



Confederation of Indian Industry

INDUSTRIAL INNOVATION AWARDS 2015

Top 25 innovative companies

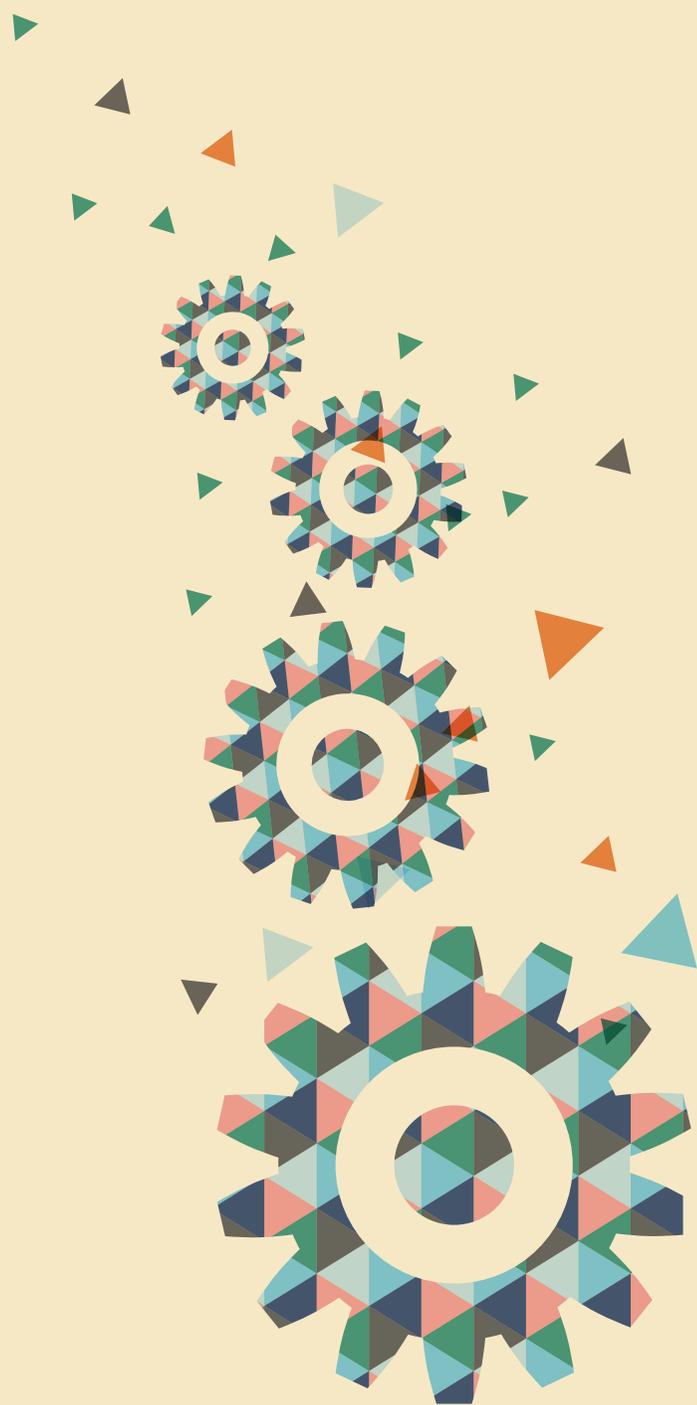






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Top 25 innovative
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FOREWORD



Mr Chandrajit Banerjee
Director General, CII

In an increasingly global and interconnected world, leaders of companies both large and small often face the challenge of staying relevant in an ever-changing business environment and consumer tastes. Creating a culture of innovation in one's organisation has often been touted as the key to solve many business challenges, offer new and improved products & services and remain competitive & relevant. Technological advances such as automation through Artificial Intelligence (AI), 3D printing, and others present themselves as both

opportunities that make life easier as well as challenge companies and communities depending on conventional products and services.

Despite rapid growth of the Indian economy, challenges like extreme poverty, unemployment, health and education remain to be addressed. India must invest heavily into research & innovation, create more efficient production processes & service delivery models, start new businesses and business models. In the midst of rising global competition and increasingly scarce and fast-dwindling resource base, Innovation and Entrepreneurship have been recognized by the Government of India as the twin engines that will drive growth and development that is sustainable and inclusive.

India is blessed with all the makings of becoming an innovation -led economy with a democratic polity, large market potential, an expanding middle class, and a plethora of frugal innovations. However,

still there exists the need to create the right environment and infrastructure that encourages a growth mindset and provides access to the right resources to spark innovation at all levels - individual, community and industrial.

To help Indian industry become innovation-oriented and create an enabling ecosystem, the Confederation of Indian Industry (CII) has been conducting the Industrial Innovation Awards since 2014 to reward and recognize the most-innovative companies across industry segments in the country. A new category of the CII Start-up Awards has been introduced lately to reward and encourage innovation-led new ventures. The Awards have successfully created a well-known and long-awaited platform for Indian companies to showcase their stories of innovation to the world.

This Compendium comprises of case studies of companies who were recognized for their innovation and their best practices in 2015. We believe that the best revolutionary innovation occurs when the best practices of the most innovative companies are shared and learned. Therefore, it is pertinent to share and spread diverse knowledge and experiences, so that they can help give rise to new innovations. In this current version of the Compendium, we have tried to ensure that the Awards continue to serve as true motivators for practicing innovation so that more and more innovation case studies can be shared with the industry.

Finally, I would like to congratulate all the winners of the Industrial Innovation Awards and Start-up Awards and wish them success. I would like to thank all the members of the Grand Jury for their time and energy in supporting CII in selecting the most innovative Indian companies and start-ups and a final thanks to all my colleagues in CII who have contributed to this edition and made it possible.



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Zydus Cadila

Headquartered in Ahmedabad, India, Zydus Cadila is an innovative, global pharmaceutical company that discovers, manufactures and markets a broad range of healthcare therapies.

The group employs over 19000 people worldwide. As a leading healthcare provider, it aims to become a global research based pharmaceutical company by 2020. The group has a strong research pipeline of NCEs, biologics and vaccines and has over 1200 scientists engaged in R & D and is dedicated to creating healthier communities globally.

In 2014, the group launched Exemptia, the world's first biosimilar of Adalimumab, the largest selling therapy worldwide for inflammatory arthritis. Zydus is also the only Indian pharma company to launch its own patented NCE - Lipaglyn, the world's first drug to be approved for the treatment of diabetic dyslipidemia.

THE INNOVATION

Lipaglyn is the world's first drug for treating an unmet healthcare need, diabetic dyslipidemia, combining lipid and glucose lowering effects. It helps in a reduction of triglycerides and LDL (bad) cholesterol, and an increase in HDL (good) cholesterol and has also shown a reduction in Fasting Plasma Glucose and glycosylated haemoglobin (HbA1c).

Lipaglyn™ (Saroglitazar) was launched in September 2013 in India, for treating Hypertriglyceridemia and Diabetic Dyslipidemia in Patients with Type 2 Diabetes not controlled by statins alone. Lipaglyn is the first Glitazar to be approved anywhere in the world and is the first New Chemical Entity (NCE) discovered and developed indigenously by an Indian Pharma Company.

Exemptia is the world's first biosimilar of Adalimumab – the world's largest selling therapy. The revolutionary therapy that is providing a new lease of life to millions of patients suffering from inflammatory arthritis both globally, and in India at far more affordable prices with access to patients in India. Developed at the Zydus Research Centre. Exemptia treats Rheumatoid Arthritis, Juvenile Idiopathic Arthritis, Psoriatic Arthritis, Ankylosing Spondylitis, Crohn's Disease, Paediatric Crohn's Disease and Ulcerative Colitis.

This novel non-infringing process for Adalimumab and a novel non-infringing formulation is a 'fingerprint match' in terms of safety, purity and potency of the product.

THE APPROACH

Saroglitazar (Lipaglyn) belongs to a class of drugs called the PPARs which are nuclear receptor proteins that act as master regulators of multiple metabolic pathways. THEY believed that if they could design the right kind of molecule that binds and interacts with the subtypes of PPARs in a unique manner, it may be possible to develop a novel drug that addresses two major lifestyle diseases, diabetes



and dyslipidemia. Saroglitazar was developed with a different mechanistic concept, which led to its successful development. Saroglitazar was selected since it showed the best safety profile and an impressive efficacy profile in both diabetic and dyslipidemia models. An IND was filed in 2004 for initiating clinical development of Saroglitazar. The clinical development strategy was very innovative & included adaptive trial designs. Having completed the first-in-man (Phase-1) trials successfully, additional non-clinical toxicity studies were conducted in-house and clinical trials (phase-2 and 3) were conducted across India. Based on impressive overall safety & efficacy profile Saroglitazar was approved as the first new drug from an Indian Pharmaceutical Company and the first glitazar class drug approved anywhere in the world.

While Lipaglyn is a New Chemical Entity, Exemptia is a biosimilar. A true “biosimilar” or a “similar biologic” is one which can demonstrate a fingerprint like match in its physicochemical characteristics to the originator product that it is being compared with. The group focused their efforts on selecting a clone and developing a bioreactor process that gave a highly biosimilar, fingerprint like product. This contrasting idea of controlling drug development cost by not focusing on expression levels but the degree of biosimilarity helped reduce the time of development and the cost. This work on process development led to two inventions which have been protected with two separate international patents.

THE BENEFITS

Lipaglyn (Saroglitazar) is highly beneficial to patients who have both diabetes & dyslipidemia. It helps in a reduction of triglycerides and LDL (bad) cholesterol, and an increase in HDL (good) cholesterol and has also shown a reduction in Fasting Plasma Glucose and glycosylated haemoglobin (HbA1c). Lipaglyn has a non-renal route of elimination, and has not shown adverse events like edema, weight gain, myopathies or derangement of liver and/or kidney functions, thus making it safe and efficacious.

Exemptia is the world’s first biosimilar of Adalimumab – the world’s largest selling therapy. For 12 long years since global launch, this revolutionary therapy has not been available to patients in India. It provides a new lease of life to millions of patients suffering from inflammatory arthritis both globally, and in India at far more affordable prices with access to patients in India. Exemptia treats Rheumatoid Arthritis, Juvenile Idiopathic Arthritis, Psoriatic Arthritis, Ankylosing Spondylitis, Crohn’s Disease, Paediatric Crohn’s Disease and Ulcerative Colitis.

THE FUTURE

Zydus Cadila now wishes to develop their innovation of Lipaglyn for additional indications such as type 2 diabetes, lipodystrophy and nonalcoholic steatohepatitis (NASH). NASH is a liver disease in



which fat accumulates in the liver. Obesity, insulin resistance, diabetes and lipid disorders lead to Nonalcoholic Fatty Liver Disease (NAFLD) which progresses to lethal NASH situation. The clinical trials are in progress in India to support these indications. They also have plans to develop Saroglitazar for the global markets. Since US is the biggest market for pharmaceuticals, their plan is to conduct clinical trials in the US as per the directions and

guidelines of the US Food and Drug Administration (USFDA) for management of hypertriglyceridemia. They are also planning to explore the potential of Saroglitazar for management of NASH, a disease for which there is no approved treatment at this stage.

Zydus which launched Exemptia in December 2014 and was the first in the world to launch this “biosimilar” or “similar biologic” of Adalimumab. In the next 3 years, the company plans to launch this drug in many emerging markets and Complete additional clinical trials and file market authorization applications for this drug in EU and US so as to be able to launch it in these two regions also by 2020.

Uflex Ltd.

UFLEX began its our journey around 3 decades ago and is today a 2 billion dollar flexible packaging company having fully integrated infrastructure spread over 500 acres across four continents with manufacturing facilities in India, North America, Mexico, UAE, Egypt, Kenya & Poland.

UFLEX offers a complete spectrum of flexible packaging solutions, a vast array of innovative packaging products and services that enriches and creates value for the customers and shareholders. The in-house manufacturing facilities include Polyester chips, PET / OPP / CPP Films, Roto Gravure Cylinders, Digital Flexo Plates, "Inks, Adhesives & Coatings", Flexible Laminates, Pre-Formed Pouches, Laminated Woven Bags, Building Material Packaging, Modified Atmosphere Packaging, Flexible Tubes, Security Holograms, Converting & Packaging Machines.

With a dedicated work force of over 7000 professional, Uflex is proud to be serving its customers in over 125 countries with clients like P&G, Nestle, Cadbury, Pepsico, Coca Cola, Unilever GSK to name a few.



Revolutionary
Flex SafePack
Black Barrier Bags For Cement,
Powder & Granular materials

THE INNOVATION

The Cement Bags are largely stored in open environment across the supply chain making it vulnerable to damage caused by the unpredictable outdoor conditions and extreme climate.

“Flex SafePack – Shower Proof Cement Bags” provides this unmet need thereby extending the shelf life of the product by restricting the Moisture and Carbon Dioxide absorption. Moreover it avoids lump formation due to ingress of water droplets thereby reducing losses significantly. The estimated total loss of cement in the complete supply chain exceeds 3%. This innovation has been achieved

thru’ special material characteristics / specifications and production process: - Fabric made on specially designed tape lines with controlled quenching/cooling system, multi drive stretching and specially designed direct drive extruder for better melt quality. - Reduced stretch ratio to prevent internal fracturing of fibres, results in improved malleability, improved softness, and enhanced mechanicals. -

Flexible extrusion layer to avoid “clear hole” formation when Nano embossed. - Optimised Nano embossing – to address the two conflicting requirements, i.e. de-airation holes required to escape the air from inside while cement filling and to prohibit the water / moisture / carbon dioxide ingress from outside during transportation. Cement is usually shipped in 50 kg bags. Once bagged cement becomes a perishable commodity as absorption of moisture and carbon dioxide significantly deteriorate cement over time. The deterioration may not be visible but it significantly reduces its performance. Moreover, the rain plays havoc as cement Solidifies when wet.



THE APPROACH

The Cement Bags are largely stored in open environment across the supply chain making it vulnerable to damage caused by the unpredictable outdoor conditions and extreme climate. This was the trigger which led to the conceptualisation of “Flex SafePack – Shower Proof Cement Bags” which provides this unmet need thereby extending the shelf life of the product by restricting the Moisture and Carbon Dioxide absorption. Moreover it avoids lump formation due to ingress of water droplets thereby reducing losses significantly.

THE BENEFITS

“Flex SafePack – Shower Proof Cement Bags” extends the shelf life of the cement by restricting the Moisture and Carbon Dioxide absorption. Moreover it avoids lump formation due to ingress of water droplets thereby reducing losses significantly - Fulfills a user need and provides an enhanced experience. - Aids product merchandising and motivates purchase. - Enables greater supply chain efficiency. - Establishes a preferred price/value equation. as The estimated total loss of cement in the complete supply chain exceeds 3%

THE FUTURE

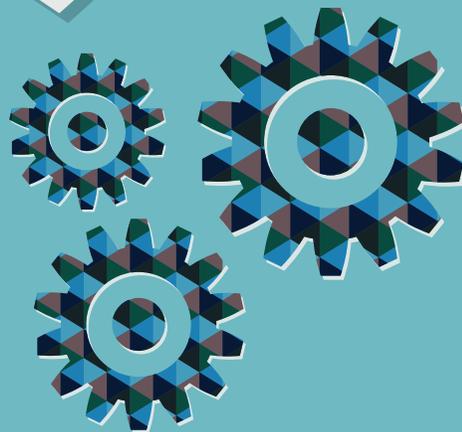
UFLEX is very excited about the future of this innovation as it represents a breakthrough in the cement packaging industry in terms of technological advancement, responsible packaging and user experience while significantly increasing the supply chain efficiencies. They aim to reach Rs. 2000 crore turnover within next 3 years.





CoreEL Technologies (I) Pvt. Ltd.

CoreEL Technologies is a Customer Application Specific Product & Solutions (CASPS) company offering innovative solutions. Our diverse portfolio includes Intellectual Property (IP) cores, System Design & Manufacturing, COTS/Semiconductor products, EDA and University Solutions. Our strength lies in the ability to blend deep domain knowledge with the right ingredients across our portfolio of offerings. CoreEL's unique solutions are crafted with one or more of the following offering like creation of multi-disciplinary System Level products incorporating cutting edge technologies with indigenous talent & resources. CoreEL works closely with customers along the product life-cycle, from inception of the idea to the product roll-out and manufacturing. Our expertise ranges from System Level, Sub-System Level, VLSI/FPGA, DSP, Radio Frequency, and Optical to Mechanical Engineering.



THE INNOVATION

Feeds for TV, Radio and Web were being transmitted from BBC, Scotland (at Glasgow) to over 25 locations of BBC, London simultaneously using a novel innovative internet based technology called Stagebox. Instead of using inflexible, expensive and heavy traditional equipment for satellite based broadcast, Stagebox offered a world of flexibility, functionality, reliability, and cost-effectiveness without compromising on quality. Stagebox is the first of its kind ALL IP (Internet Protocol) product, targeted for live broadcast market. This unique broadcast and production technology is developed by CoreEL Technologies, India in collaboration with BBC R&D and was adopted in various BBC productions like Glastonbury music festival, London Olympics, annual London boat race to name a few.

Stagebox's camera-mounted device enables linking of multiple cameras and move HD content over a standard internet network. Stagebox combines all professional broadcast feeds and cabling – including Video, Audio, Talkback, Tally lights, Timecode and Genlock – and distributes them over Ethernet instead of using expensive and inflexible SDI (Serial Digital Interface) networks. With Stagebox the need for the intermediate satellite transmission and the associated delay is removed. Further, since the data is transmitted on internet, live video can be made available for post-processing in multiple studios anywhere in the world. These unique features make it ideal for the next-generation live broadcast production.

