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From Anantha's Desk

The digital world is constantly evolving. While completely new technologies may not arrive on the horizon too often, there are new solutions and new use cases for the technologies and combination of technologies that come up regularly.

Here we are with another issue of Digit.ally, to share developments about enhancements to our existing digital solutions and new solutions that have either been launched or are under development. Given that we are at a certain stage of maturity in this journey, with many solutions developed, deployed and yielding benefits to the business, our focus currently is on the following;

1. To improve the usage of solutions
2. To redesign interfaces and dashboards for senior management to enable decision making
3. To develop new solutions for projects with certain unique requirements

Our journey to explore the use of AI for various solutions is making good progress. You will find articles in this issue about some of them. We are gaining invaluable experience designing these AI solutions, evaluating their impact and value for business and building our expertise. The potential for adding the AI dimension to our solutions is immense and while we build our expertise, we will also work with the businesses to explore use cases that will deliver value to give our businesses a competitive edge.

Automation is another area that is becoming very popular with the growing demand to eliminate drudgery and non-value adding routine office activities using Robotic Process Automation. We have described a few such solutions that we have developed for the Finance & Accounts function in this issue.

As we approach the end of 2020, with ardent hopes for a brighter better year ahead, it is also time to celebrate the good solutions and implementations of the current year. The Digital Excellence Awards for 2020 have been announced and we are looking forward to receiving entries from the project sites and digital officers and an exciting contest ahead.

Best Wishes,

Anantha Sayana
Chief Digital Officer

An Unmanned Weigh Bridge Solution – using IOT and AI (Computer Vision)

UWBS or Unmanned Weigh Bridge Solution is an end-to-end solution that integrates a Material Inward System and connects and consolidates all weighment transactions associated with multiple weighbridge systems inside a plant. Through UWBS, a weighbridge can be operated in a completely automated mode without a human operator, while at the same time, it takes care of all the precautions to ensure untampered accurate weighments. Multiple weigh bridges in a plant or project site can be retrofitted to connect to this platform to give Material Stores administration a real time view of material flow from the security gate through the weigh bridge till unloading at stores. UWBS is the next logical evolution of connected weighbridges that we had previously introduced at our construction sites.

High Level Process

UWBS comprises of a gate entry system, which enables the security at the gate to register the vehicle details in the system along with the material details like PO, supplier, transporter, etc., and issue a RFID card to the vehicle driver.

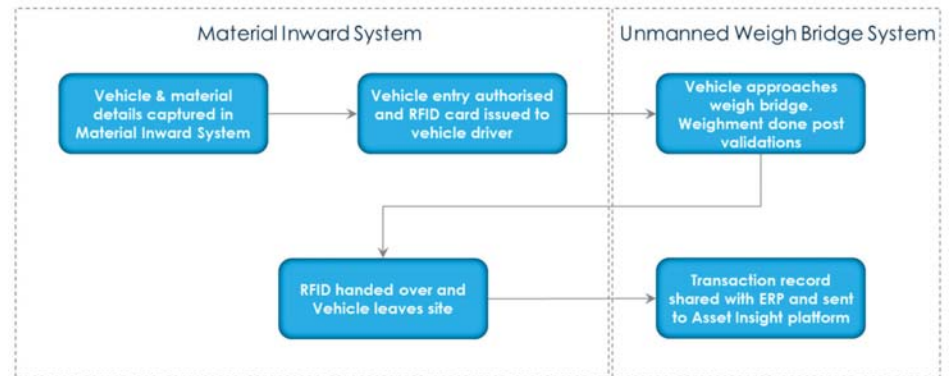
At the weigh bridge, UWBS has a vehicle positioning system and an application to capture both gross and tare weights against the details already registered at the gate. After loading or unloading, the driver returns the RFID card at the gate and collects the weighment slip when leaving.

Weigh Bridge Operation:

The unmanned weighbridge system can be operated in three modes

- Autonomous
- Manual
- Calibration

These modes can be manually switched upon authorization in an application that runs inside the operator's cabin.



Arrangement:

The vehicle can approach the weighbridge via two entry points. The vehicle driver is guided by traffic lights that are placed on either side of the entry with an announcement hooter during the entire course of the weighment.

Autonomous Mode:

The driver scans the RF Card that was registered and provided to him at the

Security Gate. The system validates his entry and the empty weight value of the weighbridge before his entry. He is then informed about the validation status of his card and guided inside the weighbridge by traffic signals and announcements. The movement of the vehicle is tracked by through-beam sensors.

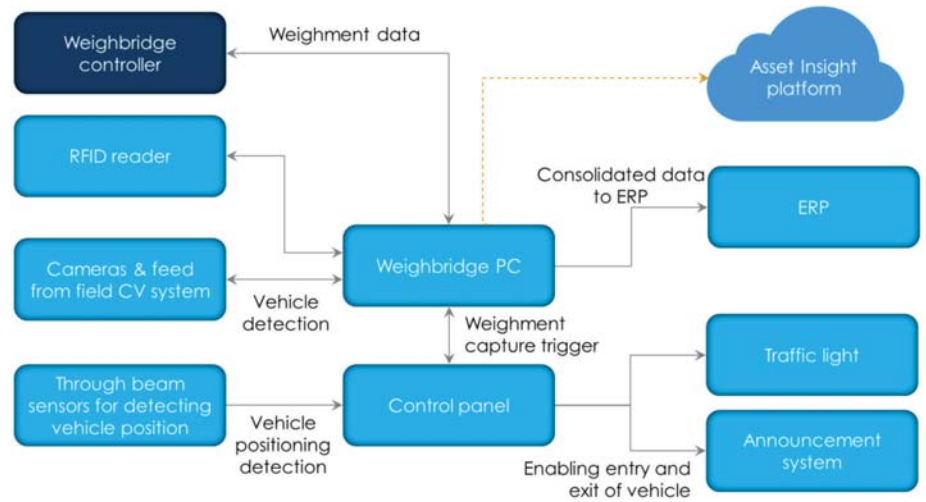
After the vehicle has entered the weighing area, the weighbridge is thoroughly

inspected for any foreign objects powered by the through-beam sensors and Computer Vision AI from cameras positioned across the scope of the entire weighbridge. The system records images from the camera feed too along with additional details such as vehicle type, material type, number of persons inside the driver's cabin using Computer Vision AI.

