How Clayco is Implementing BIM 360 Build: Successes, Challenges & Lessons Learned

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AUTODESK UNIVERSITY
Mark has 18 years of experience in the AEC industry. His focus is on enterprise technology platform adoption for tools such as BIM 360. Mark’s work experience ranges from being a trainer at an Autodesk reseller to implementing BIM at large multi-office AEC firms. He has been at Clayco for 2.5 years focusing on the enterprise adoption of BIM 360 Build for all projects within the firm.
Shirin Arnold

Shirin has a Master’s degree in Structural Engineering from Stanford University and over 15 years of experience and deep understanding in technology as a solution in construction. Through her first job at Webcor Builders, Shirin’s passion for technology as a solution to help promote efficiency within the industry began to grow. Since then Shirin has gained extensive experience in the tech space as both a Product Manager as well as several leadership roles including; founding her own software company that produced digital 3D BIM models, serving as a Vice President of Credit Suisse where she led the Global CFO IT and CRO IT OnePPM implementation, and most recently as the Senior Product Line Manager for BIM 360 Field Management at Autodesk.
SAFETY IS OUR FIRST PRIORITY.

35 YEARS 1984 — 2019

2,000 EMPLOYEES

$2.6 BILLION TOTAL REVENUE IN 2018

Clayco provides FAST-TRACK, EFFICIENT SOLUTIONS nationally.

LEED PROJECTS
- PLATINUM: 5
- GOLD: 30
- SILVER: 23
- CERTIFIED: 24
- 85+ LEED ACCREDITED PROFESSIONALS

AWARDED OSHA VPP STAR REGION 7

CURRENT EXPERIENCE MODIFICATION RATE (EMR)
0.57
WELL BELOW THE INDUSTRY AVERAGE OF 1.0
develop | design | build

It’s not just the steps in the design-build process that set us apart, it’s how we overlap each step to make every project better.
Clayco Built Projects

PMWeb
- Track submittals
- Track RFIs
- Daily Reports

PlanGrid
- Issued Drawings
- Issued Specs
- Copy of PMWeb approved RFIs
- Copy of PMWeb approved submittals

BIM 360
- Safety audits, violations, great catches, toolbox talks, issues
- QA/QC checklists, issues
- Field Observation Reports
- Punchlists
- File Exchange
- Quantity Takeoff
- Clash coordination

Smartvid.io
- All construction progress photos
- Safety Analytics

Non Clayco Built Projects

BIM 360
- Design issues
- Field Observation Reports
- Punchlists
- File Exchange
How We Got Here

BIM 360 Field
Used on Clayco projects since 2009; Vela early adopter

Safety
• Switched to EHS Insight for over 1 year in 2017
• Adopted Field Management in Feb 2019; mobile phone access was key to them switching back

Document Control
In 2018 Clayco switched all projects to PlanGrid for issued drawings/specs

QA/QC
In late 2018 Clayco switched all projects to Field Management for issue/checklist construction progress tracking through punchlist
Facts & Numbers

2214
ACTIVE DOCUMENT MANAGEMENT MEMBERS

1620
ACTIVE FIELD MANAGEMENT MEMBERS

150
PROJECTS

2427
COMPANIES

95% of all active projects using BIM 360 Field Management

Clayco Built and Non Clayco Built Projects
3 Main Use Cases of BIM 360

File Exchange
- Collaborate 2D/3D files between design architects/engineers
- Extracting quantities from architectural Revit models through Destimator BIM 360 integration
- Create transmittals of issued drawings for Clayco to then issue to the field (place on PlanGrid)

Safety
- Great catches, issues, violations, toolbox talks and weekly audits all complied in Field Management
- World Tour checklists

QA/QC
- All construction issues, field observations, punchlists run through Field Management
- QA/QC checklists (concrete pours, steel erection, tilt up, etc)
- World Tour checklists
VDC Role in BIM 360 Implementation

**Project Creation**
- Setup all projects using a clearly defined process (project template that includes a comprehensive folder structure, standard QA/QC & safety checklists published to every job, operations management staff added)
- Setup procedures are based on if the project is Clayco built or not
- All internal staff are made a Project Admin

