengaluru provide engineering support to all parts of the company, including Avionics, Aerostructures, Interiors, Mechanical Systems, Missions Systems, Power & Controls.

Delivering Innovation through products and solutions, Collins India has over 40 Trade Secrets and 390 Patents filed in India and across the globe over last 6 years. Collins Aerospace has strategic partnership with industries and academia in India and across the globe. Customers of Collins India include all major global and Indian Airlines, all major Aerospace & Defense OEMs such as Boeing, Airbus, Embraer, Bombardier, Gulfstream, Mitsubishi etc. and Airports around the world including New Delhi & Cochin International Airports. Business Development office in New Delhi enables to support local and global markets.

The Innovation

Innovation 1: Connected Ecosystem

A Wireless network inside aircraft connecting avionics and sensors with scalable, robust, secure, fault tolerant and agnostic architecture is leading to IoT solution that connects inside aircraft to external world. This “future of flight Innovation” is about adoption of Wireless technology to inside aircraft by overcoming the challenges due to sources of emission and absorption, EMI/EMC and to meet the QoS in a resource constrained environment.

Innovation 2: Integrated Air Data System

Multifunctional Air Data System with AI/ML technique and integration of processing unit with variety of sensors to relay vital information for aircraft flight control by providing highly accurate measurements over a wide range of angles of attack and airspeeds, even in extreme icing conditions.

Innovation 3: RampNet

RampNet is integrated solution for tracking of airport assets, ground vehicles & aircrafts on the ground and avoiding collision on the ground during preparation for takeoff and landing. The innovation is about integrating long range & low power tracking device for GSE tracking and integrating ADS-B for Aircraft tracking.

The Approach

For Innovation 1:

Amalgamation of several inventions on architecture design, network protocols for ISM band, security algorithms and universality features. Leverages Collins AID, TIM, Data Concentrators and a bundle of software applications

to enable wired, wireless hybrid communication

For Innovation 2:

AI/ML technique for ensuring robust performance, accuracy and redundancy management of integrated air data, advanced materials and additive manufacturing for increasing deicing performance and digital twin for aftermarket solutions.

For Innovation 3:

Designed, developed and built the RF sensors and User Interfaces in collaboration with industry partners with in India and outside, integrated with LORA RF that provide long range & low power tracking solution.

The Benefits

For Innovation 1:

Reduced wires from Aircraft reduces weight and fuel cost, minimizes aircraft on ground, enhances safety, reliability, maintainability and availability by enabling PHM, AHM, IVHM and related applications.

For Innovation 2:

Simplified design, reduced weight, ease of installation and increased accuracy.

For Innovation 3:

RampNet has been deployed in Cochin & Delhi International Airports. The solution has significantly reduced accidents in the airport area besides enabling asset tracking in airport that brings in accountability and effective deployment of goods service regulations in the airport.

The Future

For Innovation 1:

Deployment of ISM band network for Aircraft application and enhance protocols for WAIC band Network.

For Innovation 2:

Deploy advanced engineering techniques for increased deicing for enhanced flight safety.

For Innovation 3:

Deploying the solution to a number of airports in India and across the globe.





Cyril Amarchand Mangaldas

About the Company

At Cyril Amarchand Mangaldas, they combine expertise with foresight and innovation that lay the foundation of everything they do.

With 750 lawyers and pan-India presence, they are India's largest full-service law firm providing focussed, end-end solutions to their clients. Through their innovative ideas and domestic as well as international collaborations, they strive to stay ahead of the curve.

Their highly-experienced teams advise a large and diverse set of clients, including domestic and foreign commercial enterprises, financial institutions, private equity and venture capital funds, start-ups as well as government, and regulatory bodies. Their crew of generalists, specialists and senior ex-regulators expertly guide clients across the spectrum of transactions, sectors and regulations.

They are the first Indian law firm to adopt AI technology to drive delivery, which in turn has allowed them to identify challenges and explore relevant solutions with increased efficiencies. The fusion of innovative thinking and legal technology helps them to consistently deliver solutions that set precedents in today's complex market paradigm.

The Innovation

In their relentless pursuit of perfection, they clasped technology early in the day to provide client-centric, best in class services. Their dedicated innovation team focusses on continuous improvement of legal service delivery and refinement of both the business of law and the practice of law, thereby helping them to remain ahead of the curve.

Their innovations are divided into two parts --Driving the culture of Innovation and Legal Service Delivery, both through technology-enabled solutions.

Driving the culture of Innovation includes India's first legaltech incubator Prarambh and their annual innovation week Vichaar -. Prarambh is their way of giving back to the fraternity and lending a hand to the domestic legaltech startup ecosystem. Vichaar is focussed on allowing their lawyers to innovate. The results of these innovations can be both internal and external.

Their Legal Service Delivery is focussed on identifying the right technologies, creating process workflows, implementing the technologies, and evaluating the impact of these technologies. This aspect of innovation also allows them to create new tech-driven service lines. Their eDiscovery and Contract Abstraction services are an example of the innovative solutions they provide. The firm also provides innovation consultation, which allows their clients to reach out to them with their problems. The innovation team then defines the problem, identifies the solution (tech or process oriented) and suggests and implements the solution. This allows them to innovate with their clients and participate in their problem-solving exercise.

The Approach

They approach innovation with the intent to deliver better, faster and efficient legal services. This allows them to continuously identify problem areas, measure the extent of the problem and ascertain the impact of

the solution, thereby helping them to innovate with all the stakeholders involved. Their innovations are both internal and external, technology intensive and process focussed. While applying innovation, they follow both top-down and bottom-up approach. This allows all stakeholders to participate in the process of innovating and, thus, driving the culture of innovation at all levels. Their approach has allowed them to move away from the traditional consultative law firm to a modern, collaborative law firm.

Benefits

Their innovations have resulted in quantifiable benefits such as considerable cost savings, increased efficiency, improved accuracy, quality service delivery, client satisfaction and faster turnaround time. These innovations have also influenced the culture of the firm, the mindset of the lawyers and their relationship with their clients. They have seen efficiencies increasing by as much as 40%, leading to a better work life balance for their lawyers. This, in turn, allows their lawyers to upskill, transform and focus on improving their learning curves.



Dow Chemical International Pvt Ltd.

About the Company

Dow Chemical International Private Limited (Dow India) aims to be the most innovative, sustainable, inclusive customer-centric materials science company. The company is committed to delivering the right solutions to its customers' challenges every day. With broadest technology sets spanning performance materials, industrial intermediates, and plastics Dow India delivers differentiated science-based products and solutions in high-growth segments, such as packaging, infrastructure, and consumer care.

With approximately 1000 employees, its operations are spread over 7 locations in the country, including three manufacturing sites, two established Centers of Excellence, and two commercial offices. As a responsible corporate, the company supports its Corporate Social Responsibility (program) with technology expertise and employee volunteerism. Dow India works with non-profit partners towards the empowerment of differently abled, women, and children in communities where it operates. The company aims to redefine the societal blueprint, by supporting holistic sustainability and circular economy initiatives.

The Innovation

ECOFAST™ (patented)

The conventional cotton dyeing process suffers from low efficiency, wherein not only are large amounts of dye wasted but it also requires multiple wash cycles post-dyeing to create a no colour-bleeding product. This results in wastage of hundreds of gallons of water everyday creating an adverse environmental impact. ECOFAST™ solution when added to dyeing process allows the fabric to pick up dyes efficiently, without the use of salts or additional processing chemicals, reducing CO2 footprint and providing a sustainable alternative for the textile industry.

PRIMAL™ EC 4642 COOL ROOF

Asian countries, situated in the tropical region, experience maximum exposure to sunlight which results in high roof surface temperatures followed by subsequent rise of in-house temperatures. Further catapulted by global warming, buildings (Industrial in particular) consume more energy with increasing electricity demand along with long term deterioration of workers' health. PRIMAL™ EC4642 is a waterborne acrylic coating that helps in reducing surface temperatures by 15°C and inside non-insulated industrial buildings by 4-5°C in peak summers. Additionally, the coating is waterproof, offer dust pick-up resistance and flexibility there by able to handle other environmental impacts along with UV radiation. Since it is waterborne it does not require any personal protection equipment for application.

SILASTIC™ LTC 9400 Textile Printing (patented)

Curing of traditional LSR requires temperature around 150 – 160 deg C, to get a balance between productivity (time required) without making any damage to the heat sensitive fabric(s); for some special fabrics, so much temperature can't be applied. Curing at higher temperature is an energy intensive process due to more heat loss to the surrounding environment due to higher temperature gradient. Recent development of Low Temperature Cure (LTC) technique SILASTIC LTC-9400-40, will allow their customers to do the curing of LSR at around 100 deg C, improving the productivity by 30 % and reducing Carbon Footprint through

more sustainable production process, without compromising on standard LSR benefits of wash fastness, soft feel, etc.

Benefits

ECOFAST™:

- Reduces water utilization by 12.5%, energy consumption by 50%, total dissolved solid by 40%, colour in wastewater by 35% and carbon footprint by 20-40 %
- The life cycle assessment shows zero discharge of hazardous pollutants.

PRIMAL™ EC 4642 COOL ROOF

- Market feedback has reported energy saving of up to 10-20% depending on climate and insulation level.
- Application of the coating does not require PPE. Tools can be cleaned easily by water. Not harmful to environment

SILASTIC™ LTC 9400 Textile Printing

- Increase production capacity > 30 %
- Avoid shrinkage of heat sensitive fabrics
- Meets the requirement of Zero Discharge Hazardous Components

The Future

Dow plans to extend/enhance each of these environmentally friendly and sustainable technologies to multiple application areas. Further work on SILASTIC LTC LSR is done to reduce the cure temperatures to about 60-70 deg C, enabling printing on variety of temperature sensitive substrates. ECOFAST will be extended to knit and woven fabric and to semi-continuous and continuous process in Indian textile mills.





LAKSHMI MACHINE WORKS LIMITED

Lakshmi Machine Works Limited

Textile machinery division

About the Company

Lakshmi Machine Works Limited (LMW) is a leading Textile Machinery Manufacturer in India and one among the three in the world to produce the entire range of Spinning Machinery. In 1962, LMW was founded to provide Indian textile mills with the latest Spinning Technology, but Over a period, the company has gained worldwide reputation for its state-of-the-art technology and high-quality standards. One can be assured of the unique LMW brand excellence on every product.

LMW, has been consistently at the forefront of technological advancements in textile machinery. Its wide range of machinery caters to different applications and has the capability of processing a wide variety of raw materials too.

LMW is continuing to march ahead as the largest manufacturer of spinning textile machinery in India, which in turn is a huge market when seen at a global perspective. With greater efficiency and better return on investment for the customer, LMW has more than 50 million spindles capacity installed worldwide. With an extensive sales force and service hubs, LMW has emerged as a preferred global partner who provides end-to-end services in the textile machinery world.

LMW diversified into CNC Machine Tools and is a brand leader in manufacturing customized products. LMW Foundry makes Precision Castings for industries world over. LMW has added the Advanced Technology Centre to manufacture components for the Aerospace Industry.

The Innovation

FIXFIL

Carding machine producing at 100 to 200 kgs/hr, deposited material into a “Can “which holds 40 kgs and to be changed once full. Unique features are Positioning of material depositing coiler, moving the can to minimum possible extent so that carding need not be slowed down for container change and drive system for the cans. Widely appreciated by customers and peers for less moving parts, user friendliness and simplicity in design with use of latest technology. Has six first to market features with two patents registered for it.

Lap former LH20S

To increase production of machine, team Identified the basic underlying weakness as lap sheet strength and worked on improving it instead of side stepping the root cause which resulted in entirely new sliver drafting arrangement. Deployment of servo drives in drafting of slivers and correcting the quality in a closed loop “Auto levelling “, monitoring the efficacy of this and previous machine quality through automatic weighing with feedback is unique. The algorithm of levelling / drive and use of machine learning technique with IoT has made this machine a success. Has 10 new features embedded into it with 5 patents applied for IPR.

Speed frame LF4280

Increasing the number of production units in one machine i.e. the number of spindles in Speed frame had two major stumbling blocks, Torsion of a 32 mm dia shaft called “Fluted roller” with at least three rollers

running along the machine for 35 metres with one side drive and suction drop across the machine. This IoT enabled machine has Two patented innovative approaches, 1. The rollers were driven from both sides with precise speed control using servo motors and 2. Development of “CQ duct “ (constant discharge) to have uniform suction across the length with suction unit positioned at only one end.

