

The 5 Ps of Lean Manufacturing: A Process-First Approach to Deployment of BIM 360

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Learning Objectives

- Understand the importance of a clear purpose for technology deployment
- Understand how to keep data at the center of process development
- Learn how to gain buy-in and conformance from all team members
- Learn the importance of the process behind any technology initiative

Description

In the effort to digitize the construction site, project teams and company leaders are tasked with deploying new software, but adoption of new technology in construction is not as simple as buying software and training users. A structured approach to deployment of any new process or platform is essential to successful deployment. This class will demonstrate how a lean manufacturing methodology can be applied to technology deployment, specifically BIM 360 software, to drive a digital construction site.

Speaker(s)

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Mitch Cornelius is a Business Consultant with Autodesk and has been engaged with construction companies across the US in this role since early 2016. Mitch has a passion for improving outcomes for construction companies through refining business process. Mitch has been involved in the construction industry since 2004 with a focus on application of technology to construction processes. He has worked on projects that range from very small to very large, but on every project his focus is to improve business outcome through process refinement and application of technology.

Deployment Strategy

A strategy for how to get to the desired future state cycles from executive support, to planning, to infrastructure development, to implementation/deployment, then to change management.



Executive Support

The deployment strategy starts with support from project executives and divisional leaders. Without their support, it will be difficult to ensure adoption on projects. The executive support needs to come from VDC leadership *and* operational leadership. If only the VDC leadership group is supporting the deployment of these processes, team members are more likely to abandon them.

Project Mandate

A process mandate at the project level will lay the groundwork for adoption. You will not reach a high level of conformance without a project level mandate for project adoption and trade partner participation. The mandate should establish the need for the processes and the responsibilities of each team member/trade partner. Compliance to the mandate should be measured independently of the results of the process.

Reporting Strategy

Reports of the process activities need to be distributed to applicable team members, from project engineers to project executives. Each team member will be interested in slightly different metrics and will use the information differently. Executives need high-level understanding of company performance, while project managers want to know how their individual project and their trade partners are performing. A reporting system must be created to support the needs of everyone engaged in the process.

Executive Involvement

Process programs must start with an executive sponsor to be effective. Everyone in the organization needs to have a firm understanding of what the process is and what it intends to accomplish. Project executives and divisional leaders must make a review of process compliance part of their regular review of the construction projects they are responsible for.

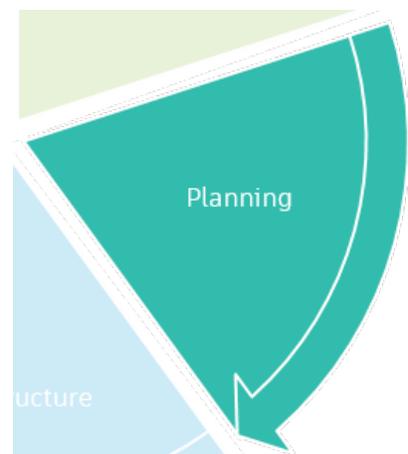
Planning

Content

Understanding the capabilities of the tools in place is important, but the priority should be the content. For example, checklists can be created and shared among projects, but what enterprise standard of checklists have been established for ease of use for project teams? What other built-in content can be created and repeated utilizing technology platforms? The focus should be to minimize the headaches and struggle at the project level and create meaningful content to fulfill required processes.

Processes and Workflows

Before an effective deployment can occur or meaningful content created, a well thought through process must be defined. A simple plan should be diagrammed into a legible workflow to be easily read and understood by project teams. It is important for the project level roles have a say in this process.



Roadmap and Timeline

A critical component for successful deployment is an agreed upon schedule with reasonable expectations. Implementing a process in an organization is more than training on a new program, it is shifting company culture to include core values and what is most important. This culture shift takes time and it should be recognized in a realistic timeline.

Infrastructure

Governance

A governance team is the first piece of critical infrastructure needed for a successful deployment strategy. The governance team should include the corporate sponsor, VDC leaders, and super-users that interact with the systems daily. This team is responsible for deployment strategy, training, support, and technology. This team will be the main program stakeholders and will drive the adoption of the program throughout the organization.

Communication Planning

Communication of the processes, training opportunities, plan effectiveness, project reports, etc must be managed effectively for each role in the process. Every group that interacts with the process will need to receive communication in a unique way. A communication plan that addresses how information will be delivered to each group will be essential to its effectiveness

Support

A support infrastructure is another important consideration for an effective deployment strategy. How end users will be supported from initial training through the entire process lifecycle needs to be considered. Will Autodesk support the users' needs? Will internal IT support them? Will internal quality management support them?