**Training, Support, Strategy**
- Provide new user, project training (Clayco staff and with onboarded subcontractors), customized one-on-one training
- Respond to support requests (phone, email, webex)
- Work with our architects, quality & safety managers to implement new BIM 360 procedures

**Account Administrators**
- Provide defined company and role for each internal staff member (architects, project engineers, project managers, superintendents, technical assurance group, VDC, IT, document control)
- Archive projects when they are closed out
- Make members inactive that have not signed in to BIM 360 for over one year

**Autodesk Engagement**
- Share feedback with Autodesk BIM 360 Product Managers of bugs and wishlist items
- Developers and research analysts occasionally looped in
- Beta test new features and provide feedback

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**Autodesk Engagement**
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Autodesk’s Role in BIM 360 Implementation

- Develop a trusted partnership
- Support a feedback channel to drive continuous improvement to the product (Agile methodology)
- Provide transparency of current product capabilities
- Provide transparency on upcoming releases
- Drive awareness of the end users workflows and struggles
- Provide support for adoption teams
- Listen and learn
Challenges

Autodesk Rollout of Next Gen
- Staff are quick to compare 1.0 vs 2.0 features and functionality even if they did not favor using 1.0 at the time.
- Some features still lacking in 2.0.
- Web/mobile functionality needs to be intuitive and robust.

Training Staff on Which Application to Use for What
- Many changes in the last few years in terms of applications.
- Many applications being used.

PlanGrid vs BIM 360
- Workflow to manage issued drawings between both applications.
- Not all issued drawings are in BIM 360.

Many changes in the last few years in terms of applications. Many applications being used.
Lessons Learned

Clearly communicate to project teams how they are expected to use BIM 360 and the current limitations of the software

- How to fill out safety audits – apply filters before creating the checklist
- How the punchlist process works – assigning issues to subs, printing detailed reports
- How to issue drawings to the field – creating transmittals
- 1.0 vs 2.0 – features still lacking in Next Gen

Tight feedback loop with all stakeholders including Autodesk

- Keep Autodesk informed of any specific software bugs, limitations; let they understand your pain points and your specific workflows; keep a priority list of items updated for Autodesk to view
- Accountable from all sides – office to the field; eg: Safety Audit Count
- Learn from end users, eg: Monthly User Group Meetings (recorded presentations given by project staff)

Autodesk Engagement

- Emails, calls, web meetings with Autodesk Product Managers to share workflows – publishing checklist hiccups
- Autodesk to share roadmap
- Insider Program – 30 minute weekly calls very beneficial
- Release Notes – quick way to digest new features
- Look for the software to be: robust, intuitive and flexible to customization
Autodesk’s Lessons Learned

- Engagement programs such as the “BIM 360 Insider Program” are extremely beneficial
- Monthly Product Call – recently released, upcoming features
- How to scale “BIM 360 Insider program” and implementation efforts within the product team
- Communicate pivots in the roadmap earlier
- Advantage of a partnership such as the one with Clayco is immense
- Provide the “Why” part of the strategy, the broader picture
- Explain the trade-offs
Lessons Learned

Have a replicable process for every project
- Staff move from job to job and expect consistent processes
- Document and train all teams on that process
- Clear processes allow for trends to be tracked in a dashboard

Don’t wait for the perfect moment to implement a new procedure
- Went to Field Management very early on; the pros outweighed the cons
- Never going to be the right moment if you always wait
- Learn how to implement and use the software as you go

Keep refining your implementation process
- Have specific implementation goals, eg: overall safety dashboard, tracking subcontractor performance
- Be critical of all areas you can improve, eg: training, documentation, dashboard
- Be quick to change something if it is not valuable or working
- Stay organized
Lessons Learned

Get Management buy in

- Leverage the momentum from announcements at Friday PM Meetings, eg: Document Management, Power BI presentations
- Management access to Power BI Dashboard
- Leverage them championing a software implementation, eg: Smartvid.io

Be urgent on responding to support needs

- Important to respond quickly when support is needed; helps build respect
- Help using all mediums (webex, calls, emails, one on one)
- Treat all support requests as priority
Successes

Team,

The enterprise has made a substantial commitment and investment in Auto Desk. This includes BIM. There are many advantages to using BIM for tracking issues on job sites. Tracking issues is in no way a bad reflection on the job. There are always issues. Tracking them will do two very important things:
1. Provides a clear record of an issue from start to finish.
2. Identifies trend. This will allow us to continuously improve.
Continuous improvement is a key component of Lean Construction and aligns with another enterprise initiative. Please start using BIM to track and close issues. Reach out to VDC and myself for any help or questions.