The Approach

While collecting the Voice of customer and meeting the stated needs satisfies them, providing solutions for the hidden and intrinsic need delights the customer. Their focus is on creating innovations through embedding themselves into the user place, identifying pain points and resolving them through “Design thinking approach”. In this virtual world, encouraging the designers to work hands on with paper modelling, card board mechanisms and rapid proto typing is the way to create a child’s mind in adults with inquisitiveness and empathise with the internal and external user. “ACDE” – Accelerating Competence for Design Excellence an internally developed system of guidelines and checklists for achieving first time right within chaos of innovation. Rewarding the team for each step in Patent filing process motivates them in abundance.

Benefits

Textile mills being capital intensive with higher operating costs and raw material costs ranging to 65% of selling cost and minimum profits, always aim to utilize the machines 24 X 7 with frugal operating costs.

The above innovations cited has resulted in Capital cost reduction, Productivity increase, Higher OEE up to 10%, Space reduction up to 35%, better quality output up to 10% and Power saving of up to 5%.

The Future

Reducing physical labour with automation

Reducing human dependency in decision making with deployment of IoT, machine learning and artificial intelligence for achieving optimum production, quality with lower power consumption.





Matrix Comsec Pvt. Ltd.

About the Company

Established in 1991, Matrix is a leader in Security and Telecom solutions for modern businesses and enterprises. As an innovative, technology-driven and customer-focused organization, the company is committed to keeping pace with the revolutions in the Security and Telecom industries.

With around 40% of its human resources dedicated to the development of new products, Matrix has launched cutting-edge products like Video Surveillance Systems - Video Management System, Network Video Recorder and IP Camera, Access Control and Time-Attendance Systems as well as Telecom Solutions such as Unified Communications, IP-PBX and much more!

The solutions are reliable and conform to international standards. Matrix has global footprints in Asia, Europe, North America, South America, and Africa with an extensive network of 2,500+ channel partners. Over a period of time, Matrix has gained trust and admiration of customers representing the entire spectrum of industries and has won many international awards for its innovative products.

The Innovation

In the Access Control and Time-Attendance domain, Matrix COSEC ARGO is a biometric Door Controller with an innovation that involves higher processing speed with flexible mounting options. Armed with a 3-layered PCB and Gorilla Glass 3, it was much sturdier and stronger than all the other competitors.

Matrix Face Recognition Technology is aligned with the Deep Learning algorithm that offers unprecedented accuracy even in varying light conditions!

With the convolutional neural network-based matching, it had a lower false ratio.

Matrix COSEC VYOM is a cloud-based people mobility management solution that offers innovation in terms of chucking out the traditional hardware-based servers. This solution aimed to offer Infrastructure, Platform and software as a service with a whopping event and user storage capacity!

In the Video Surveillance Solution domain, Matrix offers IP Cameras that provide glitch-free performance even under extreme operating temperatures. Backed with Exmor technology, it features the back-illuminated sensors to offer high definition and detailed images. With the latest in-built Intelligent video analytics, these cameras are engineered to offer features like true WDR.

Matrix SATATYA SAMAS is a comprehensive video management solution that offers distributed and federal architecture to monitor all the cameras in an organization. It can manage 100,000 cameras and cover upto 10,000 locations. Equipped with intelligent video analytics, it enables some high-end features like missing object detection and more!

In the Unified Communications domain, Matrix offers real-time collaboration, communication, and mobility.

Firstly, Matrix VARTA was an application designed for smartphones, tablets, PCs and laptops. It featured new options like 1000 DSS & 600 BLF keys, call management, drag and drop conference and presence sharing.

Furthermore, in the IP based Unified Communication Server, Matrix has designed an efficient software-based

communication solution – ANANT UCS. It offers upto 5000 IP users, 1024 concurrent calls, unified messaging and more!

The Approach

The aftermath of the industry post-COVID will be an opportunity to learn about innovations and experiments to combat such situations, henceforth. Talking about this industry in specific, contactless biometrics to thermal cameras or large scale remote surveillance, they are all a part of it. With these solutions, they intend to see a substantial uplift in various sectors which would inhibit the betterment of society.

Thus, giving a fair chance in predicting such unfortunate events beforehand and proactively taking measures to prevent them.

The Future

Since this year the definition of normal stands evolved, Matrix intends to present an extensive range of contactless products and solutions, to provide complete assistance while ensuring the overall security of any segment.

Furthermore, with their prime focus on contactless solutions, they aim to navigate focus on their mobile-based solutions.



Microlit

About the Company

Established in 1991, Microlit is one of the world's leading manufacturers and exporters of laboratory liquid handling instruments. Their product range includes micropipettes, bottle top dispensers, electronic burette, electronic pipette filling device and other micropipette accessories. With their patented products, innovative technologies and the unfaltering trust of 8000+ consumers in 65+ countries, they are recognized as a respected and dependable brand in the Healthcare and Lifesciences industry worldwide. Their principal offices are located in India (HQ), USA and Brazil.

With a research-oriented and customer-centric team of product design engineers, their product design blends the best of functional performance and user experience. Their innovative products have helped them carve a niche in the industry while providing their users high level of precision and accuracy in their research work.

During the 30 years of innovation and constant product and process improvements, Microlit has stood by its vision of 'Redefining Liquid Handling Systems'.

The Innovation

Innovation 1: First Miniature Micropipette in the world with 'Tip Ejector System' and Two-Step Plunger Operation

Lilpet Pro is a fixed volume miniature micropipette designed to be distributed as part of the diagnostic test kits and to perform sensitive laboratory operations with safety, accuracy and ease. It is optimally designed - 130 mm in length and 12 grams in weight, to fit inside test kits and in their users' hand ergonomically. The two-step plunger operation of Lilpet Pro enhances the accuracy of tests by enabling last drop dispensing. The presence of a tip ejector has extended the use of this mini pipette to the healthcare industry wherein it is extremely important to dispose tips without the risk of cross-contamination.

Innovation 2: Unique 'Single Operation Calibration Mechanism' in micropipettes

Microlit NERO is a next generation micropipette with patent-pending UniCal™ technology. The UniCal™ mechanism allows their users to re-calibrate their micropipettes conveniently in a single operation. This eliminates any trial and error as prevalent in the calibration procedures of other micropipettes. Users also do not need to disassemble the pipette for recalibration as is required by other single operation calibration procedures. Microlit NERO also has a unique μ Air™ technology which ensures minimum dead air space between the piston and the liquid in the tip for improved accuracy and precision.

Innovation 3: Bottle Top Dispenser for Hydrofluoric Acid

Microlit LENTU™ is a high precision liquid handling instrument engineered with carefully selected and tested materials for use with Hydrofluoric Acid, high purity media and acids and bases for trace analysis. Built by Their in-house team of products design engineers, LENTU™ houses Springless Valve™ technology for high chemical compatibility and the recirculation valve to avoid spillage of hazardous chemicals when the instrument is not in use.

The Approach

Their innovation objectives are defined based on the customer feedback and product lifecycle. For each

new product/feature, in-depth analysis of market size, competition and scope of improvement is thoroughly studied. A project report is then created defining detailed product specifications, development time, target cost and necessary vendor collaborations. The prototyping step includes the development of core product technology to mitigate technology risks. They then proceed with industrial and engineering design adhering to product design guidelines to manufacture robust and aesthetically attractive products. Educating their users about the new features and technologies is also a key component of their innovation process.

Benefits

Innovation 1

The presence of tip ejector in Lilpet Pro miniature micropipette has made it a perfect fit for the diagnostic test kit industry as it enables the disposal of pipette tips without the risk of cross-contamination.

Innovation 2

The introduction of UniCal™ Single Operation Calibration Mechanism in NERO micropipette has enabled quick in-lab calibration without using the hit and trial method. This has reduced the recalibration cost and time and has also enabled frequent recalibration.

Innovation 3

MicroLIT Lentus™ has enabled safe and accurate dispensing of Hydrofluoric Acid and other corrosive chemicals in the lab at a minimal pricing.

The Future

In the near future, MicroLIT R&D will be focusing on electronic instruments and software innovation for workflow automation of their user processes. For instance, their 21 CFR compliant E-Burette software (under development) is a necessity for FDA regulated pharmaceutical customers to securely store and access their experiment data.





Nicco Engineering Services Limited

About the Company

Nicco Engineering Services Limited (NESL) was established in 1981 as the Indian Pioneer of On-Line Leak Sealing services. The company has grown into a full fledged specialty maintenance services provider by bringing in many state-of-the-art technologies from around the world while continuing to establish an indigenous R&D program.

NESL has its Head Office at Kolkata and 6 branches located at Delhi, Mumbai, Vadodara, Chennai, Kochi & Kolkata as well as 60 site offices across the Nation. They serve all core sectors of the Engineering industries throughout India. It has also two manufacturing/repairing workshop facilities at Kolkata & Baroda. NESL has complete in house facility for manufacturing for Rubber Compounds along with R&D, Adaptors, Clamps, Fleet- fusion Repairing, On – Site Machining besides own Training Centre.

NESL's business now covers following activities.

- On-Line Leak Sealing
- On-Line Safety Valve Testing
- Industrial Protective Coating
- On-Site Machining
- Metal-Stitching
- Fleetfusion Automatic Spiral Mig Welding

The Innovation

In Industrial plants, corrosion occurs due to harsh conditions such as elevated temperatures, high operating pressures and chemical attack from acids and other fluids. This corrosion causes leakages that are hazardous, can injure or kill people, destroy assets and cause economic losses in terms of energy, time and product losses. Their compounds allow for safe online sealing of these leaks without shutting down the plant or line.

The Approach

Field conditions and resulting service requirements are assessed by their team of site engineers in conjunction with the customers. The R&D team works on formulations using a variety of raw materials comprising specialty polymers, reinforcing fillers and other fibers to produce custom compounds with the desired chemical and physical properties. These formulations are manufactured in small scale and then subjected to laboratory and field tests. Continuous research is done to identify new materials and how they can be incorporated to extend the range of applications. In each case, comprehensive safety testing on parameters such as flash-point temperature, auto-ignition temperature and TGA is done.

Benefits

They developed 21 such sealants having various characteristics of chemical and physical stability. The compounds can be used at temperatures ranging from -100°C to 850°C and upto 200 bar of pressure. Their

Compounds are resistant to fluids such as super-heated steam, acids, alkalis and hydrocarbons. This allows are customers to increase process complexity without worrying about problems resulting from unwanted leaks.

Innovation leads to both tangible and intangible benefits in terms of business growth and to brand value to customers.

The Future

At present there are no National or International Standards relating to either the on-line leak sealing process or the characteristics of the sealants used. Standards are needed to establish the parameters for design and engineering SOPs to ensure safe and effective practices. Regulatory compliance with Labour and Environmental Laws will be easier and more enforceable. This will lead to a mature and stable market. They are working with BIS to create the first standard for on-line sealing.





Nokia Solutions and Networks India Private Limited

About the Company

At Nokia, they create the technology to connect the world. Nokia offers a comprehensive portfolio of network equipment, software, services and licensing opportunities across the globe with commitment to innovation, driven by the award-winning Nokia Bell Labs.

From launching the 1st GSM call in India in 1995, to enabling rapid growth of 2G/GSM technology, to bringing high quality 3G services, to pioneering 4G/LTE technology and now preparing India for 5G, they are an integral part of India's remarkable progress in technology and connectivity over last 25 years.

Nokia's Chennai facility manufactures & ships the complete gamut of telecom products (2G, 3G, LTE & Core Networks) for domestic and global markets. It was the first to start production of 5G radio equipment in India. Having deployed the next level of industrial automation, leveraging 4G LTE technology, it is India's first 'real-world' application of Industry 4.0.

The Innovation

Factory in a Box (FiaB):

The current manufacturing set-ups across the world are typical brick and mortar facilities predominantly with static capacities. With an increasing need for flexible, factories close to the markets, there is a shift towards Distributed manufacturing. Their innovation "Factory in a Box" bridges this gap by putting a Flexible, Production Grade Manufacturing setup inside a Shippable Container Box with Industry Grade Wireless Connectivity, ensuring World Class Quality. This is the 1st "Factory in a Box" solution developed in India for PCB assembly. The key elements of the FiaB are Robotic Automation (SMT Line + Collaborative Robots), Wireless Connectivity (Industry Grade Pvt LTE Network+ Universal IoT), Cloud Data Management (Digital Twin+ Smart City Applications), Video Analytics which are all cutting edge technologies in itself and have come together to enable this innovation.

Nokia Automated Analytics Solution (NAAS):

NAAS (Nokia Automated Analytics Solution for Access Control), a truly innovative platform that combined three products from the Nokia portfolio, which ticked all the boxes and met their stringent requirements for privacy. Space Time Scene Analytics uses machine learning and advanced analytics in processing the thermal video images for temperature and mask compliance rules. Nokia's Integrated Operations Center (IOC) takes the information provided by Scene Analytics and uses its business rules engine to automate contextual action workflows, while also providing visualization and report generation capabilities. And the Nokia Digital Automation Cloud provides connectivity to deliver uninterrupted private wireless coverage required to support locations that typically would not be easily accessible.