Once the ideal position is achieved, the system waits for a stable weight value from the weighbridge load cell and records the same.

Business Benefits

By automating the complete weighment process, the threat of mischief is greatly reduced that otherwise would have required very tight monitoring by several personnel both at the location and remotely through cameras. UWBS eliminates tail gating and the presence of foreign objects in the weigh bridge by means of images, positioning sensors and AI. Both an operator and data entry of the transaction at the weighbridge are eliminated.



The vehicle details are captured by means of ANPR; the RFID card and weighment are captured and recorded against the details already captured at the gate.

In addition, this solution can track vehicle movement inside the plant/site and record the cycle time of each material inward/outward transaction that will be useful to optimise material and vehicle transactions to avoid demurrages.

UWBS can be seamlessly integrated into the existing operations of a plant, construction site, mining operation, etc., where weighment of vehicles is critical to operations; it can also be integrated to work with the existing ERP solutions.

UWBS is currently at an advanced stage of development and is expected to be implemented at a pilot site and thereafter rolled out for deployment on a larger scale.



UWBS Development Team with Lab set up

Tracking fabrication and installation of OSD panels for the MTHL project



Mumbai Trans Harbour Link [MTHL] Project

The Mumbai Trans Harbour link is one of the most ambitious projects being undertaken by L&T. When completed, it would be the longest sea bridge in India connecting Mumbai to Navi Mumbai through the sea across a distance of 22 kms.

Since the bridge should also allow for unhindered movement of ships, About 4.6 kms of the bridge will be made entirely with steel spans instead of concrete deck, thereby allowing the movement of ships.

More than 50,000MT of steel is expected to be used in the construction of these spans comprising of more than 3200 steel blocks

The interesting part is that predominant section of the bridge will be assembled on-shore and would be shifted via a barge and installed in location.

Thus, considering the uniqueness of this project, there was the need to track the structural elements across their lifecycle from receipt to assembly.

Tracking of Orthotropic Steel deck(OSD) panels -

The OSD tracking solution helps give an identity to every panel by affixing a unique

QR tag on every panel. This, accompanied by a mobile application enables the personnel at various touchpoints in the supply chain track the movement of material. Be it the port of receipt, site store, Site engineers or the Project manager, the information on the status of various components of every OSD and there is available digitally. This helps in keeping a close tab on inventory vis-à-vis project plan and to mitigate any inventory related delays.

Key features

Panel identification: Since every panel is tagged and Identified using a unique tagging mechanism, traceability becomes very simple.

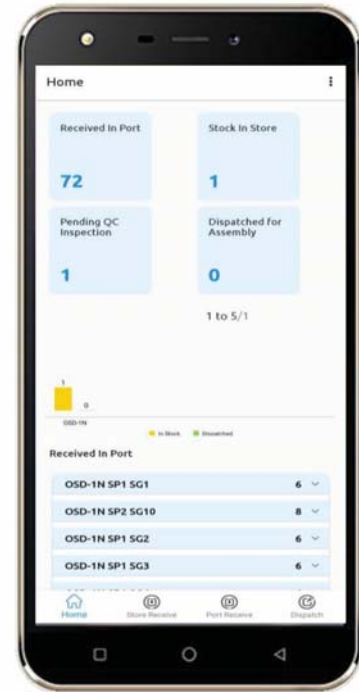
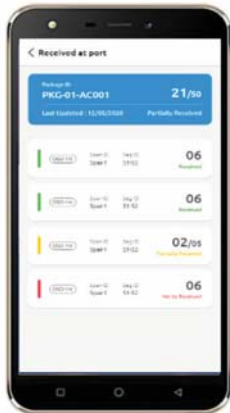
Faster receipt and retrieval : Significant improvements to turnaround time both at the point of receipt and also in locating material in the laydown yard.

Quality inspections: Simplifies and improves efficiency of Quality inspection process. Only panels which have passed Quality inspection will be available for assembly.

Reduction in project delays : Digitally managed inventory visibility across various touchpoints helps flush out inordinate delays and eliminates the time spent on follow-ups and manual tracking.

Integrated with Project Monitoring : The OSD application doesn't stop only with material management. It is also integrated with Procube to enable the site team to track the fabrication and erection related progress thus completing the cycle of receipt to installation.





This application has been developed in line with the practice of developing bespoke solutions for tracking critical materials. This is being used extensively by the MTHL project team for over a month now. As of November, more than 200 blocks have been handled using this application.

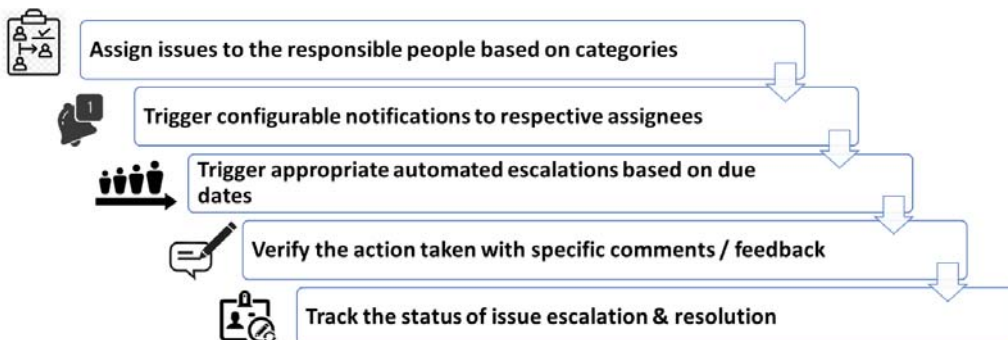
Going forward, we are also working on developing similar solutions for other marquee projects to help alleviate their inventory management challenges.