“The Scottish referendum event broadcast was a huge success for us. The live feeds were used for all the main broadcasts including BBC1, BBC1 Scotland, BBC Radio 4 and BBC Radio 5 Live. Stagebox held BBC's output running for over 15 hours”, Nicholas Pinks, Technology Transfer Manager, BBC R&D.

Stagebox includes some of the most innovative technologies developed by CoreEL, using a very advanced FPGA technology platform. CoreEL was able to resolve various complex issues related



to networking algorithms, video & audio technology, thermal and structurally viable product. Our engineers from various disciplines worked on Hardware, VLSI/FPGA, embedded firmware, and application Software for over two years.

THE APPROACH

In recent years, top tier management school (Stanford, Harvard, MIT, and recently IIM-A), have been focusing on a concept called “Design Thinking” for advance R&D. The “Design Thinking” concept was introduced in CoreEL three years ago, when the initial academic papers had just appeared. Today, Design Thinking approach is widely adopted by companies such as Apple, Google, Facebook and many other San Francisco Bay area start-ups. Design thinking approach at CoreEL starts from marketing and initial product specification and is followed throughout product life cycle. Constant customer interaction is very critical, but equally important is the

understanding of end-use of the product, which in our case typically means understanding the requirements of our customer's customer. Innovation is always important in new product development, but more important is the ability to deliver a high quality, reliable, rugged, easy-to-use, easy-to-learn product. We stress with our engineers the good old Murphy's Law – If it can go wrong – it will. They have put in place a very comprehensive development process, which focuses on quality, verification, and validation at every stage of the development process. CoreEL emphasizes that Innovation and Quality are two sides of the same coin. It is due to their rigorous process and innovative methods we are able to produce and introduce many "First-of-its-Kind" and "First-time-right" products in timely manner, considering the financial and other limitation a small Indian company faces in the Global Product market.

THE BENEFITS

In the case of Stagebox or KARL STORZ's Next-Generation operating room (OR) Network box, CoreEL was building "First-of-its-Kind" product in the world. In both cases, CoreEL's product brought a paradigm shift compared to the legacy schemes currently in use. In addition to producing high quality video, the engineers had to ensure that large amount of data was transferred transmitted error-free over a somewhat unpredictable and error-prone internet backbone. There were also power, size and cost constraints. StageBox is uniquely positioned in the market with unmatched levels of integrated functionality for live broadcast applications. One can avoid sending OB trucks and a big crew for the local events enabling live coverage of these events on a national scale and thus providing significant capital and operational cost reductions to broadcasters. The solution is next generation IP based workflow from content capture to content delivery.

THE FUTURE

The manufacturing phase for many of the products developed over the past few years have started. Over the next three years we will receive increased revenue and profits from manufacturing. We expect



our revenue from the current level of about 120 crores to grow to 250 crores in three years. By the third year over 60% of the company's revenue will come from manufacturing. CoreEL plans to outsource the routine manufacturing job to houses that deal with large volume, but will perform all the critical manufacturing functions internally. In order to maximize product yield, CoreEL has developed complex diagnostic software modules and test fixtures that can identify errors at each stage of manufacturing. We will continue to invest very heavily in R&D. Our R&D expenditure is expected to be about 15% of our revenue in the next three years. The significant difference between our approach and that of the large industrial houses is that CoreEL's technical experts will develop a significant part of the technology in-house. With this new initiative CoreEL is setting a seed to develop A&D products that can also be exported.



Robert Bosch Engineering & Business Solutions Pvt. Ltd.

Robert Bosch Engineering and Business Solutions Private Limited (RBEI), is a 100% owned subsidiary of Robert Bosch GmbH, one of the world's leading global supplier of technology and services, offering end to end engineering, IT and Business solutions. RBEI is the largest software development center of Bosch outside Germany, indicating we are the Technology Powerhouse of Bosch in India. RBEI is ISO 9001:2008 certified (2012), appraised at CMMI-L5 as per version 1.3 (2011), ASPICE - level3 based on version 2.5 and ISO 15504- 5 and 7, and also ISO 27001 with seven state-of-the-art facilities. They provide solutions for businesses in primarily Engineering Services, IT services, Business services. Their focal industries are Automotive industry, Industrial Technology, Consumer Goods, Healthcare and Building Technology, Their vision statement is 'Smart solutions for the Globe'.

THE INNOVATION

Based on their three-pronged strong vision in the medical space that is 'Better Health', 'Better Care' and 'Lower Costs', Bosch introduced an eye screening and detection solution which consists of a modular hand-held non mydriatic Eye Camera, the MediBilder client software, a cloud enabled Picture Archival and Communication System with automated detection platform. The hand held Eye camera is Non-Mydriatic enabling fundus examination without dilatation saving time for both patients and the technician. The system allows the data capture on patient eye images, data sharing and detection seamlessly across vision centers and tertiary care hub hospitals. The system fits into the existing workflows and enhances detection rates for conditions beyond cataract. The system requires very little training (~3-4 Hrs) and the vision technicians are enabled to provide a deeper and a more comprehensive and quality eyecare to the patients. The patients experience the diagnosis as more credible because of the technology and ability to take and see the image of the eye. The system enables capturing of rare eye conditions. The camera is lightweight and portable to offer better point of care services. In addition, since the device operates on a rechargeable battery, it can be taken to a patient's door steps in the case of community screening.

THE APPROACH

Bosch Eyecare Solutions India bears a disproportionately high burden of blindness. According to statistics, 40% of blind people in the world & 21% of visually Impaired are in India. Almost 80% of the times the blindness could have been avoided through timely detection and treatment. Limited resources and criticality of the problem prioritises Curing over Prevention. There is just 1 ophthalmologist for 83,000 Indians today, and one doctor for every 2000. The constraint in setting them up is mainly the infrastructure cost and skill availability Based on our three-pronged strong vision in



the medical space • 'Better Health', 'Better Care' and 'Lower Costs' Bosch identifies the need for these especially in emerging markets like India and addresses them through locally developed solutions through New Business Teams (NBT). The Indian NBT team constituted within RBEI was responsible for the current innovation under discussion. For the pilot phase which was defined for a specific duration, a variety of customer segments were chosen (like diabetologists, ophthalmologists). Iterative processes involving various configurations of hardware, software were installed in pilots towards validation of parameters like customer expectations, product value, sales channels, technology, marketing, price, affordability etc. The NBT team approached the need statement with the philosophy 'Patriotic about the problem, but democratic about the solution'. This enabled Bosch to be inward and outward looking to arrive at the best solution to address the need ' to make comprehensive eye screening accessible and affordable' Bosch Strategy Development model.

THE BENEFITS

Bosch wanted to impact positively on making eyecare accessible and affordable to the masses in India to reduce the incidence of preventable blindness. With Bosch solutions, patients are able to get comprehensive eyecheck up closer to them at as low as USD 14 cents. Without dilatation, they are able to quickly resume work. Diagnosis is more accurate and documentable. In just less than a year since launch, nearly 1,20,000 patients have been screened with Bosch device. The detection rates have been at around 8%, almost 3 times the national average using traditional means of 2 - 3 %. Care delivery providers are able to provide affordable services to the patients due to a combination of factors. The time per patient has come down from 30 minutes to less than 5 minutes for retinal examination. Unnecessary dilatation reduced from 45% to 5%. It is 30 times lighter and 20 times smaller than comparable solutions, freeing valuable real estate which was found as a constraint during their need identification phase. Bosch has been able to tap the eco-system effectively to develop the product and is currently enabling or setting up the eco-system for wider proliferation of the solution and maximising impact.

THE FUTURE

Bosch is exploring innovative business models like pay per click, service based pricing, revenue sharing models, etc. towards making their solution feasible. To provide wider coverage of diseases and maximize detection, Bosch introduced the automated detection platform using deep learning that automatically detects and marks lesions in Diabetic Retinopathy patients and detects Glaucoma using nerve-head analysis. They are working on higher sensitivity & specificity for eye care solutions along with inclusion of more disease conditions like dry eyes. Bosch as a thought leader in the space is spreading awareness about comprehensive Eye screening to not just patients but also to non-Ophthalmology practitioners like Diabetologists, Optometrists. Bosch is offering this solution across



markets such as Africa, SAARC, Middle East & Brazil. In geographies such as Middle East there is a high prevalence of pre-conditions (for eye problems) such as diabetes, hypertension and obesity. In geographies such as Africa, Brazil and SAARC in addition to these preconditions, there is an additional challenge of inadequate supply infrastructure. Bosch Eyecare solutions is also working on a technology road map integrating technology from around the globe to provide world-class technology at affordable prices to create a wider impact. They are looking at bringing in more technology into the space of ophthalmology from other domains. They are actively working on leveraging the learnings from Eyecare to other business domains as well.



ARTERIA®

Arteria Technologies Pvt. Ltd.

Arteria offers a suite of Portal & mobility based solutions on SAP HANA cloud and on-premise that can help organizations to extend their on-premises SAP data to external partners (distribution network, suppliers, transporters and sub-contractors). These solutions have helped organizations with the tracking & collation of data from their partner ecosystem and the integration of this data with their SAP system. The resulting business benefits are extremely cool to business managers. The solutions (Finessart) offer the following benefits with reference to benchmark savings range. Inventory Savings of 30% against benchmark of 20%, Forecast Accuracy of 30% against benchmark of 30%, Improved SLA's of 98% against benchmark of 98%, Freight Charge Reductions of 3% against benchmark of 5%-3.5%, Decrease of Inventory on Stock to ~9 Days against benchmark of 10 to Seven Days.

Finessart: A strategic platform that extends business process beyond four walls of Enterprise to suppliers, transporters, sub-contractors, warehouses, sales team and multi-tier distribution network. It also help Banks/NBFC's help fulfill the lending and cash flow needs for the participants. For Bank, the risk goes down as soon as they have access to the transactions which are verified by the manufacturer there by minimizing the NPA's. For participants, they get access to cheaper credit.

THE INNOVATION

Real Time Flood Monitoring & Forecasting (ReFORM) by Arteria Technologies - Developed in cooperation with SAP Co-Innovation Lab. The flood monitoring and forecasting solution built on SAP HANA platform enables water resources /state irrigation departments to centrally monitor, analyse and forecast water flood situations Every year, flood, the most common disaster in India causes immense loss to the country's property and lives. If these floods could be predicted with a warning along with forecast of the possible magnitude of the rains by state administration, then many precious lives and property could be saved. However, many state irrigation departments still use manual process to collect rainfall, water level and discharge level data and do not have computational mechanism to monitor and predict flood situations. The departments are unable to monitor and forecast flood situation and alert the impacted regions at the right time.

THE APPROACH

The Product idea was due the calamity that had happened in Uttaranchal flash floods. Based on the social need the idea was to use the latest technologies and save human lives. Arteria Partnered with SAP to work on its In-Memory Database HANA where high volumes of data can be crunched much faster. The team was selected from either side to participate in the project and have visited various places in Uttar Pradesh along with their Irrigation department to check on the available data and various measures that can be implemented to put the idea in place. As a part of hydrology projects and IMD Government of India there are various devices which capture the data and weather forecasts that are available. So it was logical to use this data effectively and ensure that an algorithm that could iterate and forecast floods at a probability better than earlier was necessary. So the data collected over the field trips was used for this purpose and an effective way to monitor and alert the concerned was arrived at as a phase -I.



This paved the way for forecasting based on the information available. Multiple devices and approached to capture the data. This was overcome by having an intermediary server to capture various formats and then standardize the same. The willingness of the various departments to share and work on the data. This was overcome by working with them to show the benefits they would derive out of such a situation and by making them a part of the overall ownership.

The technical difficulties of various devices and the functioning due do various changes in weather and surroundings and how to improve on the accuracy that need to be addressed and work is on with device manufacturers.

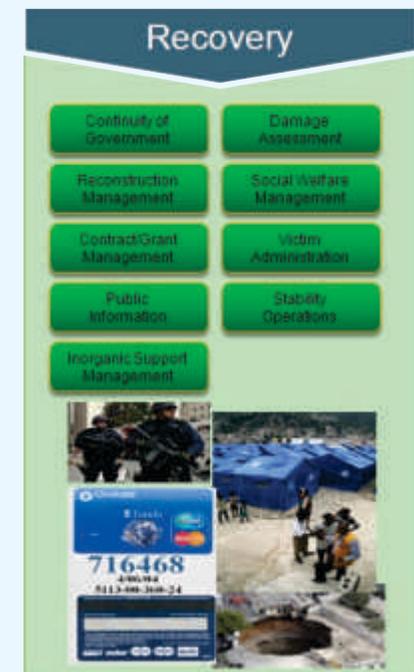
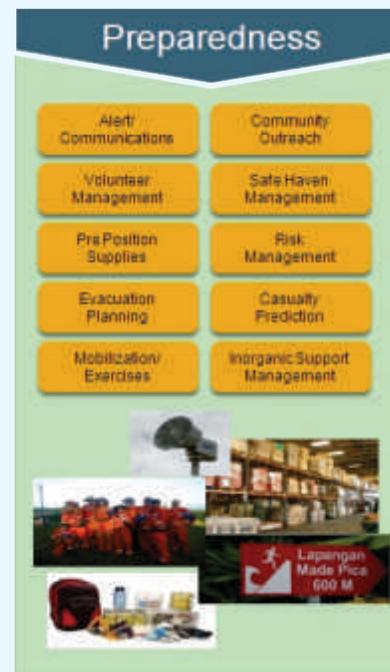
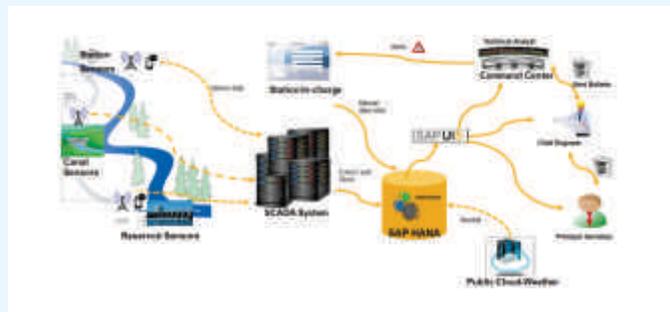
THE BENEFITS

Our solution, addresses these challenges faced by the department and provide following benefits.

- Collect - Automated data collection and consolidation of data from various sensors installed across reservoirs, dam sites and canals.
- Monitor & Forecast Monitor and Central Monitoring and Analysis of flood influencing parameters that detect flood situations. Also, forecast flood situation based on pre-defined algorithms.
- Respond automatically alert impacted regions on potential flood situations.
- Impact Minimize the loss of property and lives by accurate forecasts of flood situations and impacted geographic zones.

THE FUTURE

Arteria wants to increase the probability of Flood Forecasting to 95% and plug the infrastructure into National Disaster management and Central Water Commission systems for supporting the nation in various floods. Eventually the platform would be extended to ensure precious water is re-routed and distributed across to canal and distribution networks for better usage.





Bharat Heavy Electricals Ltd.

Embarking upon the 50th Golden Year of its journey of engineering excellence, BHEL is an integrated power plant equipment manufacturer and one of the largest engineering and manufacturing company of its kind in India engaged in the design, engineering, manufacture, construction, testing, commissioning and servicing of a wide range of products and services for the core sectors of the economy, viz. Power, Transmission, Industry, Transportation (Railway), Renewable Energy, Oil & Gas and Defence with over 180 products offerings to meet the needs of these sectors.

Establishment of BHEL in 1964 was a breakthrough for upsurge in India's Heavy Electrical Equipment industry. Consistent performance in a highly competitive environment enabled BHEL attain the coveted "Maharatna" status in 2013.

BHEL also has a widespread overseas footprint in 76 countries with cumulative overseas installed capacity of BHEL manufactured power plants nearing 10,000 MW including Malaysia, Oman, Libya, Iraq, the UAE, Bhutan, Egypt and New Zealand.

Our greatest strength is our highly skilled and committed workforce of 47,525 employees. Every employee is given an equal opportunity to develop himself/herself and grow in his/her career. Continuous training and retraining, career planning, a positive work culture and participative style of management - all these have engendered development of a committed and motivated workforce setting new benchmarks in terms of productivity, quality and responsiveness.

THE INNOVATION

INNOVATIVE PROJECT 1 AND OUTLAY:

Design and Development of CO₂ Capture System in Pilot Scale /



Rs.318.74 lakhs

ABSTRACT

Co₂ capture has been identified as one of the mission areas (MP No. 15) in 2012-2017 Strategic Plan. CTI and IGCC groups successfully developed novel membrane contactor system and tested in slip stream of APFBG syngas. Membrane contactor system showed CO₂ capture efficiency of around 95%. Based on the aforesaid results, this project was initiated to establish the Pilot plant CO₂ Capture system at CCDP. In this project, the syngas generated at CCDP will be passed through the membrane absorber. In membrane absorber, direct interfacial contact between liquid amine solution and syngas will be present; CO₂ present in syngas preferentially gets absorbed into lean amine solution (less in CO₂ concentration). The remaining



syngas after CO₂ capture will be flared. The rich amine solution (high in CO₂ concentration) leaving membrane absorber will be heated through heat exchanger. The preheated rich amine solution will be fed to stripper. In stripper, through packing structure liquid phase moves downwards and gas phase (Vapour + CO₂) moves upwards. Gas phase leaving from top of stripping column is condensed in condenser and CO₂ and liquid phase gets separated in knockout drum. The Separated CO₂ will be vent to atmosphere.