Fastmile Controller:

Fastmile Controller provides solution for operator to deliver fixed wireless broadband as good as fiber broadband. It aids them to fully utilize deployed 4G capacity and simplify 5G deployment. Provides one click installation, using Intent Based Networking, push configurations from the cloud. Gathers data on existing RAN capacity and performance, uses innovative coverage and capacity prediction algorithms using Self Optimizing Network module to determine best Radio cell (4G and 5G) available. Keep track of RAN cells around CPE, using

live CPE radio & RAN statistics, guarantees optimal usage of radio resources and reliable QoS to customer. Innovative Geo-lock by measuring CPE movement to other location, using changes in radio signal metrics.

Benefits

Factory in a Box (FiaB):

Helps to serve the demand for:

- Close to Market / “Make in Country”: Build Where needed When needed.
- Fluctuating (Increase/Decrease) in Demand: Optimize the Capacity.
- New Product Introduction: Closer to R&D.
- Lead Time Reduction: Save Weeks in Supply Chain Lead Time.
- Repair Centre: Closer to Customer.
- Business Continuity during Natural Disasters.

Nokia Automated Analytics Solution (NAAS):

- High accuracy, fast and no touch measuring of temperature and PPE (mask) compliance.
- Quick set-up of screening center in hours.
- Advanced Analytics with strong privacy and security.

Fastmile Controller:

- Fully utilize existing 4G capacity without upgrading the RAN by setting rules to connect to specific primary and alternative cell sites.
- Reduced installation and troubleshooting site visits (20 to 30% reduced customer support tickets)

Optimized SLA on CPE problems, detection, prevention & resolution. (30 to 40% reduced customer tickets).

The Future

Factory in a Box (FiaB):

FiaB is future ready which can be upgraded to 5G for enhanced wireless connectivity and can be migrated to manufacturing processes other than PCB assemblies.

Nokia Automated Analytics Solution (NAAS):

Owing to its open architecture this solution can be easily expanded to use cases other than thermal measurements.

Fastmile Controller:

Fastmile controller is best prepared for new 5G deployments, simplifies installation of 5G CPEs especially with mmWave where the line of sight is key for reliable connection.





PHILIPS

Philips Innovation Campus, Bengaluru

About the Company

Philips Innovation Campus, Bengaluru is the innovation hub of Philips in India developing software focused solutions to achieve Philips purpose to touch 2.5 billion lives a year by 2030. It hosts over 3500 experts including doctors, data scientists, researchers working on developing products and innovative solutions across the healthcare continuum to improve people's health. The center has extensive expertise in cutting-edge technologies and is working on solutions based on Artificial Intelligence & machine learning, IoT, smart phone and tablet enabled Data Analytics, adaptive intelligence based Radiology Solutions, remote management of ICUs and cloud-based solutions. Their software and product innovations enable global advancements in Image Guided Therapy, Ultrasound, MRI, CT, Advanced Molecular Imaging, Diagnostic X-Ray, critical care and healthcare informatics. The center is ably supported by a front-end Research team, creative design team and a strong Intellectual Property & Standards group that contributes to the global Philips IP&S portfolio.

The Innovation

The Philips Mobile Obstetrics Monitoring (MOM) is cloud based tele-health solution that helps community caregivers and doctors collaborate to identify, manage high-risk pregnancies and track mother and child post-delivery bringing care to where it's urgently needed: primary health centers and patients' homes.

MOM features a way for community caregivers to capture vital information so that a clinical decision support (CDS) pregnancy risk level can be calculated to standardize pregnancy risk stratification. Mobile applications connect doctor, caregiver and patient for diagnostic assistance and progress assessment.

Key features include:

- Digitization of data: covering demographics, examinations, investigations, review etc.
- Clinical decision support pregnancy risk score
- Philips Lumify ultrasound integration for remote review
- Patient mobile app for mothers to build awareness & engagement
- SMS based alerts to mothers and caregivers
- Baby growth charts for PNC tracking of child till 2 years of age
- Reporting: high risk cases, ANC visit coverage, workload, complication split etc.

The Approach

The Philips MOM solution has been co-created with key clinical partners across Africa & APAC over the last 5 years. It follows WHO approved care protocols for ante-natal and post-natal care. At each stage, they have put the solution in the hands of the actual users (CHWs, Midwives, Doctors, OBGYNs) to collect usability feedback and assess if it helps in overcoming the challenges they face on a daily basis. An iterative engineering process with User experience design has been the foundation in evolving the solution.

Benefits

- Enhanced outcomes: high-risk pregnancies are identified early and tracked for intervention as appropriate.

MOM tracks child growth through baby growth charts with guidelines, growth milestone surveys and educational content.

- Improved access: front-line caregivers gather the data in the patient's home to guide action as necessary
- Efficient workflow: clinical decision support allows for remote specialist review of the right cases at the right time

The Future

By the end of 2020 MOM will be in use across approximately 50 primary health centers across Kenya, South Africa, and Congo. There are conversations already started with key states in India to roll-out the MOM program potentially in Q2 2021. The solution will potentially integrate with ecosystem players for more comprehensive, holistic care pathways including chronic disease management.

Philips Compressed SENSE

The Innovation

Time is one of the most precious commodities in MR Radiology department at hospitals. There is a pressure to reduce cost per scan, a key healthcare KPI globally. Almost 50% of radiology healthcare staff are overworked due to unscheduled patients. What if there was a way to recover time that is being lost during the MR examinations? And use that time more wisely? Imagine how that could help to make better use of the scarce resources and better meet the demands of referring physicians. That's exactly what Philips Compressed SENSE can do for the MR department. The Philips MR Compressed SENSE is a signal processing technique built on the fact that signals contain redundant information. In MR this technique is used to reconstruct a full image from severely under-sampled data (in k-space) while maintaining virtually equivalent image quality. The time which can be gained with Compressed SENSE allows to increase productivity & diagnostic confidence and enhance patient comfort at the same time.

Key features include:

- Speed without Sacrifice: Up to 50% acceleration with virtually equal image quality
- For all Anatomies: Can be used for all anatomical contrasts, in both 2D and 3D
- Higher spatial resolution: Enables up to 64% improvement in spatial resolution

The Approach

The Philips MR Compressed SENSE solution has been co-created with key clinical partners across India, Europe and North America over the last 5 years. A significant research over the past decade on the iterative, knowledge-based algorithms to fill in the empty lines in MR frequency domain k-space. When a signal is digitally sampled, the signal is not recorded continuously (like old cassette players used to do) but at intervals. This removes the image artifacts while keeping the final image fully consistent with the acquired data.

Benefits

- Accept challenging patients: Patients with MR Conditional implants have a limited amount of scan time. And with Compressed SENSE, they're able to complete more of the protocol or sometimes even the entire protocol.
- Extra time and attention for patients: Due to the shorter scan times achieved with Compressed SENSE, technologists can spend the gained time on increasing the image quality, or to take more time for patient preparation and dealing with safety aspects
- Shorter Breath-Holds for patients: A 15- or 16-second breath-hold is tough for many cardiac patients. With Compressed SENSE they actually have protocols now that can get that below 10 seconds. It's a lot easier to get through for a patient, and patients are a lot more satisfied with the experience.



Pidilite Industries Limited

About the company

Pidilite, established in 1959, is a pioneer in consumer and specialty chemicals, and is committed to quality and innovation. From adhesives, sealants, construction chemicals, arts & crafts, to industrial resins, polymers and more, their product portfolio is as diverse as it is ever-evolving. Their brands like Fevicol, Fevikwik, M-Seal and Dr. Fixit are not just market leaders, but trusted names that have become synonymous with their product categories.

At Pidilite, they search for new ideas in everything they do, and more than two thirds of their sales happens through in-house innovation. They have 5 fully-equipped in-house R&D centres, and leverage a customer-focused innovation process to bring to fruition the learnings from these interactions.

They have an extensive manufacturing footprint, with 57 locations in India, and 9 overseas. Their diverse portfolio comprising 6000+ SKUs is available to customers and consumers in over 80 countries.

The Innovation

Innovation 1: Fevicol Ezeespray

Woodworking contractors face hassle in laminating difficult to reach areas e.g., ceiling, corners, and vertical surfaces. Regular glue drips downwards, sustained pressure is required, and it takes at least 4 hours to dry. Ezeespray is the first of its kind sprayable adhesive, with a controlled spray pattern to enable convenient adhesive application in such situations. It is now available at more than 15,000 outlets and loved by more than 20,000 users.

Innovation 2: Road marking paint binders

Road marking paints/binders are typically solvent based, and especially have low wet abrasion strength – thus environmentally unfriendly and needing frequent periodic re-painting (<2 yrs). Pidilite is the first Indian company to develop a range of water-based, high abrasion resistant roadmarking specialty binders, with customized and patented resins to meet country-specific standards or application requirements. These products are now approved and supplied globally to many countries across Europe, Asia, Australia and Latin America.

Innovation 3: Fevicol Microprotect

Microbes, spores and fungi grow in low/stagnant air circulation areas, e.g., HVAC ducts when circulation shuts, and cause health and other issues. Pidilite launched Microprotect – an innovative water-based anti-microbial coating for internal metal surfaces of HVAC ducts. This is ideal for green certified hospitals/ medical facilities, schools, pharmaceutical packaging, food processing area, etc. Microprotect is now available across GCC and has approvals across 25+ leading projects.

The Approach

Innovation 1: Fevicol Ezeespray

Their team worked extensively with woodworking contractors to understand their pain points. This led to deep insights for development of the product, which underwent extensive on-site contractor trials prior to

commercialization.

Innovation 2: Road marking paint binders

Innovative specialty resins were developed in stages, e.g., moving from a workhorse product in the first generation, to more specific and complex applications/ chemistry in future generations.

Innovation 3: Fevicol Microprotect

They developed technical specifications basis several standards, and worked closely worked with a lead HVAC partner to develop and test prototypes. They conducted extensive product validation prior to commercialization.

Benefits

Innovation 1: Fevicol Ezeespray

- Enables convenient adhesive application on difficult to reach surfaces, with no drip, and no pressure required
- Dries in 5 minutes

Innovation 2: Road marking paint binders

- Environment friendly (zero VOC)
- Easy application and quick drying enable fast traffic release
- High glass bead retention drives high durability and abrasion resistance
- High low light reflectivity results in better traffic safety

Innovation 3: Fevicol Microprotect

- Eco-friendly - zero VOC, compliant with LEED IEQ 4.2
- Pesticide/harmful chemicals free
- Prevents long term fungicidal growth on HVAC Duct system
- Resists surface mold growth and odour-causing bacteria
- Fire resistant (zero flame, zero smoke)

The Future

- Expand Ezeespray to further users, and develop new water-based chemistry
- Road marking binders will undergo continuous improvement to product performance, and will be extended to other geographies
- Microprotect has opportunity for developing efficacy against additional microbes and in other environments where air quality is critical (e.g., airplanes, industrial applications, etc)





Praj Industries Ltd.

About the Company

Praj, India's most accomplished process engineering company in the Bioeconomy, is driven by innovation and integration capabilities. Over the past three decades, Praj has focused on the environment, energy, and agri-process industry, with over 750 customer references spanning 75 countries across 5 continents.

Bio-mobilityTM and Bio-PrismTM are the mainstays of Praj's contribution to the global Bioeconomy. The Bio-Mobility portfolio offers technology solutions globally to produce renewable transportation fuel, thus ensuring sustainable decarbonization through circular bioeconomy. The company's BioPrismTM portfolio comprises of renewable chemicals and materials solutions, promises sustainability, while reimagining nature.

Praj Matrix, the state-of-the-art R&D facility, forms the backbone for the company's endeavours towards a clean energy-based Bioeconomy.

Praj's diverse portfolio comprises Bio-energy plants, Zero liquid discharge plants, Critical process equipment & skids for oil & gas industries, Breweries and High purity water systems.

The Innovation

Innovation 1: Synchronised High Brix Fermentation Technology (SHIFT)

For sustainable ethanol production, PRAJ had directed considerable efforts in development of advanced yeast strain, SHIFT conditioning reactor and performance enhancer. Developed advanced yeast strain has high solids tolerance limit which will reduce effluent generation at source itself. This will reduce the Effluent treatment operating cost as well as process Water requirement in fermentation.