New feature in Procube - Issue Management System

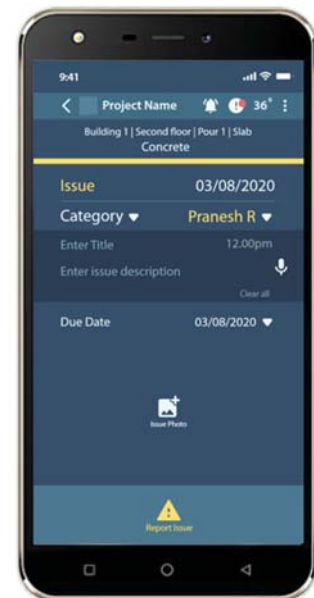
At a construction site, the front-line execution team faces numerous issues / constraints daily that hinder them from completing the assigned work on time. Generally, these issues are reported using different media like E-mails or phone calls or via WhatsApp on an AS-IS basis making it very difficult for various stakeholders to track the status of these issues independently. It is imperative that every issue faced by the execution team is mitigated / resolved as quickly possible to avoid any negative impact on site progress or quality of work.

We have envisaged a solution to build an end-to-end issue management system to report, address & track issues WBS-wise, systematically on a centralized platform with uniform workflows.

This enables the users to:



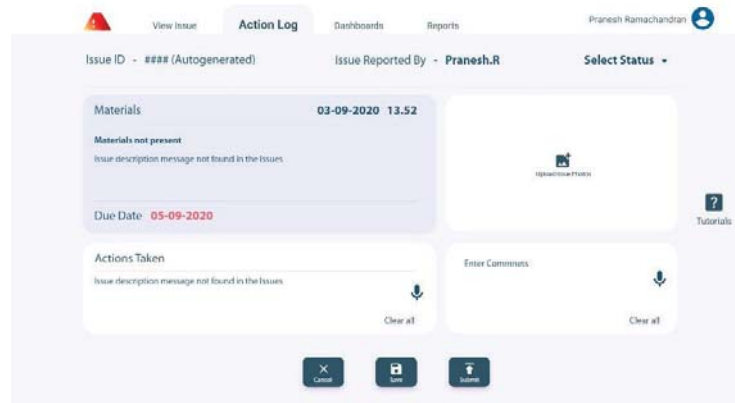
Automated notifications are triggered for every action taken by users in the Issue Management System (IMS). The medium of notifications can be SMS, mail or push alerts which are configurable based on the project.



Issue recording in Mobile App

The system consists of an user interface, made available as a part of the various existing mobile apps of Safety, Quality, etc. It also features a separate web portal for consolidated reports & dashboards for management review & analysis.

The first phase of the IMS will be integrated with the ProCube solution and rolled out by the end of 2020.



View action log & Dashboards in Web Portal

Enhancing Procube - Automated Client DPR

DPR or the Daily Progress Report is critical for any construction site for it helps Site Engineers, Project Managers and Clients to keep track of the progress of construction and ensure that the project is on schedule and within budget. However, manual compilation of DPR by collecting data from various site engineers, who may in turn rely on their scribbled notes or memory is complicated and time-consuming, that can also delay the generation & circulation of the report.

Automated Client DPR is a new desktop feature added to the ProCube solution, wherein real-time progress data is recorded on the ProCube mobile app by multiple site engineers that is automatically consolidated and provided as a Client DPR in a custom format. It also provides all the required information like Project Brief, Machinery, Manpower, Materials, Safety Observations, Weather Conditions, etc., in addition to details of progress.

Available at a single click, the report eliminates the drudgery of manual data collection & compilation, and saves a lot of valuable time to understand status quo during client reviews.

One of the sites where the Automated Client DPR has been successfully implemented is the AIIMS Guntur project.

30-Sep-20					
Site Status					
Building name	Activity	UOM	Total Scope	Completed till date	Completed as of today
EXTERNAL WORKS					
	Storm water Drain PCC	cu.m	1923	1772	0
	Storm water Drain RCC	cu.m	5693	5151	0
	Excavation	cu.m	368928	343027	0
	Formation	Sq.m	168985	61426	0
	GSB	cu.m	32555	13465	0
	WMM	cu.m	34604	18083	0
	DBM	cu.m	10265	947	0
	Kerb stone	cu.m	1523	1220	0
	Blockwork	cu.m	2123	1416	0
	Plastering	Sq.m	21500	11122	0
Ancillary Structures					
	Concrete	cu.m	5293	5026	0
	Blockwork	cu.m	489	423	0
	Plastering	Sq.m	4820	1814	0
	Structural steel	kg	29621	26000	0
	Granite Cladding	Sq.m	1340	1190	0
	Glazing	Sq.m	362	2290	0
	Structural steel	kg	34200	22200	0
	Granite Cladding	Sq.m	1380	1339	0
	Glazing	Sq.m	332	152	0
	Blockwork	cu.m	3043	2678	0
	Plastering	Sq.m	40530	33888	0
	Terrace waterproofing	Sq.m	2350	1476	0

RPA solution for Finance & Accounts - Vendor Master Updation and ITC Reconciliation

F&A functions including tax compliance involve certain legion of transactional processes that are mundane, repetitive, cumbersome and time-sensitive. They are data-sensitive too; a slight clerical error can potentially result in substantial re-works. Robotic Process Automation (RPA) can satisfactorily address such issues. The Indirect Taxes team at DC proactively decided to automate two such processes using RPA.