Idea Generation & Its Implementation:

Coal fired power plants are major source of CO₂ emissions. One of the way to reduce CO₂ emissions from power plant is to capture CO₂ from flue gas and use the CO₂ for various purposes. There is a need to develop efficient CO₂ capture technology which can be installed in

the power plant to cut CO₂ emissions. Capturing CO₂ via CO₂ capture technology will help power plants to earn carbon credits and meet stringent environment regulations. Traditionally available Amine based CO₂ capture plants employ tray/packed absorber column to capture CO₂. Utilizing these absorber columns for capturing CO₂ from the flue gas from boiler requires huge size of absorbers which will increase capital cost of CO₂ capture system. BHEL R&D has developed membrane based absorber which has 2.5 times higher surface to volume ratio than traditional tray and packed column. The pilot scale study have been conducted by testing membrane based absorber at APFBG and CTI facilities at BHEL corporate R&D. The pilot results indicates that CO₂ capture efficiency of membrane absorber can be >99 % and substantial size reduction/ foot print reduction can be achieved in CO₂ absorber.

Future for Innovation:

- A test facility for CO₂ capture will be set up at existing coal based power plant and slip stream from flue gas will be taken for CO₂ capture testing.
- Various experiments can be planned to reduce CO₂ capture penalty and test membrane based CO₂ absorbers.

INNOVATIVE PROJECT 2 AND OUTLAY:

Carbon Nanotube Yarn for Current Conductor Applications / Rs.220.39 Lakhs

Abstract:

Nano-materials such as pristine carbon nanotube (CNT) possess excellent properties like electrical resistivity 1MΩ cm, tensile strength 37 GPa and thermal conductivity 2000 W/mK. Major advantage the CNT current conductors is, reduction in weight (10-50%), better or equivalent electrical conductivity and higher (10-20%) current



carrying capacity than copper. Preparing CNT yarn by dry drawing from a highly aligned nanotube array grown by low pressure thermal chemical vapour deposition (CVD) method has been developed indigenously. Highly aligned carbon nanotubes grown on four inch diameter catalyst coated silicon wafers have been converted to 75-100 m continuous CNT yarn by a state of the art dry drawing process. This technology is first of its kind in India.

INNOVATIVE PROJECT 3 & OUTLAY:

Development of Technology and process for superconducting pole coils / Rs.775 lakhs

Abstract:

EMC lab working on 200kW HTSC motor and proposed to take 5MW/8MW HTSC motor. The motor research program has to be concentrated on manufacturing and testing of pole coils using state-of-the-art HTSC wire / tape. We tried to import HTSC coils from the wire manufacturers and other, which were very expensive, almost double the wire cost. EMC is proposing a new technology, involves importing the raw material and making the HTSC pole coils. The pole coils are measured for performance at cryogenic condition after the final assembly. This is useful for 200kW and proposed 8MW HTSC motor, and will offer large amounts of cost saving and time cycle reduction.





Carborundum Universal Ltd.

Industrial Ceramics Division

CUMI Industrial Ceramics was established in the year 1991 at Hosur for manufacturing of High Alumina Technical Ceramics for diverse industrial applications. Among the various products manufactured by this division, one of the important products is metallized alumina cylinders used in the electrical industry for High and Medium voltage power distribution. CUMI decided to focus on the above product line as a part of its aggressive growth strategy in the year 2007-08. An investment was made in a state-of-the-art manufacturing facility with imported equipment for a capacity of 50,000 nos per month of metallized ceramic cylinders for Vacuum Interrupter applications. Products manufactured from this new facility is qualified by major Vacuum Interrupter manufacturers across the world.

THE INNOVATION

To meet the growing demand for this product in the domestic as well as the export market, the team worked on several improvement initiatives to discover additional capacity in the existing plant. The improvements were undertaken in a very structured manner and in line with a simple innovation framework for driving process initiatives. The approach was analogous to the Russian Matryoshka doll, the volume is effectively utilized by packing progressively smaller sizes within the next larger size of doll. This innovative methodology was adopted in optimally nesting together the metallized alumina cylinders in the furnace which aided in better volume utilization. This also helped in a significant increase in production capacity, reduction in lead time and reduction in production costs. All the innovations deployed in the key business processes in CUMI Industrial Ceramics division were focused on customer centricity. With the above innovations CUMI is currently the second largest producer of metallized ceramics in the world and with further improvements, geared to be world's largest producer of this particular product line.

THE APPROACH

There was a need to innovate in every stage of the process to meet the sudden surge in the market requirements for metallized alumina ceramics. In the metallized ceramics plant, the strategic priority was to improve the capacity of the plant to meet the growing demand from the market. To realize this, the innovation council translated this problem into a set of more granular issues and deployed it to the various levels of the plant management team. The inputs received from various levels of the teams were categorized as simple shop floor kaizens and breakthrough innovations and set priorities to work on respective innovation ideas. The teams subsequently prepare a



charter to keep track of the program implementation with a cross functional approach. This ensures smooth transition of the

innovation idea into a reality in the shop floor at defined timelines.

THE BENEFITS

CUMI is the only producer of metallized alumina ceramics in India. This has helped all the leading producers of vacuum switch gear manufacturers in the country including Bharat Electronics Limited, ABB, Schneider, Toshiba and others.

In other words, CUMI has contributed significantly in improving the competitiveness of the Indian Electrical Equipment Industry. Setting up this unit has also contributed in creating job opportunities for around 300 people in and around Hosur and Bangalore. It has also provided opportunities for skilled manpower in ceramics, chemical, mechanical, electrical and several other disciplines. The various improvements undertaken in the plant have resulted in benefits like water conservation, energy conservation and fuel conservation.

THE FUTURE

Based on the success of the current innovation program, the team is preparing to implement further innovations in the existing plant as well as in the new line which is being set up with assets acquired from a leading international competitor from Japan. There will also be horizontal deployment of innovations to create better competitiveness in this business and the team will set for taking up larger strategic priorities.





Efficient Always

Cotmac Electronics Pvt. Ltd.

Cotmac Electronics Pvt. Ltd (CEPL) was incorporated in 1992 and is a part of 'COTMAC GROUP'. They are one of the leading Solution Providers in the field of plant intelligence and industrial automation. Cotmac offers its customers sector-specific, integrated total solutions. Cotmac Electronics has proved its efficiency by offering innovative solutions and services in Industrial Automation using DCS, PLC's, Drives and CNC's for various application in industries. Their manufacturing division makes Onsite Gas Generator(Green Gas) which is the replacement of oxyacetylene with safe and economical hydro-oxy gas. Cotmac is ranked 14th amongst the Top 50 System Integrators in the World in last year Control Engineering USA Magazine

THE INNOVATION

Cotmac have developed high capacity gas generators that converts distilled water into an oxygen/hydrogen fuel gas that is created on demand, as required by customers. Hydro-oxy soldering is very safe, clean, effective and economical. Hydro-oxy is light in weight so even a leakage in gas is risk free. It can connect 10 to 100 torches on a single machine and it reduces combustible gas inventory, eliminates cylinder transportation & handling also is Convenient and has dependable gas supply so makes this innovation highly beneficial.

THE APPROACH

Cotmac observed that most of the unorganized industrial sectors were using the domestic LPG cylinders for brazing, soldering, cutting etc. They were also aware of risk and danger in industries due to storage and use of highly pressurized fuel gas cylinders (LPG and DA). The problem was serious in jewelry industry since most of jewelry manufacturing industries in Mumbai operate in congested and closed shop with very high risk of gas leakage and accident. . They thought of generating a product which should be portable and generate gas only when required without storing anything. The challenge was to make low cost product without compromising safety. By overcoming many technical challenges they developed AG1000 model and found that torches available in market are only suitable for LPG gas and performance of their machine was not satisfactory with standard torches. After close interactions with various operators they developed user friendly, handy, light weight and aesthetically good torch. To give further comfort to operators, they replaced rubber piping and developed our own solutions for machine, torches and piping system. Clients and operators were reluctant for change so we were forced to carry our products at each place and conduct demo. Later Cotnac developed few more models of different capacity like AG500, AG2000, AG3000 & AG4000 to target various industrial customers.

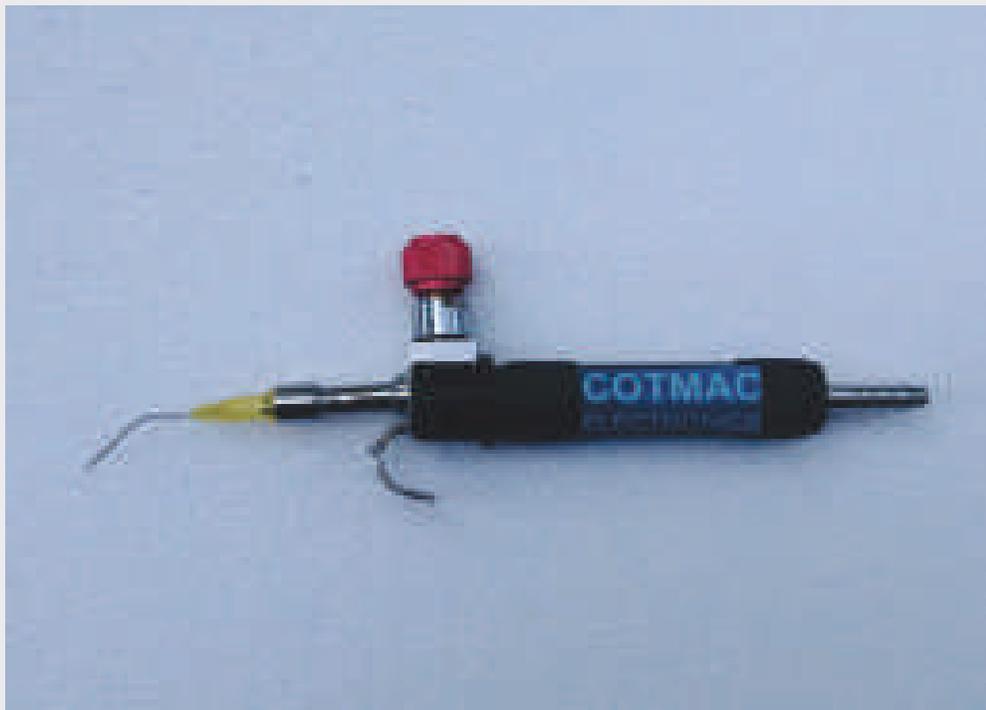


THE BENEFITS

It reduces combustible gas inventory and eliminates cylinder transportation & handling. It has Convenient and dependable gas supply which provides price stability. It reduced post brazing cleaning and increased productivity. It has high purity, clean burning flame, Highly focused heat, smaller heat affected zone, environmentally friendly The innovative gas generator product has better margin so it has helped us to improve overall gross profit. The gas generator have saved more than 10000 LPG gas cylinder per year used in jewelry industry.

THE FUTURE

Cotmac started within Jewelry applications which include Gold, Silver & Fashion Jewelry industry and later they aimed to reach various segments of industries for its day to day applications like Profile cutting, Welding, Brazing, Soldering, Heating, Flame Polishing and Annealing. Cotmac is creating awareness through several marketing & promotional activities like presentation, seminar/trade fair and at site working demonstration among the Industrial users of LPG & DA about the uses & utility of their product as cost effective, safe and pollution free alternative fuel gas. They are in the verge of building up a dedicated team comprising a group of marketing and technical professionals to forward Aqua Gas into the next level to have its own positioning in the domestic as well as global market, for further sustainable growth during the next 3 years. They are exploring possibility of replacing LPG in hotel industry and as fuel for DG sets.

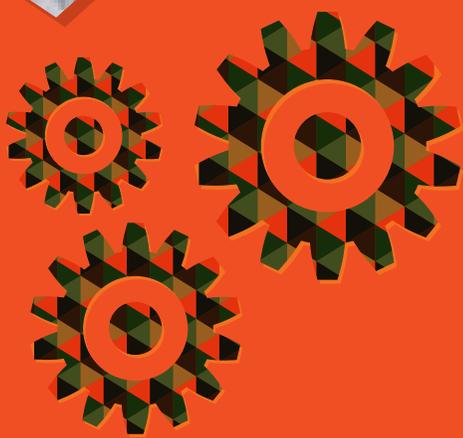




Efkon India Pvt. Ltd.

Incorporated in July 2001, EFKON India Pvt. Ltd. is a fully owned subsidiary of Strabag SE, largest infrastructure company of Europe. EFKON specializes in Intelligent Transportation Systems for SMART CITIES and SMART HIGHWAYS including Advanced Traffic Management & Electronic Enforcement Systems, Revenue collection systems and Logistics Management Systems.

EFKON's solutions have been implemented over 50 projects in India and ensure smooth traffic flow and save hundreds of lives on Indian roads. EFKON's Revenue Collection System designed for hassle free toll payment, ensure that road users have a smooth and comfortable road journey. Our Advanced Traffic Management System aims at saving lives by providing real-time traffic information to road users and thus, planning the journey in advance.



THE INNOVATION

EFKON ATMS (Advanced Traffic Management System) is a comprehensive system for effective highway monitoring, incident and congestion management and speed enforcement/challan generation. It aims to identify & mitigate the potentially fatal scenarios and save lives. The platform is successfully delivering on the objectives of monitoring roads on 24X7 basis with automated intelligence to ensure error free and quick response for rescue of accident victims within GOLDEN hour. In all the cases, rescue service is dispatched within 45 to 60 seconds of an accident being reported/ spotted and many lives are saved every month. Also, it aims at inculcating better driving behavior by identifying & challaning the violators.

The system is composed of 3 modules viz.

- a. B-SMART solution- It is a control room application for identifying & mitigating the potentially fatal scenarios on highways.
- b. DRIVESMART mobile app - A road user mobile app for road users, for advance journey planning & incident reporting to control room.
- c. N-FORCE system- Non intrusive speed enforcement system for enforcement agencies (RTO etc.) that generates challan on identifying a violator.

Various subsystems such as VIDS (Video Incident Detections System), Speed Enforcement System, CCTVs, Emergency Calling Booths (ECBs), Meteorological (MET) systems and Variable Message Signs (VMS) work in tandem to develop a 360° approach for reducing road accidents and ensuring smooth traffic flow. These sub-systems detect incidents/events and send them to the control room where the B-Smart application processes these events based on the Standard Operating Procedures (SoPs) and notifies the concerned stakeholder (Police, Ambulance, clearing services etc.) for prompt action.

The Drivesmart mobile application allows road users to plan journey in advance, check weather conditions, accidents, events, view real-time highway images and locate utility services such as hospitals, restaurants, petrol pumps etc. With its "Plan my trip" feature, the user can select their entry and exit points to find out for congestions/jams in advance. Also, they can use an emergency call option provided in



app to report to the control centre about any mishap/accident by just a single click.

This N-force system for the enforcement agencies generates challans for over-speeding. With an android based user interface, the police can issue challan on-road or off-road (at control room).

THE APPROACH

Every year more than 1.5 lakh people die in road accidents, which is more than 10 % of total road deaths happening annually worldwide. EFKON wanted to make a difference to these numbers.

For us, safe roads mean prevention and mitigation of accidents. Prevention involves identification of potential situations which could

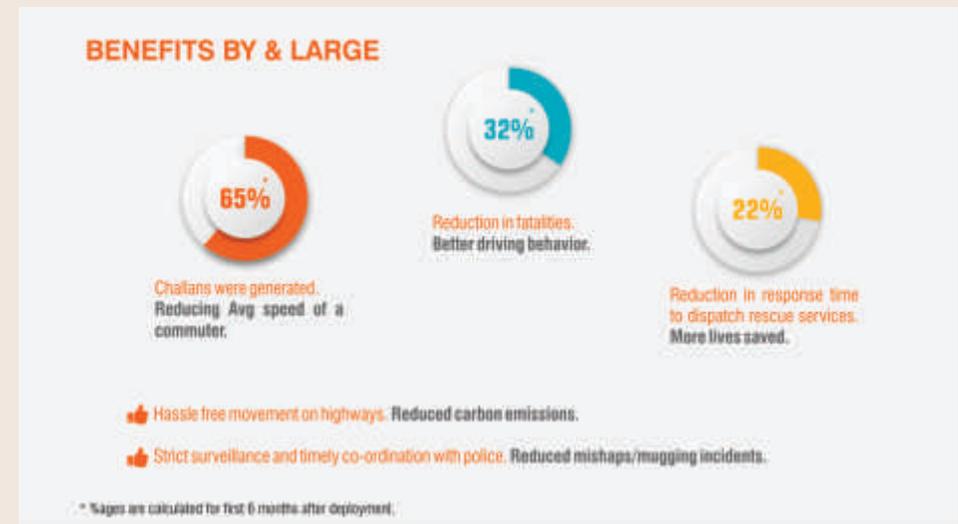
turn into incidents and thus, mitigating the same. In the extreme event of an accident happening, we wanted our system to reduce the probability of fatality and thereby making the roads more forgiving.

An extensive discussion with road users was done to understand their expectation and vision of a SMART HIGHWAY. The system had to comprise state of the art, sensors that could automatically identify potential causes of incidents. A classic example of such sensors would be a meteorological data station giving inputs on visibility conditions or a video based incident detection system that can identify a stopped vehicle or a vehicle moving in reverse direction. Post identification of the accident, every second is precious as the likelihood of survival goes down with every passing second. At this point EFKON closely looked at the operator functions like data input forms, response time to identify relevant stakeholders and sending the appropriate messages. And thus was developed a user friendly web portal and a mobile app that would keep the users posted on the various updates. The app and the portal are highly customizable and the users can use it to receive updates that are of interest only as per his travel patterns.