Innovation 2 : HBCS (High Brix concentration system)

Spent wash is the unwanted residual liquid effluent generated during bioethanol production. To minimize the pollution, currently spent wash is concentrated in multiple effect evaporator from 15 % to 55 %w/w. This concentrated spent wash is send to incineration boiler which is used as fuel.

By using HBCS technology; the concentration of final spent wash increased from 55 % to 70 %. This increase in concentration to 70 % instead of prevailing 55% reduces the moisture content which increases the boiler efficiency thus reducing the supplementary fuel consumption in Boiler. Reduction in supplementary fuel increases the sustainability & viability of ethanol production. Reduction in supplementary fuel reduces GHG emission & hence reduces carbon foot print. HBCS is self-cleaning evaporators hence there will be substantial reduction in the cleaning requirement

Integrated offering of SHIFT and HBCS technology along with Incineration boiler is called as PROFIIT technology (Process Optimised Flexible Integrated Incineration Technology)

Benefits

- 30%-35% Reduction in the Evaporation duty
- 15%-20% Reduction in Process water requirement

- 5% -7% Reduction in Overall Power Consumption of process plant
- 3-5% Increase in Boiler Efficiency
- 50-60% reduction in supplementary fuel
- Reduction in GHG emission for Ethanol production

The Future

PROFIIT technology is already commercialized and implemented in plant. Technology is beneficial for sustainable ethanol production at user end.





Ramani Precision Machines Private Limited

About the Company

RAMANI is one of the leading & reputed Engineering Company, established in the year 1993, presently having 2 factories. The latest factory is in Mohali, near to Chandigarh International Airport, having all the modern Designing & High precision manufacturing facilities. The Company is basically a family owned company, managed by qualified Directors, backed with more than 50 years of practical experiences in Engineering.

RPML is in business of Designing, Developing, Manufacturing & Export of Customised Machines. These solutions are Innovative involving High Technology and Precision.

RPML starts development work after conceptualizing solutions to the problems & then implement the same, for successful results, as per specifications agreed with the customer. That is why every project is unique & Innovative. During last One year, they have developed more than 10 such new Products.

RAMANI is developing the Innovative Solutions for many Multinational Companies in India & also exporting the same to various developed countries including Germany, UK, Switzerland, Finland, Spain, Turkey, Russia, Brazil, Morocco, Taiwan, etc.

Good percentage of Ramani machines are delivered to Tier – II companies of all Automobile companies & last year their exports were around 45% of turn over.

The Innovation

Innovation 1 – Brake Friction Plate Manufacturing for Automotive

RAMANI designed, developed & innovated Automatic Pasting and Segmentation Machine for friction plates. These plates are used in 2 wheelers and 4 wheelers for Braking. The conventional methods for manufacturing these plates was very laborious and crude, which involved huge wastage of raw material.

Innovation 2 – Fin Insertion for Automotive Heat Exchanger Tubes

RAMANI designed, developed & innovated Automatic Fin Insertion System for mass production. The technology involves challenged handling of highly delicate Aluminium Fins and Inserting them one by one into Rectangular Aluminium Tubes. Another challenge was different sizes of Fins required for every tube.

INNOVATIVE SOLUTIONS EXECUTED

Innovation 1

- Loading and handling of Parts is Automatic, with automatic Transfer system.
- Precision Gluing on parts Automatic, with controlled quantity of glue
- Using specially made Ribbon of Friction material, instead of Washer shaped Cut materials.
- Process of cutting by their machine has saved around 85 % on use of Raw Materials.
- Parts automatically shifted from one station to another. Both sides of plates are glued, pasted & pressed, all automatically.

Innovation 2

- With many different sizes of Tubes to insert with Fins (Products), system is capable of handling any

number of products. Selection of various products is done from Operator Panel HMI. All product recipe's are stored in PLC.

- Feeding different sizes of Fins is automatic, with fool proofing. Large & Small size Fins are automatically selected by machine. Fins Automatically inserted by powered shovel.
- Fins Counting for each tube done automatically. After inserting all Fins into Tubes, ready part is automatically removed & unloaded.

Benefits

Innovation 1

- Raw material Saving up to 85%
- Production output has increased by more than 200%
- Product Rejections have been reduced to almost Zero, with consistency of automated operation.

Innovation 2

- Ease of Working
- Production output has increased by more than 80%
- Product Rejections have been reduced to almost Zero, with consistency of automated operation.
- Final Products Quality has gone high. Damages to parts, during Manual handling eliminated
- Ultimate net saving in raw materials is around 12%. Manual Labour removed.
- Fool Proofing / Error Proofing introduced, resulting in No Rejections.

The Future

- Smart & High performance manufacturing.
- Prevention of National loss with huge savings on Raw Materials consumption.





Richcore Lifesciences Pvt Ltd

About the Company

Richcore Lifesciences, with its advanced R&D and manufacturing facilities, develops and manufactures recombinant technology based biotech products that are critical for manufacturing biological drugs and alternative proteins for food.

Number of critical medicines today, including vaccines, contain animal and human blood derived products as active and/or inactive ingredients. These dependency on animal derived products pose safety challenges including risks of viral contamination.

Richcore, with its large scale precision fermentation capabilities, manufactures animal origin free (AOF) recombinant products. These products help vaccine, insulin, stem-cell based regenerative medicine and other biopharma companies eliminate dependency on animal and human blood derived products, in turn helping them to produce safer medicines. Of date, >20Bn doses of medicines have been made safer using their products. Richcore serves customers across 18 countries and complies to the most stringent regulatory guidelines. Their recombinant products are also used by cultured/lab grown meat companies to produce 100% animal free “vegan alternates”.

Richcore also provides contract research, technology scale up and commercial manufacturing services to global, novel food/alternative protein companies thus playing a critical role in producing future food.

The Innovation

Richcore has developed proprietary product development, scale up and commercialization platforms to bring these ‘Vegan alternate’ animal origin free recombinant products into market very efficiently and cost effectively.

In a nutshell their innovation model helps them genetically modify microbes such as bacteria, yeast and fungi to produce proteins which are otherwise produced by nature in plants and animals. Their technology development process includes identifying the target protein, designing the expression gene which is inserted into bacteria, yeast or fungi, the modified microorganism is transformed into a production clone, which produce high yields of the targeted protein in large scale fermenters. Their time tested, product development/innovation platform helps them produce a recombinant clone from an idea in three months and scale up the same in large scale in eight months; this is 2X faster and 3X more cost efficient compared to global industry standards.

The Approach

Richcore’s high throughput and high yielding microbial strains help bring down the price barrier for global pharmaceutical and alternative food companies to do away with animal derived products and to switch their manufacturing process to use these safer recombinant products.

Benefits

Using unique techniques such as using microbial strains instead of low yielding and difficult to manage mammalian cells as an expression system coupled with innovative scale up processes enable Richcore to produce these products in bulk and in turn helps make even very price sensitive, but very critical products

such as vaccines safer.

The Future

Richcore will continue to make these fermentation based safer products which replace animal derived and human blood derived products to help make all their medicines safer. The company also aim to become the world's largest novel food manufacturing companies leveraging the India's key strategic advantages, skilled manpower and cost arbitrage.





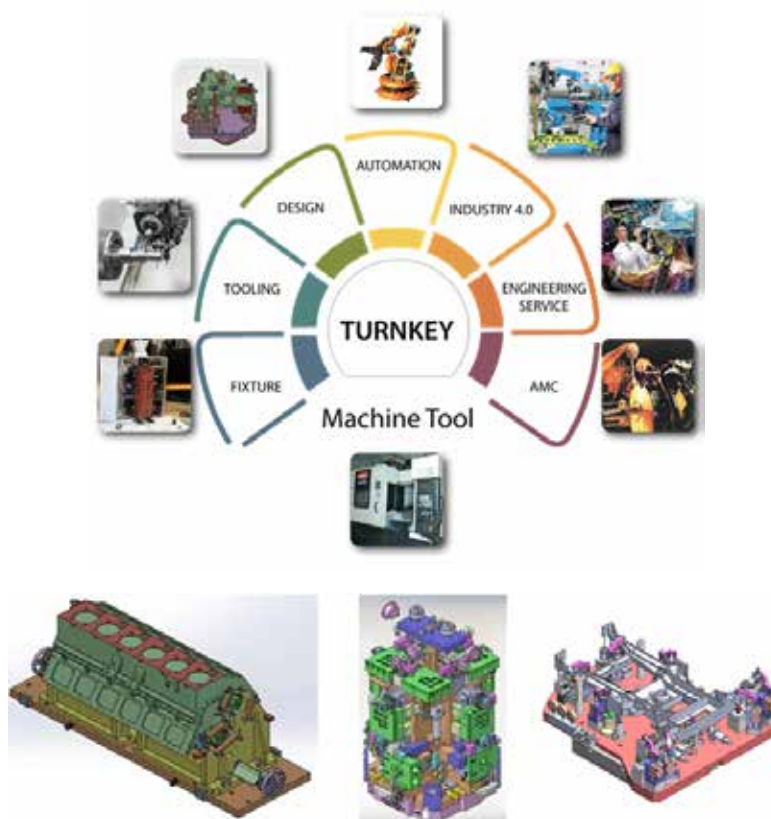
RV Forms & Gears

An ASM Technologies Limited Group Company

About the Company

RV Forms & Gears - Asia's leading fixture builder provides complete fixture solutions from concept to run off on Turnkey solutions. From the smallest fixture to the most complex fixture solutions, Forms & Gears has been providing the complete Fixture Solutions across the globe for the last 48 years.

Industrial manufacturing companies are facing strong demand to increase their productivity by realizing smart factories and smart manufacturing. Their Industry 4.0 solution enables manufacturers to connect multiple manufacturing/ production lines and machines, acquire data at different stages of production from several disparate sources, and develop capabilities like remote monitoring, predictive maintenance and related solutions.



High Precision Machining Fixtures

The Innovation

A PATENT PENDING product, "SmartFix 4.0" which is one of its kind for the Manufacturing Industry meeting the Global Initiative of Industry 4.0

SmartFix4.0 is the first industry solution that collects data directly from the fixture, giving the operator insights

into the machining operation from a brand new point of reference.

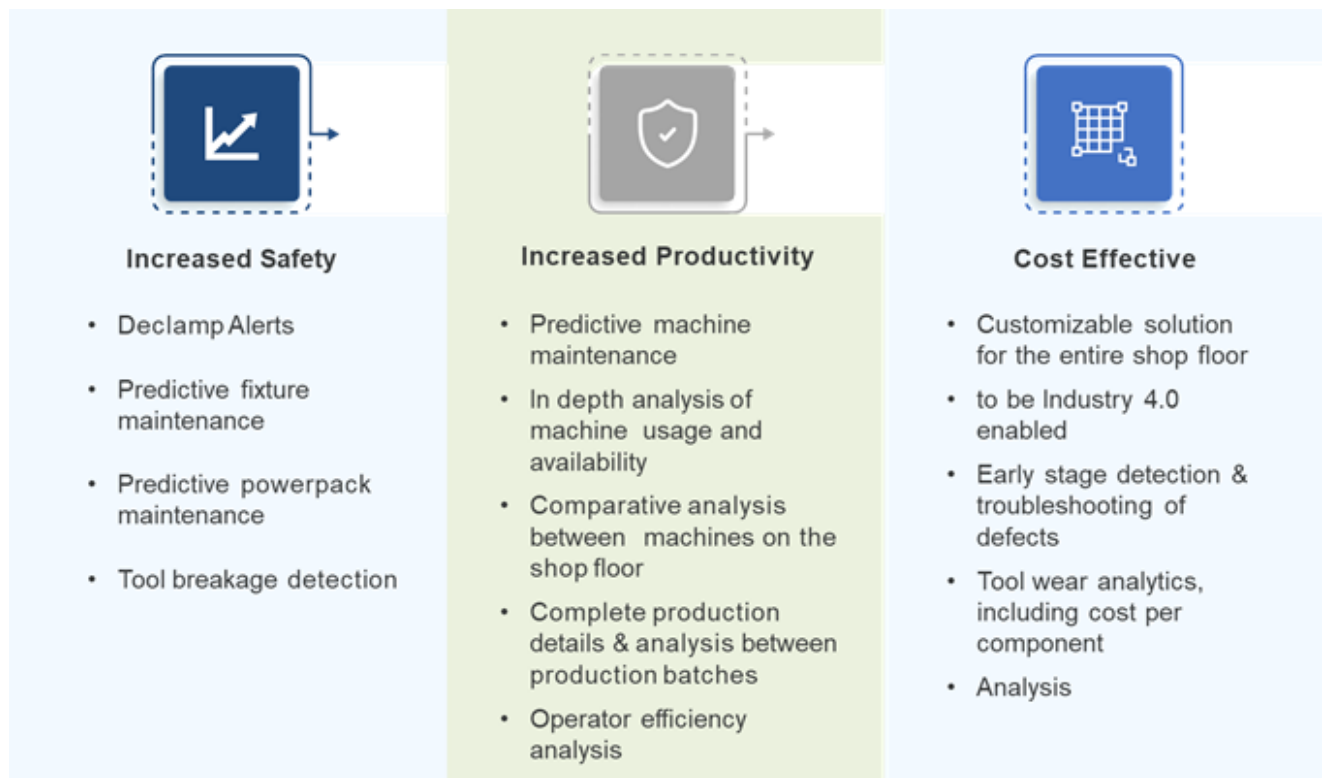
Since the fixture is in direct contact with the component being machined, it is able to pick up on nuanced details that are overlooked by other machine IoT solutions.