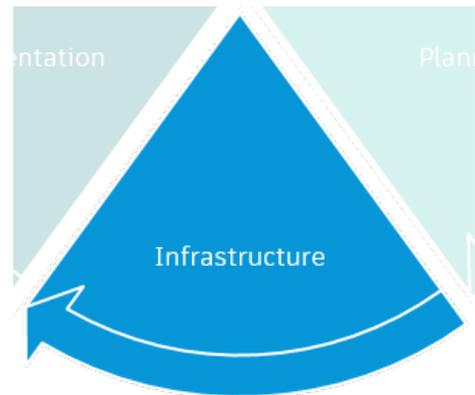
Internal Peer to Peer Network

An internal network of super-user peers should be developed and empowered to support their circle of peers. This moves the support infrastructure from one or two team members to many users that interact with the system while their own business every day.

New and improved processes will be identified as more users participate and have a platform to share their innovation. This team also builds trust and confidence amongst its members and provides opportunities for some who otherwise wouldn't be willing to ask questions and find solutions.

Technology

Does the organization have the correct technology infrastructure available for all the users that need it? Will trade partners have mobile tablets available for effective use of the systems in place?



Implementation

Priority Processes

When determining which Processes to deploy first, a process health assessment can help triage the most critical process concerns. Training on processes will include different phases where more focused efforts (demonstration projects) will commence, then broaden into larger scale trainings. Finally, strategic approaches should be employed to reach the individuals not yet reached or who have meaningful influence.

Training Strategy

The team that is responsible for training end users will likely start with the construction technology leadership group or third-party trainers but should transition to project team members over time. Your construction technology leadership group should support the initial training of end users, but project team members should use those trainings as an opportunity to develop their own training skills. The goal of the deployment is to make the projects self-sufficient, and self-training is a critical piece. The VDC leadership team may be brought back to periodically re-train internal trainers on new features of the process and technology.

Follow-Up

After initial training, it is important to follow up with the project teams to view compliance to the processes, identify areas of improvement, and give specific training on needed topics. Returning to the projects will also continue the relationship building, verify consistency in process standards and provide project teams an opportunity to ask questions after they have started to participate. This consistency becomes even more important when trying to extract data, as the data needs to be validated before it can be viewed.

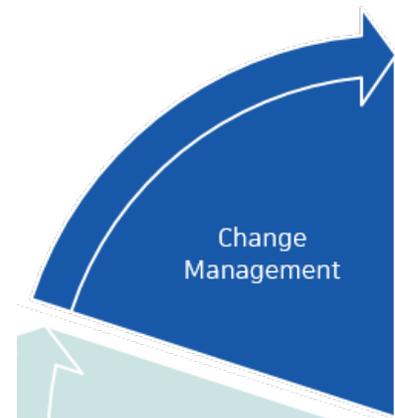
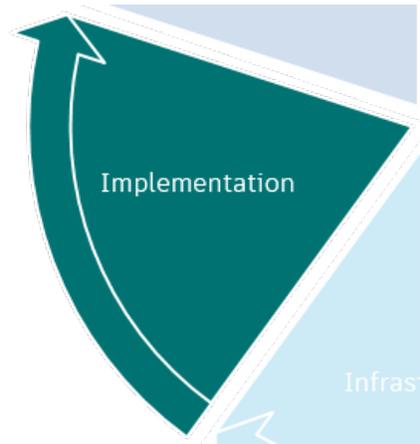
Change Management

Incentive Plans

Each group that interacts with the processes should be incentivized to participate. Without incentives, it is difficult to have the compliance needed for effective deployment. The deployment team should develop a plan for the incentives that each team member will realize by their compliance with the process. Incentives can either be the results of an effective adoption or can be externally applied incentives. For executives, the resultant incentive may be better quality performance on their projects. For a project engineer, it could be a reduction in non-value-added activities. The governance team may also choose to externally apply incentives to program adopters through rewards based on effective adoption.

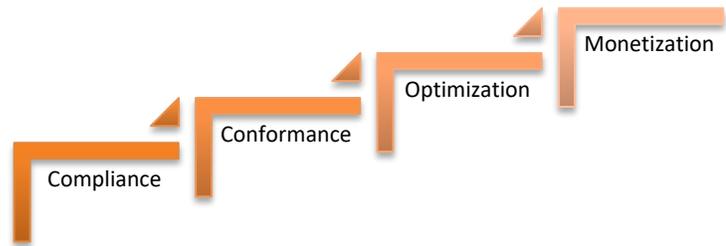
Resistance Plans

An important part of any change management exercise will be understanding where resistance to change will come from and how to mitigate that resistance. Are there groups within the organization that are traditionally resistant to change? How do we best reach these groups to get buy-in?



