Project Management Tools for Efficient Job-Site Practices

Using data and information to transform knowledge from tacit to explicit

By Phil Nimmo, MCA, Inc.

All our jobs are taken with the expectation that we create an accurate estimate and a good plan of attack to complete the work in a timely, efficient, and profitable manner. Our best-run jobs follow that planning with an execution that ensures these results are delivered. For most jobs, the estimate and planning can be completed with just a few people working closely together. Still, the installation phase generally requires a lot of people working simultaneously and not necessarily close together, making verbal information sharing difficult.

Preconstruction can often be effectively accomplished with a few people who understand the work and customer's needs and have some individual experience/knowledge (also known as tacit knowledge) that they can lean on to make a good plan. However, successfully sharing that experience and knowledge to help the entire installation team perform with the same continuity of preconstruction requires that tacit knowledge be transferred into explicit knowledge.

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FROM TACIT KNOWLEDGE TO EXPLICIT KNOWLEDGE

No aspect of our interaction supports the transfer of tacit to explicit knowledge more strongly than our communication. Everything from face-to-face meetings to phone calls to emails to text messages set up these communications. How and what we communicate dictate the effectiveness of this process. Most job-site interactions are built on tacit exchange, such as progress meetings, laydown area discussions, and informal meetings "in the trailers." All provide an avenue for exchanging firsthand experience and knowledge related to the job. This is very effective to ensure that everyone has the same current understanding of status, but it has its shortfalls. Tacit exchanges like these provide the content for setting up the transfer to explicit knowledge, but that action doesn't happen naturally.

Simple tools like notebooks and cameras capture observations but do not easily support sharing in a manner easily retrieved and searched by others. Operationally focused tools such as Short Interval Scheduling (SIS®) and Job Productivity Assurance and Control (JPAC®) are designed specifically to digitize workplace observations into a format that can be easily shared and searchable. Even time sheets provide better communication than a notebook full of sketches or a free-flow discussion at the coffee pot.

AVOIDING PROJECT RISK THROUGH EXPLICIT KNOWLEDGE

Project risk comes from not seeing issues that could be seen or not seeing issues soon enough to prevent them. The effective transfer of the information to explicit happens when we can take that common information and knowledge among all stakeholders. The most immediate results come from taking project information from the job site and translating that into impacts that will alter our completion time, cost, and quality. These impacts form the basis of project meetings and project reviews for early detection and correction of the impacts.

Examples of effective transfer of tacit knowledge on the job site to explicit knowledge within the business system

Project	Meeting	Frequency	Participants	Leads the Meeting	Information Received/Given	Data/Report from Meeting Outcome
Project 1	Weekly BIM coordination	Mondays/ weekly	All trades on site	GC	Addresses questions on any clashes between the trades and any RFIs that haven't been addressed	Information is updated in the BIM coordination schedule
Project 1	Project scope review — job-site trailer	Tuesdays/ weekly	PMs, general foreman, project coordinators, executives	PM	Information on the project to identify areas of risk or items that need follow up. Changes, submittals, billings, updates to the overall schedule.	Meeting notes from project coordinator
Project 1	Company BIM team coordination	Tuesdays/ weekly	Company internal BIM team	BIM Leader	Identifies and addresses any impacts and slippage	BIM/sign-offs schedule
Project 1	Touchplan 3-week schedule update	Thursdays/ weekly	All trades F/GF on site	GC	3-week look-ahead confirmation from all trades	Touchplan 3-week look-ahead report
Project 1	Weekly BIM/ prefab/field meeting	Fridays/ weekly	BIM/field/prefab	General foreman	Discussion on sign-off dates/current 1-week look-ahead matches job-site reality — GF gives an update on the job site	Weekly look-ahead schedule

Table 1. This chart shows the specific meeting names along with their frequency, attendees, leader, and topics discussed during job sample No. 1. Several meetings were conducted that did not feature all necessary participants/stakeholders.

Fig. 1. Despite several meetings corresponding with job sample No. 1, this project faced a steady decline that remains unresolved throughout its life cycle.