SmartFix 4.0 can be installed even as a retrofit on existing fixtures running in the plant, making it a flexible and cost-effective solution to get the whole machining facility Industry 4.0 and IoT-enabled.

SmartFix 4.0 on a Precision Work-holding Device with the ability to collect, transmit and analyse data in a useful format for the end-user with measurable outcomes in the following areas:

- Tool wear Analytics
- Cost Per Component Analytics
- Vibration Alerts
- De-clamp Alerts
- The output of Fixture and Machine
- Predictive maintenance of Fixture and Power pack
- Analytics of Operation Efficiency

The Benefits



The Future

- Predictive machine maintenance through SmartFix4.0 solutions and outcomes
- SmartFix4.0 solutions for Adjacent industries and markets including Electronics Assembly, Test and Inspection equipment/ Gauges, Assembly equipment



SAP Labs India Pvt. Ltd.

About the Company

SAP Labs India (SLI) is the fastest growing subsidiary of SAP, a market leader in enterprise application software. Founded in November 1998, SAP Labs India represents the entire breadth of the SAP product portfolio and contributes to SAP flagship products. SAP Labs India is in Bangalore, Gurgaon, Hyderabad, and Mumbai. It is one of the earliest R&D centres of a global organization to have a footprint in India.

Their holistic approach to innovation is customer-centric and agile. They focus on making innovation real by covering all areas of the innovation equation from user experience, business model design, and technology's role - from ideation to full-scale operation. Throughout this entire innovation experience, they balance the multiple demands of successful innovation, including financial, regulatory, consumer, commercial, and technical, to support their customer's sustainability and profitability.

The Innovation

Innovation has always been the core of SAP since its inception around 50 years ago. It is a part of their work life, and unless they innovate, their customers cannot be successful. They are promoting a culture of Innovation within SAP Labs India through these three pillars, and the outcome has been fantastic.

1. **Ground-up Innovation:** Through an initiative called InnVent, they are targeting a culture change in the organization. They do this by running one of the largest Startup School to coach more than 4000 employees on entrepreneurship basics. Participants take back with them lifelong learning, which they can implement in their day jobs. In the six weeks of intensive curriculum, participants in the school, learn to think like an entrepreneur and innovative rapidly to meet customer demands.
2. **Collaboration with Customers:** Design thinking is the core methodology they adopt to collaborate with customers on their innovation journey. It helps them bring out precise, innovative solutions to address specific issues the customers face. Through their Experience Center, they showcase their cutting-edge solutions and how they work closely with customers. Their Experience Center helps their customers understand their solution offerings better and gain a deeper understanding of how SAP can provide appropriate solutions to address their business challenges.
3. **Ecosystem –** Within their SAP Labs India campus, they house the SAP Startup Studio, their startup accelerator. It acts as a mirror for their development organization to see how startups can scope out a problem and address it quickly. It fits perfectly with SAP's philosophy of fostering entrepreneurship and promoting innovation for growth and development.

The Approach

All their innovation efforts, initiatives, and programs is directed to achieve their vision and mission. SAP's vision is to help the world run better and improve people's lives. Their mission is to help every customer become a best-run business. Their focus is to bring out technology innovations that will address today's and tomorrow's challenges without disrupting their customers' business operations.

Benefits

Their innovations benefit their customers and the community. Through Their innovations, they are helping the world run better and improving people's lives. Their employees benefit from continuous learning, which keeps them relevant, agile, and successful. Their sustained focus on innovation is to help their customers become an Intelligent Enterprise and ensure that SAP Labs India is the most prominent innovative hub for SAP.

The Future

Their innovations keep up with the continually growing market demands and produce cutting-edge, future-focused technology quickly, to help their customers run at their best. They achieve this by investing a large portion of their capacity to drive co-innovation with their customers and by relentlessly focusing on customer success.





Sigma Electric Manufacturing Corp. Pvt. Ltd.

About the Company

Sigma Electric is a global leader in manufacture of ferrous and non-ferrous castings, precision machined components and sub-assemblies. Sigma has established long term partnerships with its global customers, working closely to help them meet the challenges of a highly competitive business environment.

Sigma manufactures castings, precision components and stampings for supply to varied market segments like electrical, appliances, diversified industrials, power tools, instrumentation, aerospace, defense, renewable energy, electric vehicles.

Set up over 35 years ago, Sigma, today has 5000+ team members worldwide with a majority shareholding from Argand Partners, USA.

Sigma has 16 world-class facilities in India, North America and Mexico for aluminum, zinc, aluminum-bronze, copper, iron and steel products.

Manufacturing capacity is over 50,000 MT/annum with state-of-the-art manufacturing equipment tool room and design/engineering capabilities. Plants operate on Lean Manufacturing System, certified for ISO: 9001, AS: 9100, TS: 16949, ISO: 14001 and OHSAS: 18001 management systems.

Sigma's global supply chain is one of its key USP, supported by its global warehouse at Garner, NC, USA which caters to the requirements of its customers with Just in Time (JIT) principles with 99.5% On Time Deliveries.

The Innovation

Innovation 1: While in Use Cover

A case of user centric product strategy approach, Sigma has addressed pain points of users through product innovation. During the course, Sigma has innovated a patented product version that offers tool-less modularity of product orientation. The 'Modular While in Use Cover' makes use of a ball and socket joint in conjunction with cylindrical pin joint to facilitate the door movement in landscape as well as portrait orientation. The cylindrical joint acts as a hinge and snap-lock achieve the objective of door hinge along with door lock.

Innovation 2: Double Snap Squeeze Connector

Sigma has invented a tool-less electrical connector to connect flexible metal conduit and armored cable to steel outlet boxes, load centers and other metal enclosures. All existing Squeeze Connectors require tools for their installation. Many times, installation locations are difficult to reach and use of tool becomes a difficult task. The patented innovation of 'Double Snap Squeeze Connector' uses a cam operated lever to hold or release the conduit. The lever can be easily operated with single hand. A snap-spring is used to attach the connector with electrical panel which snugly fits and holds the connector, making the product installation completely tool-less.

The Approach

At Sigma, we have adopted 3 pronged product strategies.

1. User centric approach

2. Market centric approach
3. Product centric approach

Understanding user's pain points through focus groups and user interactions followed by a dedicated design thinking and collaborative efforts between marketing and R&D.

Benefits

For Innovation 1: While in Use Cover

- Orientation shift time saving by 100% and thereby high productivity as a result of time saving
- Space saving on inventory up to 50%
- Tool-less orientation shift and thus ease of use – Plug & Play product nature

Innovation 2: Double Snap Squeeze Connector

- Tool-less product installation which eases work at heightened and non-reachable areas
- Installation time reduction by 86% and high productivity and savings in project cost as a result of time saving

The Future

Sigma remains focused on profitable growth -higher revenues & EBITDA and plans to grow organically, expanding the present product range and market segments. And plans to keep growing inorganically with a focus on new products, processes, customers, and geographies. The vision is to make Sigma a competitive global enterprise, focused on delivering excellent service to diverse customers worldwide. A new iron foundry at Jaipur and a new aluminum die-casting foundry at Pune have been setup recently. After the recent acquisitions of Microcast - Mexico, Avalon Precision Casting – CL, Ohio and Tooling Dynamics – York, PA, the company is looking to make further acquisitions across the globe.





Sundram Fasteners Limited

Sundram Fasteners Limited

About the Company

Started in 1996, Sundaram Fasteners Limited has grown into a global leader, manufacturing critical, high precision components for the automotive, infrastructure, windmill and aviation sectors.

Their varied range of productions encompasses fasteners, power train components, sintered metal products, iron powder, cold extruded parts, radiator caps, water pumps, oil pumps and wind energy components.

An unwavering focus on delivering quality has won Sundaram Fasteners Limited the trust of both OEM and aftermarket customers in highly competitive markets like China, Germany, USA, UK, Italy, France and Brazil.

The Innovation

Innovation 1: Integrated Net Shape – Net strength Functionally Graded Components

The Concept

Functionally graded design of components and its manufacture to net shape and net strength through a globally unique, patented design and manufacturing process.

The Method

1. Functionally grade the component design where a high performance region of the component is made out of a alloyed steel and the nonfunctional region of the component is made out of a plain carbon steel.
2. Manufacture this functionally graded component by having multiple powders mixes specially designed for the purpose flowing into the die cavity and form the integral multi-material functional graded component in a single stroke of the press.
3. Sinter the functionally graded green compact in a manner that the high performance regions made out of alloy steel are hardened and strengthened to it final requirement without going for a separate heat treatment.

Benefits

A novel, patented, efficient, effective and waste free method of designing and manufacturing of components developed as an alternative to convention and deployed with > 95% RM yield and no secondary heat treatment.

The Future

A whole range of forged and machined components e.g gear shifters , rail ends etc are converted from their existing manufacturing to being manufactured by this net shape-net strength-functionally graded method providing Sundram Fasteners access to a hitherto nonexistent market in both components as well as powders for making such components.

Innovation 2: Manufacturing Design Evolution for Global Supply Chain

The Concept

Design evolution of transmission shaft for noiseless high torque transfer, which is a combination of output shaft & yoke for the first time in the industry for automatic transmission application across North America.

The Method

1. SFL evolved a design with the global customer to integrate the external and internal splines in one part resulting in an integral slip yoke instead of separate slip yoke & output shaft.
2. Manufacture of long splines in the slip yoke for noiseless torque transfer through recursive forming and its dimension control by optimized heat treatment

Benefits

Gained competitive edge over competitors thereby being among the top 3 suppliers across the globe for transmission shafts with this global supplier.

The Future

By offering value addition to product design, gained the single source identity which edged over competition and obtained new business on similar product family of parts for transmission application in ICV and also in EV in global platforms.

Innovation 3: Fail Safe Designs – Leak Proof Water Pumps and Anti Loosening Fasteners

The Concept

Through organic innovations at SFL, provide fail safe design in its products as illustrated by (i) leak proof water pumps and (ii) anti loosening fasteners

The Method

1. Novel “bearing less and seal less” leak proof water pumps designed and developed by making redundant the bearings and seals which cause the leak .
2. Proprietary helical screw thread profile developed in fasteners to ensure an inbuilt anti loosening mechanism without need for external anti loosening aids.

Benefits

1. Failure safe designs in products prevent failures and increase customer satisfaction.

The Future

1. Deploy such fail safe designs in SFL products wherever possible in all vehicle platforms,



Tata Chemicals Limited

About Company

Established in 1939 in Mithapur, Gujarat, Tata Chemicals Limited (TCL) is a part of US \$110 billion Tata Group. They serve customers across 40+ countries in 5 continents. They bring together their knowledge, expertise and innovation prowess to positively impact industries, consumers and farmers with their science-led products spread across two business verticals – Basic Chemistry and Specialty Chemistry.

The story of the company is about harnessing the fruits of science for goals that go beyond business. Tata Chemicals ranks 1 in Responsible Business Rankings 2019 and has been awarded the 'Asia's Most Trusted Companies Awards 2019'.

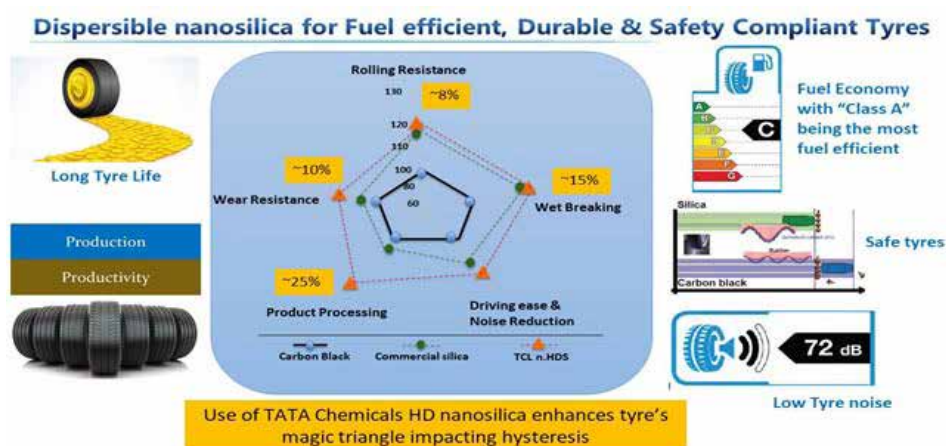
Sustainability as a practice is at the core of all of Tata Chemicals' activities, including their corporate social responsibility initiatives, and is intricately woven into all their business functions. It encompasses their enduring commitment to stimulate economic activity and enrich the quality of life, while sharing its lasting benefit in the regions they operate in and strengthening relationships with the communities.