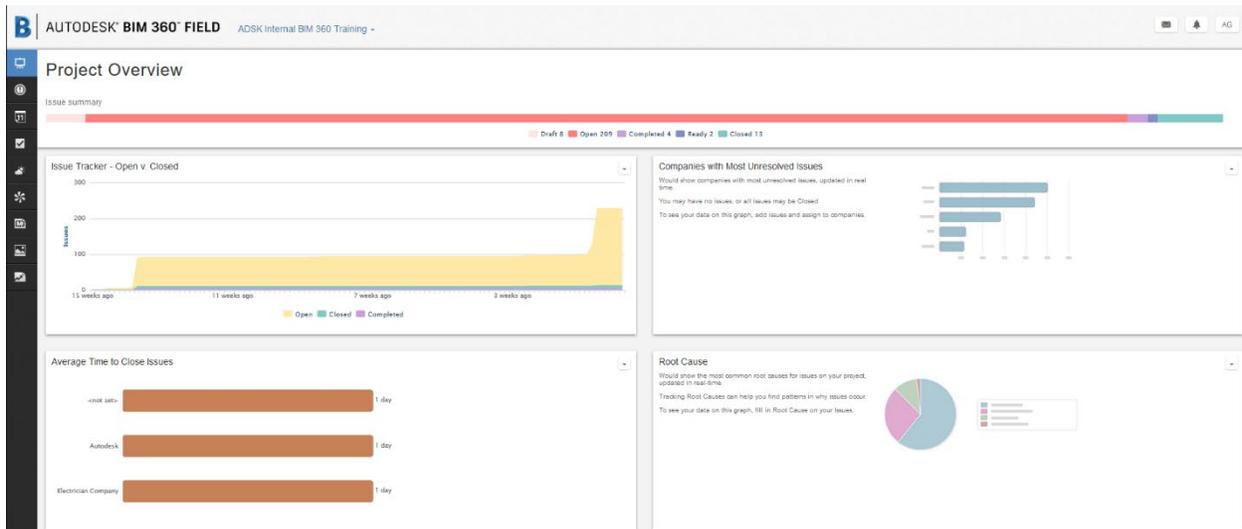
Data Strategy

When planning for the desired future state, a careful look should be made at how data collected from these processes could be utilized to improve the performance on the projects undertaken. This data strategy starts with information that is available out of the box from the products used to perform the processes but steps through to basic analysis, focused analysis, tying to financial performance, database configuration, and final refinement of the process. An effective data strategy begins with compliance to a process, then moves to team members conforming and buying into the process. Once conformance occurs, the process can be optimized with effective data analysis and use. Finally, the data can be monetized by providing real value to the organization.



Out of Box Reports

Standard out of the box reports exist for BIM 360 Field. Information like number of issues generated, checklists filled out, daily reports populated all give insight into the adoption of the system for any specific process.



This information on its own provides some insight into project performance, but until the information is used to solve project challenges, it is not useful.

Basic Data Analysis

Basic analysis of the data that comes from the standard out of the box reports starts with asking questions of the data received:

- Issues – Why were there so many?
- Issues – What time frame of the job had the most?
- Issues – What was the most common? Subcontractor?
- Issues – How can I get more information to change in the future?
- Checklist – Who was the worst subcontractor for follow-up?
- Punchlist – Were there checklist items saved to the end?
- Punchlist – How much did we overrun General Conditions?

Asking these types of questions can enable a project team to start to triage process challenges on a project. Using the data that comes from these questions can enable further analysis to identify actions that can be taken to improve adoption of the process on the project.

Focused Analysis

When the basic questions are asked, a clearer picture begins to emerge showing how a project is performing and what processes, trade partners, and people are contributing to that performance. More focused analysis can then be taken to use this data to continue improvement in specific areas. Sample focused analysis questions could be:

- Issues – What was the most common? Subcontractor?
- Checklist – Who was the worst subcontractor for follow-up?
- Punchlist – How much did we overrun GC's?
- Checklist compliance – Are processes and workflows being followed?
- Checklist conformance – What are the checklists telling us? How are we performing?

