

VISUALIZING DAILY ON-SITE SPACE USE

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1 BACKGROUND AND IDENTIFICATION OF PROBLEM

The problem is that the AEC industry lacks a simple and cost-effective tool to visualize on-site space use. Visualizing on-site space use matters, because:

1. **Safety:** fast-tracked projects often imply that more trades share construction space. A higher density of workers on site poses safety concerns.
2. **Production control:** fast-tracked schedules with many concurrent activities makes tracking of manpower needs and completed work difficult.
3. **Collaborative planning:** space use visualization can support the project team develop a shared understanding of the plan.

2 RESEARCH AIM AND METHODOLOGY

- **The research aim** was to prototype a simple and cost-effective tool, LOSite, to visualize on-site space use and test it on a large and complex project.
- **The project** selected for developing LOSite was a 41,000 m² (430,000 ft²) office building, on which the project team issued, on a weekly basis, a 3-week rolling lookahead schedule created in Primavera (P6).
- **The research methodology** followed is the Plan Do Check Act (PDCA) cycle (action research). In the planning phase, the researchers defined the conditions of satisfaction for LOSite as follows: (1) make the schedule visual to facilitate the conversation around planning work, (2) be easy to use and time-effective, (3) not require training to use, and (4) not rely on significant make-ready work.

3 RESEARCH FINDINGS

Figure 3-1 shows the output of LOSite.

LOSite benefited both the subcontractors and the General Contractor in many ways:

- Subcontractors
 - LOSite conveyed quantity of the work by area, which facilitates planning for manpower on large projects.
 - LOSite captured how scattered site work is, which is important to know because manpower depends on it.
- General Contractor
 - LOSite helped avoid time space interferences and catch mistakes in the schedule.
 - LOSite emphasized the importance of using a Location Breakdown structure (LBS) for production control.

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- LOSite enabled superintendents to track resource commitments from subcontractors.
- Overall
 - LOSite is adaptable to projects of other sizes and complexity.

However, LOSite presented the following limitations:

- LOSite was heavily dependent on the consistency of the wording used in the schedule. Lack of consistency in the team's P6 schedule complicated the development of LOSite.
- LOSite depends on the LBS used and could not color up areas that were ill-defined or overlapping with others.
- LOSite did not display the name of the activities in each location. Subcontractors recommended to add such feature to the tool.

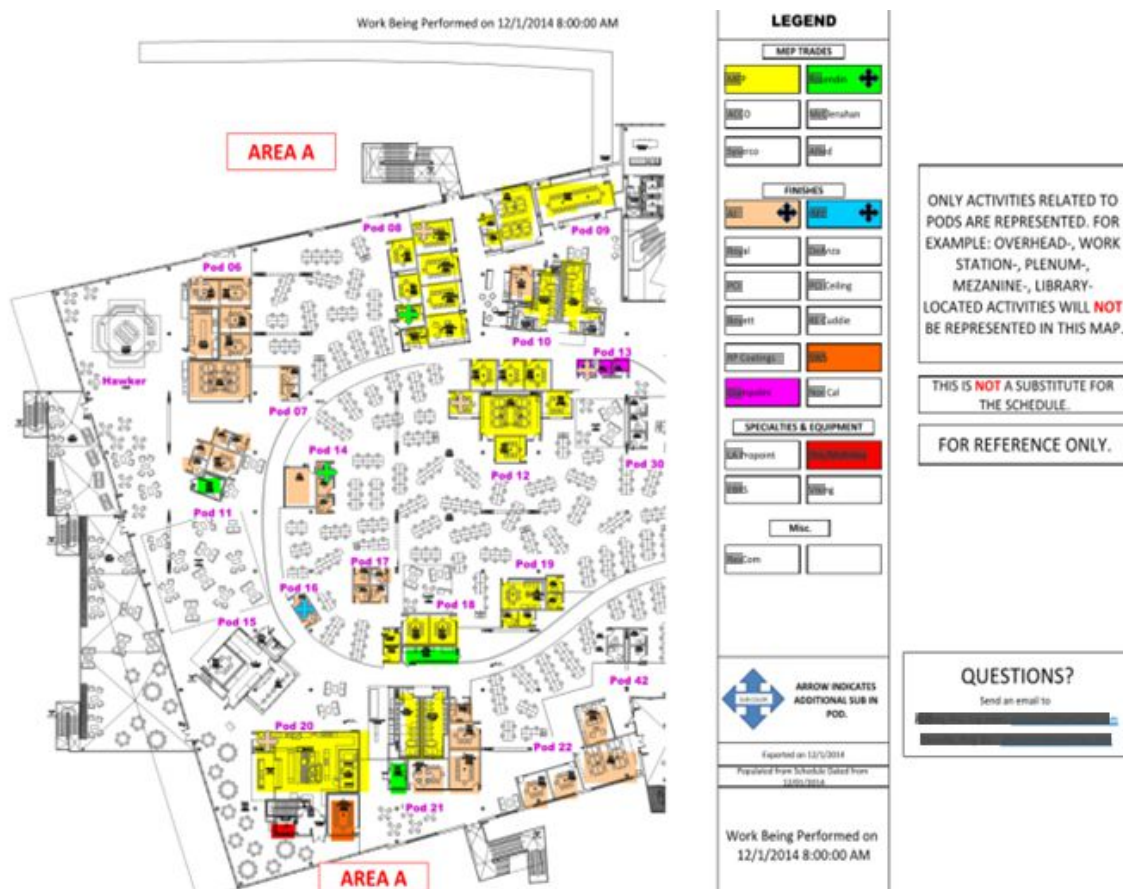


Figure 3-1: Output of LOSite for area A

4 FUTURE RESEARCH

Further research is needed to understand how one could make the project team consistently use LOSite throughout the project. Other questions are to be addressed, e.g., to which extent (if any) does visualization of site space use impact handoff reliability between trades? Finally, LOSite should be tested on other projects to gain robustness.