The Innovation

Innovation 1

TCL produced Silica from Rice Husk Ash (RHA) and commenced commercial production of Silica at a plant in Cuddalore, Tamil Nadu. Precipitated Silica is a highly versatile product which finds application in a wide range of industries such as food, garments, automotive elastomers, oral-care products, agro-chemicals, detergents & others.

TCL also came up with another variant, Highly Dispersible Silica (HDS) for use in high performance and fuel-efficient green tyres. TCL High dispersible silica (HDS) facilitates low rolling resistance, thereby reducing the fuel consumption as it provides less friction when the tyre rolls down the road. It is also used in high-performance tyres as a low-heat, build-up reinforcement filler. On the other hand, carbon black has higher rolling resistance, which results in higher consumption of fuel. Thus, High Dispersible Silica is substituting carbon black in the tyre industry.

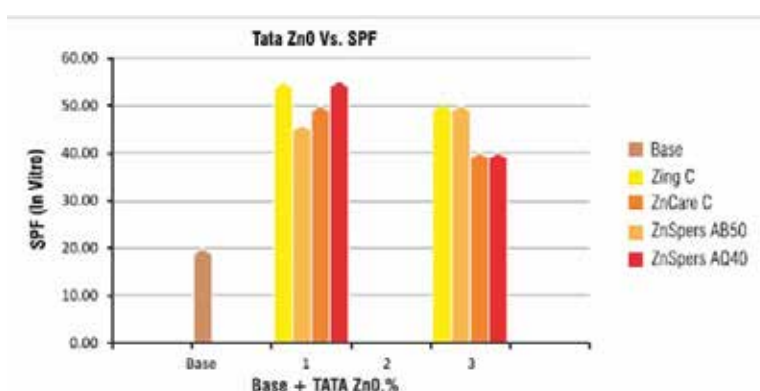


Innovation 2

Tata Chemicals used its inherent knowledge of chemistry to indigenously develop a performance material 'Nano Zinc Oxide', which has multiple applications for its strong anti-microbial, anti-fungus and broadband UV-blocking properties. Tata nZnO is water-dispersible which addresses the concerns of traditional oil-dispersible products and also replaces organic UV blockers with harmful side effects.

They manufacture pure grade and functionalized nano zinc oxide (F-ZnO) using their patented technology ensuring that the product is free from harmful heavy metal compounds.

It shows significant reduction in Staphylococcus aureus bacteria and E-coli bacteria inoculated in PE films and also prevents the growth of mould, fungus and other microorganisms. TCL's F-ZnO stands apart from bulk ZnO because of its fine powder form that has higher surface area and higher absorption cross-section for UV rays. This ensures preservation of colour and gloss in paints and polymers.



F-ZnO: Anti-Bacterial Testing of PE (polyethylene) films as per JIS Z 2801:2010 (Done by Intertek)

Test Bacteria: Staphylococcus aureus ATCC 6538

Quantitative Assessment of Activity- JIS Z 2801:2010

A. Untreated: Conc. of Inoculum on untreated sample at 0 hours (A): 1.16×10^6				Log = 5.06
A. Untreated: Conc. of Inoculum on untreated sample after 24 hours (B): 5.10×10^5				Log = 6.74
Sample Identification	No. of Bacteria on treated sample (C)	Log of Bacteria on treated sample	Antimicrobial Activity (R) (Log B-C)	Microbial Kill (% Reduction)
1% ZnO PE film	52000	4.71	2.03	99.05
0.8% ZnO PE film	52000	4.71	2.03	99.05
0.6% ZnO PE film	47000	4.67	2.07	99.14
0.4% ZnO PE film	72000	4.85	1.89	98.69

QUV testing data for 1000 hours exposure

Sample	Material	Dosage % (w/w)	HLS % (w/w)	Colour Value (ΔE)	Gloss Retention
Tata Chemicals	ZnO	0.2 - 0.5	0.2 - 0.5	1.2 - 1.4	>92
Competitor 1	ZnO	0.1	0.6	2.5 - 3.2	>85
Competitor 2	Organic	0.8	0.4	3.5 - 4.0	>85

The painted surface also achieved a scratch hardness of 3300 g force

F-ZnO provides high scratch hardness, helping paints to resist scratches.



Tata Power Delhi Distribution Limited

About the Company

Tata Power Delhi Distribution Limited (Tata Power-DDL) (earlier North Delhi Power Limited) 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. The company changed its name from North Delhi Power Limited to Tata Power Delhi Distribution Ltd. in November 2011, to signify the direct relationship with the Tata Power Company Limited, and thus to significantly leverage its Tata lineage for enhancing sustainability and growth of business. The company has achieved unprecedented reduction in AT&C losses since inception bringing it down from 53.1% in July 2002 (during takeover) to 7.86% at the end of FY 20. At present, Tata Power-DDL has presence in India in nearly 15 States & UT and working with 20+ Discoms including Goa, Haryana, Uttar Pradesh, Chhattisgarh etc. as well as in International cities such as Benin, Eko, Kaduna, Kano etc.

Tata Power-DDL is the first Indian utility to be a member of Global Intelligent Utility Network Coalition (GIUNC) which is a coalition of 14 power utilities worldwide and is working towards accelerating the development of common standards, technology solutions and processes for intelligent networks. Tata Power-DDL is focused and committed to the road ahead and is exploring new opportunities to replicate its experience of distribution reforms both in India and abroad. It is leveraging its unique learning and skillsets solely and in collaboration with leading utilities and technology providers like GE, IBM, Enel, Omron, 3M, Panasonic, AES, Mitsubishi etc. in the areas of communications & smart grid technology, change management, consumer service delivery and business process re-engineering. Tata Power-DDL has also collaborated with leading international and national Institutions like Harvard, MIT, Reyson University, IIT Delhi, Punjab Engineering College, Delhi University, Netaji Subhas Institute of Technology etc. to carry out research activities in energy space.

The Approach

Tata Power-DDL has, over the years, evolved a performance improvement system, which acts across all levels of management (strategic and tactical) of the organization. This is further supported & guided by the Leadership System and serves as a key to building culture and value. Leadership encourages and supports workforce to identify improvement & innovation opportunities and explore ideas through various platforms such as Innovista, Innovar, SHINE for systematic problem solving for improvements within existing system (QCC, PRAYAAS) and for improvement/innovations beyond existing system (SPARK, EUREKA), Task-oriented CFTs, Quality Control Circles & Kaizens, Six Sigma, Tata Edge, specific projects of Innovation Council & Collaboration/Co-innovation projects.

The Innovation and Benefits

1. Tata Power-DDL collaborated with AES and Mitsubishi corporation to install first of its kind 10MWh BESS in South Asia to demonstrate the Battery Energy Storage System through in-house developed algorithms thereby improving the performance of the utility, Reducing the penalty on account of Deviation settlement Mechanism, savings on account of CAPEX deferral. BESS also helps to manage the short term power requirement to meet peak loads where during that instance the price of the unit will be high in open market. This can be managed by charging the Battery during low price and discharging the power when the cost of the power is high. Total cost of the Project is 70 crore and we envisage a payback in 10 years. This initiative has fulfilled the internal customers in managing the Peak load, reducing the Deviation

settlement mechanism penalty, improving the power Quality by maintaining proper voltage regulation.

2. Integrated tamper sensor device developed in collaboration with M/S Omron, pioneer in developing medical devices and equipment. This sensor is designed in such a way that it can measure and record abnormal fields / activities made to disturb accurate recording of an energy meter. This will also serves as black box of Energy meter in case of deliberate burning. To develop this sensor tear down analysis was done of each tampering device and further analysis was carried out for the field spectrum in order to develop appropriate antenna cum sensor for capturing accurately the filed strength and type. As they are operating just under 8% of AT&C losses and with the help of this project approx. 1% of commercial losses arising out of energy meter tampering will be reduced and will help with financial revenue benefits of around 75 crore to their organization. This innovation can be scaled all across the country as well as abroad where tampering with energy meter is a problem.
3. The AT& C loss across country is around 25% but the loss ranges from around 8% to 40% from state to state. The major part of the loss is arising due to theft of electricity and tampering with energy meter is undoubtedly prominent part of the commercial losses. The notorious consumers initially tamper the energy meters and later burn them to destroy tampering evidences. The problem is wide spread across pan India. The electrical testing of burnt meter is not possible therefore utilities can't punish the consumers with 100% conviction. Tata Power-DDL, having a culture of reaching to the root-cause of the problems, joined hands with reputed forensic investigating lab for identifying the root cause of burning of meters. This investigation strengthens utility hands at various legal forums to prove the case. Forensic testing uses scientific method to pin point the root cause of burning by Gas chromatography, Material Chemical Examination, Stereo microscopic Examination, Visual analysis, Physical Examination. Based on the investigation result case is concluded. Both tamper evident sensor and Forensic testing helps the utility to detect theft through scientific detection and thereby reducing the commercial losses.

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 Steel Limited

About the Company

Tata Steel Group is among the top global steel companies with an annual crude steel capacity of 341 million tonnes per annum (MTPA). Tata Steel Group ranks 11th in the world in global steel production (FY'19 rankings) with a revenue of 139K1 Crore. Crude steel production stands at 18.21 MnTPA for Tata Steel India (Tata Steel Limited+TSBSL+TSLP), with an EBITDA/turnover of 24.98%¹. Tata Steel India can be described as a combination of 3 businesses / industry types – Mining, Iron & Steel and Engineering & Projects because of the scale at which these activities are performed in the company. The diversity in the major activities, coupled with the challenges of a long and integrated value chain, requires a complex balance of handling heterogenous raw materials (7 types) to produce homogenous hot metal to finally meet a variety of customized requirements of customers in the chosen market segments. This has been achieved through focus on quality and breakthrough / continual improvements which has helped create a leadership position in the market place. Further, Tata Steel operates in multiple geographies within India, working closely with a large number of stakeholders. The operating principle continues to be excellence driven and inclusive with a focused commitment towards positively impacting the environment and lives of the communities in its areas of operation.



Tata Steel Kalinganagar

The Innovation

It has been empirically seen that maintaining the Blast Furnace Hot Metal Temperature (HMT) leads to stable metallurgy of the metallic constituents. The challenges are 1. Operational (black box behaviour, dynamic delay effects of raw material chemistry and controlling parameters). 2. Parametric (thumb-rule operations creating noisy data, HMT readings aperiodic). Variation in HMT leads to variation in Hot Metal chemistry which demands additional flux (lime) at next process (steel making). This increases the cost of steel making. There was no model predicting HMT, which was a 150 year old problem. This innovative project examines the extent of control towards HMT outcomes by mapping it with the input process and casting parameters, eventually leading to reduction in hot metal silicon standard deviation. So major achievement was capturing these input raw material chemistry and process variations by creating a hybrid structure model thus white boxing the furnace. Since this is based on first principle, model could capture all states and regimes of the

Blast Furnace and there is no need for repeated model training. This is another uniqueness in this project. Digital Hand for HMT prediction model thus became world's 1st use of hybrid model of stoichiometry data and thermodynamics + data science – to reduce variations in HMT in blast furnace. As a result of this innovation, it was possible to achieve monthly standard deviation to 5 degrees which is close to world benchmark.