1. Vendor Master – GSTIN Verification

Manual verification of GSTIN (Goods and Services Tax Identification Number) involves logging into the GSTN website, keying in the GSTIN numbers one-by-one, download from the vendor master and verify the details like vendor name, GSTR1 last filed, GSTR3B last filed status, etc. In case of an incorrect GSTIN, several trial & error attempts based on the vendor PAN number have to be made to find the correct GSTIN. RPA uses a better alternative by pulling the vendor details through an API provided by the service provider to complete the task in no time. Automating the Vendor Master verification also helps to capture correct Vendor GSTIN in our master to avoid ITC mismatches and help identifying the vendor return filing frequency incl. the status of their GST registrations.

2. ITC Reconciliation

ITC 2A reconciliations are made using the GST service provider portal. However, due to the huge volume and complexity of our

business, 100% accurate reconciliation using the service provider portal is a challenge and hence the records are manually matched after downloading the pending to be matched with 'supplier only' and 'purchaser only' records. The herculean task of trying to identify a probable match based on the GSTIN numbers, invoice numbers & dates, tax structures & components is a continuous process. For example, a supplier might have uploaded the data using a valid GSTIN of another state or of another unit or jumbled the tax structure with IGST / CGST / SGST, etc. RPA does all this cumbersome reconciliation and provides a clean report identifying the possible matches as well as the reasons for mismatched records.

Automation of Procuring Daily Material Prices – An ongoing initiative

One of the daily tasks of a Procurement team is to verify & analyze the latest commodity prices before finalizing an order. They have to browse through various websites that provide pricing info of various commodities like Aluminum, Zinc, Copper, etc., download the pricing sheets and search for the price of the item tagged with the required grade / specification and location. RPA BOT avoids all this drudgery by providing the latest prices at the click of a button. The team can instead focus on other more important tasks that require human intelligence & skills.



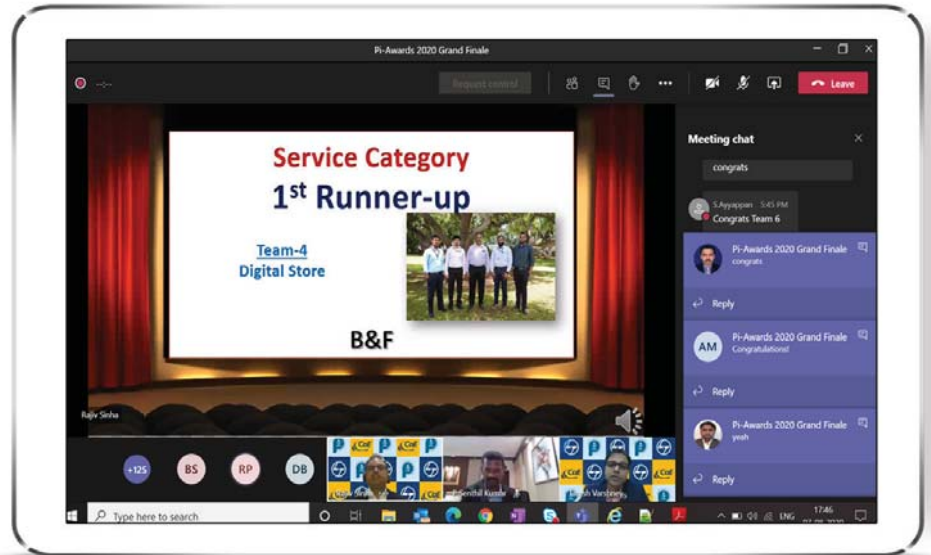


B&F IC Projects adapt to new normal with Digital Transformation

During the lockdown when physical movement was affected, site teams showed resilience to adapt to new protocols & procedures with Digitalization the primary enabler. Seven webinars conducted during the lockdown saw massive participation of 2000+ employees, revealing their enthusiasm to learn what new digital had to offer to add value to their daily work.

Over the past 3 months, there has been a considerable improvement in the usage of all digital solutions with a decided 'pull' from the Projects, which is a healthy sign that will help realize long term benefits, both tangible and intangible, by getting ready status and making course corrections based on performance across various areas like Quality, Safety, Progress Monitoring, Material Tracking, Asset Management, etc. It has become a standard practice to brief all new sites about our Digital solutions at Site Kick-off meetings to ensure 100% implementation of flagship solutions like P&M IoT, Procube, Safety, Conquer, iB4U, Smart Meter, WISA and Weighbridge.

While Digital Stores is one of the newest solutions to the list, it is expected to be rolled out across all sites by end of 2020. Digital Stores has already proved its mettle, during the Process Improvement



PI Award Announcement

(PI) awards this year with B&F IC being 1st Runners' Up in the Service Category.

On Innovation front, B&F IC ventured into RPA (Robotic Process Automation) to automate the tedious PMS process. Earlier, IC Accounts team had to work late nights to prepare the PMS data every month. The P&M department has also automated monthly reports downloaded from EIP to reduce the burden on the CMC (Centralised Monitoring Cell) team to download heavy data files from the EIP system.

B&F IC has virtually launched the ICAM

solution for the internal control audit team, to facilitate online audits with a data bank of audit observations and closing, and continuous learning.

On the project management front, ProCube has been the centre for all progress related information. Automatic Client DPR is a new feather in the cap, recently deployed across projects with the hope that all project teams will come forward to customize the format and use the new feature.