Link to Financials

This more detailed analysis can begin to provide real, actionable data for a project team to consume to improve process performance on a project. However, adoption of these processes remains a result of buy-in to the idea in general, but evidence of the influence of these processes on the financial performance of a project is still missing. Without understanding how implementing these processes affects financial performance, adoption will be limited to those individuals who value the process on its own merit. Tying financial performance of a project to these processes will open the drive for adoption to a larger audience. Sample metrics could be:

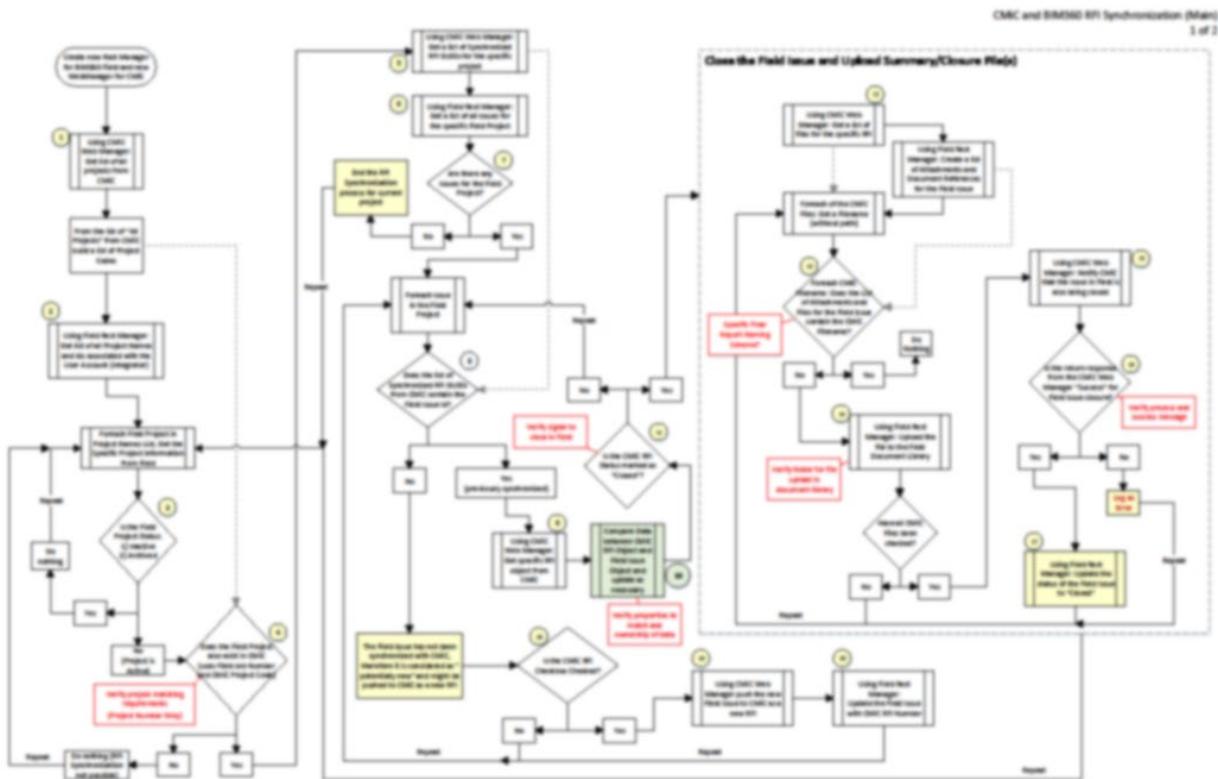
- Issues – What was the most common? Subcontractor?
 - This issue cost ___% of contingency
 - Subcontractor ABC was ___% late on install
- Checklist – Who was the worst subcontractor for follow-up?
 - Subcontractor ABC took 2 weeks average to fix checklist item
- Punchlist – How much did we overrun GC's?
 - This cost ___% of our GC's by not closing out faster
- Correlation of financial performance and BIM 360 usage

Configure Database

When a project finds the need to tie financial performance to process execution, the databases of information need to be digitally configured. This configuration will allow a deeper look at root causes like:

- Issues – What was the most common? Subcontractor?
 - Targeted Focus
 - Time to Completion/ Phase of Construction
 - Data Mapping – What kind of data is important to client
 - Keyword searches help identify common issues much faster
 - Most of late issues were due to design RFI's
 - Onsite crew was not the “A” team
 - Too many issues discovered too late

The configured database map would look something like the following graphic which shows the mapping of BIM 360 Field processes to a project management financial planning software solution:



Define Process

Once a data analysis plan is put in place, the data should support a process change for the projects and the entire organization. Processes should be defined and implemented based on the data collected on each project. The questions to ask as part of this process could be:

- Issues – What is the Step by Step Process
 - How can we simplify?
 - What can we automate?
- Submittals – What is the Step by Step Process
 - What can we automate?
 - Earlier submittal review possible?

The redefined process would look something like the following graphic which is a streamlined workflow for the punchlist process:

