

DIGIT-ALLY

ISSUE 4

DECEMBER 2023



Leading Digital Transformation

“Digitalisation is certainly not an intervention, it must be seen and appreciated as a movement and a movement requires champions to succeed. Each one of us must be ‘digitally sensitive’, to transform L&T into a company of ‘digital natives.’ SNS

FROM THE DESK OF SNS



Dear Colleague,

Three major trends significantly influencing our lives are the 'green' revolution, a renewed thrust on sustainability and, digital transformation. While terms like the Internet of Things (IoT), cloud computing, AI, ML, AR & VR, geospatial, big data, predictive analytics, have become commonplace these days, they are also key aspects of our journey of digital transformation that we embarked upon over 5 years ago.

Greater depth & width of implementation

The good news is that our varied suite of digital solutions deployed at various project sites, factories and manufacturing facilities across businesses and geographies are showing results. They are helping teams predict better, improve productivity, reduce costs & wastage, make more informed decisions, and enhance efficiencies and thereby deliver faster and better to our Clients and Customers. With greater depth and width of implementation, we have sharper visibility and better control of processes, are better placed to detect, and successfully plug gaps. With the versatility to positively influence every aspect of our business, going forward digitalisation could well be the single defining reason to stay ahead of the curve.

The numbers are telling a story

The impact on business is both qualitative & quantitative, tangible and intangible. By merely spreading the digital net wider to cover the entire process cycle of activities like fuel dispensing, concrete pouring; material management, putting sensors on weighbridges across mega project sites or even project progress monitoring is impressive. Not only are we arresting leaks but, at the same time, our quality of our delivery is improving much to the delight of our clients. Both by keeping a good thing going and by adopting more frontier technologies like advanced sensors, embedded software, and robotics there is no doubt that we can deliver even better.

Young blood to lead the charge

Our continued success will depend on how we face and overcome the challenges of the emerging world by rapidly adopting, adapting, and, most relevantly, cross-pollinating best practices across the Company. We cannot and should not be wasting precious time reinventing the wheel when some business somewhere within the system has already developed the solution. It is imperative to consolidate all our intelligence, learning and applications onto one platform, to create and maintain a central repository that all businesses can access and adopt as per their specific requirements.

It is heartening that our digitalisation effort is being driven by several youngsters. They should rightfully lead the 'digital' charge, with the freedom to infuse fresh thinking and the boldness to attempt new approaches. We need the vigour and the passion of young blood to win the day.

When developing & deploying digital applications, we cannot afford to focus from our workmen, quality, and EHS. These areas offer the greatest potential for continuous improvement through our digital solutions.

Every L&T-ite is a potential Digital Champion

Like it is just not the responsibility of EHS managers to drive EHS, similarly digitalisation must be embraced by every single L&T-ite. It is a shared responsibility. Digitalisation is certainly not an intervention; it must be seen and appreciated as a movement and a movement requires champions to succeed. Each one of us must be 'digitally sensitive'; to transform L&T into a Company of 'digital natives.' We have already instituted a system of Digital Officers, Ambassadors and Digital Catalysts. They will provide the 'push' but it is for each one of us to give the 'pull' to drive this movement deeper and wider.

Technology adoption must move to the next level. An integrated framework with generative AI technology is imperative for contracts, finance, engineering, and project management. Drone-based project monitoring is a must for linear projects. The entire precast activity from mould to precast must be digitally tracked real time with sensors, and a time and motion study will help us find the cycle time between each precast activity. Digital tracking of formwork & scaffolding material at project sites will reduce loss of material and improve the efficiency of transporting them from site to site. A lot has been done; a whole lot yet needs to be done.

Speed is of the essence

Though huge opportunities exist, to avail them, we must move at the speed of thought. Blue-sky thinking and an innovative spirit must thrive within our portals. Yet, staying relevant and in the present is important even as we imagine futuristic solutions, all to understand, meet and exceed client expectations. Technology is the future that we must build together.

All the best! SNS

December - 2023

CONTENTS

02 From the desk of SNS

04 Miles to go
Message from CDO

06 Propelling Innovation
The Digital Academy

08 Cruising the Blue Sea
Project Monitoring System

10 Analytics Powerhouse
CoE

12 The Sixth Sense
Natural Language Processing

14 CIDCO Projects driving digitalisation

16 The Power of Location
GeoDataBank

19 The Digital Squad

24 Digital Excellence Awards 2023



MANY MILES TRAVELLED. MILES TO GO...

Mahesh A Chikodi, Chief Digital Officer - L&T

The business landscape is rapidly changing with new emerging technologies, that are disrupting traditional industries. For enterprises like L&T to remain competitive and succeed in this digital age, we need to transform ourselves into an agile and innovative digital organization. At L&T, we are preparing for the Digital future.

Transforming into a truly digital enterprise starts with having a culture that embraces change, encourages innovation, and integrates technology into all operations. We are driving a digital culture by encouraging & empowering employees at all levels to think creatively and drive digital initiatives. We are pursuing a 100% adoption of all Digital Solutions built for Project Sites and Manufacturing plants. We are also consolidating standalone applications into Integrated solutions that operate Pan L&T with an L&T One mindset.



To keep pace with technology changes, we are proactively investing in emerging areas like artificial intelligence, internet of things, big data analytics, blockchain and quantum computing. Having the agility to integrate cutting-edge technologies ahead of competitors can provide a distinct strategic advantage. 13,000 + equipment pan-L&T are connected that stream one message every 10 seconds and generate 40 GB of data every day.

As a Cloud native organization, cloud computing provides us the flexibility, scalability, and cost efficiencies to adjust to rapidly evolving business environments. Migrating core business systems and processes to private cloud platforms are crucial for gaining technological agility. Hybrid cloud models can balance customized solutions with convenience of managed public cloud services.

The digital weighbridge covers 3.5-billion-dollar commodities flowing into the project sites. We have implemented digital monitoring of fuel & concrete supply chain with a consistent improvement month on month. Almost 40% of projects across the company leverage Geo spatial engineering & technology.

In addition, WISA actively covers 300,000+ workmen across 500+ active project locations. Our Drone survey cost has reduced by 15% and project progress review time by 20% with Drone Analytics. 25 project sites across Heavy Civil, B&F & M&M IC's use Vision Analytics while the I-RUDRA App, a digital thread strung across the entire value chain in the Heavy Engineering IC, is providing strong analytics and invaluable insights to take critical managerial decisions.

These statistics are only a glimpse of how deeply digital solutions have penetrated within L&T. Perhaps, the encouragingly rapid rate of adoption lies in the fact that each of our solutions have been developed and deployed to address specific issues encountered at project sites or manufacturing locations to either arrest loss or enhance efficiency.

Stakeholders are now getting a clear visibility of ROIs which gives us, L&T-ites, the confidence to spread the digital net wider and increase the tribe of 'digital natives' within the Company. Our 5-year engagement with digitalisation has taught us that the digital journey is as much as about cultivating a digital mindset as it is about massive change management.

Spread the digital benefits wider & deeper

It is, however, important to acknowledge that the adoption of new technologies is a journey, not a destination that requires ongoing commitment, adaptability, and a willingness to embrace change. Our digital efforts rests on some key pillars: to improve the reliability of existing solutions, to standardize and cross pollinate, and be future ready with respect to technology.

By adopting and maintaining a proactive and strategic approach, we can succeed in today's ever-evolving

technological landscape for which it essential to possess a growth mindset with clear objectives, prioritize security and compliance, start with small pilots, pursue data driven decision making, aggressively network and stay informed of the latest technologies.