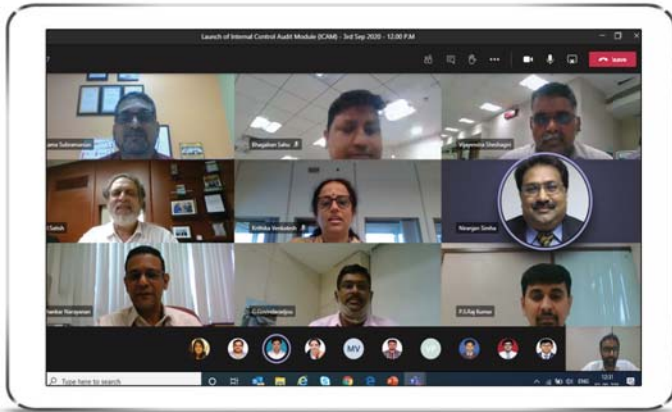
Apart from all these, we have lined up some interesting project specific Digital



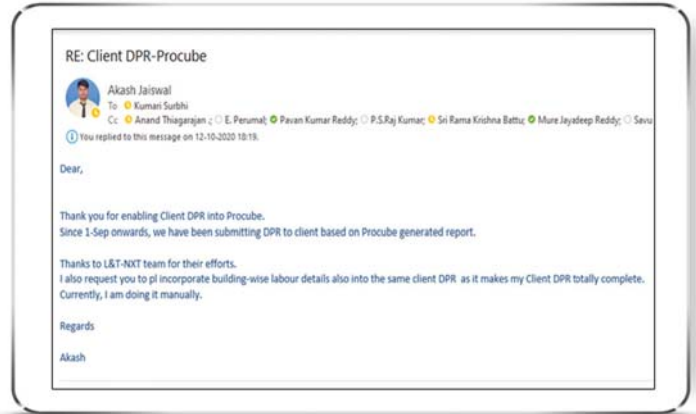
Popular Choice Award & 1st Runners up Presentation by MVS (B&F IC Head) to team



Team Photo with Mr. Anantha Sayana (L&T Chief Digital Officer) and L&T Nxt team



ICAM launch



Site team appreciation email on Automatic Client DPR report

initiatives across the IC. For CIDCO, one of our largest residential projects, Procube has been integrated with external solutions like Primavera and BIM to showcase project progress in a user-friendly format with the help of BIM-based 3D models that is expected to be a benchmark to replace excel-based progress reporting. A few more to note are the Ram Mandir store tracking, IC procurement tracker and the RPA for vendor registration.



TRAXION - OFC Project Management Tool:

TRAXION is a customised Project Management tool developed as a one-stop solution for PT&D's OFC (Optic fibre cabling) projects, cutting across various functions of project management. It will facilitate the complete project management cycle by bringing all the stakeholders including the Customer, Consultants and the business functions onto one platform.

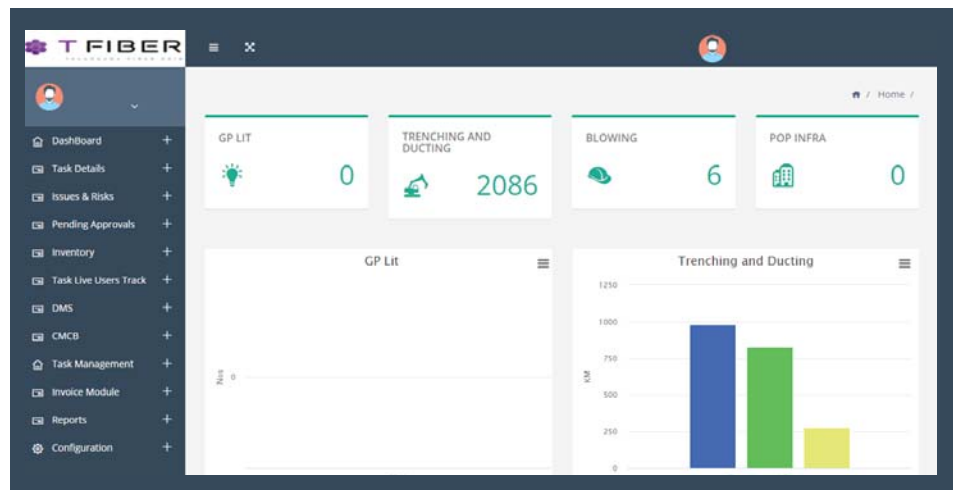
Modules: -

- **Project Configuration** – Customised WBS and role based user group
- **Survey** – KML file and Survey Documents linked for WBS with approval process by customer and consultant. Online streaming / download of survey videos.
- **Progress Module** – Progress update (geotagged) through mobile application with approval from customer and consultant.
- **Dashboards and Reports** -

Consolidated summary of tasks and activities at various levels of WBS with graphic representations.

- **Inventory Management** – Classification of material based on inspection requirement followed by transactions like receipt and issue.
- **Invoice Module** – Recording & tracking of billing, payment and other monetary terms.

- **Change Management Module** – Route deviation, time extension, change in execution methodology and cost variance, etc. can be managed.
- **Risk & Issue Management Module** – Hindrance & issues pertaining to the project can be registered and tracked.
- **Document Management System** – Enables the user to upload, view &



download documents, which supports all kind of file formats.

- **Live Tracking** – ‘Live’ tracking of field engineers on a geospatial platform.
- **Alerts & Notification** – Mail alerts are triggered by the system for pending tasks and notifications are generated on a periodic basis for progress.