Project	Meeting	Frequency	Participants	Leads the Meeting	Information Received/Given	Data/Report from Meeting Outcome
Project 2	Weekly BIM coordination	Mondays/ weekly	BIM leader/ prefab/field	BIM leader	Discussion on sign-off dates/current 1-week look ahead matches job-site reality — GF gives an update on the job site	Weekly look-ahead schedule
Project 2	Weekly work plan	Thursdays	All trades on site	GC	3-week look-ahead schedule	A report is produced from the scheduling software

Table 2. Job sample No. 2 featured two project meetings but did not include all of the necessary stakeholders.
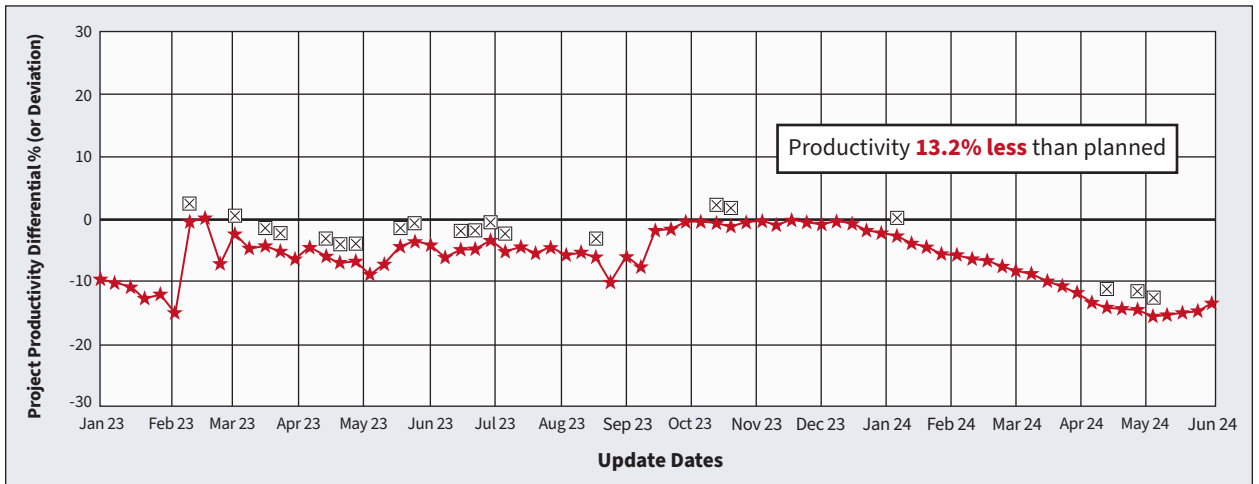

Fig. 2. There were less meetings in job sample No. 2 compared to No. 1, but it still resulted in a rapid decline in productivity during the last one-third of the project.

can be seen easily using properly built project models and schedules, such as:

• Daily installation nuisances can be translated into schedule impacts.

• Change-orders can be translated into productivity impacts.

• Material delays can be seen as missed deadlines, labor stacking, and even liquidated damages.

In the following examples, the use of simple tools designed to capture tacit knowledge and support the transfer to explicit analysis in the project model can be seen clearly. In the three cases shown, the first two use more meetings but fail to involve all the people who need to know. The third example is a job with fewer meetings but involves

Project	Meeting	Frequency	Participants	Leads the Meeting	Information Received/Given	Data/Report from Meeting Outcome
Project 3	OAC meeting (owner, architect, contractor)	Tuesdays/ biweekly	All trades on-site to include the GC with owner, architects	GC	Schedule updates outlining current % Completes per floor, area, and building	Updated GC schedule
Project 3	Schedule review and 3-week look-head feedback meeting	Tuesdays/ biweekly	PM and WEM, LLC	WEM, LLC	Project schedule summary, project support summary, 3-week look-ahead report	Updates to the schedule regarding impacts to the 3-week look ahead