Our interventions in the fuel and concrete chains are prime examples of what I mean by spreading the digital benefits wider and deeper. Earlier, only assets within the L&T system were being monitored with no mechanism to correlate whether we were paying for quantities despatched from source or what was delivered. Today, with digital solutions, we have visibility over the entire fuel chain right from the amount

either leaving from the oil company or the local retail pump to the transfer first to the dispenser unit and thence to our bowlers to the exact amount delivered at site. The advantages are manifold: real time quantity reconciliation, optimum resource utilization, improved planning, and forecasting, and most importantly, reduced pilferage & wastage and better efficiency. We are enjoying the same advantages by monitoring the concrete chain right through its journey from the batching plant to site. Our weighbridge solution has already arrested substantial leak and the accruing benefits can only multiply as more projects adopt the solution.



Corporate Digital team

A Sanyog to drive Quality

Set for launch very soon, Quality Sanyog, a joint initiative between the Quality Council and Corporate Digital, is a low-code & no-code platform envisioned to enable all quality processes across ICs on a single platform. Featuring the 19 modules in L&T's quality process, it encompasses a set of attributes to define the overall standard of the project and how well it meets the intended purpose & safety requirements to delight customers. The 19 Quality modules include Project Quality Index, Inspection, Customer Feedback, Audits, Incident Reporting, Site Walkdowns, Memos, Skills Management, Lab Testing, Calibration and more. Quality Sanyog is planned to be implemented in all 600+ construction project sites, EWL Kanchipuram, L&T Realty projects and other manufacturing ICs.



Within our vast and diverse organisation, each business unit is constantly developing digital applications and technologies for various activities. We have identified around 20 such applications for standardisation under the umbrella of "Quality Sanyog", a comprehensive Digital platform. This will enable uniform implementation of Digital tools across various verticals in the organisation, improve Product Quality deliverables and help review the performance through Dashboards. The next phase of our digitalisation efforts will be to incorporate Artificial Intelligence and the Internet of Things into our standardized digital applications, to ensure Quality Control throughout the construction process with real time project monitoring.

Mr. P. Sivasankaran

Convener – Quality Council, Head – QMS, WET IC (WWW)



The future of material management

At L&T, we handle approximately 80,000 material transactions involving about 500,000 line items in a month apart from consuming 50,000+ litres of perishable products like paints, coats, and waterproofing agents. Come December 2023, Material One will enhance mobility and scalability of material management to effectively monitor and manage these multifaceted processes. Instead of creating paper indents and later transcribing them into the system, engineers will be empowered to generate indents directly on their mobile devices at site reducing manual data entry by a whopping 95%. The solution will provide visibility for value-added materials too such as precast and structural steel, valued around INR 25,000 crores, and by integrating these into EIP, comprehensively address our diverse material management needs. Material One will streamline processes, and has the potential to cumulatively save some 200,000 manhours.

Material One is accessible through both web and mobile applications. It can enable modification in approver even after creation of the indent. The material request can be approved by the site in-charge too. The authorized supervisor details of the vendors can be added manually or from WISA. Real-time transactions help with quicker response time. The material consumption can be easily recorded through Material One and the consumption details can be accessed from a multi-level work breakdown structure. With Material One our entire site team can save cost and time and increase their productivity.

Muthu Krishna Kumar S

Manager Stores
BWSSB CP 26 PROJECT,
WET IC



Data is the new oil

15 projects from TI IC, 12 from B&F, 2 from PT&D and one each from Heavy Civil & WET ICs are availing the Geodata Bank that has increased the accuracy of their bidding process, increased their project management knowledge, reduced survey costs by 10% and time taken to source material by an impressive 50%. The bank has over 2636 Toposheets. A measure of the success of the bank is the increase of users from 126 in June 2023 to 170 in Nov 2023.

On the safety front, Vision analytics is aiding teams to detect unsafe acts & conditions like workers in the path of vehicles, not wearing PPE or safety harnesses, wandering into non-working areas at sites or under suspended loads or even over-speeding. On the workers front, the mobile-led WISA App has quickened the process of worker onboarding, skill assessment and database management and site leadership is today better aware of worker availability and productivity zone wise.

We need to focus on having people with the right technical skills and digital mindset to drive enterprise-wide technology transformation. We are proud to have successfully certified 261 Digital Ambassadors and 25+ Digital Catalyst in last 12 months. Our goal is to reach 500 Digital Ambassadors by end of 2024. Investing in re-skilling the existing workforce and acquiring fresh digital talent on emerging technology areas must be a priority.

The industry is looking at L&T as forerunners of digitalisation thanks to the vision of our CMD. Our integrated digital enabled supply chain approach is enabling 100% adoption. Our playground is huge and the possibilities limitless but as I said earlier, the continued success of digitalisation lies in the alacrity with which we adopt it. The benefits are staggering. Therefore, nothing should stop us now from transforming into a Company of digital natives.

PROPELLING INNOVATION



Gowthaman M

Executive Design Engineer

Any leader worth his or her salt would leap for joy if given the option of seamlessly monitoring project progress & manpower engagement at the mere the click of a button. That has been the privilege M. Arunachalam, Unit Head PDC, CBE, CMB MIP IC has been enjoying since July 2023 thanks to the new EL portal.

"Poring over reams of excel sheets to manually monitor site progress, manage and optimize manpower allocation was both arduous and time-consuming delaying the whole process, Today, with real time data, everything has speeded up to the rate of knots including my work and decision making."

M. Arunachalam

Unit Head PDC, CBE, CMMB & IMB IC



Introducing the architect of the new EL Portal

Arunachalam has a lot to thank the architect of the EL (Employee Log) portal, Executive Design Engineer, Gowthaman M. "My brief was to create a portal for extensive performance metric tracking, and interactive progress monitoring through dashboards," he informs, "though I was entering into unfamiliar terrain using Microsoft Power Platform software to craft a bespoke full stack software." Undeterred, using L&T's Academy of Digital Transformation as his crucible, he set about coding the programme over hectic weekends and early mornings, honing his digital acumen under the guidance of seasoned IT experts.



Amidst the challenges and steep learning curves, his efforts culminated in the creation of a new portal. Proud to be part of L&T's journey of digital transformation, Gowthaman proudly describes his creation. "It captures multifaceted performance metrics and granular data, for a deeper understanding of project timelines, employee productivity, and work engagement all displayed on an interactive dashboard for real-time project tracking and data-centric decision-making."

Drumming up efficiency levels

Senior Design Engineer, PDC CBE, CMB IC G. Nallamuthusamy, is another happy beneficiary of Gowthaman's digital creation. "It empowers me now to efficiently monitor manpower spending and gain valuable insights from data-driven charts, enhancing my ability to reference past data for upcoming projects."