Benefits: -

- Online progress monitoring on a Geospatial platform
- Progress reporting and approval on the go
- Workflow driven approach for all activities including customer & consultant
- Visibility of project status on a single platform for all stakeholders
- Inventory tracking & control

Format	Day	Week	Month	Quarter	Resource	Duration	% Comp.	Start Date	End Date	A-Start	A-End	Milestone
-	Package A					278.6 Days	12%	01/05/2020	02/02/2021	01/01/1970	01/01/1970	MikeStone
-	Bejarki					178.4 Days	6%	07/07/2020	31/12/2020	01/01/1970	01/01/1970	MikeStone
-	Bejarki					178.4 Days	6%	07/07/2020	31/12/2020	01/01/1970	01/01/1970	MikeStone
	Trenching and Ducting(New)				GAUTAM	147.3 Days	18%	07/07/2020	30/11/2020	01/01/2019	28/09/2020	MikeStone
	Aerial (ADDS)					1 Day		05/11/2020	05/11/2020	01/01/1970	01/01/1970	MikeStone
	DIT					1 Day		05/11/2020	05/11/2020	01/01/1970	01/01/1970	MikeStone
	Blowing				GAUTAM	122.2 Days		01/09/2020	31/12/2020	01/01/1970	01/01/1970	MikeStone
	Splicing and Termination					1 Day		05/11/2020	05/11/2020	01/01/1970	01/01/1970	MikeStone
	ISC Report					1 Day		05/11/2020	05/11/2020	01/01/1970	01/01/1970	MikeStone
	Manpower & Resources				GAUTAM	99.2 Days		24/08/2020	30/11/2020	01/01/1970	01/01/1970	MikeStone
	Excavating Duct				GAUTAM	99.2 Days		24/08/2020	30/11/2020	01/01/1970	01/01/1970	MikeStone
	Chamber Installation					1 Day		05/11/2020	05/11/2020	01/01/1970	01/01/1970	MikeStone
	POP Inlet					1 Day		05/11/2020	05/11/2020	01/01/1970	01/01/1970	MikeStone
	GP LA					1 Day		05/11/2020	05/11/2020	01/01/1970	01/01/1970	MikeStone
	POP AT					1 Day		05/11/2020	05/11/2020	01/01/1970	01/01/1970	MikeStone
	New found duct					1 Day		05/11/2020	05/11/2020	01/01/1970	01/01/1970	MikeStone
-	Husnabad					158.3 Days	13%	26/06/2020	30/11/2020	01/01/1970	01/01/1970	MikeStone
-	Husnabad					158.3 Days	13%	26/06/2020	30/11/2020	01/01/1970	01/01/1970	MikeStone
	Trenching and Ducting(New)				G	97.2 Days	30%	26/06/2020	30/09/2020	26/06/2020	07/08/2020	MikeStone
	Aerial (ADDS)					1 Day		05/11/2020	05/11/2020	01/01/1970	01/01/1970	MikeStone
	DIT					1 Day		05/11/2020	05/11/2020	01/01/1970	01/01/1970	MikeStone
	Blowing					1 Day		05/11/2020	05/11/2020	01/01/1970	01/01/1970	MikeStone
	Splicing and Termination					1 Day		05/11/2020	05/11/2020	01/01/1970	01/01/1970	MikeStone
	ISC Report					1 Day		05/11/2020	05/11/2020	01/01/1970	01/01/1970	MikeStone



AI Solution update - Brief on Cognitive Search Solutions

Business Challenge

Information is a key enabler for projects, especially for front line engineers to execute work. Handling documents in the field to access information is a challenge for site personnel. Since information is dynamic, there is also the risk of missing out on key pieces of information. To address this challenge, we have developed a Cognitive Search engine for Safety and Quality documents.

Solution overview

The Cognitive Search solution works on a domain specific document corpus that

is an information repository containing all the updated and relevant documents, separately for Quality and Safety. Once the corpus is created, this solution will empower users to search and retrieve relevant information from the documents in a matter of seconds. It provides answers to factoid as well as non-factoid questions in a user friendly interface, made possible by leveraging state-of-the-art technologies in Natural Language Processing, MI, Elastic Search and Transfer Learning.

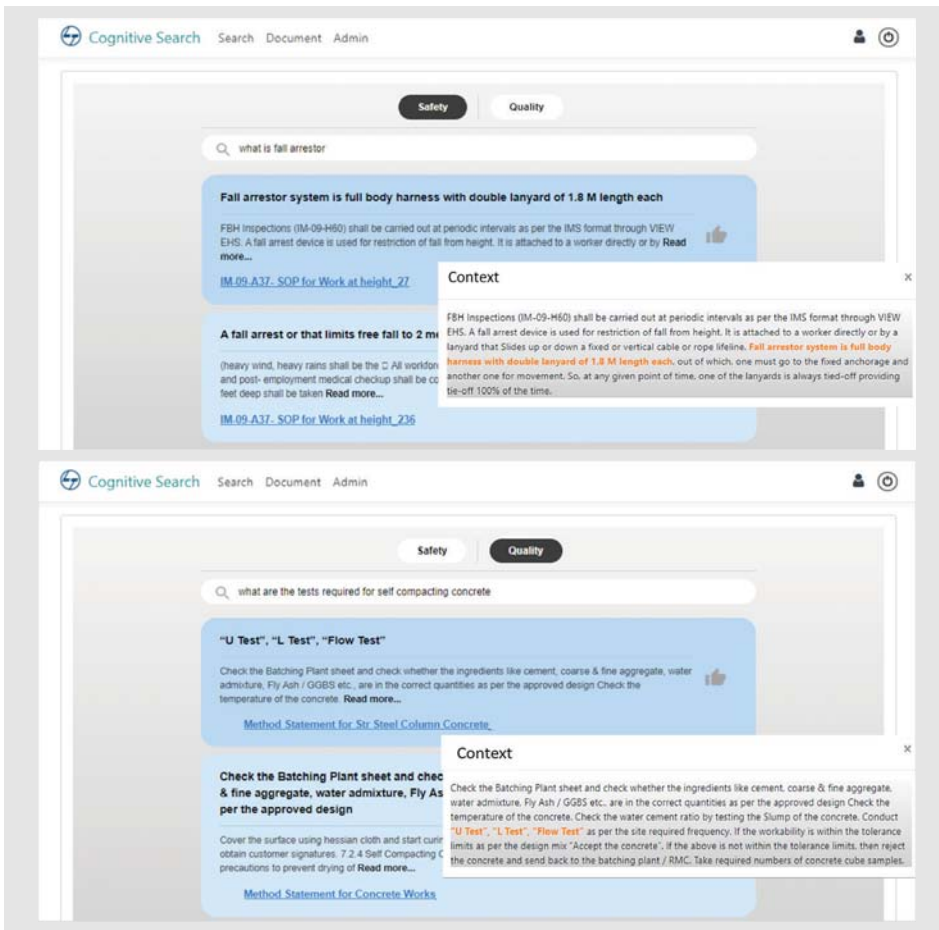
How it works?