The Approach

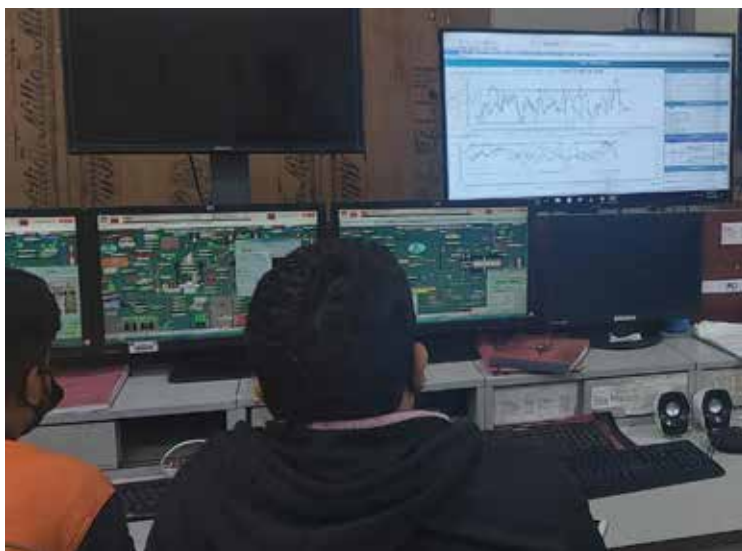
There are three major novel components implemented in this project. First, the parameters contributing to heat input of the furnace have imparted a dynamic delay mechanism towards contribution of heat to HMT, hence capturing more realistic parametric effects. Second, the cast-based patterns capture the state behaviour of the furnace which depends on the last observed state only to predict the next incoming state of the furnace (leading to improvement in directional HMT behaviour). Lastly, the model is hybridized by incorporating a physically determined parameter which calculates the sensible heat of hot metal and slag creating a highly targeted and reliable solution.

Benefits

Initial operations reveal that post model implementation, furnace has observed a reduction in standard deviation of HMT outcomes by 0.5. This has resulted in around 4.0 kg/THM (tonnes hot metal) reduction in total fuel consumption in the furnace converting to around INR 11.50 Crores per annum recurring saving (due to coke considered in one blast furnace) and more than INR 22 Cr. saving at steel making (due to less lime addition. Due to reduction of temperature variations, fuel rate gets saved leading to a reduction in carbon foot print.

The Future

To quantify fuel requirement & automatically regulate, turning black box furnace into “Smart Blast Furnace”.



Deployment of HMT Model at Blast Furnace (digital dashboard)



The Tata Power Company Limited

About the Company

A pioneer in its field, Tata Power is the largest integrated power company. It has installed and managed a capacity of 12,772 MW along with its subsidiaries and jointly controlled entities. The company has made a significant impact within the entire gamut of power value chain. This includes generation of renewable, as well as, conventional power including hydro and thermal energy, transmission & distribution, trading and coal & freight logistics. Tata Power has generated 3.9 GW of clean energy development. This includes 2.7 GW of renewable solar and wind energy and 1.2 GW of hydro and waste heat-based assets. This is in line with the company's aim of developing sustainable and clean energy. The company is tapping new business growth in EV charging & storage, distributing generation on rooftops, micro grids and home automation & smart meters. Thus, Tata Power is striking a balance and transforming utilities to integrated solutions.

The Innovation

Innovation 1: Tata Power has built India's first multilevel substation in Mumbai as part of World -One Project in Mumbai. The power organisation has overcome the challenges of safety, risk, design and statutory requirements to innovatively distribute power in high rise buildings in a way that leads to savings of Rs8Cr per annum. While focusing on innovation, the Tata Power team efficiently coordinated with Lodha Design Team focusing on aspects like Special Cast Resin transformer, usage of pile earthing for protective earthing, high length fire retardant low smoke cable, safety methods to achieve unique solutions of bringing 312 no floor-wise meters for a single luxury Lodha tower.

Innovation 2:

Financial challenges around non-performing assets and funds getting stuck in stressed assets coupled with a growing demand for cheap power and shrinking appetite for large scale investments in coal-based generation led Tata Power to find a breakthrough in non-digital innovation of business models by adding capacity in Thermal Power domain. This was a unique solution to alleviating the woes of limited cash reserves, land acquisition, high gestation period and govt. clearances and to achieve 18,000MW by 2022. Thus, a Singapore-based platform called Resurgent Power was born to invest in Power Projects in India. Tata Power joined hands with ICICI and global investors such as Kuwait Investment Authority & SGRF Oman to acquire some of the stressed thermal assets which were either completed or nearing completion.

Innovation 3:

TP Renewable's Rural Microgrid is a techno-socio innovation which will serve as a game-changer for India's rural electrification & transformation. Through an innovative public-private partnership, that has brought together technology, capital and grassroots social activism, this project holds the potential to change the electrification landscape of rural India. These microgrids provide clean, affordable, reliable & quality energy to the remotest villages of India, also helping in the abatement of global warming. This new Business Model is not only addressing Technology and Social Innovation but also will create a Non-Subsidy based Self-Sustaining Business Model, replicable not only in India but also in other developing countries. Having established 100 microgrids in 10 months, this is India's fastest growing microgrids.

The Approach

For Innovation 1:

This unique solution of distributing power to high-rise buildings was achieved within time frame in close coordination with Lodha Design team. Each challenge associated was identified and a specialised solution arrived at depending on the requirements.

For Innovation 2:

Through persistent efforts, the Tata Power team reached out to various investors globally and pitched to them about the prospects of Indian economy and the tremendous opportunities that are available in the Indian power sector.

For Innovation 3:

Technology was leveraged for Business Transformation whereas the social fabric of rural India was transformed through social innovation. The technological innovations include an optimized electrification solution using Reference Electrification Model, Digital Elevation Model for selecting the land for microgrids, patented SMART group meters with Load controlling capabilities especially for rural consumers with unique RF-based & GSM-based communication technologies, proven technology storage batteries along with SMART Energy Management System. The social innovations on the other hand focused on preparing all members of the community towards a brighter future through various touchpoints.

Benefits

For Innovation 1:

Tata Power focuses on timely release of power supply, space optimization, saving of space leading to the utilization of same by developer for other application, cost saving on account of infrastructure saving for DG supply to end users.

For Innovation 2:

Some of the benefits of the innovation include attractive returns on investment, access to fresh capital & reliable power, exposure to world class O & M practices by Tata Power.

For Innovation 3:

Tata Power intends to transform rural India by creating 10000 microgrids over 7 years and which will help in reducing CO2 emissions by 1 million tonnes and diesel usage by around 57 million litres. The project will help provide affordable & reliable power for around 25 million people , 5 million households and 100000 rural enterprises.

The Future

Tata Power strives to be future ready with a focus on innovation in areas like offshore wind, Energy storage, strategic partnership with key oil companies, virtual power plant, use of hydrogen as an energy option, creating future readiness of work through human and digital interfaces





Thejo Engineering Limited

About the Company

THEJO Engineering Ltd is a pioneer, leader and global organisation, offering comprehensive solutions for the bulk material handling, corrosion protection, and mining & mineral processing industry. It pioneered conveyor belt Splicing, in-situ pulley lagging and in-situ recapping process of conveyor belts by cold vulcanisation, revolutionising the belt conveyor maintenance industry in India. THEJO is among few organisations in the world offering design, manufacturing, marketing, servicing, consultation, operation & maintenance activities under one roof. It has a global presence with subsidiaries in Australia, Saudi Arabia, Brazil, Chile and wide distribution network across the globe. With five manufacturing plants and a state-of-the-art R&D Centre at Chennai, THEJO is recognized by the DSIR, Government of India. Starting as a partnership firm in 1974, THEJO is currently a listed public limited company. The company has the distinction of being the first company to be listed in the EMERGE platform of NSE, India.

The Innovation

Innovation 1: Advanced Air Blaster with Dual Piston Arrangement For Flow Promotion

The internationally patented invention relates to air blasters with quick release discharge mechanism, used to resolve bulk flow problems for a wide range of material clogs and jams, in the bins/vessels of various sizes. The air blaster consists of a tank for compressed air, a valve assembly inside the tank for triggering an air blast into the clogged/jammed material with high impact force, thereby clearing the clogging/jamming. The innovative Dual Piston Valve assembly consists of an inlet piston connected to an outlet piston with a coupling mechanism such that both pistons move in tandem.

Innovation 2: Reengineering & Retrofitting of Existing Pressure Filter Presses

The innovation is about complete re-engineering and retrofitting of pressure filter presses installed at an iron ore beneficiation plant of an Indian PSU, to make them operational for production. The polypropylene chamber and membrane plate design adopted by the International OEM proved ineffective for the application, resulting in frequent breakdowns, major operational and maintenance hassles. Design of detachable HIPO rubber diaphragms with compatible filter plates in place of polypropylene membrane and chamber plates help to increase the service life of spares and reducing the number of spares. HIPO design provides common filter 9plates and diaphragms instead of multiple plate designs supplied by OEM.

Innovation 3: Vulkan Two Piece Press

Field Vulcanizing presses are used for making conveyor belt splices at the field; hence portability is a major design feature. Conventional presses consist of multiple heating platens, cross beams, end bolts and nuts, which are assembled to form the press at site. The assembly process typically takes 45 minutes and an equal time for dismantling after vulcanizing. Vulkan Two Piece press is a new addition and as the name indicates, it is made as two parts and this design enables quick assembly and disassembly. The innovation integrates heater plate and supporting structure and fastening arrangement in to two pieces.

Benefits

For Innovation 1:

The patented valve assembly achieves a blast force more than 20% of conventional air blasters, while time for filling between successive blasts is reduced by 40%. It eliminates technology dependence through 100% indigenization.

For Innovation 2

THEJO's solution involves comprehensive supply of customized designed parts for the existing Presses, ensuring 100% availability for production. The consumption of spares is estimated to be reduced by 75%.

For Innovation 3

The assembling and dismantling time is reduced by 75 %. Vulkan 2PP reduces the 25% of the down time required for the splicing. It is made of lightweight material which makes the press light weight and portable.

The Future

THEJO aims to be a global leader in its field, offering one-stop solutions to the core Sector (Mines, Metals & Minerals, Energy, Port etc.,) always ensuring Safety, Reliability, Quality and Cost Competitiveness. THEJO believes that in order to capture the global market, developing of innovative products is a must



**Top Innovative research
institutes of the year 2020**



Indian Institute of Technology Madras

The Indian Institute of Technology Madras (IIT Madras) is a premier academic institute, well-known both nationally and internationally for excellence in higher technical education, research, innovation, entrepreneurship and industrial consultancy. IIT Madras has been consistently ranked as the No.1 Engineering Institution in India right from the inception of the National Institutional Ranking Framework (NIRF) of Govt. of India five years ago.

IIT Madras, established in 1959 in sylvan settings within the city of Chennai, has about 630 faculty members, 9100 students and 1200 administrative & support staff. The Institute has sixteen academic departments and several advanced research centres in various disciplines of engineering and sciences, along with nearly 100 laboratories. IIT Madras has produced more than 50,000 top-notch engineers, scientists and managers so far, who have contributed significantly to the economic and social development globally and nationally. A unique feature of IIT Madras is its large and well-facilitated Research Park, a facility that houses start-ups and nurtures Industry-Academia collaboration. IIT Madras engages actively with a large number of companies and academic institutions in India and abroad.

1) Multi-parameter patient monitoring device

The Innovation

Over the past three years, IITM's Healthcare Technology Innovation Centre (HTIC) has developed VITALSENS, a platform technology for clinical grade wearable health monitoring that includes wearable sensors, small form factor electronics hardware for wireless data communication, smart phone based apps for signal processing, data analytics, and cloud storage of data.

Recently, HTIC, in collaboration with IITM Research Park startup, Helyxon Healthcare Private Limited, has developed, validated and manufactured a continuous, wireless, clinical grade, multi-parameter patient monitoring device for vital parameters - SpO₂, Pulse Rate, Temperature and Respiratory Rate, along with Perfusion Index and Plethysmograph. "Oxy-2", the clinically accurate patient monitoring solution for COVID was found very valuable by hospitals and has reached over 5000 installations in less than three months of deployment.

The software platform is fully integrated with telemedicine features for patient calls, engagement, escalation of alerts, while also remote monitoring trends of the measured parameters.

The Approach

To meet the multiple requirements and constraints of clinical accuracy, cost, ease of use, portability, wireless, the device was engineered in such a manner that it can be clipped on to patient's finger and wrist, and the data is directly streamed to mobile phone or central system. The point of temperature measurement is axilla and of SpO₂ is the finger itself. The device is reusable and has a lifetime of over a year. The core technology was validated by a year-long multi-centric study at various Chennai based medical institutions for the accuracy and performance with reference to current standards.

Benefits

Portable and Clinically accurate: The greatest benefit to the hospital, caregiver and patient is its reliability without



occupying space or requiring constant monitoring, reducing burden of anxiety in patients and caregivers.

Continuous Monitoring and Seamless integration with telemedicine: The device allows continuous monitoring and can be scaled to hundreds of patients monitored at home.

Clinical adoption during COVID times:

Specific to COVID, the reduction of close contact with patients by doctors and nurses, savings in PPE and monitoring equipment was found to be a significant advantage by hospitals.