THE FUTURE

This innovation is a first step towards developing systems that are “service level based” rather than “technology-compliant”. This helps us to measure the key performance indicators (KPIs). The next big move would be to adapt the ATMS to a complete urban scenario and integrate more subsystems like traffic signals, patrol vehicles, distress call centers etc. The main focus would be on creating information wealth that can be very useful to the road user. Integrating our ATMS solution with traffic violation rules such as not wearing helmets/ seat belts, PUC compliance, insurance compliance etc. with non-intrusive methods is how we envisage our product. Another major area of work we envisage is linking all the traffic related databases starting from vehicle registrations to compliances like pollution, insurance. This would ensure a more foolproof system that would create a symbiotic atmosphere between all stakeholders.

With the integration and collation of the data, we would intend to develop engines that would make possible harshly penalizing habitual offenders and create a sense of respect towards the traffic rules.

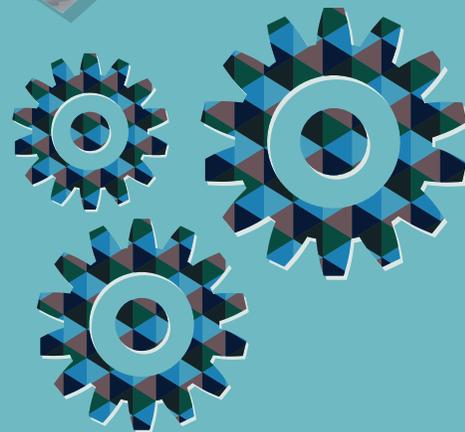


<h4>STAKEHOLDER BENEFITS</h4>	<h4>N-FORCE</h4> <ul style="list-style-type: none"> • Mobile based Challan generation • Minimal manual intervention • Bring down bribery and citizen harassment • Inculcating a sense of responsible driving
<h4>DRIVESMART</h4> <ul style="list-style-type: none"> • Real-time highway image • Advanced information about traffic jams/congestions • MET details- ambient temperature, Road surface temperature, wind speed etc. • Locating utility services before hand (petrol-pumps, hospitals, restaurants etc.) • Hot button for incident reporting • Compatible to all major mobile OS • Web portal also available 	<h4>B-SMART</h4> <ul style="list-style-type: none"> • Incident monitoring and accident management • Reduce congestion and delay on roads • Notify concerned stakeholders • Immediate rescue services • Reduces operations and maintenance costs • Reporting module for equipments and incidents • Safe and secure traveling experience for the road users



Elcome Integrated Systems Pvt. Ltd.

Elcome Integrated Systems Pvt Ltd was founded in 1978 and has been providing yeoman's service to the Navy, Coastguard, Army and Air Force, in delivery, installation and repair & maintenance of electronic systems. It comprises electronic equipment including Navigation, Communication, Machinery Control, Ship Safety, Satellite Communication, Radars, Sonars and Homeland Security Systems etc., and customized solutions. Main work areas include Hardware design of PCBs, Modules and Equipment, Software design, GUI based and embedded, Interface planning and solutions, customised end-to- end solutions, Testing and Repair of PCB and Third Party project management.



THE INNOVATION

Warships need to keep a continuous track of their positions at sea on a paper chart, besides the information on electronic media provided by the ECDIS and GPS. For the last 65 years, this was being done using imported equipment. The foreign equipment is low-tech, outdated and inefficient. Elcome identified this customer's need and started development of Marine Auto-Plotter as a technically novel substitute for the imported one in 2013. Such a feature is particularly useful in anti-submarine warfare, wherein the motion parameters of underwater targets can be computed based on passive sonar detection alone. Unique, unconventional and ground-breaking innovative achievements in this project are: a) 100% indigenous. b) Software to correctly compute the position of a ship on earth's surface at any latitude. c) General Operations Plot (GOP) and Local Operations Plot (LOP) capability. d) Supporting ASW tactical plotting for computation of target motion parameters, not achievable by ECDIS. e) Innovative electronic suite, simplicity of design, minimum maintenance requirement, very user-friendly. Above all, this 'Make in India' product eliminates the need for import. Elcome's innovation provides a fully functional, ergonomic and cost-effective solution with assured availability and local support.

THE APPROACH

The Marine Auto Plotter's function is to facilitate periodic plotting of own ship position on a nautical chart. The market potential of this equipment lies in its inevitable need on all warships. Elcome had the domain knowledge of geographical charts and plots, as well as the skills necessary to design and manufacture this product. The developmental activity was initiated by assimilating the technical and operational requirements promulgated by the Navy in the form of Statement of Technical Requirements (SOTR). Elcome broke this SOTR down to sub-tasks and prepared the System Requirement Specifications (SyRS). Hardware selection was the next logical step, to identify components with the desired positional accuracy. The



next step was to select the software development environment. Linux Ubuntu was selected and a flow chart was prepared for each activity. Software test plans were generated for simultaneous development and testing of modules. A versatile serial interface was implemented in the software to ensure interfacing of Log, Gyro and GPS. The interfaces were proven by simulation, for which sensors' simulator was also designed. The prototype so developed was then handed over to our expert team for the Independent Verification and Validation (IV&V) process.

THE BENEFITS

The specific benefits would be assured maintainability and immediate product support. Flexibility to customize and seek additional facilities and features in the system. Import substitution. Thus, on all counts, the customer stands to benefit from this innovation. Benefit to Industry they Operate In. 'Make in India' is the new mantra for the Industry,

propagated at the behest of the Hon'ble Prime Minister, with 'Defence' being one of the major areas of focus. THEIR innovation is a shining example of 'Make in India in Defence'. The technology developed by us is new and it adds to their reservoir of available technologies. Since their Marine Auto Plotter is a defence product, in terms of indirect benefit, over the long term, by virtue of contributing to growth of the domestic Defence Industry, both through domestic consumption and exports, society is likely to benefit from its economic outcomes.

THE FUTURE

The primary objective of embarking on this project was to design, develop and produce a robust Marine Auto Plotter, with the Indian Navy as our prime customer. The secondary objective was to provide a totally indigenous system, thereby obviating the need for importing it from a single foreign source, resulting in saving of foreign exchange. The fact that the Indian Navy, post exhaustive trials over one year, has found the equipment meeting their requirement in entirety, reinforces the confidence that we have in our design and development capability of a product, right from conceptualization to its delivery. Once the Indian Navy initiates its acquisition process, the next logical step for the company would be to position our Marine Auto Plotter in the international market, since it is a mandatory fit for naval warships the world over. The next progression will be to plot it on an electronic chart on LCD screen. It is noteworthy that this would be different from ECDIS, in that it would have additional tactical facilities for contact motion analysis, manual fixes etc., and can thus become an aid for the Combat Management System (CMS).





JK Lakshmi Cement Ltd., SIROHI

JK Lakshmi Cement Ltd established in 1982 is a member of JK Organization (Eastern Zone), which is one of the largest privately owned industrial groups in India and is having it's Corporate / Head Office at Nehru House, 4 Bahadur Shah Zafar Marg, New Delhi-110002. JK Lakshmi Cement, an ISO9001:2000; ISO 14001:2004; OHSAS 18001:2007 and ISO 50001:2011 certified company. JK Lakshmi Cement is a well known company for in-house innovations and the least cost producer in Indian Cement Industry. Company is pioneer in the innovative initiatives like generation of Waste heat power, around 12MW, utilization of PetCoke, utilization of alternative fuel like biomass, pond fly ash drying, and hot air recirculation. All kilns are here two to three decades old but the efficiencies are at par with the latest plants and the results motivate to continuously strive for improving the plant efficiency. We have won various accolades in the area of Productivity, Safety, Energy Management, Human Resource Management, Corporate Social Responsibility, and

THE INNOVATION

1. Hot air recirculation

Installation Of hot air recirculation system in cooler to increase green power generation @ 8500 units /day. In house Brain storming sessions to optimize green power generation from WHR system evolved the concept of hot air recirculation. This type of installation is one of the unique concepts in the cooler to improve heat input to the boiler. The recirculation of cooling air allows increased available heat at constant flow or additional flow at constant temperature, respectively. With the use of waste hot air having temperature 110-130 Deg.c to the cooler in kiln-1.

2. Fly ash Drier

Domestic demand of PPC was increased during last few years with Non availability of Dry Fly, forced them for wet fly ash usage to cater increased PPC demand. Specific power consumption of Cement Mill section has increased because of wet fly ash usage. Above 20% usage of Wet Fly Ash has resulted in Operational trouble. Hence, the need of wet fly ash drying system has arisen.

Benefits . Increase in fly ash consumption from 20 to 22 % . Increase in Cement Production 0.706 LTPA . Reduction in power consumption 0.5 Kwh/ton of cement . Reduces emission of hot gases in the environment thus help in prevention of “global warming”. Cost Benefit Analysis (Rs/ annum) Contribution from increased cement volume 565 lacs Power saving 84 lacs Total benefit for one year 649 lacs Project Cost 899 lacs Pay back Period 16 Months

THE APPROACH

JKLC the ,major innovative projects like “waste heat Recovery system “ and Fly ash Drying were the results of the ideas generated by the team of JKLC together. The reason behind the idea generation and its implementation is Hot Air Recirculation system Idea



generation and Implementation as They are already generating the green power by Waste heat recovery system, but in order to further increase it the thinking process were going on and idea was conceived to go for Hot Air Recirculation, where the vent hot gases from cooler stack will be re-circulated in the cooler in order to increase available heat to WHR boiler. While going for this idea it was always a major concern that let not to increase the clinker temperature. The proactive approach of the team helped us a lot to identify each hurdles associated with this project and they could mitigate those hurdles in smoother way and it was the result of our idea generation only that at present we are among the few organizations which have succeed in this project. Als, Dry Fly Ash System The team of JKLC takes any hurdles as a challenge. Due to non availability of dry fly ash and high demand of PPC in the market, it was a major concern for the team of JKLC to find a solution for the dry fly ash availability. The team did a lot of brain storming and an idea was conceived to go for Dry fly ash system

THE BENEFITS

In the face of growing concerns about global warming, Global Warming is the increase of Earth's average surface temperature due to effect of greenhouse gases, such as carbon dioxide emissions from burning fossil fuels. So it's our prime responsibility to reduce GHG and uses of primary energy sources. Hot Air Recirculation System installing Hot air recirculation system we have reduced 3701 TPA CO₂ emission through generating green power. Fly Ash Drier By installing Fly Ash Drier System we have reduced 8350 TPA CO₂ through drying of wet fly ash by using waste heat of cooler vent gases..

THE FUTURE

In JKLC the future of any innovation done till date is accountable and the innovative team always want to accelerate it further in future. They have done a lot of innovative projects in JKLC during last so many years, but due to the word limit we are focusing on some of the major innovations for the future perspective. "Future of Hot Air Recirculation" Project. One of the best innovations done in JKLC is the "Installation of Hot Air Recirculation from Vent stack to cooler" to improve the green power generation through Waste heat recovery system. This was an idea which has been recognized both at India and World level platform.

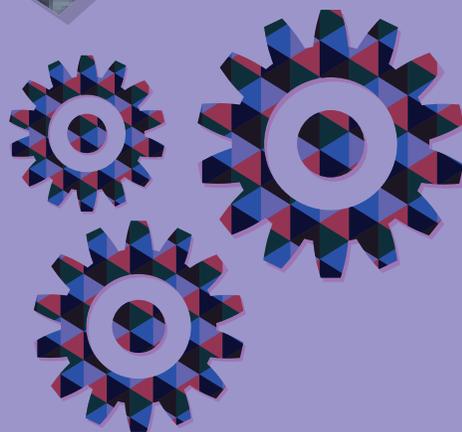




Jyoti Cero Rubber

JYOTI CERO is an ISO-9001-2000 certified company. The result is a unique product launched under the production facility known as "CERO RUBBER" Tata Steel Ltd, Jamshedpur.

Jyoti Cero develops the products as per working environment and requirement of machineries to achieve the maximum satisfaction for our customer and always aim to improve the quality with the help of in-house R&D and adopt new technology to meet the customer requirements & specification whilst increasing the productivity. The use of rubber is widespread, ranging from house hold to industrial products, entering the production stream at the intermediate stage or as final products.



THE INNOVATION

New Innovation (Coil Edge edge protection) Customer - Tata Steel
Project scope To carry out improvements in the coil

packaging activities to avoid surface damages during transit via Rail or Road. Issue of Surface damage in wire rods Suspected causes for Surface damages Abrasion between coil to coil end faces (edges). Abrasion between body of two coils. Abrasion between coil end faces / body with the wagon bed and sides. Hence, there is a need to maintain Physical separation between: a) Two coils b) Coils with wagon bed / walls and the trailer beds c) Lashing chain and the coils on the trailer - Keep use of metallic chains to a minimum. Towards deployment of the Solution: they have inhouse research and development and develop Coil packing Strap of best suitable quality for coil packing after successful trail we have signed a MOU with Tata Steel and supplying the same with excellent results. This new product “ Coil Edge Protection” has replaced conventional packing strip of made by rejected conveyor belts.

THE APPROACH

In India a study has been done and estimated that approx 36000 crores losses occur per annum because of tribology problem. The report was the key factor for Jyoti Cero to enter in this area. They have done an extensive study in the eastern zone where Steel industries, mining industries, cement industries, Power Plants are situated in good numbers and good opportunity is there. Their USP is to develop the products as per working environment and requirement of machineries to achieve the maximum satisfaction of our customer and always try to improve the quality with the help of in-house R&D and adopt the new technology with little modification to suite our requirements to meet the customer requirement & specification to increase the productivity. Approx Rs. 36,000 crore per annum loss due to wear and abrasion effect is estimated in Indian



Industries. Their mission is innovate to protect the abrasion effect and for that before start the manufacturing of product. they gather all information for working environment and our professionally managed group of technocrats visit the site and collect the information of previous used product on existing machineries and analysis the existing life. Thereafter they discuss with the designing and R & D people to finding the solutions and innovate against the wear and abrasion problems to enhance the life of machineries.

THE FUTURE

Their slogan is “wear is unlimited ...Jyoti Cero brings it within limit” and Motto is “Innovate to enhance the life” Our Product “Coil Edge Protector” is having a great success story. it is used in final material during transportation it is used as packing material and it is reduced damage up to Zero percent. , customer get benefits and generate

revenue. Apart from this, they have planned to establish Dealers also for the valuable and successful marketing for the Product. Training to our Marketing team for continual improvement is to be benchmarked. As they put all effort and focus on to the market strategies and also to upgrade the continues changes, demand and R& D Obtain financing to expand manufacturing capabilities increase distribution and introduce new product lines .. Developing new tools of marketing. Like web site, twiter, youtube promotional program at customer site. Maintaining strong relationships with our customers. Thier all the new innovations are commercialized and having 5 years MOU with our customer. They are capturing market of conventional product with our innovated product "Coil Edge Protector".

THE BENEFITS

Coil Edge protection (New Innovation) Development of a product which is used to prevention of transit damage of wire rod coils through improvement in packaging practices for the packing plant of Tata Steel.

PREVENTION OF TRANSIT DAMAGE OF WIRE ROD COILS THROUGH IMPROVEMENT IN PACKAGING PRACTICES Wire rod coil edge damage has been a nagging problem and to avoid surface damages during transit via Rail or Road, we have developed a product "Coil Edge Protection" . With guidance from Tata Steel. There were 19 accepted customer complaints against WRM-E coils in FY13 on account of transit damages. The complaints involve around 77 tons and a claim of Rs. 34 Lakhs. Suspected causes for Surface damages: Abrasion between coil to coil end faces (edges). Abrasion between body of two coils. Abrasion between coil end faces / body with the wagon bed and sides. To carry out improvements in the coil packaging activities to avoid surface damages during transit via Rail or Road. we have developed "Coil Edge Protector".





Enriching Lives



Kirloskar Oil Engines Ltd.

Incorporated in 1946, KOEL is the flagship company of the Kirloskar group. They have four state-of-the-art manufacturing units in India that offer world-class service. Today KOEL is an acknowledged leader in the manufacturing of diesel engines, agricultural pumpsets and generating sets.

KOEL specializes in the manufacture of both air-cooled and liquid-cooled diesel engines and generating sets across a wide range of power output from 5kVA to 3000kVA. They also offer engines operating on alternative fuels such as bio-diesel, natural gas, biogas and straight vegetable oil (SVO). The “Kirloskar Green Genset” is the market leader and most preferred brand among customers in the power generation and telecom industry in India. Our customized power solutions suite a wide range of applications including both standby and prime power requirements.

THE INNOVATION

MEGA T - REVOLUTIONARY FARM MACHINE - Power Tiller is one category in India which has not grown since several years due to several reasons like age old products, no engineering, lot of drudgery in the operation, complete dependent on subsidy etc. They have seen the successful example of tractor Industry which had grown to 6.5 L industry size in very less time but it is not easy to afford the tractor for a small and marginal farmer with a small land holding of 2–4 acres.

The Agri & Allied BU of Kirloskar Oil Engines has started working on Agri Mechanization path. On this journey, the team has just introduced the first product called “Mega T 15”. This is a “category creator product” with numerous user friendly features. This machine is positioned in “looks like a tiller but works like a tractor” category. This is a truly a multipurpose machine, which can be used across India in multi crop-multi soil - multi application scenario. The machine is suitable in dry land, wet land, primary & secondary cultivation. This also can be used for crop care & in field movement of Agri produce. This is the only machine with these many capabilities from a single machine. The users safety is tremendously enhanced as effortless hydraulically actuated brakes which are available on this machine. This enables user to cultivate using this machine around the difficult terrains with ease and with safety. The total usage dynamics changes, when user sees this machine with a comfortable sitting arrangement. (Otherwise he is expected walk behind in prevalent products in the market) This immediately increases his operating speed & productivity by 50%.