G. Nallamuthusamy

Senior Design Engineer, PDC CBE, CMMB & IMB IC

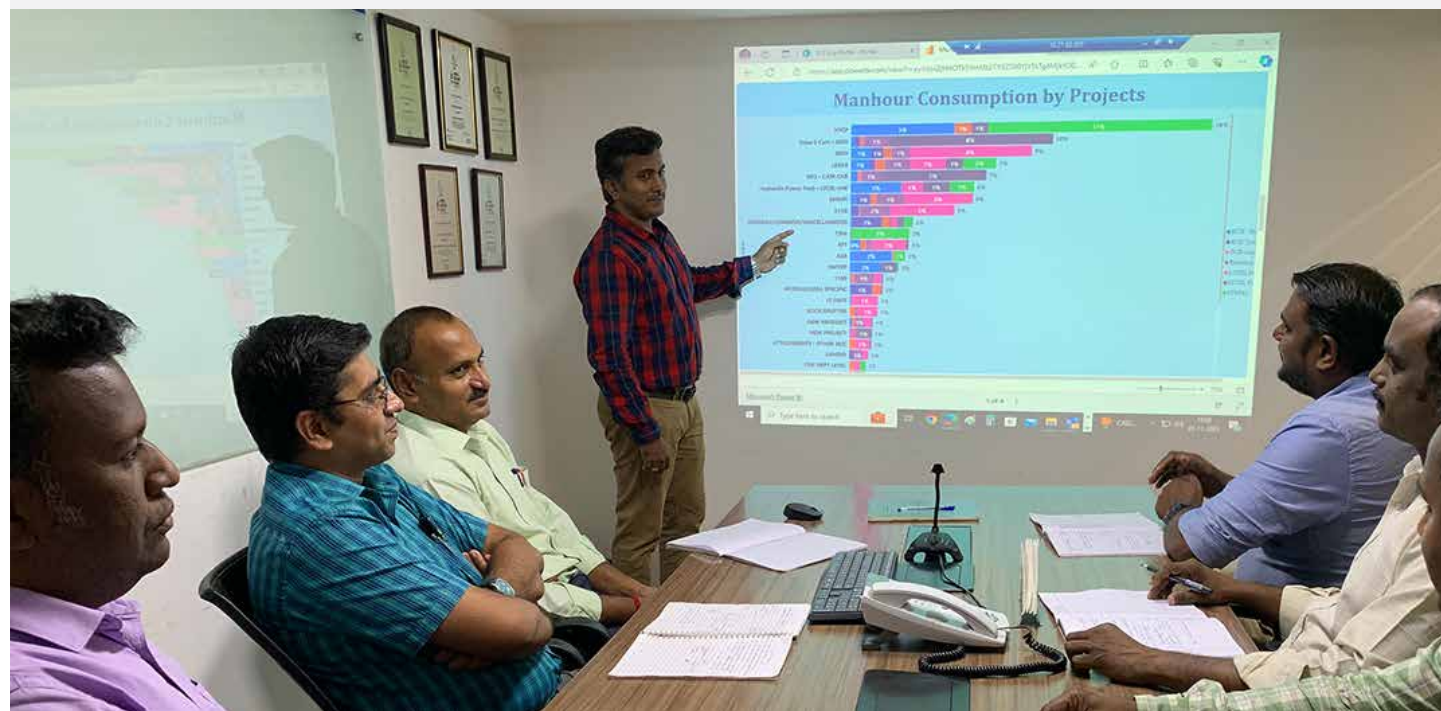


The shift from manual to automated methods have significantly contributing to his project success.

Wave of the future

Currently immersed in crafting a Power App for asset management, Gowthaman continues to represent the spirit of perpetual learning. His transition from a Digital Ambassador to a Digital Catalyst is certainly inspiring others to embrace digital change and drive towards fostering a future, powered by innovation.

Gowthaman's foray into the realm of software development against the backdrop of mechanical structural designs, a world far removed from the intricate dance of coding and algorithms, is an encouraging example of moving out of one's comfort zone to make a difference and a reaffirmation that opportunities abound in L&T's digital space. It just needs the right people with a right mindset to succeed.



CIDCO PROJECTS DRIVING DIGITALISATION



- BMWR concrete wastage reduced to 0.2%.
- WISA induction time reduced from 15 hours to 3 hours.
- Average ageing of non-conformities reduced to 3 days from 7.

Such statistics and more are reasons to warm the cockles of one's heart. The Project Managers at the three CIDCO projects at Bamandongri, Kharkopar, and Taloja, are delighted to merrily ride the digital wave led by their Project Director – CIDCO Housing Projects, Shaik Nawaz Shareef. That the sites are spread over a total area of 18 million sqft Built up area, with 320 employees and an army of 5000+ workmen, have sternly tested Project Managers, determined to drive digital adoption. Happily, though for him, the numbers reveal that his efforts are bearing fruit. At CIDCO Digital implementation is looked through the lens of Change Management with guidance from T Sriraman (Head- Residential BU), O V Divakaran (Head Operations – Residential North & West).

"Our focus has been to optimize planning, design, and construction by integrating and leveraging digital tools,"

Shaik Nawaz Shareef

Project Director – CIDCO Housing Projects



Nawaz remarks, with a quick glance at the visually attractive, data-rich dashboard displayed on his laptop screen.

The project received 4 Digital awards in a span of 2 years at the Annual Digital Excellence Awards. Bamandongri led by R Kannan winning the IC – Annual Digital Excellence Award 2023. Kharkopar led by Karunanithi Rajasekharan being the runners up for IC – BIM Excellence Award 2023. Taloja led by Sachin Suryawanshi being the winners for IC – BIM Excellence Award 2022. Also, Krishna Kumar T (TFL Digital & BIM Coordinator) bagged the Best Digital Ambassador Award 2023.



Rather than having dedicated Virtual Digital Champions (VDCs), the CIDCO project has a unique organization structure with hybrid roles. Md Shadan Salik at Bamandongri has a dual role of being site VDC as well as MEP Planning engineer, Yash Keshavrao Bakal being P&M Engineer is also VDC for Kharkopar and Ramendra Pratap being Planning Head at Taloja also shoulders additional responsibility of being project VDC along with Saranya. This approach adds more meaning to the individuals as they remain connected to their core domains while adding credibility for digital implementation.

BIM driving efficient outcomes

The extensive deployment of BIM has significantly improved collaboration, reduced errors and delivered superior construction outcomes. "We saved a whopping Rs. 1.8 Crores by detecting a clash between FPS and PHE pipe routing on the stilt floor at the Bamandongri site using BIM," Krishna Kumar Tenthuses. Apart from substantial savings from BIM-based value engineering, both MEP quantity extraction and client certification are on the BIM platform. "The as-built drawings extracted from the BIM models are acceptable to the Architect, PMC and client," he points out, mentioning that progress meetings, delay analysis, monthly execution plans are all monitored via BIM.

The team can visualize project progress through the Parimaan App using 3D BIM Models integrating Planned vs Actual, forecasts, delay analysis, progress visualization. Further, these models are directly linked to the Primavera schedule to view project status.

More digital impact

Nawaz has more to show for the projects digital drive. "Our IB4U inspections after due date has reduced from 60% to 8%, indents processing time from indent creation to cost booking has come down from 14 days to 4 hours and the number of manual indents has been cut to less than 1%." BIM 360 has substituted paper-based drawings and BIM models have replaced 2D CAD drawings. The digital intervention in weighbridges has already arrested substantial leak and a smart meter facilitated settlement of insurance claims for Tower Crane VFD damage.

Mure Jayadeep Reddy (Digital Officer, B&F IC) asserts "Digital implementation in B&F projects like CIDCO involves integrating technology to enhance efficiency, accuracy, and productivity.

By leveraging digital tools like Building Information Modeling (BIM), Internet of Things (IoT), and data analytics, CIDCO

projects have streamlined planning, design, and construction phases. Moreover, employing digital twins and cloud-based collaboration platforms facilitates smoother communication among stakeholders, enabling better decision-making throughout the project lifecycle."

Even as the CIDCO project sites go full throttle, they are aware that what is fueling their progress is a whole suite of relevant digital solutions and the passion of their digital teams, admirably led by Nawaz. He sums up saying that entrepreneurship is in the DNA of L&T. For people willing to stretch there are opportunities galore within the organization. Meritocracy is the only yard stick. There is a tremendous goodwill which brand L&T carries. He thanks his seniors T Sriraman, G V Srinivas, O V Divakaran, M P Deshpande, Niranjan Simha, Kaustuv Ghosh and J S S Murthy for mentoring in their own style thus adding to the richness of the organization.

Metrics speaking through a digital scoreboard.