Once the documents are ingested, we apply our custom pre-processing pipeline

to clean, filter and extract content from them. Then a pre-trained language model is used to understand the semantic and contextual meaning of the content. When a user poses a query, the language model understands the intent of the query and searches for the relevant segments in the document for a potential answer. A custom answer extraction model is then applied to process these segments to extract the specific answer.

Search Results

The search results will have the specific answer to the user query followed by the contextual segment and the document



page link where the answer is located. Users can access the document link and view the search response highlighted inside the document apart from relevant images extracted from the parent document and mapped to each search result. The results are sorted and filtered based on the confidence score of the model predictions. We have achieved an average accuracy of 80%+ for Safety and Quality document corpuses. The user can also share feedback for the correct answer from the search results which is stored and used for incremental model training to further improve its accuracy.

Benefits

The Cognitive Search solution will significantly reduce site engineers' time to search and retrieve information, freeing their time for more productive work. It is easy to operate, works on the go, saves time and cost, and learns with time. This solution will empower engineers with quick and accessible information in the field to work smartly and efficiently. Fire up your information and make it talk.



Using Advanced Analytics for Design Optimization

Design Optimization focuses on achieving the best design for a set of design requirements that are taken as design constraints. This could entail maximizing factors such as the bearing capacity, and/or minimizing factors such as cost. Our journey started when PT&D's EDRC approached us to work on design optimization in December 2019. Today, we are working on design optimization for the foundation of substations, the foundation of transmission lines, and the foundation and structure of a solar farm, not just in India, but in America, Britain, and Europe as well.

Understanding Optimization

Optimization is the process of finding the best among all feasible solutions by attempting to maximise or minimise an **objective function**. An objective function is a mathematical expression that is to be optimized given certain constraints and variables that need to be either minimized or maximized. There are several methods to carry out optimization.

A branch of AI, known as **Computational Intelligence**, is how we approach optimization for ongoing projects. It refers to bio-inspired computing. For example,

the evolutionary optimization algorithm, **Differential Evolution**, in which the objective function is termed as a fitness function because of how the algorithm is structured. Differential Evolution iterates through generations of feasible solutions and uses Darwin's concept of survival of the fittest to find the most optimal solution. Differential Evolution was chosen among other optimization techniques due to its ability to efficiently handle a complex problem space that would otherwise require heavy computation and deep mathematical knowledge.



(Substation, Transmission Lines, Solar Farm)

Understanding Design Optimization

For design optimization, the objective function is formed such that the variable denoting **cost is minimized**. An objective function for design optimization considers **safety design constraints**, and input variables. For example, the input variables could be length, breadth, thickness. The algorithm to optimize the objective function is Differential Evolution. The result of design optimization is the

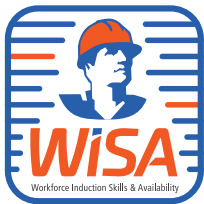
optimal values of the input variables that are then used by design engineers to develop their designs drawings.

Milestone in Design Optimization

Design optimization offers great scope for **cost reduction and time savings**, that is already evident. On completing the foundation design of a substation, we have estimated the cost and time savings we were able to deliver through design

optimization trial runs. **The estimated cost savings were 6% per project**, and the **time taken to complete the project was optimised by up to 4 times**.

Bridging design optimization and computational intelligence has proved to be both fascinating and beneficial. Going forward, the ongoing works will be deployed, and we are excited to see where this journey will take us.



Training module in WISA

The WISA (Workmen Induction Skills & Availability) solution has become an important part of the workmen induction process and today manages data of more than 5 lakh workmen. Continuous enhancements have been done in the last 6 months to capture other aspects about the worker apart from induction process. One such key dimension is on the training details of the workmen. WISA's training module is a big step in recording training details that the workmen undergo during their tenure in L&T. This functionality enables us in building a complete profile for a workman, also becomes a first step in building the skill inventory of workmen at an organization level. Training module digitalizes the process from Training

Calendars at the beginning of the year to accounting training hours per year conducted throughout the year.

Training module covers the following functionalities.



1. Plan – Training Calendars – Standard/ Custom trainings
2. Schedule – Schedule these trainings Standard & Custom trainings with PD/ PM Workflow for approvals, Email Invitation, Skill selection, Sub-contractor selection
3. Conduct – Capturing Photographs, mark Attendance using FR/QR

4. Record & Close – Close training all information - Feedbacks, Videos, Pics, training materials etc
5. Retrieval – Records of training conducted, Training details in worker profiles (Retrieval any at instance), forms a data repository.

In our endeavor to build workmen profile for our Industry sector, these steps

would play a pivotal role and drive us in propelling towards our goals. This module is now available in WISA for sites to add and augment training data to the worker's profile. Please reach out to us to know more about this module and how it can be beneficial to your project site and your IC.