THE APPROACH

This started from the decision of the Company to expand its operation in Farm Mechanization vertical under our Winning Aspiration “Be the Power to Transform Lives of 50 Mn farmers by Year 2025 through Innovative Products, Technology and Delivery,”

The Process of Idea generation started as per the below process. It



started from Market research regarding Mechanization in India. The team met several customers in different parts of India and found that farmers doesn't want one more tractor in the market as there were several players already in to it. Team also found that there needs to be some mode of mechanization for the small and marginal farmer category. Findings” During market research we found that this Power Tiller Industry is not growing since several year in-spite of the Mechanization growth in India. Even tractor has eventually grown from 200 K in FY 06 to 550 K in FY 15. Also the industry of Power tillers in several other countries were more compared to India. The reason needs to be found for it. To dig more in Power Tillers, team had met around 150 customers around several parts of India and found that there is lot of drudgery in operating the conventional Power Tillers. People have to walk behind the machines in mud and other operations for several hours during the field operation. THEY have taken their views on our first proto against their conventional power tillers. They

gathered their feedback again and started working on it. Name and Positioning was for its name called "MEGA T" and positioning as "It Looks Like Tiller but Works Like Tractor" This was positioned as one of the premium product in its category.

THE BENEFITS

Kirloskar have considered to have the product to run for more than 400 hrs. of operation at customer end without any A class failure which came true. We have few of the farmers in different states who have run the machine for more than 400 hrs in one year time. MEGA T is being offered to the farmers where all major applications are covered in field compared to any mini tractor in the industry. In order to make innovation sustainable, it is necessary that the company / dealer explain all these benefits to the end customer and the user of the machine. To help this understand at the first level company had ensured the below mentioned parameters at his end.

In MEGA T, they have developed PTO which rotates at 1200 rpm @ 2000 rpm of engine. This rotary power can be used to run the stationary applications like water pumps, alternators etc. This is a truly a multipurpose machine, which can be used across India in multi crop-multi soil - multi application scenario.

- The machine is suitable in dry land, wet land, primary & secondary cultivation.
- This also can be used for crop care & infield movement of Agri. produce. This is the only machine with these many capabilities from a single machine.
- Better Physical & Social Life, Small and marginal farmers have got the best mileage out of this product. For their regular livelihood they need not have to purchase power tillers which are very risky machines to drive. They can feel the comfort of the drive and the physical pain can be released resulting in better social life.
- Farmers can get the maximum advantage in terms of productivity



which is almost 50 % more with less fuel consumption which is almost 20 - 25 % less than any conventional Power Tillers.

- The user's safety is tremendously enhanced as effortless hydraulically actuated brakes are available on this machine. This enables user to cultivate using this machine around the difficult terrains with ease and with safety. The total usage dynamics changes, when user sees this machine with a comfortable sitting arrangement. (Otherwise he is expected to walk behind in prevalent products in the market) This immediately increases his operating speed & productivity by 50%.

In addition to this KOEL has also extended special efforts to cater farmer's financial needs by the way of retail finance tie ups & product enlisting with majority banks like SBI, BOI, BOM, DCB, IDBI, RBL, etc.

L&T Electrical & Automation

The businesses of L&T Electrical & Automation comprise low and medium voltage switchgear products, electrical systems, energy meters and automation solutions. Its products and solutions address the power distribution and control needs of segments like industry, utility, infrastructure, buildings & homes and agriculture. A major strength of L&T is its in-house design and development centre for switchgear as well as a tooling facility that designs and manufactures a wide range of high precision tools, a pre-requisite for high quality products.

THE INNOVATION

Development of AU-Series of final distribution products is an example of innovation blend into product design. Through deeper understanding of actual & latent customer's need, several 'first time in industry' features have been developed with patented (filed) techniques in the product design. These features offer increased customer convenience and unmatched energy saving potential for long term sustainability. It has Fault identification which is when a product trip & protects the installation due to an electrical fault, it is very important for a customer/end user to identify the type of fault. AU products are first of their kind in the World that are capable of differentiating between overload, short circuit and earth leakage faults through a unique design. The multi-pole MCBs can also detect which phase has seen the short circuit faults. This feature gives a lot convenience to end user (especially installations with concealed wiring) for easy detection of fault and minimizing power outage. Minimum Power loss, where design has helped in optimizing the current carrying path and joints, thus reducing power loss substantially. This can lead to large energy saving, considering the millions of MCBs being used across the country. This is in line with our endeavor to strive towards sustainability and a greener tomorrow. The AU-Series of final distribution products combines both conventional and intelligent system solutions in the areas of distribution, protection, control & monitoring, communication that can be integrated with building management systems. AU-series ensures highest level of safety to the end user and total reliability to installations.

THE APPROACH

L&T uses techniques like creative problem solving process, green hat sessions, brainstorming, innovation workshops etc. E&A's Product Development System (EPDS) implemented since 2005, is a robust product development and management system to carry a product idea all the way through to the market. They have been achieving a



New Product Index (Sales of new products introduced in the last 3 years as a percentage of total sales) has been consistently at around 30% for the last 5 years. The structured innovation process (iP3) facilitates experimentation with ideas pertaining to our processes, business model and delivery mechanism etc. A number of projects are taken up by teams across locations in initiatives based on ideas generated by employees, to improve resource utilisation

and enhance operational excellence. As result over 60% of their employees are involved in working on new ideas across different functions and locations. Every product in the range is unique for its application. Having common features across all products was a major challenge. These products are for mass market, volumes are high. Designing features suitable for ease of manufacturing was a challenge.

THE BENEFITS

AU-Series of final distribution products helps in Minimizing power loss. Differentiating between fault types Wiring process in Accuracy of wiring - Accuracy of routine of wires Impact Extrusion innovation: Three dimensions per protrusion i.e. two on diameter measured at 90. and one on height. Low cost communication solution for customer. It has Unique Short circuit fault indicator. Hot calibration for large production.Helps in Processing of new high end plastic materials. Also, has Low power loss breakers Lowestpowerloss in the segment thru AU-Series is a green initiative. Apart from the stress of working out the charts & finding the exact length, ferrules, lugs being eliminated by introduction of innovative wiring, the scrap percentage of wires has gone down. Thus helping in saving the prestigious natural resources.

THE FUTURE

The new set of innovative features in AU Series can be extended to future series of products. Wiring process innovation can similarly be extended to other product assemblies like 33kV AIS, 11kV and 33kV GIS and other similar product assemblies. The impact extrusion based manufacturing technique developed can be further extended to different grades of materials, various geometries, etc. It can be tried in different products to take the advantage of reducing the number of components and assembly time, thereby improving the material utilisation.



Manatec Electronics Pvt. Ltd

MANATEC is an ISO 9001 certified organization, located in Puducherry, on the East Coast of South India. Established in 1987, MANATEC started to manufacture the Industrial shaft alignment systems for Industrial applications and later in 1991, the Automotive Garage equipment manufacturing division was started.

MANATEC is an R&D organisation recognised by DSIR. MANATEC has designed and developed the following products through its In-House R&D for Automobile Garages:

1. Computerised Wheel Aligners & Wheel Balancers for both LCVs and HCVs
2. Pollution Checking Equipment for both Petrol & Diesel Vehicles
3. Head Lamp Aligners & Automatic Tyre Inflators
4. Online Alignment Projects for Vehicle manufacturing Lines

The above products have been successfully commercialised and the company enjoys 30% market share in India besides Exports to 50+ countries.

The R&D division is a 50 member team having the best infrastructure to design and develop products involving Electronics, Software, embedded, Mechanical, optical technologies and supported by latest Testing and validation facilities.

Besides ISO 9001-2001, the company's products are CE certified and ARAI approved as applicable.

THE INNOVATION

Modern Alignment bay uses different types of Lifts to facilitate under vehicle service. MANATEC's unique Fox3D AutoBoom uses an innovative method of controlling a Motor driven Camera beam using intelligent software to track the movement of Target plate mounted on the vehicle and positions the Camera assembly to respective height automatically while the Vehicle is lifted during alignment sequence. This enables the operator to service underneath vehicle during the adjustment phase of alignment without any human intervention to set up the Lift or Camera. This innovative feature eases operator efforts, thereby reducing additional resource and cycle time. Hence this Model is compatible with different types of Alignment bay.

Videographic Wheel balancers in market were DOS based balancing programs with limitations in graphical representation & user friendly interface that indirectly leads to tedious balancing procedures & long cycle time. MANATEC launched a unique Videographic Wheel Balancer that runs on Linux platform, a stable Open source with flexibility to customize according to their application. The graphical representation helps in optimizing the balancing sequence that indirectly contributes to reduce balancing cycle time. Linux compatible Single Board Computer is a revolutionary hardware that comes in a credit card size with built-in Memory modules and Graphics card. This Single Board Computer delivers video output in High Definition format. Multi-lingual balancing program facilitates usage across the continent.

Engine RPM measurement is one of the important requirements for checking the Pollution of Automotive vehicles. The RPM is measured by various methods like using Tachometer by pasting a sticker on the pulley using Piezo clamps on the Fuel injection pipes, measuring AC ripple signals on the battery terminals. MANATEC has come out with an innovative way of measuring the Engine RPM using Accelerometer that measures the changes in gravitational acceleration. MANATEC used this method to measure the vibration in



Engine which corresponds to Engine RPM which in turn has got a direct relation to the power stroke of Engine. Another highlight of this innovative module is the ease of use by sticking the magnetic probe just on the surface of Engine.

THE APPROACH

The approach is to replace High cost imports with affordable indigenous products.

- MANATEC focuses on developing Garage equipment which is user friendly for less qualified Mechanics.
- Make service easy and spares affordable.
- Design products ruggedly for garage environment.
- Be reactive to the ever changing Automobile field.
- The products are for Safety, Cost saving (tyre life) and Environment



THE BENEFITS

The products developed by MANATEC have benefits of Safety, Environment and Cost.

1. The Wheel Aligners and Balancers increase the road safety when today's vehicles are running at high speed.
2. Wheel Aligners and Balancers reduce tyre wear and increase the tyre life resulting in cost saving and environmental pollution.
3. The Pollution Checking Equipments helps in measuring pollution levels in the exhaust of automobile.

THE FUTURE

MANATEC plans to develop Modern Service Station Equipments which will replace imports, save cost and time. The specific plans are to develop:

1. Muti-Axle Truck Wheel Aligners using 3D technology for simultaneous wheel alignment of Multi-Axles (will be Patented)

2. Space saving Wheel Aligners for LCVs with Cameras fitted on to the Lifts (will be patented)
3. To develop the most advanced Touchless Wheel Alignment System in the world where the Digital Camera can tell the wheel alignment angles of the wheel just by seeing the wheel and its profile (will be patented)
4. Indigenous Gas Bench for 4 Gas Analyser
5. AC Gas Charging equipment for effective servicing of automobile air conditioner systems



Max Life Insurance Company Ltd.

Max Life Insurance Company Ltd. (Max Life) is a joint venture between Max India Ltd. and Mitsui Sumitomo Insurance Co. Ltd. Max India Limited, is a multi-business corporate, driven by the spirit of enterprise and focused on people and service-oriented businesses. The group's vision is "To be one of India's most admired corporates for service excellence - in what we do, how we do it and the positive impact we have on society and our stakeholders." The company has constantly strived to deliver value to its customers focused on advice based sales and quality service. Max Life delivers its products through a diversified distribution model and reaches more than 1,000 Indian cities & towns with its own branch offices as well as through its multiple distribution partners. The distribution model is based on three pillars - Agency Distribution, Bancassurance and Partnership Distribution. Out of these three distribution channels, Agency distribution has been and remains the core distribution channel with a strategic long term focus.



THE INNOVATION

Maxis 2020 is a complete transformation program designed for Max Life's bancassurance distribution channel with Axis Bank. The program is credited with many 'firsts' for the Axis-Max Life partnership, such as the 1st tripartite IT development (Axis Bank, Max Life, Cognizant), 1st co-located analytics engine development, 1st joint product innovation workshop, and the 1st multifunctional transformation between Axis Bank and Max Life. The program was developed to enhance Max Life's performance, in the Axis Bank channel, across multiple fronts comprising various innovative initiatives such as the mSales and mApp applications (jointly called Esales - an end-to-end digital sales process) and their ability to pull information from the bank's Core Banking System, use of analytics to generate customer leads that have a higher probability of conversion, input focused governance mechanism supported by technology for review tracking and recording, and the overall integration with the Axis Bank technology platform to create a well integrated eco-system. The program has also led to a significant increase in mind-share from the Axis Bank management team, as well as from the sales lines (both Axis and Max Life). Sales line is excited to have a process that makes the selling process smoother by having a guided journey that ensures minimal errors on their part. Moreover, digital issuance has enabled them to significantly reduce document requirement and errors thus reducing issuance Turn Around Time significantly. They can now issue a policy within a few hours. The goal is to increase adoption such that we can completely migrate to a digital, centralized selling model thus doing away with the additional costs of the current decentralized model.

THE APPROACH

In its first phase, the Max Life - Axis Bank relationship had generated significant benefits for both partners. However, a benchmarking exercise conducted to identify opportunities for further enhancing this partnership highlighted some gaps against best-in-class competitors, mainly in terms of life insurance penetration among the bank's customers and in terms of digital integration. Thus was born



the Maxis 2020 program. Prior to detailing contours of the program, the core team (led by the CEOs of both organizations) laid down its key objectives: Ensure 'right-selling' through a need based approach Build long term capability, increase earning potential and enable long term sustainability in the job. Build reputation as a high quality bancassurer, improve regulatory compliance of sales process, increase bank's (life insurance) fee income To test hypotheses generated from the benchmarking exercise and initial rounds of brainstorming, a team (with members across functions from Max Life, Axis Bank) set out to conduct a diagnosis that spanned sales, operations, marketing, technology and products. A leading consulting firm was engaged to bring in global best practice knowledge, ensure adequate external provocation and to also provide an independent third party perspective. A truly transformative set of outcomes (some listed below) were then synthesized from the list of ideas collated from the diagnosis to Implement customized analytics on bank database to generate greater and better quality leads for life insurance.

THE BENEFITS

axis 2020 Provides customers with a seamless purchase experience that leverages the information they've already provided to the bank, reduces documentation to the bare minimum and issues policies in a matter of hours leading to customer delight. Decrease in number of customer grievances / complaints, especially related to mis-selling (since the process now involves a mandatory template-based digital need assessment tool). Also, leaner business model that helps eliminate nearly 50% of operations cost which earlier incurred in the field.

THE FUTURE

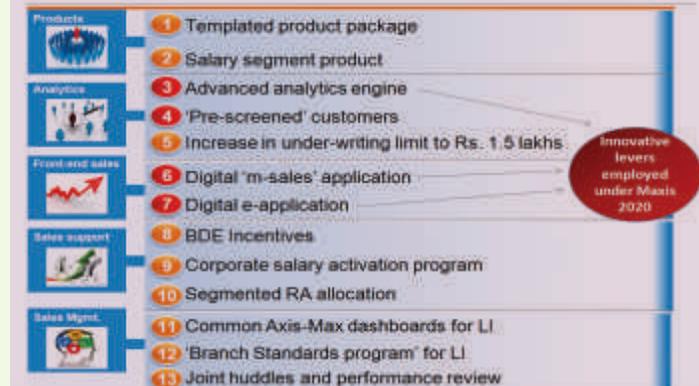
While it may still be relatively early for the program, Max 2020 is clearly the future of the Max Life - Axis Bank partnership. The program initiatives are structured to push specific levers in order to drive performance in specific areas. On the eSales front, they are well on their way to achieve their ultimate objective of fundamentally altering the way they sell, to move from a non-standardized sales model to a standardized one, to move from a document intensive model to a 'document light' model, and to shift from a world of issuing policies in days to now issuing them in hours. Also, the standardized & automated performance management system has increased visibility across levels in both organizations resulting in better governance. channels as well, which may make the Maxis 2020 model the bedrock of Max Life's business model in future!



Maxis 2020 is based on 6 Pillars of the life insurance business



Maxis 2020 comprises a comprehensive suite of initiatives, including several innovative levers



Maxis 2020 was rolled out nationally in 2 months - a massive effort given the scope of the program and scale of the channel

• More than 20,000 sellers have been trained in the last 60 days • Around 1,000+ applications have been processed through eSales • Close to 1 Lakh analytics offers have been provided to CSOs and RBs



The 2 day training program has helped us to understand all the initiatives in detail
-ITM

mSales seems to be an excellent process for need analysis of customer
-Branch Head

Selling team was very knowledgeable ; all initiatives are well thought of
-Priority RM

Thank you Maxis team. The program will enable us to sell more LI this year
-CBO

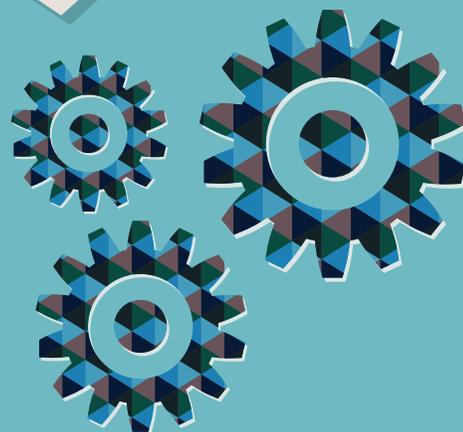
Dedicated RA in the salary vertical will surely bring more focus on LI
-Salary Head



Neogi Technologies and Research Pvt. Ltd.