"App-based KPIs track the usage of tools like Shield, Conquer, Digital Store, WISA, IoT, IB4U, BIM, Parimaan, BMWR Concrete, BMWR reinforcement across all the sites monthly, that creates healthy competition among the sites," quips Nawaz. "Of course, these have brought in transparency, alignment, and unwavering focus towards our end results of EHS, quality, progress and PBIT," he adds meaningfully.

With Power BI dashboards throwing up key project metrics on EHS, procurement, consumption, and such like, decision making is quicker while EHS PPMS scores show system compliance and focus on EHS Implementation. QR Codes are affixed at strategic locations across sites to record digital feedback and grievances. "This feedback is directed to the Virtual Digital Champions at site to ensure direct interaction between the Site Engineer and the top management for faster resolution of issues," remarks Nawaz purposefully.

Ramya T (B&F IC Digital Ambassador – West & North) says that CIDCO projects are proactive in collaborating with IC Digital team to do trials / tests / pilots of new emerging technologies & solutions / enhancements of existing solutions. They have positively impacted in streamlining the process & have always stood ahead of the curve in digital innovation.



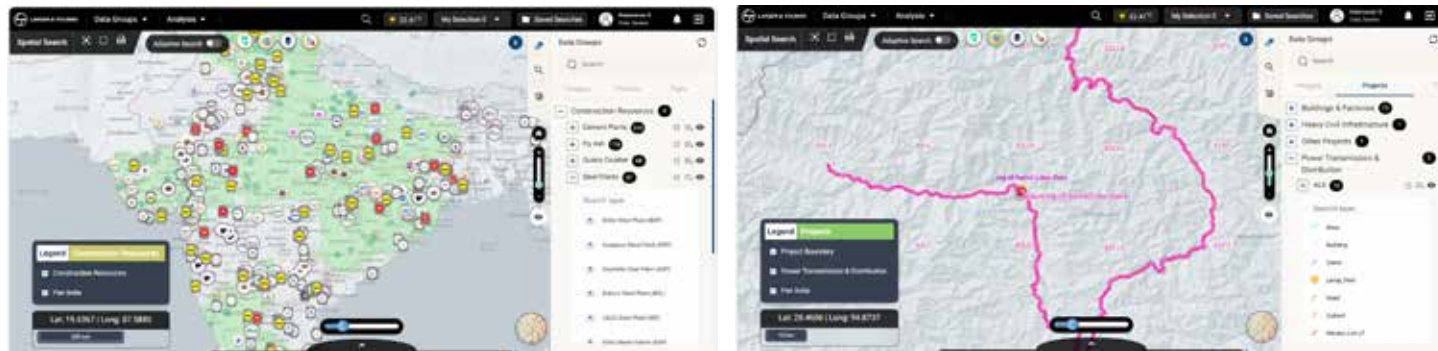
THE POWER OF LOCATION



Visualized data, however complex, is far more comprehensible and useful for stakeholders which was the Digital Team's endeavour to present geotechnical information precisely, concisely, attractively and in an easy-to-access format.

The One Stop Shop

The result of their endeavour is the Geo Data Bank, a repository of data on aspects like soil composition, rock characteristics, subsurface profiles, groundwater conditions, geophysical data, engineering properties and more, including third party data like from the Geological Survey of India. Not only do engineers now enjoy visibility of projects PAN-India but they can even input relevant data that can be beneficial & visible to the entire organisation. The data bank is a Cloud-based – Living Atlas of all Geospatial Data on a single portal which organically grows as data is ingested, facilitates probing earlier constructed project-related data, mapping crucial resources and restraining Government authenticated GIS data.



4 groups

The Imagery group contains Toposheet, Drone Data, Global Elevation Data and Satellite Imagery.

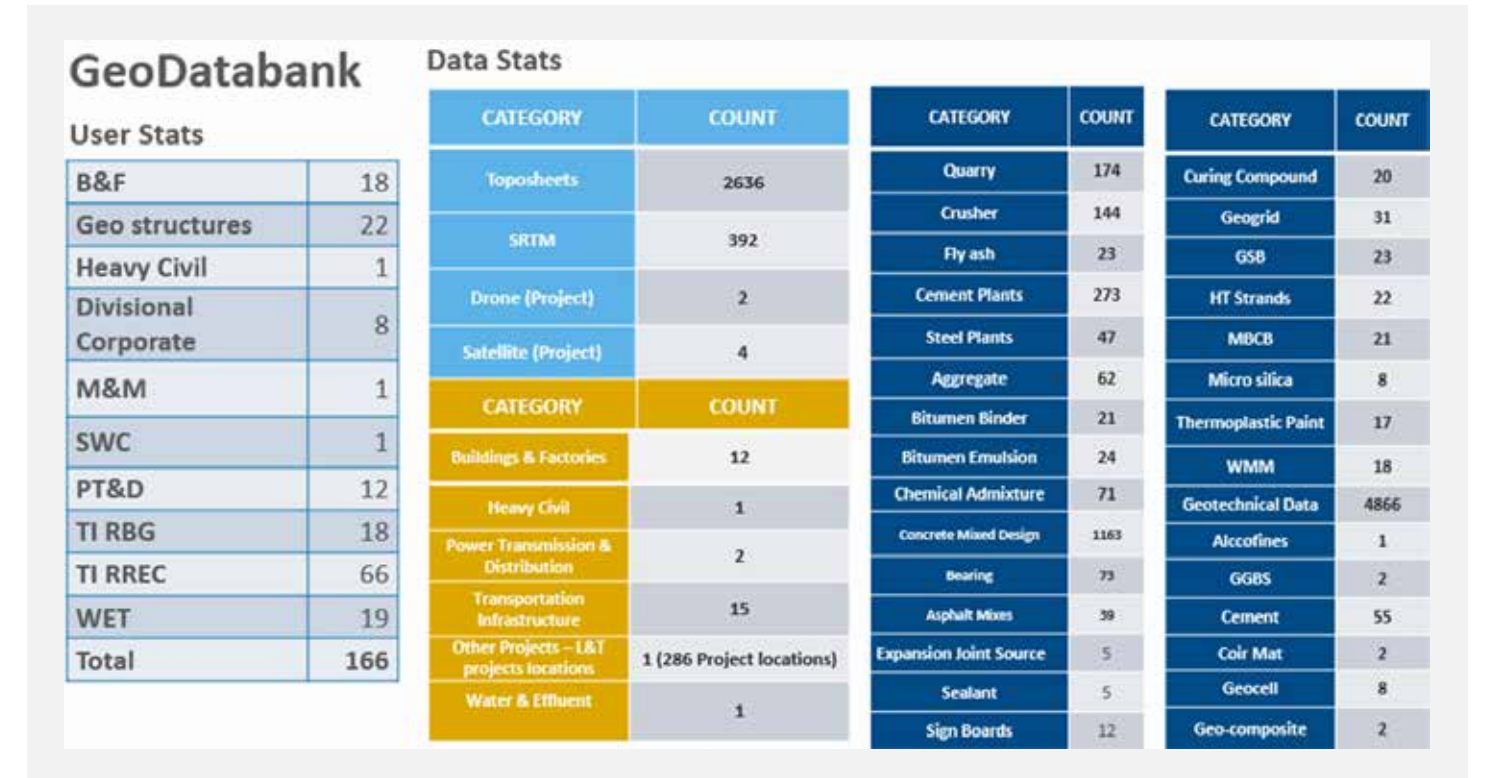
All the information about an area like roads, railways, settlements, canals, rivers, electric poles, post offices and more reside in the 2636 Toposheets available presently. Apart from the facility to upload drone data project-wise, shuttle radar topography mission provides high, quality consistent global elevation data while satellite imagery is high-resolution satellite data about the Earth.