Table 3. Job sample No. 3 had few meetings, but they involved all major stakeholders — not only on-site installers and direct supervisors.
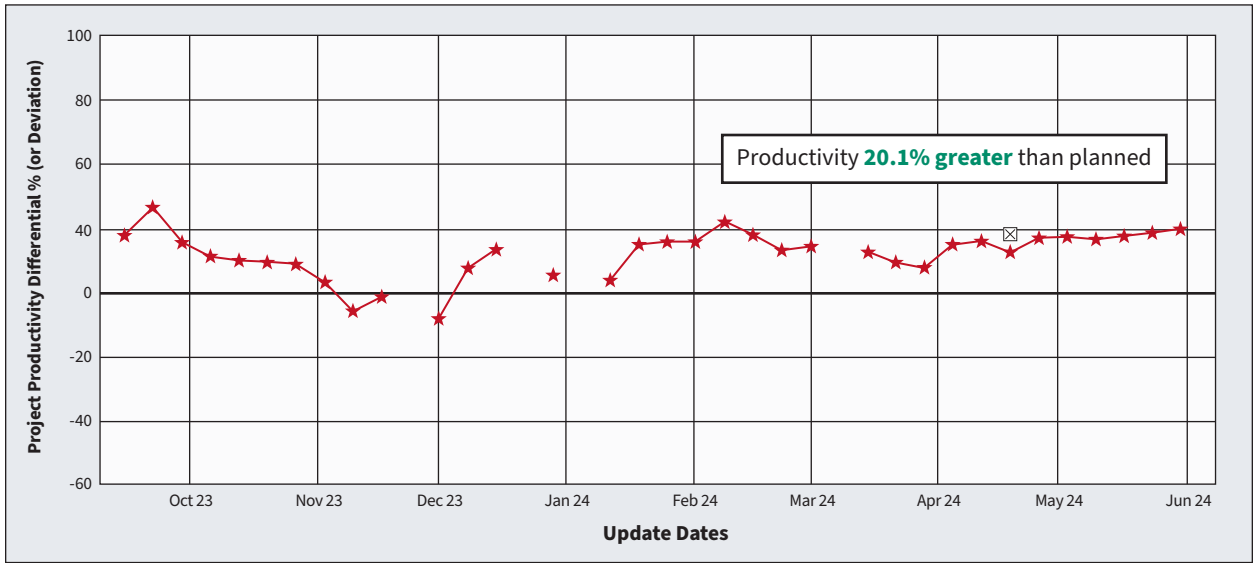

Fig. 3. Due to more effective transfer of information throughout job sample No. 3, productivity significantly improved throughout the project's life cycle.

all the stakeholders and players that impact each other's productivity, timing, and profitability.

JOB SAMPLE NO. 1
This job has the most meetings of our samples, but they are limited in attendance to those people who already know the material discussed (**Table 1** on page 15). There is no transfer of tacit to explicit, and the job productivity suffers steadily as the job progresses (**Fig. 1** on page 16).

JOB SAMPLE NO. 2
Similar to sample No. 1, the wrong people attend, and the meetings aren't maintained (**Table 2** on page 16). So as the project progresses, the lack of knowledge transfer results in declining productivity at an increasingly poor trend (**Fig. 2** on page 16).

JOB SAMPLE NO. 3
Sample No. 3 has few meetings, but they involve all of the stakeholders — not just the installers on site and their direct supervisors (**Table 3**). This model is more effective for the transfer of information from tacit to explicit, and productivity improves significantly throughout the life of the project (**Fig. 3**).

CONCLUSION
Realizing the expected benefit and profitability of each project that we manage is the goal of project management and every project manager. Many project managers are managing many jobs or single large jobs to the result that they rarely see what the installers encounter each day. Good and bad events and impacts need to be shared and communicated promptly so that the collective wisdom of the entire project

team — and the entire business — can be used to ensure that the project meets its expectations.

The transfer of tacit to explicit knowledge remains a challenge for managers. Using effective tools to identify/measure the data and converting it to information only takes us part of the way. Getting the effective transfer requires effective collaboration that encourages and supports the transfer of knowledge. The meetings, their leaders, and their attendees — along with their diligence in using the gathered data — are the only effective way to transfer tacit to explicit knowledge and allow your business to benefit from the learning. **EC&M**

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