As Integrated Management System (comprising of ISO 9001:2008, ISO: 14001:2004 & BS 18001: 2007) Certified company, NTR is well aware of it's social responsibility while selling it's product and services, which started a business in as early as 1971, for repairing of Fuel Dispensing Pumps for the oil companies. MOONLIGHT ENGINEERING CO. a partnership organization, established in the year of 1986, started manufacturing various spare parts of Fuel Dispensing Pumps of all models available in India .MEC is registered under MSME Development Act 2006. MOONLIGHT ENGINEERING CO. has been renamed as NEOGI TECHNOLOGIES AND RESEARCH PRIVATE LIMITED from 01.04.2014. Meter for Volumetric Measurement (Flow Meter) both Electronic & Mechanical Functionable in urban, suburban or rural areas and can be operated without any electricity Patent obtained Mini Dispensing Pump Functionable in urban, suburban or rural areas and can be operated without any electricity Patent obtained MAIN CUSTOMERS - Contributes 80% of Turnover BPCL, IOCL, HPCL, The South Point , BALCO , JK Tyres, TAJ SATS, Ambuja Cement, Suguna Foods, SICAL (CAFE COFFEE DAY), TATA STEEL, JUSCO, BEBCO, AMPL, SAIL, BHILAI ENGG. Corporation, Indian Railways , Ordinance Factory I, PC Associates.



THE INNOVATION

Product development at NTR. 1. “Register for Volumetric Measurement “ through our tenacious R&D efforts in 2004 (Patent Certificate No. 7760 issued on 13.09.2004).

Mechanical & The Innovative Electronic Meter for Volumetric Measurement (Flow Meter) with mobility. Our developed This innovation register successfully competed with International Brand supplying Volumetric Measurement Meters (Flow Meters). This R&D effort helped NTR To develop viable commercial products which contributed to the business growth of NTR From 1.5 Crore to 4.00 Crore. Further we developed Electronic Register (Patent Certificate No. 258634 issued on 09.12.2013). Based on this core technology to measure flow of fuel with an accuracy of 30.1% (Certified by Legal Metrology Dept. Of GOI), The other Innovative use of our above Product has been -mounting it on mobile tanker or Browser and extend its applications further to go to the point of filling up fuel oil. This filling up operation requires unnecessary use of fuels oil which is substantial for heavy vehicles movement, in this way it reduces 32 million kgs of CO2 per year as reported on Low Carbon & Climate Change Circle (LC4) in Micro, Small and Medium Sized Manufacturing Industries in India submitted by Sadhan Kumar Ghosh Professor. The product is going to facilitate conservation of energy by reducing vapour loss from Retail Outlet storage and will substantially reduce wastage of Petrol presently estimated by the oil industries in India at 0.3% of total national consumption. The product is more innovatively designed compare to imported one for meeting Customers requirement of NIL contamination through ingress of water and dust. The product is having an inbuilt flame arrestor and is certified by CCOE/PESO.

THE APPROACH

NTR promotes idea generation under two broad categories New Product Development and Operation Improvement Further for New Product Development NTR identifies the following avenues



Feedback from existing and prospective customers. Feedback from Exhibitions, Trade Fair where NTR has participated Feedback from Employees visiting Exhibitions, Trade Fair, Road Show etc \ Feedback of Employees from our sister concern THE SOUTH POINT who is engaged in maintenance of various Fuel Dispensing Pumps at Retail Outlets of Oil Companies. Marketing Department carries out Research on prospective market through scope of Import substitution and other possibilities of product in line with our vision and mission statement. . HOD Marketing Department organises a structured monthly meeting dedicated for idea collation for new / modified/customized products. The Managing Director chairs the meeting , other participants are Design & Development Head , Chief Operation & Training Quality Head & Production head. The various ideas are deliberated and filtered . The Chief Operation & Training is the custodian of collating the ideas under 3 categories - Active, Under consideration & Parked for future consideration. The action plan is

made for “Active” Ideas. The meetings starts with review of previous meeting ‘s actionable points. For Operation Improvement NTR identifies the following avenues Employees’ Suggestion Scheme, Kaizens and Feedback from Suppliers Employees suggestion scheme and kaizens are managed by a steering committee chaired by Chief Operation & Training, other participants are HOD Production and Maintenance & Quality Control. A documented Award and Reward scheme is in place for sustaining the innovative culture. Suppliers suggestion is collected & processed by HOD Production & Maintenance that there is documented reward / recognition scheme for suppliers.

THE FUTURE

In line with the vision of becoming Rs. 600 million company, NTR envisages a long term development of a portfolio of new products. NTR plans To establish a DSIR approved dedicated R&D Centre at NTR premises at an approximate cost of Rs.100 Lac by 2017-18 2nd Quarter, To develop around 1000 Sq.ft. of Space to house the R&D Centre at an approx. Budget of Rs.10 Lac by 2016-17 4th Quarter, R&D centre to have special purpose state of the art machines like CNC, 2 nos. at an approximate budgeted cost of Rs. 60 Lac, R&D centre to have suitable testing facilities at an approximate budgeted cost of Rs. 30 Lac., A dedicated 3 member team will be appointed to run the R&D Centre and A “NTR Suppliers’ Cluster 2014” - (Make in India directives of GOI) with 10 MSME Industries having diversified capability like Ferrous /Nonferrous casting, Complicated DIE making, Special Spring Manufacturer, Plastic Moulders, Special purpose Machine Tools etc has been formed to train them in world class manufacturing techniques with the help of professional consultants at an approx. Cost of Rs 30 Lac. The Cluster is expected to be fully trained by 2016 - 17 4th Quarter. This to a great extent will help NTR to overcome difficulties faced in locating suitable suppliers during the incubation period of product development. This cluster approach will also help NTR in idea generation for new product as well as operational improvement.

THE BENEFITS

NTR has learnt the value of sustainability and has updated it’s mission statement “To become A Green Organisation” . Structured Feed Back / Comment from the immediate neighbourhood is captured regularly . So far the perception is excellent in more than 95% cases. Innovative development of Pressure cum vacuum (PV) valve for petrol / diesel tank led to 80% of the fuel evaporation to atmosphere from 4 KL tank is reduced, Enhanced fire safety; Reduced contamination in environment. Mobile diesel dispensing system with 0.1% accuracy for cars at office, industries. 1/2/3 KL. Led to For filling of fuel instead of 50 cars going to petrol outlet, the dispensing system goes to the office and factory and fills, reducing mileage of 50 cars into one up and down. Apart from Direct Employment which is 6.25 % every year, every sale of our Meter for Volumetric Measurement generates minimum 2 Nos direct Employment opportunities . Up to date we have sold more than 1500 Nos. Meter, so directly we claim to have generated employment of 3000 people. Some of the future innovation are directed towards development of Green Products like “conversion of waste Plastic to Fuel”, Solar Operated Products , BLDC Motor operated Pump Unit etc. NTR is the winner of GCIP INDIA 2014 National Winner, California, USA. for fostering “Clean Technology Innovation in India”





Southern Agro Engine Pvt. Ltd., Chennai.

Southern Agro Engine (P) Ltd (SAEPL) is an ISO 9001:2000 Certified Company which was commissioned in the year 1996 in technical collaboration with VILLIERS in UK the world leader of multifuelled engines. Southern Agro engine pvt ltd focuses on innovative methods for agriculture segment. SAEPL follows a Quality Management System (QMS) certified by BVQI. The venture promotes cost effective solutions to the agricultural fraternity. The agricultural SAEPL products are approved by various Agricultural Department in many states throughout India for release of subsidy under different schemes that are operated from time to time. The company is rapidly growing with new products being introduced year after year. The company is propelling towards becoming a total agricultural solution provider in the years to come by taking all sincere efforts to address all the requirements in the field of agricultural mechanization thus helping the farmers to get better yield and serve the society beneficially.

THE INNOVATION

The R & D Team of Southern Agro engines have made a detailed study on horticulture, plantations flower farming and step farming In India and found out that about 50 % of Indian farmers are into these type of farming . The detailed analysis and the information provided by the farmers made our team to conclude that there are lot of serious issues which are not being attended in the right manner and the farmers are struggling with many issues. SAEPL came out with the came out a machine named as MINI POWER WEEDER 200, a total weight of 18 kgs which can be carried easily and can Walk behind self propelled, easy to operate. Prime mover of the machine is a high efficient petrol engine and robust gear box to increase torque and reduce the speed, this gear box delivers power from prime mover to the culling blades. Using this the yield from the field had increased by 80% and the expenses were reduced to 40%.

THE APPROACH

The product is designed keeping in mind the different types of farming across India. The MINI POWER WEEDER is designed and developed for horticulture, floriculture and step farming. This machine ensures effective weeding in any type of dry farm lands, maximum weeding is ensured by the ergonomically designed blade profile and this enables maximum and effective usage of fertilizers and higher yield. This innovation redefines power weeding in horticulture and inter-cultivation. This machine is 100% indigenous and first of its class in India. The blade design forcefully uproots the weeds and makes sure that the fertilizers will be consumed for the plant growth. This machine can be utilized for land preparation for farming as well and is a unique feature of this machine. Besides this, the functions were further improvised by consulting various agriculture institutions. The new technology used with different orientation of blades made this machine suitable for any type of dry farm land, land preparation and weeding . The weight of the machine



was very less and so it could be carried easily. The design and engineering of the machine enables a layman to handle the machine. The number of moving parts has been reduced for low maintenance and better life.

THE BENEFITS

The machine has the maximum weeding effect since the weeds are forcefully uprooted by the tynes. The weeds are cut and removed along with the roots giving maximum effectiveness of weeding, and increase in yield. The combined function of tynes and blades, results in good aeration of soil. At the same time, the soil is diverted towards the plant giving additional strength to the standing crop. This helps in growth of healthy roots thereby giving a good growth of the plant



and increase in yield. The compact design of the product gives an added advantage of minimum storage space as compared to that of other powered weeding equipments. The machine is also easy to maintain and it requires minimum maintenance. No trained technician is required to assemble the product as it is directly functional. The product helps the customer to overcome manpower shortage and achieve effective weeding.

The yield from the field had increased by 80% and the expenses were reduced to 40%.

THE FUTURE

The company's long term goal is to become a complete solution provider for mechanization in agricultural field. The company aspires that every Indian farmer should be a proud owner of this product in the next 3 years. The company is working at creating awareness of the product among the farmers by different means of promotional activities and enhancing government support to farmers by means of subsidies. Definitely this product will revolutionize the mechanized farming at large.





Sterlite Technologies Ltd.

With the cumulative investment of \$60 billion by public and private sector envisaged over the next 5 years in the creation of robust telecom infrastructure in the country, Sterlite Technologies, in partnership with the Government, is aiming to be one of the major drivers behind India's transformation to the digital age. In line with the Government's and customers' requirements for integrated expertise in designing, building and managing high-speed data networks, Sterlite has built a full portfolio of innovative, future-proof offerings, including products, solutions and software. Sterlite is India's only fully integrated producer of optical fibers and one of the largest suppliers to overseas markets of China, Europe and Asia.

The company is implementing key Government projects network projects across India including secure communication network creation in Jammu & Kashmir for Indian Army, enabling BharatNet, establishing urban high-speed Fibre-to-the-Home (FTTH) networks and multiple interstate ultra mega power transmission projects. As a Master System Integrator (MSI) for high-speed broadband solutions for cross-country networks, Sterlite has already connected 1,65,000 homes in 6 cities and 32 universities across India with high-speed broadband. The company manufactures full range conductors from ACSR to high-performance conductors, HV/EHV cables and OPGW, and offer solutions such as uprating capacity, T&D loss reduction and integrated O/H & U/G T&D network with communication capability solution.



THE INNOVATION

Innovation has been the counter-stone of Sterlite's growth story in rapidly evolving technology domains of telecom and power. Sterlite has maintained market leadership in India and grown her global market share in fiercely innovative and competitive environment. Our innovations are protected by 110+ patents worldwide. Our recent innovations in the telecom domain solve long standing problems of call drops, bandwidth deficiency and space constrains. The key innovations are multi-terabit optical transmission (128 Gbps) over a long-haul network, bend insensitive optical fiber and small diameter optical fiber:

1. Multi-terabit optical transmission (128 Gbps) over a long-haul network is a proud moment for Sterlite that allows telecom infrastructure to accommodate faster transmission of huge volumes of data. The DWDM technology saw 80 wavelength operating at 128 Gbps each spaced at 50 GHz travel over 1,840 km of Sterlite's fiber. Such innovative high-speed transmission can transform bandwidth deficient telecom networks in India into future-proof telecom infrastructure capable of providing upto 1 Gbps speed to end users, which is central to upcoming smart cities, smart grids, smart homes, digital classrooms, among other initiatives. Sterlite is working on even higher data rates, such as 400 Gbps, as well as longer transmission distances. Implementation of this technology on telecom networks has already demonstrated disruptive potential of this technology.
2. Sterlite has developed bend insensitive (G.657.B3) optical fiber, making Sterlite the only company in India that has capability to design and manufacture such complex optical fibers. Bend insensitive optical fiber is ultra-low sensitivity to bending that ensures practically zero loss of data at bend radius of 5 mm and is important for high-speed connectivity, indoor applications and advanced hi-tech equipment (including defense



applications). Development of this fiber solved a long-standing problem of loss of data (and deteriorating broadband speed) at sharp corners. It allows telecom operators to provide high-speed broadband connectivity in a reliable and sustainable way right up to the homes, leading to superior operational effectiveness. This fiber has been already adapted, esp. for FTTH applications, by some customers.

3. Small diameter (200-micron) optical fiber, developed by Sterlite, has usage for high density cabling applications. The 200-micron optical fiber allows high fiber packing density in cables and reduces the space required for installation by up to 30%. In a developing country like India with low broadband penetration, the 200-micron optical fiber allows carriers to maximise limited duct space usage, bring down the cost of expansion of network infrastructure, and significantly reduces operational expenses.



THE APPROACH

Sterlite has adapted a highly structured approach towards innovation, perfected and refined over years. The company is very protective of its innovations and a patent portfolio of 110+ patent publications globally protects all key innovations. The company believes that there are four fundamental pillars in the Innovation Process – Discovery, Incubation, Acceleration and Scale.

Discovery Phase: It includes developing a holistic understanding of the problem in hand by involving all stakeholders, understanding the technical, market and Intellectual Property perspectives and defining the scope of the problem. Then deliberating on innovative solutions & approaches, developing consensus on short-listed solutions and approaches, and identify & validate assumptions and gather feedback from ecosystem of customers, suppliers and partners to re-validate scope of problem, assumptions and approaches.

Incubation Phase: It includes theoretical validation of short-listed solutions and approaches, followed by simulations, experimentation & trials. Proof of concept is required to validate practicality of innovative approach, followed by iterative approach to identify and address technical challenges.

Acceleration Phase: This includes iterative approach to evolve and refine the approach.

Scaling Phase: It includes iteratively testing and evolved innovation suitable for commercial production and championed innovation within the ecosystem to shorten learning curve and increased acceptability.

THE BENEFITS

These innovations will transform bandwidth deficient telecom networks in India into future-proof telecom infrastructure capable of providing upto 1 Gbps speed to end users. Customer (telecom operators) will be technologically empowered to multiply their data carrying capacity and speeds on existing infrastructure without deploying additional optical fibers in their telecom network.

Customers are benefited by increased network capacity in existing network infrastructure, reduced space requirement, ease of handling due to lighter cables, substantially higher bit rates, practically zero data loss for bend radius >5 mm and faster & low skill instalment. Most importantly, these innovations are a quantum leap in making India self-reliant on advanced optical fiber technologies and applications in the defence sector.

THE FUTURE

In the coming years, the company expects their innovations to contribute both tangibly in terms of improved margins and top line, and intangibly through efficient nation building, enhanced customer satisfaction and furthering their thought leadership.

Sterlite also plans to focus on the entire value chain from products to system integration to application development, which will further strengthen capabilities in creating broadband solutions for converged networks and transmission solutions.

Leveraging this innovative optical fiber in Sterlite's own network has resulted in dual benefits of providing economical fiber-fed gigabit services at homes, and demonstrated superior operational efficiency to telecom operators. This innovation is thus, likely to transform bandwidth deficient telecom networks in India into future-proof telecom infrastructure capable of providing upto 1 Gbps speed to end users.

SURYAGARH
Jaisalmer

Suryagarh - Jaisalmer

Suryagarh-Jaisalmer is a boutique hotel based in Jaisalmer, Rajasthan. Architecturally pure and true to an ancient craft, Suryagarh offers its guests a wonderful sense of space. At Suryagarh, the team believe that they are not just a hotel but also a representation of a unique way of life carefully preserving the traditions of the past yet framing them in a modern idiom. Suryagarh excitingly takes the path less well traveled, and discovers with its guests, secrets of a land that has been shrouded in myths and legends. With great consideration to its guest's comfort, its hospitality is intuitive and genuine.

M.D MRS Hotels, Suryagarh came into operations in Dec 2010 and since its inception has registered exponential growth. It operates in the Luxury boutique segment in India and has been constantly ranked among the best in its category. Frequented by the crème-la-crème Suryagarh has successfully positioned itself as a unique getaway among the 'High Net worth' adventurous travelers across India. Key products & services offered 1. Residential Hotels inspired by cultural heritage. Offering patrons the Luxury of Space and Time. 3. Unique Food and beverage, Spa and Adventure experiences. 9. Case study on Real estate development at Harvard Business School, Boston. Suryagarh had unparalleled effects on its stakeholders.