The Geotechnical group helps in bettering dredging efficiency, cost estimation, equipment selection, environmental impact assessment, risk management and project planning. It provides information on the site quarries and borewells which can then help the team plan resources & timelines better.

The Construction Resources group presents information about the location of quarry crushers, fly ash, steel, cement,

and other manufacturing facilities of L&T across the country.

In the Project group, Transportation Infrastructure-RREC, B&F, PT&D, Heavy Civil Infrastructure and WET projects are listed out IC wise featuring topographic data such as the location of electric poles, hand pumps, electric lines, waterbodies, and the contour and elevation points for all projects.



Unleashing the potential

“The Geo Data bank has been extremely useful and a powerful tool, especially in the pretender stages,” shares Utkarsh Desai, Senior Manager, Corporate Centre RBF SBG TIIC, ‘. “We have created statutory documentation for quarry and crusher operations, referring the rock properties, for a cost guidance for the region to estimate the production cost of aggregates. It also helps us to fetch information on the material to be sourced.”

In the words of Vikesh Velechate – Digital Officer, Geo Structure IC, “We’ve embraced the solution and there have been clear benefits to the design, BIM coordination, contracts, and business teams. The Geodata Bank has been exclusively developed to promote Data reusability and enhance Data availability within inter and intra ICs. The four main modules: Data Group module, PAN India module, Analysis module, and Upload & Approval module are being used very effectively.

The Pan India module facilitates the visualization of Geology maps, Soil maps, seismic maps, and weather maps. The Analysis module showcases contour and elevation profiles. The Upload & Approval module is specifically designed for Data contributors and Data Validators, streamlining the data submission and validation process.”



CRUISING THE BLUE SEA



Ship designing and building is a technically complex, and challenging task, that call for the integration of multiple equipment and machinery operating in extremely limited spaces. Over a 3-5 years' time span that it normally takes to build a ship, regularly monitoring the project's progress is crucial to identify blocks, de-bottleneck and complete the project as per schedule.



Seeing is believing

The construction of the two ships for the Indian Navy that is proceeding full steam at the Kattupalli Ship building complex is being monitored 'live' at the IHQ Delhi (Indian Navy Integrated Head Quarters) thanks to a clear tracking system to capture & integrate data from different sources to provide the required visibility.

"We had to implement a sustainable Project Monitoring System that can fetch the right data from different sources using the existing technology," shares a visibly excited Priyanka K Maniyal, Assistant Manager " We had a skilled, cross functional team to put this comprehensive system in place."

Priyanka K Maniyal

Assistant Manager



Even though there were project management tools like Primavera, Hive available with features to track the project based on tasks & milestones, the customer insisted for an integrated real time Project Monitoring System (PMS). Priyanka and team ideated, designed, developed and deployed an application that addressed all the user pain points and gave total visibility of project progress. The secure & scalable PMS application connects multiple sites & locations by integrating functionalities of the following tools

- Real time reports in the PMS
- Web based online project monitoring
- Online documents for share, reviews & approvals
- Customer document approval process (that has reduced by 2/3rds from the time of about 90days)
- Seamless connectivity between the design centre, production & Delhi offices



Proof of the pudding

"It was a proud moment for us to win the IT awards 2023 under the large Application Category," beams Priyanka. "The feather on our cap was when the Indian Navy asked the other shipyards to deploy our PMS." The application is hosted in a data center at the Kattupalli shipyard, and is accessible to all the key stakeholders., including the WOT (Warship Overseeing Team), who are physically present at the Kattupalli shipyard too.

Our digital initiatives have strengthened our ability to leverage data driven solutions to solve everyday challenges for at L&T, we believe that digital transformation is not just about technology, but about people and the way we think.

EMPOWERING WITH DATA



In the era of digitalisation, the landscape of asset management is rapidly transforming. From diagnostic to predictive and now to prescriptive analytics, this journey has become the driving force behind improved productivity and efficiency. As a part of this movement of our 31K asset base, over 14k are IoT connected, that capture the key metrics to monitor usage empowering us to make business-critical, data-driven, and timely decisions.

Analytics Powerhouse

Chandrabose, Senior manager, Advance Data Analytics at the Corporate Centre, briefly highlights a challenge we face. “For assets that are IoT connected, data points are directly streamed from the sensors installed in the assets that are saved in cloud database. Whereas in the EIP system, all collected data points from assets, input by the site P&M people, are stored in AMS database. Business users find it very difficult to combine these systems, read the data, and determine the productivity utilization and efficiency of an asset, as the data sits in two different sources.”

The Centre of Excellence – Advanced Analytics (CoE-A2) created to enhance collaboration & decision making between the management and operations, led by Mr. B Balaji envisions to achieve sustainable operational excellence & profitable business growth by leveraging Big Data and Advanced Analytics. CoE-A2 has successfully developed and implemented **ASSET OPERA (Operational Analytics), an integrated IT-IoT platform designed to provide crucial metrics and actionable insights through comprehensive asset operations analysis.**

Key features of Asset Opera:

Comprehensive Metrics Capture:

On utilisation, productivity, reliability, and fuel consumption that offers a holistic view to understand the performance of assets at a granular level.

Monthly metrics & Anomaly reports:

A dynamic snapshot of asset performance on monthly basis, with anomaly reports that helps to focus on addressing issues with low performing assets across various levels, impacting expenditures.

Optimum Asset Replacement Time Prediction:

Offers predictive analytics of optimum time for asset replacement, for better planning and resource optimization.



Way to go:

Fuel productivity monitoring at IClevel:

It is imperative to monitor fuel consumption to optimize its usage across ICs.

“The data, reports, and visuals projected on the Asset Opera dashboard provides a comprehensive view of fuel productivity, measured in litres per cubic meter (LPC),” shares an excited D. Krishna Kumar, Manager – P&M (PAF), BF IC, “that can be drilled down to project levels to empower IC teams to swiftly identify deviations and implement corrective actions. We have observed a remarkable 3% drop in LPC for B&F in Q2 FY24 compared to that of Q2 FY23, a testament to the effectiveness of our optimisation strategies,” he says with the air of a job well done.

D. Krishna Kumar

Manager – P&M (PAF), BF IC



Real time productivity monitoring of the concrete chain in B&F:

Machinery productivity significantly impacts project cost & progress, and this is what Asset Opera is making a big difference enthruses Dr. Mr. Krishna. “The real-time productivity monitoring dashboards available on Asset Opera, complemented by asset-level and project-level drill-down capabilities, have facilitated the redeployment of low-productivity assets.” Additionally, exclusive batching plant alarm dashboards created by the analytics team has enhanced the team’s focus on key parameters using the Pareto rule. “These concerted efforts have translated into an impressive 2% improvement in batching plant productivity for B&F in H1 FY24 compared to H1 FY23, with a total production volume reaching 11.8L cum,” he rounds off triumphantly.

Asset Productivity:

Goes beyond conventional metrics and helps delve into nuances of asset performance.

Asset hiring & de-hiring analytics:

Analyse the entire lifecycle of assets, ensuring optimal asset utilization and resource management.

Fuel monitoring:

Provides granular insights into fuel usage helping to optimize fuel utilisation.