The Future

Oxy-2 can be used by hospitals and doctors for patient management beyond COVID. Besides this device, the Vitalsens platform has yielded a fully wireless miniaturized fever monitor ("Thermi") for both acute measurement and continuous temperature monitoring, for hospital and home settings, in adults and neonates. The device runs on battery for around a month continuously, and over a year in staggered monitoring mode, and has full data logging, alarm and wireless connectivity capabilities. We have started a state-level pilot in seven districts of Tamil Nadu with deployment in Q1 2021.

2) Arise Standing Wheelchair (SWC)

The Innovation

To be able to stand is one of the biggest unmet desires of any wheelchair user. Traditional manual wheelchairs offer only mobility, with users always in sitting position, reducing their functional height to about 4 feet. This not only reduces the functional space available but makes a wheelchair user less efficient at home, work and social spaces. The therapeutic and psychological factors are also often not considered.

The Arise Standing Wheelchair (SWC) enables users to stand, gain more functional independence, have better social interactions and thereby, significantly elevates their quality of life. Operating the Arise Standing Wheelchair requires low muscular effort because of the optimized spring-balancing. The design can be customized to a wide range of users and has been commercialized at an affordable price of INR 15000 (10-30 times lesser than existing products in the market).

The development towards commercialization was funded by the Wellcome Trust, UK. The industry partner manufacturing and marketing the device is Phoenix Medical Systems, Chennai. US patent 10,765,574B2 and Design Registration 294291 have been granted for the innovative design, and India and China patents are pending.

Arise incorporates best in class safety features to prevent accidental standing and has a 3-wheel base that makes it easy to propel, even on uneven terrain. No other standing wheelchair in the world has these features.

The innovative features of Arise that distinguish it from other imported or motorized designs are:

- 1) Low effort required for manual operation achieved through spring balancing, tuned for every user's comfort
- 2) Only standing wheelchair design that can be easily propelled on uneven terrain due to the 3-wheel base, making it suitable for rural areas
- 3) Price at INR 15000, 10 to 30 times lower than its peers. Design innovation incorporating customizability in a mass-manufacturable design is key to ensuring affordability

The Approach

Arise SWC's design stands tall and sturdy over five years of work, feedback from trials with over 100 users and rigorous testing to ISO standards. It provides standing functionality, mobility, and is aesthetically pleasing. Arise is designed to accommodate users of different sizes and body weights. The design minimises user effort with the use of a gas spring, enabling people with even fairly high levels of spinal cord injury (up to

C5 level) to use it effortlessly. Incorporating discrete adjustments into the design enables customisation while retaining the advantages of mass manufacturing - a critical part in ensuring its affordability.

Benefits

Functional benefits: Increased vertical reach for functioning at home, work and social spaces (for eg: accessing kitchen cabinets, top shelves at supermarkets, operating equipment/machine that are at an elevated level). This increases employment opportunities too.

Physical/therapeutic benefits: Improved cardiovascular, kidney and digestive functions. Reduced muscle spasticity, osteoporosis and risk of pressure sores.

Psychological benefits: Looking eye-to-eye, instead of looking up. Being looked at as an equal, shoulder-to-shoulder than being looked down – preservation of dignity.

The Future

Product enhancement: creating motorized variants, and a variant that is mobile indoors while standing.

Market strategy: Increased dissemination and creating awareness across India about Arise SWC to benefit the wheelchair user community and ultimately tap the global market potential, in line with Make in India, Make for the World principle.



Arise users, along with everyone else, standing for the National Anthem during the launch of Arise.



3) Shakti Microprocessor

The Innovation

Inspired by the India-2020 vision of Dr. A. P. J. Abdul Kalam, the Reconfigurable Intelligent Systems Engineering (RISE) Group, Department of Computer Science and Engineering, IIT Madras started a humble development effort in 2012, to build and deliver an indigenous microprocessor for our Country by the year 2020. The objective was that the microprocessor should be encumbrance free, highly customizable and its design artifacts must be available for analysis to certify trust on its functionality. Keeping these in mind, the RISC-V open source Instruction Set Architecture was selected. A roadmap comprising a family of microprocessors starting from those that can be used in embedded devices, to industry level microcontroller devices, mobile handsets to large scale high-performance devices, was put in place. Thus, the SHAKTI Family of processors got defined. Three classes of SHAKTI cores were developed, the E Class, C Class and I Class, in increasing order of complexity, to match the need. The microarchitecture level security and accelerators for mapping Artificial Intelligence and Machine Learning Algorithms will be the unique selling point of the SHAKTI family of processors. Similar efforts at the industry take several man years involving huge funding. To quicken up the process, a high-level synthesis language by name Bluespec was chosen for designing the SHAKTI family. Initially Bluespec was a commercial tool but today it is open source, thus enabling everyone an opportunity to not only use the SHAKTI core but also customize the same at zero cost. The LINUX model is adopted by IIT Madras, wherein the cores developed are released under open source BSD License thus enabling the industry to access them at zero license cost and customize these cores to meet the needs of the customer. We believe that this is the most suited approach for the domain specific architecture era.

The Approach

There are three stages in design of a microprocessor. The first step is to define and design a system-on-chip that includes the core and the peripheral interfaces. The second step is to fabricate the SoC in a silicon foundry. The third step involves designing and fabricating the motherboard that will house the SoC and make it usable for multiple applications. All the three steps were done within our shores. The first step at IIT Madras, the second step at Semiconductor Laboratory Chandigarh and the third one at Chennai and Bengaluru. The objective is to demonstrate the existence of an Atmanirbhar ecosystem within India for developing such complex cores. The peripheral interfaces are crucial as they are the end-user facing parts of a system-on-chip. All the peripheral interfaces that were put on the chips fabricated were home-grown, thus ensuring complete indigenization on that account. To prove that the processors designed are suitable to be fabricated at multiple technology nodes, the same design was successfully fabricated at 22nm in Intel Oregon Fab, USA. The software stack is an important aspect of the ecosystem. Complete Software design kits were made available in open at shakti.org.in and FPGA emulation environment on commercial off the shelf boards were demonstrated. To increase the awareness and usability, multiple versions of the SHAKTI core are made available as part of the swadeshi microprocessor challenge launched by the Ministry of Electronics and Information Technology.

Benefits

Nil License cost, customizability to meet the requirements, nil encumbrance and complete eco system make the SHAKTI family the LINUX of the System-on-chips. This will be most suitable for both civilian and strategic use, both from the cost and security perspectives. This will lead to complete democratization of Microprocessor based System-on-chip design.

The Future

Multicore architectures that could be made part of high-performance computing systems that have microarchitecture-level security features, security accelerators, AI/ML Accelerators, and Fault-tolerant features. Commercial SHAKTI chips will be launched in the next few quarters.





Indian Institute of Technology Roorkee

Indian Institute of Technology (IIT) Roorkee is among the leading institutes of national importance for higher education in engineering, science, management, humanities & social sciences and Architecture & Planning. Since its establishment in 1847, IIT Roorkee has played a vital role in training technical manpower and providing know-how to the country.

IIT Roorkee has a rapidly growing portfolio of patents, technology transfers, start-ups, and technology incubation. ReThink-Tinkering Lab and Design Innovation Centre facilitate translation of students' ideas into prototypes with the latest state of the art equipment. The business incubator TIDES facilitate incubation of ideas through physical infrastructure, industry mentorship, and seed grant funding.

IIT Roorkee has international linkages across several countries through collaborative projects and otherwise. Further, faculty members pursue challenging problems through sponsored research and industrial consultancy projects.

The Innovation

- Nano-coating mask

An anti-microbial nano-coating that can be applied to masks, PPEs, and other protective gears has been developed. The coating has been tested on several infectious bacterial pathogens using standard tests and studied using electron microscopy to confirm the results. The composition in gel form provides its anti-bacterial and anti-viral properties on the coated substrate. The known anti-viral and anti-bacterial plant-based anti-microbials which have GRAS (generally regarded as safe) properties are used. The coating can be scaled up for industrial-level applications.

- Prana Vayu Ventilator

IIT Roorkee, in collaboration with AIIMs Rishikesh, has developed a low cost, portable closed-loop ventilator, popularly known as 'Prana Vayu.' Some of the ventilator features are remote monitoring by healthcare professionals, touch screen control of all operating parameters, moisture, and temperature control for inhaled air. Prana-Vayu has real-time respiratory monitoring with a wired or wireless interface. It has all the necessary modes of advanced mechanical ventilators. The current ventilation modes in Prana-Vayu are CMV (Volume & Pressure Control), AC (Volume & Pressure Control), CPAP, Pressure Support, and SIMV (Volume & Pressure control with and without pressure support). It can provide respiratory support using invasive as well as non-invasive modes. It is now being developed as an industrial product for complete life support to compete with the most advanced versions available in the market.

- Heal-agnostic - Breast Lung Oral Cancer Detector

It is an economical screening device for rapid detection of breast or lung or oral cancer using exhaled breath. The detection process needs blowing in the device for about 5 minutes. A color change in the detector's active material indicates the possibility of having cancer. This device has undergone clinical tests in Cancer Research Institute, Sri Rama Himalayan University, for over 100 patients and 70 controls to show sensitivity and specificity of almost 96 and 95%, respectively.

The Approach

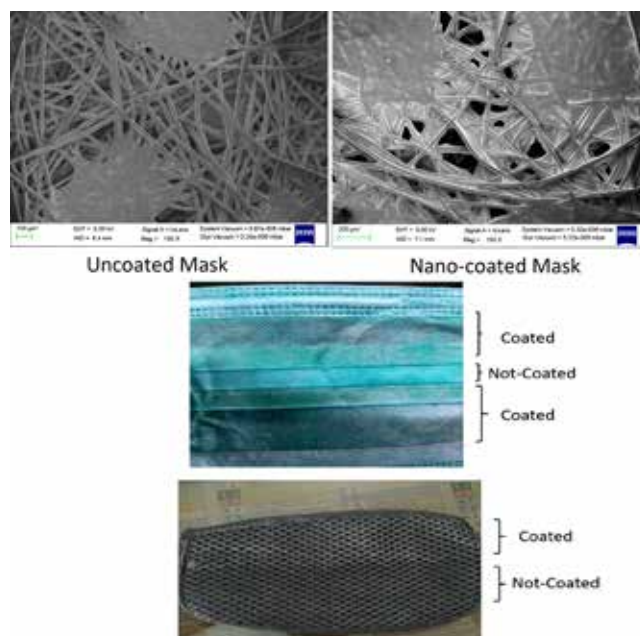
IIT Roorkee makes conscious efforts to leverage its strengths to develop solutions for practical problems. They engage their students at all levels, irrespective of their departments, in their research activities and encourage them to participate in the process of technology development, along with faculty members. The institute shuns any hierarchy in academic matters and believes that students and faculty at all levels are equally important to cultivate an ecosystem in which innovative ideas can flourish from seeds to products. The students are mentored by the faculty members using the resources of Design Innovation Centre, ReThink-Tinkering lab, TIDES business incubation center and the IPR cell.

Benefits

The technological developments and research breakthroughs in the institute benefit the students by inculcating a culture of inquisitiveness and opening avenues for them to explore their interests and accordingly ideate. They encourage blue sky research as well as development of solutions which fulfill the needs of society. All the three referred innovations i.e. Prana Vayu ventilator, antimicrobial mask and PPE kits, and the cancer detection tool address the immediate and pressing needs of society.

The Future

Innovation, creation of intellectual property, and incubation are major pillars for strengthening their research output. They aspire to continue moving in this direction with the active engagement of the industry to benefit society at large. CII innovation award has come at the right time to further boost their efforts in this direction.





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.

For 125 years, CII has been working on shaping India's development journey and, this year, more than ever before, it will continue to proactively transform Indian industry's engagement in national development.

CII is a non-government, not-for-profit, industry-led and industry-managed organization, with about 9100 members from the private as well as public sectors, including SMEs and MNCs, and an indirect membership of over 300,000 enterprises from 288 national and regional sectoral industry bodies.

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.

Extending its agenda beyond business, CII assists industry to identify and execute corporate citizenship programmes. Partnerships with civil society organizations carry forward corporate initiatives for integrated and inclusive development across diverse domains including affirmative action, livelihoods, diversity management, skill development, empowerment of women, and sustainable development, to name a few.

With the Theme for 2020-21 as Building India for a New World: Lives, Livelihood, Growth, CII will work with Government and industry to bring back growth to the economy and mitigate the enormous human cost of the pandemic by protecting jobs and livelihoods.

With 68 offices, including 9 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 394 counterpart organizations in 133 countries, CII serves as a reference point for Indian industry and the international business community.

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Reach us via our Membership Helpline: 00-91-124-4592966 / 00-91-99104 46244

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