FASTER infra development with
NEW-AGE TECHNOLOGIES

Infrastructure is critical to a nation's growth. The better the infrastructure, the better the gross domestic product (GDP) rate tends to be in that country. India wants to become a $5-trillion economy by 2024-25, and to meet that goal, infrastructure is a critical piece. The leaders of the country have promised a 1.6 lakh crore investment in infrastructure in the next five years, according to a press release from the Finance Ministry. These estimates preceded the COVID-19 pandemic that gripped the country. Realistically, these estimates might have to be revised, but the need to invest in infrastructure now has a critical second purpose – to reignite the economy and the growth engine in the country.

Apart from making such a huge investment, the country has to close the gaps in the implementation of big infrastructure projects, which are marred by cost overruns and massive delays. A country of more than 1.3 billion people can ill-afford such delays not to mention cost overruns leading to inefficient deployment of funds when faster economic growth is the only option to pull people out of poverty, keep its young workforce employed, and pave the way to grow its economy. Technological intervention is seen as a panacea in minimising if not overcoming these project delays for timely completion of critical infra projects in railways, roads, airports, and ports among others.

Even projects of national importance such as metro rail projects in various cities, dedicated freight corridor, expansion of airports in tier-II cities, and the Mumbai–Ahmedabad High-Speed Rail Corridor project can be expedited and executed with a predictable flow and speed with the use of an integrated project controls solution for proactive project monitoring. Such solutions can be further augmented with emerging technologies such as data analytics, artificial intelligence (AI), machine learning (ML), Internet of Things (IoT), and robotics.

EMERGING TECHNOLOGIES CAN CHANGE THE INFRA LANDSCAPE

Anyone who has worked in the infrastructure project planning and execution can attest to the avoidable delays and inefficient deployment of labour and materials that happens because of inefficient coordination between various stakeholders in the project. This includes clearing hindrances, land acquisition, and utility shifting not happening in alignment with the plans laid out by well-intentioned contractors can derail any plans and can have a domino effect on adding to the time and cost of the project. The solution to this means that owner-operators and EPC contractors have to move beyond superficial digitalisation wherein information is shared digitally to a digitalisation initiative that helps them

create a single source of truth – an integrated project controls solution.

It is clear that schedule delays and efficient usage of materials and human power can be improved with emerging technologies and India's goal to be digitally empowered. For instance, digitalising project controls and enabling field personnel to mark their progress with photos that capture lat/lon is a start. The next step would be to digitalise the quality works inspection along with quantity of progress and schedule activity to give context to the information. Linking of the hindrances and engineering drawings to the schedule completes the context of digitalisation. In this digitalised environment, contractors, consultants, and owner-operators are perfectly aligned and the solution is able to provide forward-looking visibility into what decisions are needed to clear a predictable work front to which labour can be deployed and for which materials can be procured. Monitoring progress in this digitalised environment with near real-time dashboards provides the 360-degree visibility into project completion to decision makers and is a better way for India to meet its goals.

Integrating material and labour requirements into the schedule can further help to optimise the procurement for contractors, as well as help monitor other issues such as the proper amount of materials that should be used, the productivity of on-site labour, and so on. As an example, because large road construction organisations employ many subcontractors to execute different parts of the project, implementing a collaborative digitalised system that connects all stakeholders with a dashboard can help coordinate their work, which will help to maintain the project's often strict schedules. The data collected in such a platform is rich in context and with the volume of data collected on a project and other similar projects provide a solid foundation for the application of data analytics and ML. These add-ons can then be used to predict project completion, repeat quality issues, and the type of hindrances that will risk project completion. All of this can make delivering infrastructure projects within time and cost more predictable. Advanced use cases of the data can even lead to identifying root causes of maintenance issues that come during the operations of these projects in the long term.

Similarly, in heavy construction and more complex infrastructure projects, creating a connected data environment, a digitalised single source of truth, for all project stakeholders to collaboratively share information on a platform that digitally inter-connects the various stakeholders and data silos to predict project KPIs can lead to massive savings in time and cost.

Such a digitally enabled integrated project controls a platform that uses data analytics, AI, and ML to inter-connect various information sources (and stakeholders) can help identify potential misalignments among engineering, procurement and construction can streamline project work and avoid delays and cost overruns. Additionally, using drones to collect the progress monitoring information and connecting them to digital models for the analysis of as-built with the design is another objective independent quality check that is possible with technologies available today. The same data can be used in the operations and maintenance phase similar to the road example cited above.

Geo-tagging is another popular technology, which has the potential of changing the infra landscape in India. In geo-tagging, geographical identification, such as latitude and longitude, is tagged to a location through satellite imagery. Currently, various government agencies are using this technique to ascertain the development of infra projects across the country. To facilitate this, the Central Government is working with ISRO's National Remote Sensing Centre (NRSC), which uses a software platform, Bhuvan, that enables users to produce a 2D or 3D representation of the earth's surface.

nPulse® FOR FASTER COMPLETION

nPulse, acquired last year by Bentley Acceleration Initiatives, the internal incubator for strategic investments of Bentley Systems, provides an analytics-powered SaaS platform to give end-to-end solutions to infrastructure and realty players for integrated project controls. The solution was adopted by forward-thinking companies such as L&T, Afcons, RMZ, Lodha Builders, Tata Realty, Godrej Construction and Shapoorji Pallonji. It provides key, forward-looking insights for their projects and portfolio, resulting in timely mid-stream course correction of projects by decision makers to complete the project ahead of schedule and within budget. Built in India for the Indian construction industry, nPulse is live in more than 250 projects, with 3,000+ users.

FASTER INFRA DEVELOPMENT IS KEY TO THE ECONOMIC TURNAROUND

While India recovers from the impact of Covid-19, faster infra development through efficient use of government funds is the key to turning around the economy. But that cannot happen unless we embrace digitalisation on a platform of digitally enabled integrated project controls. And with the widespread adoption of solutions like nPulse, India can put the wheels of growth back on the track.

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