Asset performance comparison:

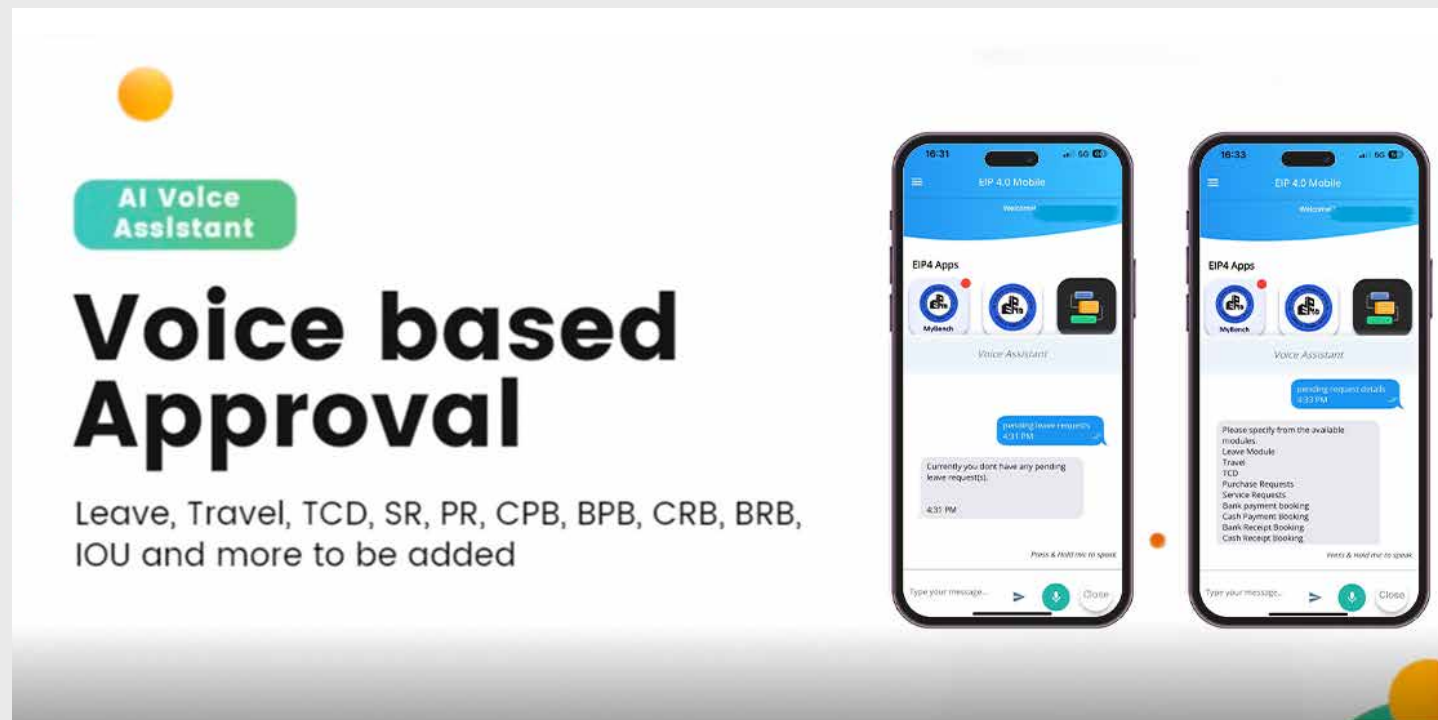
Comprehensive comparison of asset performance

Concrete production capacity analysis:

Analysis of concrete production capacity, providing critical insights that allows to optimize production processes and enhance overall project efficiency.

“Seeing is believing,” remarks Abdul Rehman Rajkafur, Digital officer, Corporate Centre, HCI-IC, in conclusion. “Asset utilization has seen a substantial increase from 69% in H1 FY 2022-23 to 82% in H1 FY 2023-24 and fuel consumption has decreased from 5% in H1 FY 2022-23 to a commendable 2% in H1 FY2023-24.”

THE INTERACTIVE AGENT



The Workbench AI chatbot, developed in-house by the CoE – Advanced Analytics & DC-ISD, is designed to streamline workbench approvals and requests. Its voice-enabled feature, integration with a mobile app, and support for various approval criteria make it a versatile and user-friendly tool within the organization.

This feature is expected to reduce the TAT from the current average of 3 to 2 days. The voice of many others like Murali underscores the practical benefits of the Workbench AI chatbot, particularly in terms of its user-friendly voice command feature and mobile app integration. This feedback suggests that the implementation has successfully improved the user experience and streamlined work processes for individuals like Murali who deal with frequent workbench approvals. Since its launch in October, the Chatbot has answered more than 1500 questions.

Murali M, JGM-Systems and process improvement's positive feedback about the Workbench AI chatbot reflects the success and utility of the newly implemented AI feature. He highlights, 'the AI chatbot effectively handles workbench requests based on our voice commands. I can approve or reject requests using voice commands. The AI feature allows me to multitask efficiently, and I can manage workbench approvals seamlessly, even when I am out of the office as the voice assistant is integrated into my mobile app.'

Murali M
JGM-Systems



THE SIXTH SENSE



Data-driven decision-making is fundamental for organisations aiming to thrive in the modern business landscape. It not only enhances the accuracy of decisions but also contributes to strategic planning, operational efficiency, and overall organisational success.

Data-driven decision-making is fundamental for organisations aiming to thrive in the modern business landscape. It not only enhances the accuracy of decisions but also contributes to strategic planning, operational efficiency, and overall organisational success.

targeted approach to data analysis and decision-making with specific domains is yielding the well-deserved results.

With the rise of new technologies, the integration of NLP-based (Natural Language Processing) Intuitive Interactive Intelligence into the EPSILON program, within L&T Hydrocarbon, has been done with a clear objective to enhance accessibility and effectiveness of data analysis processes for a wider range of users. The models are specifically trained for Logistics and AWP datasets, and this

NLP technology serves as a bridge, translating natural language queries into the technical language of databases (SQL) and executing them on the underlying data model. This enables users to interact with data using plain English or conversational language, fostering a more intuitive and accessible approach to data analysis. The integration of advanced AI and ML functionalities within NLP allows for a nuanced understanding of user queries, considering context and intent.