Geospatial - Rock Boulder Quantity Estimation & Tracking

Construction projects in dynamic coastal terrains pose formidable challenges. L&T are pioneers in designing, engineering and constructing projects in challenging terrains and conditions like strengthening river bands, constructing breakwater & jetties, strengthening shore /island stability for which estimating the volume of rock boulders and their position are key requirements. Apart from rock boulders, huge pile of medium size rock boulders are transported and dumped at various locations. Accurately and safely estimating these rock boulders of varying sizes is a challenge as it requires measures to control the incidence of rock falls and crane load failures and additional expenses are involved, both engineering and contracting charges. Although tedious and expensive, the process of estimating the size and position of huge and medium sized rocks is still critical to project operations.

With the advent of geospatial technologies, we have drones, Terrestrial/ Hand-held LiDAR, mobile and web GIS solutions to address these complications. The use of digital mapping technologies has increased over the past decade, in particular the use of LiDAR scanning for quantity estimation of rock boulders.



Realistic measurable 3D model of rock boulders

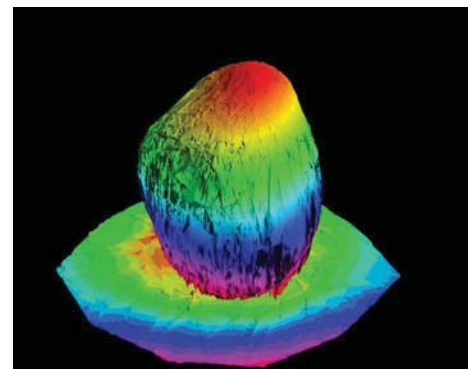
LiDAR and Drones are being extensively used to improve the accuracy and efficiency of projects involving quantity estimation of aggregates. Our in-house product FAMEVol (Fast Accurate



Point Cloud data

Measurement of Volume) has enabled fly stockpile volumetric estimation. We have devised an end-to-end workflow involving the use of LMNoP+ to locate and identify rock boulders at any temporary storage units.

The implications of using geospatial technologies are accurate and cost-effective quantity estimation compared to traditional techniques. 3D Scanning using LiDAR requires a minimum scan time in the field depending on the size and resolution of the area saving hugely on time and eliminating many of the site-related safety hazards. Geospatial technologies aids help projects to consistently remain under budget, improve work efficiencies and save time especially for projects involving difficult terrain orientation and roughness.



Digital Elevation model



L&T-NxT wins two prestigious HR awards at the HRAI Awards 2020

L&T-NxT bagged the honors for the **Best Remote Employee Engagement Program during Pandemic** in the 'Organization' category at the HRAI Awards 2020. Ms. Namita Singh, Lead Talent Acquisition and D&I for L&T-NxT, received the **Young Professional of the Year Award** in the 'Individual' category.

HR Association of India had received over 300 nominations for 6 awards in the 'individual' category and 10 awards in the 'organizational' category. The list of nominations included HR professionals and organizations from different domains and industries. L&T-NxT bagged two awards after a challenging evaluation process by an esteemed panel of Jury members hailing from various sectors and bringing a rich experience of people management with them.



The HR team of L&T-NxT led by Bikram K Nayak, Sankar Viswanath-Talent

Management and C&B Lead, Rahul Roy-HRBP & PMS Lead and Namita Singh -Talent Acquisition and D&I Lead, undertook various employee engagement initiatives during the pandemic to ensure hiring of right talent, seamless digital onboarding, improved productivity, increased employee engagement and business continuity.

The onboarding process was completely digitized to facilitate remote joining of new recruits and on-the-job skills training. Welcome kits including laptops were dispatched to their home addresses to ensure employee productivity and delight from Day-1. Additionally, Virtual Knowledge Sharing sessions were organized to promote peer-to-peer learning and collaboration among employees. The HR Team connected with every employee individually through telephonic/video HR connect initiatives to keep their morale high, ensure high productivity during the new work-from-home scenario and even gave counselling to affected families.

Free subscription to Magzter Gold and Mindhouse Wellness application were arranged for all the employees. To monitor and maintain employee productivity during work from home, MS Kaizala power app was used to collect daily work logs. Remote birthday celebrations and family get togethers were organized for employees and teams to remain connected. A series of virtual townhalls were organized during the pandemic wherein the leadership team addressed all employees about their strategic plans, impact due to pandemic including steps to combat this unprecedented situation and kept all the employees aligned to the business. To keep the young vibrant team

motivated, a new STAR of the Quarter award was launched. These were a few initiatives that won L&T-NxT the award for 'Best Remote Employee Engagement Program during Pandemic'.



Ms. Namita Singh won the 'Young Professional of the Year' award for her initiatives during the pandemic and efforts in Talent Acquisition, HR Digitization, Branding and Diversity & Inclusion. She joined L&T in 2016 and currently leads the TA and D&I function of L&T-NxT.

The HR ASSOCIATION OF INDIA is a recognized and respected HR community body formed with the help of leading HR professionals in the country who believe in empowering humans and their workplaces. This team works primarily on getting subject matter experts together to share their knowledge and provide real time strategic solutions covering all aspects of HR and other business enabling services.

Digital Excellence Awards 2020

It is now time to begin the process for Digital Awards 2020. The awards will be organised IC Wise and the distribution will be done at the respective IC Town Hall event.

AWARD CATEGORIES

1) Digitally Enabled Project

The Digitally enabled project is awarded to projects that have implemented and are using a number of Digital solutions across many functions at the project and realized improvements and benefits. Each IC may select anything between 3 – 5 projects within their IC for the award.

2) Innovative Digital Solution

The innovative Digital Solution is a solution developed by the project site or IC to solve a specific need or situation for the project. This should be a solution specifically developed for solving a business specific challenge and used some innovative processes / technology for the solution. Should have been implemented, being used successfully and delivering benefits. Each IC may pick 1 – 3 such solutions for this award.



Last date for the entries of award nomination is 10th December 2020. Please contact your respective IC Digital Officer.