Regards,

Tim West  //  COO/CEO, MBA, MS
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**End User & Management Buy in**

- Staff are getting more and more familiar on how to use BIM 360
- Management is becoming more vocal in championing the tool – Safety/Quality Regional Managers
- Adoption rates are increasing year to year from a QA/QC, Safety and File Exchange standpoint

**Partnering with Autodesk Product Managers**

- Transparent and candid with them on our specific processes
- They understand Clayco’s priority list
- Working hand in hand to improve the value add of BIM 360

**Power BI Dashboard**

- Have a comprehensive QA/QC and Safety dashboard that updates twice a day
- Many managers use it to hold their project teams accountable
- Lets us understand trends between projects and spot problems before they become too large
Autodesk’s Successes

• Clayco’s success is our success
• Enrichment of the product as a result of direct end user feedback
• Understanding of the high ticket items for Clayco
• Continuation to build a trusted relationship
• Product direction validation
Project Success – Penn State East Halls Dorms

- Zero Punch concept; tight Owner Schedule for furniture move in after Substantial Completions (less than a month)
- Over 500 Fan Coil Units (FCU) on each phase
- Each phase may be unique (subcontractors, manufacturers, sizes, components, details)
- Used a FCU checklist in BIM 360 to assess the installation quality of each unit
Project Success – Penn State East Halls Dorms

Positives
- Easily accessible from any handheld device
- Ease of access to checklist information by anyone on the project
- PDF reporting and submissions for record to the client
- Creating and tracking issues to completion with subcontractors
- Ability to attach information to each checklist item for clarification/explanations

Deltas
- Ability to delete photo once uploaded
- Hot spot tethering vs. data on handheld device

Project Benefits
- This effort originally started as part of a punch list on a previous phase
- With the zero punch concept, this was introduced as part of the QAQC process as FCUs were being installed
- Typical floors have 20 FCUs- 10 Floors a building- 3 Buildings = 600 FCUs on Phase 1C
- Addressed insulation issues
- Fire caulking penetration issues
- Established Clayco’s expectation on Quality from the Trades very early on the project
Create Pre-Elevated Deck Slab Signoff Checklist

- Assign each section to the appropriate staff (Super, Asst. Super, PM, PE)
- Slab embeds/penetrations
- Concrete – PT tendon layout
- Slab edge drawing matches scan
- MEPFP penetrations

Review penetrations are installed per plans

- Use markups in Docs to confirm this
- Create issues to document discrepancies and assign to subcontractors; subs required to close out issues prior to concrete pour

Complete all sections, print to PDF
**Project Success – One Hundred Kingshighway**

**Pluses**
- Easily accessible from any handheld device
- High quality QA/QC documentation (photos & issues)
- Improves team collaboration & accountability
- Increases efficiency & productivity
- PDF Reporting
- Private vs. Published Mark ups

**Deltas**
- Ability to delete photo once uploaded
- Mark ups not syncing
  - Hot spot tethering vs. data on handheld device
  - Mark up tool disappearing not allowing to mark up plans

**Fun Facts**
- Initially completed slab sign off on paper
- Electronic Sign Off started at level 2
- Typical floors have +/-1,500 penetrations / embeds
  - Installed roughly 25,000 penetrations / embeds to date
    - Only have missed 7 penetrations
Focus on multiple avenues of traction – project teams, management, disciplines
Power BI Dashboard
Power BI Dashboard

Ability to quickly filter all projects for open quality issues that are unassigned; can notify project teams to get these issues assigned to their appropriate subcontractors; can view these filtered issues in Field Management.
Power BI Dashboard

Can quickly view open issues by contractor by floor > room
Power BI Dashboard

Can assess who has and has not done the weekly safety audit (all PEs, Superintendents and Onsite Safety Engineers are required to do one a week)
Power BI Dashboard

Track start and end dates of staff per project; those active within the week are required to do the Weekly Safety Audit.