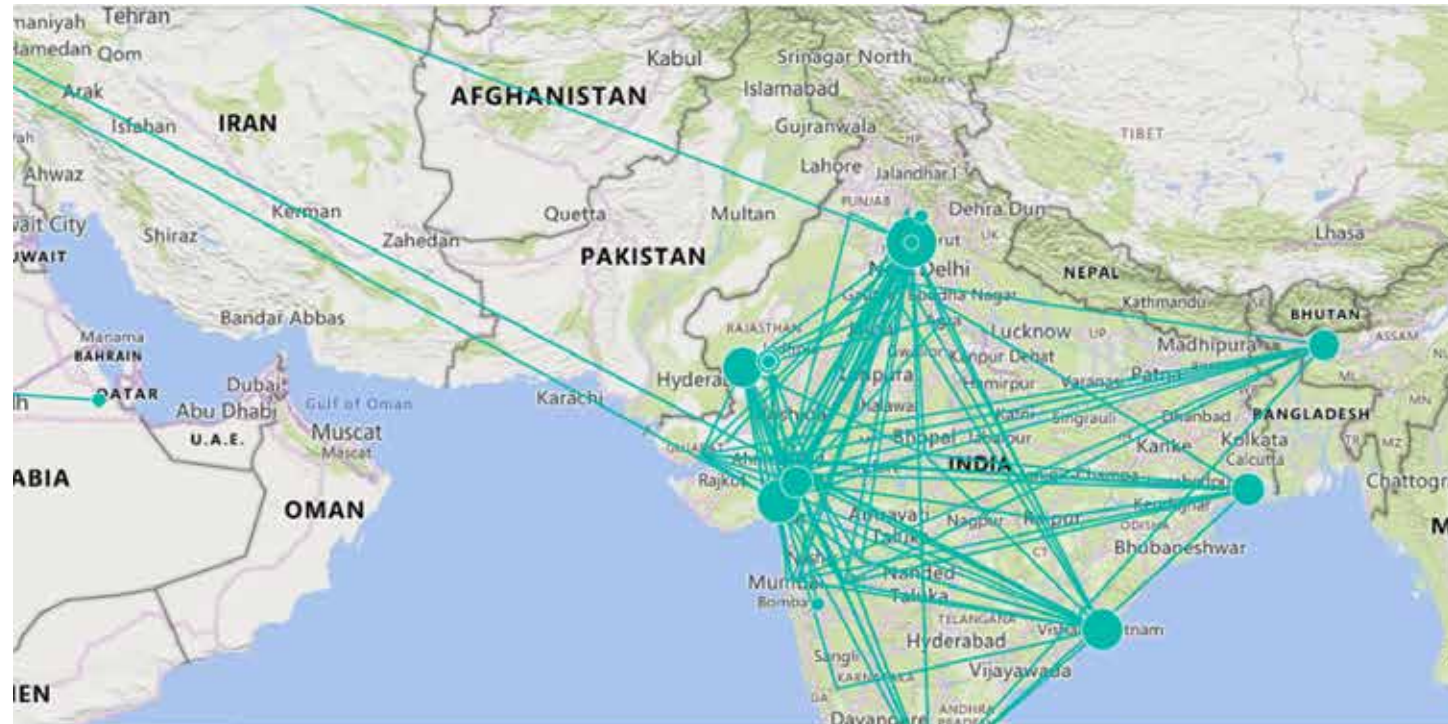


Reaping benefits

'Logistics NLP is currently implemented on historical data from 9 projects and its noteworthy to mention that 3 IOCL projects are actively contributing their data to the NLP model', says Krutharth Desai, Assistant General Manager – Digitalisation, L&T Energy Hydrocarbon Vadodara. 'The areas that NLP focuses in logistics are Trip duration plans vs actuals, Budget & actual costs, specific cargo types like Over dimension cargo (ODC), General cargo (GC), Multimodal, Imports. 'It has helped in integrating map visuals of Destination & Origin locations, and the details of the suppliers & logistic partners spread across different geographies into the system.', adds Krutharth.

Krutharth Desai

Assistant General Manager – Digitalisation



Kunal Purohit Kunal Purohit, Manager – Supply Chain Management, L&T Energy Hydrocarbon, Vadodara says with a gleaming smile, 'The quantum of material captured for the ODC is humongous – gross weight of approximately 44,000 MT, with an estimated value of Rs.0.77 Bn and volume of 140,000 CuM. The ODC does about 10-12 transactions a day and the GC averages between 40 -50.'

Well-oiled machine

Reports, data and processes are now available at a much shorter time, which has helped in a substantial productivity increase. The efficiency in historical analysis has led to time and effort savings that can now be redirected to more strategic aspects of logistics. 'NLP has enabled the logistics team become proactive and well equipped to respond to changes quicker and deliver faster,' says a happy Krutharth as the team was an ICON winner for the project "Digital Dashboard for Logistics Insights".

WALKING THE TALK BYTES FROM DIGITAL OFFICERS

In the rapidly evolving digital landscape, digital officers play a pivotal role leveraging the power of technology to drive innovation, efficiency, and growth. Here is how they have used transformative technologies to create value for the business and take the organization to greater heights!



MANJIRI PALAV

Digital Officer (L&T Defence)

We at L&T Defence are implementing a new solution for PSLV predictive analytics the subassembly and leaf level delivery predictions using transactional data for managing the first biggest space programme. We have cross pollinated our solution for GST reconciliation using RPA to LTEH.

VAIDYALINGAM

Chief Digital Officer (HEIC)

HEIC Digital team is working on an end-to-end Digital transformation program called iRDURA. We have also implemented new solutions such as Auto generation of CNC program based on geo-position data for elimination of set-up on large waterjet CNC machine by defining job reference using geo-position captured through digital scanning method, Safety Surveillance System AI based surveillance system for detection of abnormality like PPE non-compliance, violation of SOPs, etc. We have also shared some of our solutions such as Project Financial Dashboard to Defence & Multi-rating Feedback System to LTEH.





B SRINIVASAN

Head- Resources & Digital (LTEH)

The LTEH digital team has successfully Implemented new solutions in this financial year. It includes Brownfield Virtual Reality (VR) Safety videos which Imparts immersive trainings to workers to reduce hazards and risks during execution such as Gaseous Hazards in Brownfield; Excavation in Live plant ; Crane operation in proximity of Live facilities ; Fire protection ; Emergency response during Gas leak & Fire accident. We have also implemented Package Dynamic Information Modelling (PDIM) which provides Workfront availability in a 3D model in more details (at spool level) for the execution and planning team. We have also cross-pollinated RFID based Fuel Dispensing system to HCI, WET, B&F, PT&D, GEO, TI and M&M SBG. Fortnightly meetings conducted by the CDO offer a forum to cross pollinate ideas from across various ICs and drive implementation of certain organisation- wide strategic initiatives in Digitalisation. Our drive to take up Material Nxt is one such outcome to cite. This template of review has helped a lot specifically in debottlenecking the inter-dependencies with the development partners and share perspectives from other ICs which are essential for us as an organisation to accelerate Digitalisation.



NC SRINIVASA

Digital Officer (WET IC)

The two major initiatives implemented in this financial year are WET DESK and drone-based Lidar survey. WET Desk is an in-house developed web-based application for the multi-disciplinary design of various elements related to WET IC. In this application, all engineering software's (Autodesk Revit, AutoCAD, Bentley Staad.PRO, Office 365) are integrated to facilitate the design process and generate design documents, BIM models, drawings, and quantities in a predefined ready-to-submit format. Drone-based Lidar survey is mandated to enable faster capture of high-quality survey data. Using survey data & ArcGIS we developed in-house toolset to automate Chak planning, Outlets and OMS extraction Micro Dis-net routing & distribution network routing using least cost path analysis.

NEERAV MEHTA

Digital Officer (LTEH ON Shore & Offshore)

We are currently working on key Digital Initiatives as part of the programme EPSILON, which helps in improving collaboration, decision agility, predicting the potential bottlenecks and provide early warnings. We have adopted Generative AI to bring insights from our knowledge repository. To embrace the power of Digital Twin, we are integrating with IoT based safety solutions, immersive review through virtual and mixed reality and improvements in productivity and safety through video analytics.



AMIT ANIL SINGH

Digital Officer (TIIC-RBF)

With a commitment to Data Driven Organization, we are proud to inform about 'Digital Transformation Drive' initiative to upskill our users in Digital technologies and unlocking the potential in respective functions, preparing them for the data-driven future. Thus Together, we are strengthening our organization's competitive edge.



ABDUL REHMAN RAJKAFUR

Digital Officer (HCI)

HCI IC has been a pioneer in implementing digital solutions across 4Ms of infrastructure industry – Men, Material, Method & Machinery. The Business digitally monitors all aspects for effective project delivery by leveraging technologies like Drone based Project Monitoring, 5D BIM and innovative digital platforms such as Virtual Reality (VR) based training of workforce in EHS (Environment, Health and Safety) aspects on a continual basis. The two well-established applications, ConPro and RebarPro are cross pollinated to Geo Structure, WET, TIIC, L&T Power. The business is consistently moving towards a more digitally advanced work environment. Recent initiatives, such as Explosives Tracking and Precast Segments Tracking, have been launched and are actively being implemented at various project sites through our network of digital champions.



TUSHAR VAGAL

Head Digital & IT (LTRealty)

Being an IC, which deals with customers day in and day out, we have developed an application called Customer App which completely digitizes the customer experience right from booking to handing over. We also provide a solution called MyLTR which is for broker networking. Our AI powered digital booking form for customers gives paperless booking using Digital KYC Anytime, Anywhere, Any-device and Improves Customer Experience. In the future, we are working on implementing a generative AI voice bot enabled virtual walkthrough.



KUMAR S

Digital Officer (L&T RPM)

In RPM we have implemented Digi Das, which is an established online system to plan, monitor the progress of Machine Building activities & facilitate planned delivery and comprehensive status reporting. We are also extensively working on new solutions such as PLM for Design/BOM and Inspection-tab for inspectors to enable online inspection of parts, view drawings and generate inspection reports.

SUNDARRAJAN M

Digital Officer (M&M SBG)

In M&M SBG we are currently working on digital solutions for operational excellence such as WRENCH for project and contracts management, Data analytics for business intelligence and digitalisation of fabrication process with centralized application and repository which enables micro level planning & monitoring.



VIKESH VELECHATE

Digital Officer (Geo Structure)

At GeoStructure, our focus lies in advancing the development of a comprehensive digital solution for Geotechnical Investigation (GTI). This integrated software revolutionizes the entire GTI process, seamlessly connecting field operations with lab results and automating the generation of borelogs. Additionally, our commitment extends to enhancing productivity through the creation of monitoring solutions tailored for our core business equipment.

Our repertoire of digital solutions includes the implementation of innovative tools such as CountThings for automating material counting and FleetX for efficient logistics management. Embracing technological advancements, we are seamlessly integrating Quality Equalizer – Sanyog, a holistic solution encompassing all quality-related functionalities, and Material NXT, a platform designed for the efficient management, tracking, and tracing of materials on site. Our commitment to excellence is further reinforced through the incorporation of Rebar Pro and Con Pro from HCI IC, illustrating our dedication to cross-pollination and the continuous improvement of our digital ecosystem.



JIGNESH CHOKSHI

JGM Digitalisation

L&T power recently implemented solutions such as Fire Asset Management System at LMB Factory and facial recognition-based attendance system. We are also working on new initiatives such as Smart (ML Based) application developed for Pulveriser Procurement Cost and Man/Machine Hours Prediction at LMB Factory, initiated productivity measurement for P&M assets, solutions for welding consumables and productivity. We are also considering 'Wrench' as an integrated project management tool. We have cross-pollinated various applications such as WPS Digi Lock, Sheild, IPMS from central digital teams as appropriate.

PRAKASH HEGDE

Head Digital & IT (CMB)

We have implemented a new solution called S360 to deliver value to customers through consistent quality of service across Dealer networks and on complete range of products offered in construction machinery business. This provides field service as a value enhancer & key differentiator for business, parts requirement visibility to Parts sales engineer for improving parts sales, capture service knowledge & establish best practices of services. Here end-to-end process from ticket creation to dealer claims & Customer satisfaction feedback are digitized. We also received the prestigious SAP ACE award for our S360 implementation.

Apart from this, the team is also working on AI enabled conversational bots with customers on social media platforms like WhatsApp, Instagram etc.



SANKET TRIVEDI

Digital Officer - L&T Power

L&T power recently implemented solutions such as Fire Asset Management System at LMB Factory and facial recognition-based attendance system. We are also working on new initiatives such as Smart (ML Based) application developed for Pulveriser Procurement Cost and Man/Machine Hours Prediction at LMB Factory, initiated productivity measurement for P&M assets, solutions for welding consumables and productivity. We are also considering 'Wrench' as an integrated project management tool. We have cross-pollinated various applications such as WPS Digi Lock, Sheild, IPMS from central digital teams as appropriate.



MAHENDRA SINGH RATHORE

IoT Officer

I am currently working as a project coordinator for Internet of Things (IoT)-related projects in the Digital Team, where I am involved in ambitious initiatives focused on providing valuable insights into plant and machinery assets. I play a key role in the Asset One project, dedicated to the continuous monitoring of assets. Through this project we have seamlessly integrated ERP data with IoT data to provide a comprehensive view of asset fuel consumption, productivity, and utilisation. Additionally, we have integrated data from over 10 distributed IoT dashboards into a unified data source, offering a centralised platform for comprehensive analysis. I am also responsible for monitoring of IoT hardware, ensuring alignment with the latest market trends and maximum implementation of IoT in assets.



ARUN KUMAR MEHER

Digital Officer (PT&D)

Project management, the core of our operations, is managed through PRAPTI- A digital project management platform. We're driving a set of strategic initiatives to enhance operational efficiency and productivity through Pronto, real time visibility on project health/ risk indicators along with cashflow. Additionally, we're actively exploring AI applications in Market Intelligence, Tendering, and Risk Management. Our digitalisation efforts extend to ensuring regulatory compliance through a dedicated module and making various enhancements in Workforce, EHS, and Quality domains to improve hygiene and derive valuable insights.



THIRUVASAGAM A

IoT Lead

Currently, I serve as the Project Manager in the Corporate Digital department, overseeing the development, delivery, and implementation of our transformative initiative, Asset One. Recognizing the existing challenge of IOT Data being in disparate silos, with some stored in the EIP and others scattered across multiple IOT platforms, Asset One emerged as a comprehensive solution towards an Integrated Platform. We aim to integrate P&M IOT Data sourced from various Integrating Partners, our internal Enterprise data, and diverse asset classes within different ICs. Leveraging API's and advanced Data Integrating methodologies, we are seamlessly capturing and mapping crucial value chains such as Fuel, Concrete, and Material throughout the landscape. We are confident that the Asset One Platform will revolutionize our process chain, empowering data-driven decision-making. We are sure the platform will transcend individual ICs, providing a centralised hub for monitoring, control, and business intelligence, ultimately unlocking unprecedented value across our organization.



ANKUR SRIVASTAVA

Digital Officer (TIIC-RBG)

Considering the technology shift we are working to leverage the power of AI/ML for the development of state of art solutions like generation of Electronic Bill of Material (eBOM) & its application in project lifecycle. Also, solutions like precast tracking & Vision Analytics for MAHSR T-3 Project are in development phase and very soon they will be implemented in the project. RFID based fuel bowsers, Fuel Sensors in high HSD consuming assets, Batching Plant Analytics and various other applications in different domains are effectively implemented in TI-RBG, thus reaping huge benefits. The development of the QARS 2.0 (Quarterly Audit Rating Score) online Audit module, the first-of-its-kind EHS Audit Module tailored specifically for RBG, stands out as a significant achievement.



MURE JAYADEEP REDDY

Digital Officer (B&F)

We are working on implementing new digital initiatives such as Vision analytics for safety, Materials Nxt, Contracts Digitalisation and Procube with Lean principles. The B&F digital team is also working on developing an app called CAIAL Centralize Data Collection to reduce deviation from Contractual Terms, EDRC GFC drawing tracking application, Advanced AI Powered Analytics for EHS Use cases, Weld Pro-E which digitizes the entire process of creating Welding procedure Specification & Procedure Qualification Record forms and others. Matured applications like MEHA, Predictive Analytics dashboard, WISA, Digital Stores & other precast tracking applications are cross-pollinated across Construction & Non-construction ICs.



RAMESH S

Head – Digitalisation, IT & Estimation (L&T Valves)

Our current focus is on Creating a Digital Shop Floor, Adoption of AI/ML for process automation, Enhancing Customer experience through a Collaborative Eco System (CES), Comprehensive MIS enablement through Integrated Data Analytics System (IDAS) platform.



DIGITAL EXCELLENCE AWARDS 2023



Editor
Sreelakshmi Sanjit

Editorial Team
Vinod Chacko, Namitha Jayanarayanan

Content Associates
Kalaivanan S

Photography
V.S. Natanavelu, R. Saravanan

Corporate Communication Department, L&T Construction Headquarters, Manapakkam, Chennai – 600 089.

Design & Layout by Social Tribes.

The views expressed in this magazine are not necessarily those of the Management.

The content of this magazine may not be reproduced without the permission of the Editor.