THE INNOVATION

In a far off corner, such as Jaisalmer getting hotel supplies of fruits, vegetables and other consumables was very difficult. The company started a unique cash and carry approach to get the best supplies. Breaking norms of the regular credit buying systems, payment schedules and bill processing time, the company started settling the bills on the very day the goods were received. This enabled the vendors in improving their business schedule and in turn helped Suryagarh in procuring the best items at the best discounted rates. I Love Jaisalmer(ILJ). ILJ undertook a project to clean the approach road to the city of Jaisalmer on 3/2/2013. ILJ initiated a program for cleaning and maintenance of the lake and it gathered the attention of the local media. The ILJ initiative planted trees along the periphery, made public toilets accessible, identified and cleaned tourist spots near the area. Jaisalmer Fort. I Love Jaisalmer successfully organized “Sunday for Sonar” for six consecutive Sundays when 60-300 people got together and cleaned absolutely inaccessible areas of the fort. During the campaign the team cleaned 4,50,000 sqft of slope area of the trikutta hill on which the fort proudly stands, 1,80,000 sq ft of ramparts which used to be inaccessible to tourists and were community garbage bins for decades, within 6 weeks. The ILJ initiative also installed 250 dustbins in and around the fort to maintain cleanliness. Government Hospital Following the need for efficient and clean centers for health, the ILJ initiative started cleaning operations after much persuasion, in allocated areas within the Jaisalmer Hospital.

THE APPROACH

Absence of a hotel brand that was geared to cater the future travellers. i.e the Millenials. Suryagarh was able to understand the shift in the travel and hospitality market. The millennials as compared with the baby boomers would be a more stable clientele in the longer run. The management decided to position the brand, the hospitality and the experience of the guest as per their requirement and their perceived idea of luxury which was more experiential. The hotel



through its curated experiences showcase unexplored facets of Jaisalmer and its culture thereby offering its guests the luxury of time and space. This has helped Suryagarh makes its guests, its biggest brand ambassadors. Jaisalmer has the oldest living fort unlike many other which have been abandoned with time, but with due course of time the fort and the city had become filthy & polluted and the monuments were in bad shape, to add to it the city was infested with touts who would often cheat the tourists and thus Jaisalmer was earning a bad reputation for itself. As a pilot project, the approach roads to Jaisalmer were cleaned and public monuments were taken up for cleaning, later many other volunteers joined including men from army, air force and other residents of the city.

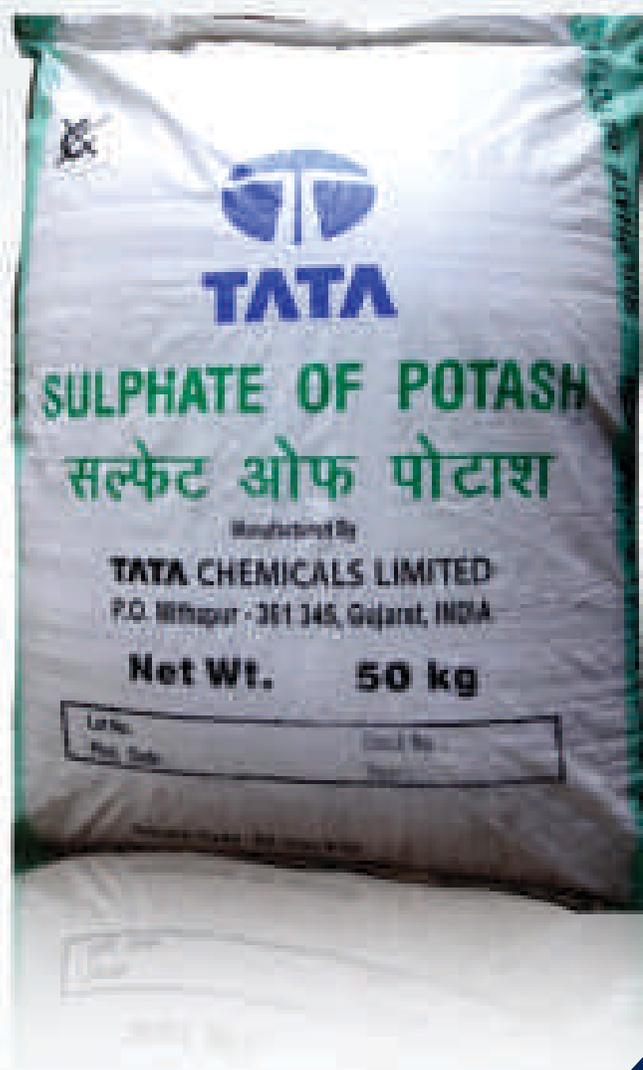
BENEFITS

A genuine hospitality experience which is both original and authentic. Experience of the unknown facets of Jaisalmer which other hotels are not able to offer. These facets are culmination of the food, music, architecture, history and culture. Experience of the better side of Jaisalmer, a cleaner and friendlier side. Experience of a sense of space and feeling of tranquillity which otherwise is rare to imagine and experience. I love Jaisalmer has helped the city in being cleaner and tourist friendly. I love Jaisalmer has helped preserve the arts and crafts of Jaisalmer and the nearby region by using them in the hotel and marketing them around the world thereby also providing employment to over 200 women of the region. It was because of the efforts of I Love Jaisalmer, that both the program and the NGO have become UNESCO Case study on heritage conservation and community empowerment. It has made an average city resident more responsible and ware of his duties towards the city. Jaisalmer has been able to develop itself as a prominent tourist destination and thus has been able to earn foreign trade for the country. Suryagarh has inculcated a sense of pride as it has become a new landmark for the city.

FUTURE

Idea is to scale up operations in different parts of the country and then bringing synergies of scale for higher profitability and higher growth. Connecting other upcoming hotels in the procurement chain: To further reduce the cost of procurement and to increase the product offerings, the hotel is trying to collaborate with other hotels in Jaisalmer. I Love Jaisalmer aspire to pick up projects which are readily acceptable to the community. All projects will be run by the members and residents who will form the project managers. The NGO shall then provide adequate support both financial and execution on ground support to sustain the project. The idea behind doing so is community empowerment and to give ownership of the project to the people of Jaisalmer for whom the NGO has come into existence.





Tata Chemicals Limited

Tata Chemicals Limited, in its 77th year, is a global company with interests in businesses that focus on LIFE —Living, Industrial and Farm Essentials. Through its Living Essentials portfolio the company has positively impacted the lives of millions of Indians. Tata Chemicals is the pioneer and market leader in India's branded Iodised salt segment. With the introduction of an innovative, low-cost, nano technology based water purifier; it is providing affordable, safe drinking water to the masses. Extending its portfolio from salt to other food essentials, TCL unveiled India's first national brand of pulses in 2010. Tata Chemicals has been rated as one of the top 10% in Business and Consumer brands across all industry and consumer brand categories in India by Super brands. The company's Industry Essentials product range provides key ingredients to some of the world's largest manufacturers of glass, detergents and other industrial products. Tata Chemicals is, currently, the world's second largest producer of soda ash. Our journey began in pre-independence India. We have set up the soda ash production plant, which has gone on to make its mark as a major growth driver in our business today. We saw our soda ash capacity expand from 100 tonnes per day in 1953 to 400 tonnes per day in 1964 to present capacity of 2400 tonnes per day. This was no mean achievement.

THE INNOVATION

Innovation made during the year 14 - 15 on Sulphate of Potash (SOP) is as under -

In line with its mission, 'serving society through science', the company is applying its expertise in sciences, to develop high-tech and sustainable products like Sulphate of Potash (SOP). SOP is a superior potassic fertilizer with dual fertilizer (K & S) value but Muriate of Potash (MOP), being subsidized is preferred by Indian farmers. SOP is essential for chloride sensitive crops like tobacco, potato, beans, nuts, strawberries, citrus fruits, mangoes, grapes, sunflower, tomato, coffee, apple, peas, spinach etc. All the potash in the country is imported. In India, Potash is not recovered commercially from bittern at present. SOP has several merits as a fertilizer: (1) It is a two nutrient fertilizer with the highest total nutrient value of 68% fertilizer (50% K₂O and 18% S), (2) It is virtually chloride free and hence an ideal source of 'K' for saline soils and chloride sensitive crops, (3) It has a much lower salt index (46.1 for SOP vs. 116.3 for MOP) which lowers the osmotic effect and thereby reduces the dehydration of plants.

Key Benefits to different stakeholders : Government of India:
Lesser potash imports, Subsidy burden reduction & forex savings, Indigenous source of potash, Validation of indigenous technology

TATA Chemicals : Foray into manufactured "potassic" fertilizers

Indian Farmer : Stability in MOP prices in the long term. Cheaper substitute for imported SOP. Economic gains through better yield & quality.

THE APPROACH

In India, Potash is not recovered commercially from bittern at present. Government of India, through National Manufacturing Competitiveness Council, Department of Science & Technology and



Department of Fertilizer, had initiated a series of brainstorming sessions on promotion of Indigenous potash technology. TATA Chemicals Ltd., in line with its mission, 'serving society through science', the company is applying its expertise in sciences, to develop sustainable products. TCL took up the pilot project with a view to establish Sulphate of Potash (SOP) technology and commercialize the same. Successfully developed technology whereby Sulphate of Potash (SOP) can be recovered from potash rich bittern generated kainite type mixed salt (KTMS). A project to set up a 3 TPD test bed pilot plant based on CSIR / CSMCRI's SOP process, put up at M/s Tata Chemicals Limited Mithapur. The raw material, KTMS, is produced in TCL's salt works on further concentration of left over sea bittern after solar salt recovery. Tata Chemicals took special care to address the problems of low evaporation & high percolation at such high bittern concentrations.

The mixed salt is processed at ambient conditions to convert into schoenite which is further processed to produce FCO grade Sulphate of Potash. As an initiative for the indigenous production of potassic fertilizers in the country which are entirely imported, National Manufacturing Competitiveness Council (NMCC), Department of Science & Technology (DST) and Fertilizer Association of India (FAI) approached Tata Chemicals to take up the pilot project with a view to establish SOP/MgO technology and demonstration of the same at TCL Mithapur with financial support from DST.

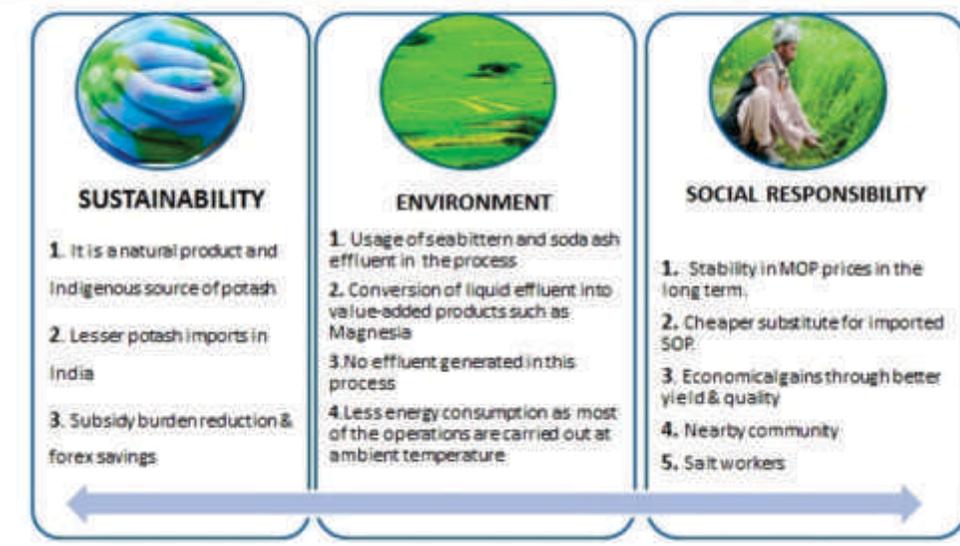
THE BENEFITS

Potassium sulphate (sulphate of potash - SOP) is more expensive per tonne than muriate of potash, as it contains two nutrients - potassium and sulphur. Sulphate of Potash can also be used to advantage for all crops grown on saline soils, which occur in arid and semi-arid areas. Sulphate of Potash provides two essential nutrients to the plant - Potassium (K) which is one of the 3 top essential plant nutrients (N, P, and K) and Sulphur which is one of the top 6 plant nutrients. SOP, Sulphate of Potash (K_2SO_4), is a superior potassic fertilizer used for healthy growth of plants/ crops specially chloride sensitive plants like potato, tomato, oil seeds, coffee etc. It does not form organic compounds in the plant. Better utilization of left over bittern generated in salt works Production of other value added products e.g. Magnesium based compounds - Magnesium Hydroxide, Magnesium Oxide, Magnesium Carbonate and Magnesium metal. This will create employment.

THE FUTURE

Seawater along the 5600 km long coastline of India is a potential though dilute source of Potash. More than 80% of salt produced in India is from seawater. India produces about 18 - 20 million ton of salt annually which can yield about 3 lakh ton of Potassium Chloride (MOP) which is around 10% of the present demand. Besides this, a

IMPACT: Sustainability; Social Responsibility; Potential



vast quantity of natural bittern is available in 'Greater Rann of Kutch (GRK)' due to natural inundation and evaporation. The by-products generated during the manufacture of Sulphate of Potash are Sodium Chloride (salt), Calcium Sulphate (Gypsum) which are already in our product portfolio and water which is a highly valued commodity in this region of perpetual water scarcity.



Tata Steel

Sukinda Chromite Mines, FAMD

The Ferro Alloys and Mineral Division, commonly known as FAMD, is a profit center of Tata Steel Limited. It has an integrated value chain starting from Mining, Beneficiation, Production to Marketing and Sales. It has Chromite Ore, Manganese Ore and Dolomite Mines in Orissa, Ferro-Alloy Production units (own and out-sourced) across many states and markets Ferro Alloys and Chrome Concentrate in India and abroad. The three distinct business lines are - Chrome (Ferro chrome, Charge Chrome, Chrome concentrate), Manganese (Ferro Manganese and Silico Manganese) and Flux (Dolomite and Pyroxentite). The customers of FAMD are the Carbon, Alloy and Stainless Steel producers worldwide. It was this exploratory zeal of TSL, which led to the discovery of the first Manganese deposit in India at Joda (1929) and Chromite deposit in the Sukinda valley of Orissa (1949). In 2007, Tata Steel acquired TS Alloys, which is a 100% subsidiary and operates as a Conversion agent for ferro chrome making. In 2008, In the pursuit of value addition FAMD stopped the sale of Chrome and Manganese Ore. Pursuing a customer focused strategy; FAMD has emerged as the 6th largest FeCr producers in the world and It is the second largest supplier of HC FeCr in India.

THE INNOVATION

Pit slope plays a vital role in Safety and Productivity in Mining. Higher the slope, lesser would be the waste to be excavated. But steeper pits lopes increase the chances of slope failure. They have been allowed a pit slope of 35 against normally allowed angle of 30 from DGMS. They came upon the idea of horizontal bore hole drilling. Horizontal bore holes helps in depressurization of benches by channelizing water from the benches thereby increasing the stability of benches. Perforated PVC Pipes were inserted to channelize the water. This was a unique practice in Indian Mining Operation. Dump stabilization: Conventional plants were unable to restrict slope failure. After successful experimentations, Padi Staw & Vetiver Plants were found effective. With roots growing up to 2m of depth, Vetiver plants help in proper anchoring of the soil and hence increase the stability of the dump slopes. Reduction in Idle Running of equipment: We have reduced the idle operation of conveyor and Apron in Chrome Ore Beneficiation Plant. Raw material from mine is fed via dumpers into hopper from where it is shifted via Conveyor. Many a times either due to shift change or breakdown of dumper, these equipment run ideal for 1-2 hour every day. Construction of hopper is in such away that we cannot put any type of Level Transmitter to know the material status. To solve the problem a motion sensor was installed at dump hopper to count the number of trips of dumper. This number was converted to the amount of material dumped with the help of Distributed Control System. Arrangement was made at the Conveyor which got operated when the conveyor ran empty indicating absence of material at hopper.

Further this arrangement operated an electrical switch which gave feedback to DCS stopping both the drives immediately. It also gave feedback to operator whenever the hopper was empty so that he could start dumping immediately. When the hopper got full, the Apron and Conveyor started automatically.



THE APPROACH

Requirement for horizontal bore drilling and dump slope stabilization were necessitated with increased safety threat and blocking of high grade ore due to unstable steep slope of benches. To meet the high excavation demand it was imperative to prevent slope failure in mining operation. Eventually a project with CIMFR (Central Institute of Mining and Fuel Research) was undertaken for rock strata condition analysis. To identify the areas of possible slope failure, real time movement of the benches were tracked and in house colour coding w.r.t. particular threshold value of critical failure of slope were developed. After tracking of critical areas, rock strata analysis was done. With the help of rock strata data we designed the factor of safety of benches. For implementation of the idea, help was taken of the TATA STEEL R&D for the modification of the drills.

Required skill training was imparted by CIMFR. Finally the idea was realized. For enhancing the stability of dump slope, visits to other

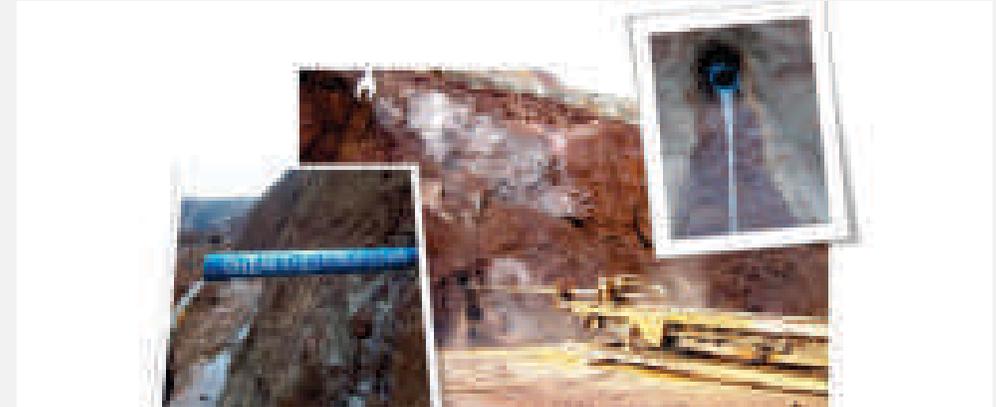
mines where conducted. Consultancy from IIT Kharagpur was sought. Initial saplings were provided and developed by the IIT. The required training for the saplings development was also imparted. All these were done under the guidance of Prof. Khanendra Pathak from IIT Kharagpur. The problem of high idle running time of the feed conveyor and apron feeder was taken by a TPM Circle of the COB plant.

THE BENEFITS

Horizontal bore hole drilling was done to achieve slope stability so that more ore could be mined without expanding beyond their lease area by increasing the steepness of their slope. With the implementation of the idea, they have been able to reduce overburden volume by 2.86 million m³. they have been successful in achieving slope stability through vetiver plantation. With completion of phase 1, about 10,000 m² area of the dump was covered by approximately one lakh saplings. After successful planation of the vetiver grass, there was a marked reduction in the rain cuts and erosion on the dump slope which was something very common initially as our location receives very high rainfall. Also there has been improvement in soil quality with increased retention of moisture corroborated by increase in natural vegetation on the slope surface.

THE FUTURE

When it comes to horizontal bore hole drilling to reduce the hydraulic pressure on the vertical walls of the mines, TATA STEEL LIMITED have planned a robust mechanism for monitoring the slope movement through slope stability Radar so that our innovation becomes further strengthened and we reap further benefit on it by further stabilising the mine slope. So far their experience has been excellent with the vetiver plantation on the OB (Overburden) dump in order to improve its stability and in the process to further strengthen the OB slope they are trying for Geosynthetics and superior dump slope design which will prevent soil erosion during monsoon and wash off of any OB dump portion. In order to prevent their idle operation of equipment in beneficiation plant they are



Slope Stability by Vertiver plantation followed by Miyawaki method and monitoring of slope with slope stability radar

going to establish real time web enabled cameras monitoring with a historian server for integration of all equipment related information monitoring, tracking and analysis of the performance level. At the same time all equipment in the plant will be coupled with the automation so that TSL have the control and can rectify the arising problems. This initiative will enable them to monitor any performance related to plant at more details and take timely corrective actions.



Vedanta Ltd. Sesa Goa Iron Ore

Vedanta Resources is a London Stock Exchange listed, globally diversified natural resources major with interests in Zinc, Lead, Silver, Copper, Iron Ore, Aluminum, Power and Oil & Gas. Iron Operation of Vedanta Limited is India's leading producer and exporter of Iron Ore in the private sector with operations in the states of Goa and Karnataka in India and a project site in Liberia, West Africa. Vedanta iron ore business (formally Sesa Goa Limited) has about six decades of expertise in the exploration, mining and processing of iron ore. Vedanta Limited is listed on the Bombay Stock Exchange (BSE) and National Stock Exchange (NSE). It has two major divisions Metallurgical Coke Division and Power Plant Operations. Our Power Plant utilizes waste heat and gases generated from Pig Iron and Met Coke Plants and uses proprietary environment friendly met coke making technology to generate electricity. Pig Iron: Pig Iron Division (PID) started operating in 1992. It was the first to introduce low phosphorous foundry-grade pig iron in India.



THE INNOVATION

At present in India, the pig iron manufacturers consumes 85-90% of high grade iron ore (Fe content of > 58%) and 15-10% of low grade iron ore (Fe content of <58%). In spite of abundant availability of low grade, hygroscopic iron ore especially in Goa, the consumption was restricted to 10 to 15% to sustain the coke consumption and productivity thereby to maintain the cost of production. This situation lighted a vision of maximizing the consumption of lower grade hygroscopic iron ore to the tune of 90% in the burden mix of pig iron process to economise cost of production and show a way to consume lower Fe ore, where the availability of the high grade ore is rare. Innovation and development on this vision, company decided to have a major shift from the way of making pig iron so has to consume the low grade hygroscopic iron ore by carrying out following Debottlenecking of the existing blast furnaces by design modification. Developed online software for accurate process controls and Reengineered blast furnace process parameters to ease the blast furnace operation. With above engineering up-gradation, the consumption of low grade hygroscopic Goan iron ore increased on progressive basis with the present usage of 90% on sustainable basis. This innovation in the process has realized a saving of Rs.50 approx per ton of hot metal with every 1% usage of low grade iron ore.

THE APPROACH

In the Pig Iron Manufacturing, Iron Ore contributes around 40-45% to the total Cost of Raw material & hence the cost of Iron Ore plays a vital role in the success of pig iron business. With the falling market price & demand in line with the Global scrap prices, as a global player in merchant pig iron producer it is very important to sustain our business. By using the available low Fe grade iron ore at economical price, the overall

cost of production is expected to reduce by 15-20%. The underlying



emphasis of efficient utilization of lower quality input materials is to ensure cost effective utilization of available natural resources, particularly iron ore which India has large stock. It is directly linked to technology choice and investment decisions in the industry. It is pertinent to mention that sourcing iron ore from new mines raises a number of issues in terms of ore quality (iron content, gangue materials, phosphorus, Sulphur etc. and granulometry) and of logistics such as access to the mines and to shipping. A rule of thumb suggests that new resources of high quality ore are hard to reach and that easy to reach ones are of lower quality. It calls for two-pronged strategies - to ensure agglomeration of input materials for use in the existing technology and to introduce & absorb technology and innovation, which can efficiently utilize lower quality input materials. In line with Vedanta's objective of being in lowest quartile cost producer of pig iron, a cross functional team was formed.

THE BENEFITS

With the success of this innovation, all pig iron producers in India can increase their low grade iron ore with little modifications in the blast furnace and its process control. This results in increased domestic consumption of low grade iron ore and thereby better realisation of natural resources. Being a good profitable business & trouble free operation, Organization would be able to focus more on the CSR activities & the communities. They are able to achieve better customer satisfaction since they maintained the cost at the lower threshold level. The huge marginal contribution helped them to achieve all aforesaid benefits to the employees, customers, stakeholders as well as communities.

THE FUTURE

Company has already taken various initiatives to use low grade hygroscopic ore into its furnaces which is widely available in Goa region. Our target is to achieve the 100% Low grade iron ore consumption within the next 3 years. To achieve this, a dedicated team of metallurgists are working. In house trials has been already started to do preferential reduction of Mn in Pig Iron without affecting other elements like Si. Metallurgical compounds are being identified to suits this requirement. Innovations in developing special grade of Pig Iron are also going on simultaneously which can fetch higher realisation and contribute in company profitability.





Hello Humans

I AM **COGNITIVE COMPUTING.**
I AM HOLMES.

#FUTUREISHOLMES
WIPRO.COM/HOLMES

WIPRO HOLMES

GENERAL INTELLIGENCE PLATFORM



Wipro Ltd.

Wipro Limited (NYSE: WIT; NSE: WIPRO) is a global leader in providing IT Services, Outsourced R&D, Infrastructure Services, Business Process Services and Business Consulting . With a track record of over 25 years, Wipro is the first to perfect a unique quality methodology, the Wipro Way – a combination of Six Sigma, Lean Manufacturing, Kaizen and CMM practices – to provide unmatched business value and predictability to our clients. Our industry aligned customer facing business model gives us a deep understanding of our customers’ needs to build domain-specific solutions, while our 55+ dedicated emerging technologies’ Centres of Excellence’ enable us to harness the latest technology for delivering superior business results to our clients. They provide integrated consulting capabilities to our clients across industries that help them understand their customer better and provide differentiated offerings. Their standardized process assets and technology accelerators help the clients across industries to improve their systems and do business better. They have also built tool based applications management platforms that integrate delivery across application and infrastructure layers.

THE INNOVATION

WIPRO HOLMES™ is India's first Applied AI platform and is an acronym for Heuristic and Ontology-based Learning Machine and Experiential System. HOLMES is based on cognitive computing technologies. Cognitive computing system adapts and improves itself through learning techniques, interacts naturally, processes knowledge and can apply reasoning to solve problems. Cognitive computing is a ground breaking new approach to develop software applications. The HOLMES AI Platform is being leveraged to transform and create a new generation of IT services for Wipro. Wipro has created an AI Lab for Co-Innovation in the AI space with customers.

HOLMES can deliver benefits of outstanding productivity, user experience, process acceleration, business agility and deliver autonomous systems. HOLMES has the potential to transform our employee base to deliver services with extraordinary experience, productivity and quality, enabling our customers to grow their business exponentially in the emerging digital economy. HOLMES AI Platform will be the innovation engine for our customers to create new business innovations and business models, offering game changing products and services.

Wipro HOLMES™ - Artificial Intelligence Platform has a rich set of cognitive computing capabilities based on open source ecosystem. It has been under development for more than four years, enabling development of six types of AI applications: Digital virtual agents, Anticipatory and Predictive systems, Cognitive process automation, Visual computing applications, Knowledge virtualization, Robotics and drones. IT process and industry-specific business processes can be augmented with intelligent bots, developed using the HOLMES AI platform. Wipro HOLMES is completely developed on open source, as a set of loosely coupled services with all the key capabilities required for an enterprise AI application. The development on open source brings another unique characteristic of freedom to leverage the innovation ecosystem and offer lower cost services which will be a competitive advantage. Wipro HOLMES key features can be categorized into 5 broad families. Natural Interaction , Knowledge Representation



,Algorithmic Intelligence, Learning and Reasoning .These five broad functions come together to create Indian IT services Industry's first AI platform.

THE APPROACH

The Wipro HOLMES™ AI platform is a culmination of efforts of more than 4 years and is a made in India AI platform. The Wipro HOLMES journey was led by a culture of experimentation. It has reached this point of maturity by following the ideology of fail fast and succeed early where the focus was to deliver innovations by building breakthrough applications. Wipro HOLMES key capabilities is a result of experimentation and pilots in the areas of Natural language processing, knowledge engineering and semantics, machine learning and neural network, AI planning and reasoning. These experiments solved specific industry problems using emerging technologies and open source tools. The outputs of experimentation and pilots in terms

of design, source code, algorithms and techniques were integrated to create the AI platform. Wipro implemented a service desk automation platform to validate the reliability, scalability, performance and benefits of the solution and this solution was rolled out globally to more than 1,50,000 employees and has been put into production for IT service desk automation. To design the Holmes platform, a use case and design thinking approach is adopted and picked from IT and Business process areas which have a strong information supply chain. The emphasis is in the space where we have access to significant volume of associated data as AI systems can be developed only when we have a significant corpus of information. Specially trained multidisciplinary teams were deployed to create this platform and its re-usable components

BENEFITS

The capabilities that Wipro HOLMES has developed are leading to realization of exponential business benefits in the form of business growth, cost savings, experience and productivity enhancements. Wipro HOLMES is establishing new benchmarks of benefit realization among the current set of leading IT industry players. HOLMES is helping its customer ride the next wave of automation, powered by a cognitive platform and helping them transform their IT and Business processes. Wipro HOLMES™ learns and brings best practices across multiple implementations and enriches the knowledge capital of the enterprise.

THE FUTURE

Our vision for HOLMES is to deliver a combination of Digital virtual agents, predictive systems, cognitive process automation, visual computing applications, knowledge virtualization, robotics and drones at various levels of maturity. We will establish a strong ecosystem of partners, collaborative research and open source technologies to deliver the applications.

1. In the future we plan to release an Open source version of the AI platform and make it accessible to our customers, partners and



academia, enabling them to contribute and evolve the HOLMES Platform.

2. Create an Open Innovation forum for university students to contribute to the development of AI systems and at the same time help them enhance their skills by working on this area, and also encourage development of applications by the community at large.
3. We want to leverage Applied Artificial intelligence and Strong AI capabilities to be part of this ecosystem, leading an ecosystem of services.
4. Enable AI for the benefit of the larger society leading to enhanced productivity and experience and a better life for the citizens.
5. Actively seek and partner with innovative organizations and universities to push the boundaries of our AI capabilities.



being there...

Zen Technologies Limited

Zen Technologies Ltd.

Zen Technologies Limited, incorporated in 1993, is in the business of design, development and manufacture of training simulators for weapons, weapon platforms and allied defence systems. Company lays emphasis on in house R&D and its R&D Unit is recognized by Department of Scientific and Industrial Research, Ministry of Science and Technology, Government of India. Zen completely custom designs its equipment in-house, including software, mechanical and electronic subsystems, to match customers' specifications and GSQR requirements. Zen has come up with the concept of Combat Training Centre, comprising of integrated virtual, live and constructive simulators, that will bring in quality changes in the way individual and collective training of officers and soldiers is carried out in the Armed forces. Training ranges from basic marksmanship skills to tactical training under simulated operational environment as Zen simulators can seamlessly integrate into war scenarios that help Commanders hone their battlefield skills. Zen Live Simulators for Infantry, Armoured, Artillery & Air Defense equipment enable these units to carry out tactical exercises where fire of weapons is simulated using laser.

THE INNOVATION

Zen VSHORAD (Very Short Range Air Defence) Simulator/Anti-Aircraft Air Defence Simulator (3AD Sim) is designed to provide intense training both in class room and field conditions, simulating multiple terrains, targets and environmental conditions. The simulator is user-friendly and provides data of missile launch, details of target movements and hit-miss information for After Action Reviews (analysis). It is light-weight, modular in nature and lends itself to up-gradation. The simulator comprises of 3 Field Simulator Sets and a Practice Launching Set. It provides five modes of Training as under:

- On the synthesized three-dimensional target environment against synthesized terrain.
- Training on synthesized target against custom terrain (photos shot).
- Training on the synthesized 3D targets against real terrain background.
- Training on actual friendly targets in real terrain.
- Training on aircraft in real terrain.

Features of the Simulator

Easy-to-operate simulator provides a Practice Launching Set that helps impart psychological and physiological training to operators with setback force/jerks, sound and flash/light which includes all the facilities for After Action Reviews and contains a wide range of target systems that include Fighter Aircraft, Transport Aircraft, Helicopters, Unmanned Aerial Vehicles and Precision Guided Munitions. It Allows instructor to feed/update target's dynamic parameters like speed, course, range and height. Generates performance reports of trainees, calculating launch boundaries and launch time based on the target's parameters. It provides manual and auto modes of firing, Displays destruction/miss of the target based on launch parameters Competitive edge. Generic design allows it to be used to train on various type of VSHORAD SAMs (short range, man-



portable/pedestal mounted heat-seeking (Igla1M, Igla-S), laser guided (RBS-70/Bolide), proximity/impact enabled (Mistral), Hit-to-Kill with laser guidance (Star Streak) missiles) and Allows replication of launch signature of different types of shoulder-fired surface-to-air missiles Increase in market share. The simulator is tested and accepted by Indian Army. Now, Indian Air Force and Indian Navy are keen to procure it.



THE APPROACH

The Armed Forces of India — Army, Navy & Air Force — are holding Short Range Air Defence IGLA Missiles of Russian origin for three decades. These missiles are very expensive and cannot be routinely used for imparting training except for test firings. Hence training on IGLA missile system is required to be carried out on simulators extensively. Original simulators were designed to track only dummy targets and it lacked training on live flying aircrafts and aero models. Zen 3AADsimulator was designed to bring in realism in training by incorporating a unique feature of Live Target Tracking. Exorbitant cost of operational missiles for training crew, tremendous infrastructural and resource requirements to place on ground real-life air defence training wherewithal (aircraft sorties, missiles) and above all difficulty in recording and analyzing trainees' performances (time to locate, track and fire) make simulators a very essential and inescapable part for training for war. Zen Technologies decided to overcome the weaknesses of the original field simulator and the recently-acquired class room simulator with a unique design combining the functionalities of both in a cost-effective and user friendly manner.

THE BENEFITS

Zen devised a unique design making this simulator under two-in-one concept for both field and class room conditions with minimum adaptation. The design of the simulator is compact, rugged, easy-to-operate with minimum use of cables. Introduced features like environmental conditions, dynamic selection of parameters of targets, fault identification, jamming by flares, calculation of launch zone, recording of various timings, distances and many other facilities makes this simulator state-of-the-art and world class substituting IR (Infra red) signal with electronic and optical signal without compromising on training procedure. The missile operators were also provided with hands-on training on how to use the simulator, maintain and repair it (field level). The operators were also provided with training materials and user manual in English and Hindi. System allows three gunners to train at a time. The fourth launching tube is designed to impart psychological and physiological training. The indigenously-developed 3AD Sim saved a lot of foreign exchange and also made sure the customer did not wait too long for factory repairs.

THE FUTURE

The 3AD Sim deals with surface to air missiles. The 3AD Sim has opened up aviation field for Zen. It has also developed a Full Mission Unmanned Aerial Vehicle Simulator, first of its kind in India, and it is ready for Army trials. Zen is seriously foraying into aviation sector. It recently signed a Memorandum of Understanding with Rockwell Collins, a world leader in avionics and flight simulators, to develop and manufacture flight simulators in India. Zen plans to put to maximum use of its expertise from UAV Simulator and 3AD Sim. Besides, there is a big demand for surface-to-air training simulators from Indian Navy and Air Force as well. This simulator provides a generic solution and it can be customized to replicate launch signature of many types of shoulder-fired air defence missiles existing with various countries in the world. Thus it has an immense potential for export.

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