July 2015

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Technology Transformation: Going Beyond Automation

BY JON FINGLAND

A walk through any construction site reveals the significant, transformative impact of today's technology. Mobile has become ubiquitous and mandatory. Contractors and subcontractors with tablets and smartphones access project data in real time, adjust schedules, verify change orders and communicate freely with project managers and owners in the office. Mobile solutions enable them to access and compare design documents while 3-D models created with BIM software direct fabrication and layout.

Job teams are leveraging high-tech advances in the pursuit of faster, safer, more predictable and profitable project delivery. Jobsite sophistication is exemplified by the use of cutting-edge tools, from 3-D scanning and layout to RFID-enabled sensors for labor, equipment and material tracking.

With technology advancing so quickly, it's easy to get caught up in the "technology for technology sake" mindset and to assume it automatically makes operations more intelligent and productive. However, bridging the gap between

technology and intelligence requires something more.

From Data Silos to Information Ecosystems

An intelligent jobsite requires more than just automation. What it needs is the capability of liberating information in real time—a seamless flow of optimized data across all work processes for all stakeholders. Yet there is nothing seamless about many of today's worksites regardless of the amount of technology in use. The shortcoming is due to poorly integrated or incompatible applications, devices and underlying information systems. This has created data silos that hinder collaboration and communication.

Often tools don't interface or communicate with each other, so data cannot be aggregated to provide a single source of truth throughout the project's design-build-operate life cycle. Perhaps this is a contributing factor for several findings contained in an April 2015 news release documenting extensive research conducted by KPMG International:

- More than half of construction project owners worldwide (61 percent in the United States)

experienced one or more underperforming projects in the previous year.
- Only 31 percent of their projects came within 10 percent of their budget.
- Just 25 percent came within 10 percent of their original deadline.

A major factor for these failures is likely the absence of project and jobsite synchronization. Despite all the technology some projects deploy, the stakeholders coexist with a collection of information silos in the form of IT platforms that do not communicate with each other. Without synchronization, it becomes too time consuming to get everyone on the same page—resulting in a substantial loss of time and money.

Connecting the office and the field is a fundamental requirement for an intelligent jobsite, but there has to be more. One connection should be between 3-D BIM and 2-D design plans. While 3-D constructible models are driving the work, construction contracts and legal decisions are still reliant on 2-D documentation.

The owner, architect, contractor and building trades need the same information at the same time, but frequently one constituency has to scramble to get it. The same can be said for providing continuity for internal stakeholders to leverage data throughout the process, from design plans to estimating, scheduling, fabrication and field execution.

Achieving Synchronization

As technology continues to evolve, three essential criteria are shaping the intelligent jobsite.

- **Measurement.** The late management guru Peter Drucker famously said, "If you can't measure it, you can't manage it." His axiom applies to the jobsite. Immediate measurement and ongoing analysis of every project aspect are among the best executive tools to ensure efficiency, timeliness and a cost-effective operation.
- **Connectivity.** For a jobsite to become intelligent, connectivity has to streamline data and information flow not just from person to person, but also from platform to platform. All stakeholders need to be able to access a single set of this data for every piece of information.
- **Synchronized.** Cloud computing is an important tool for the intelligent jobsite with its offerings of storage, archive and retrieval of all relevant information for remote access. Data does not just disseminate; it expands as stakeholders contribute additional details. One of the most critical requirements is bridging the gap between 2-D and 3-D and keeping both synchronized throughout the building project. An intelligent system will streamline the maintenance of two sets of documentation by isolating the changes and highlighting differences between them.

Comprehensive Platform

Executives recognize the importance of connective platforms in developing a constructible model for every contracting requirement. "Over the past five years, an increasing amount of new technology systems and applications have emerged across the construction industry," says Doug Rowe, senior vice president of Lend Lease. "Unfortunately, a majority of these technologies are standalone 'point solutions.' As rich as they might be in functionality, more often than not, they fail to consider the project delivery process as a whole, thereby neglecting the considerable cost, time and quality benefits that can be realized through the integration of project management software. Moreover, they can cause a host of additional inefficiencies and inconsistencies both within project teams and among them.

Recognizing these significant pitfalls, Lend Lease has adopted a technology strategy that leverages a platform rather than chases point solutions. The platform is a comprehensive set of solutions designed to support 80 percent of a typical project's technology needs. Sourced from a limited number of established vendors, the suite of solutions not only spans the entire project life cycle, but also integrates critical aspects of BIM and field technologies with traditional estimating and project controls systems.

An all-encompassing ecosystem for design, estimating, project management and field systems has facilitated efficient and cost-effective business planning.

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