AUTODESK Construction Cloud

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The Effective Construction Cost Management Playbook

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Introduction

Welcome to The Effective Construction Cost Management Playbook. This resource is a collection of the lessons from the ecourse, Effective Construction Cost Management, 4 lessons with 4 leading coaches.

The lessons include:

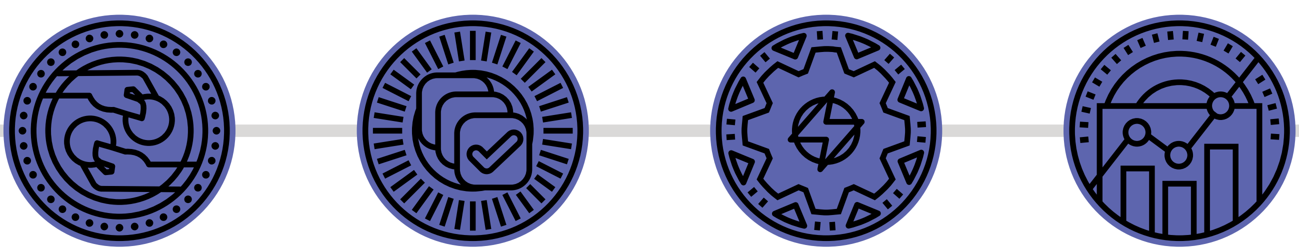
- Effective Construction Cost Management: The Ball is in Your Court with Esteban Corrales
- Standardization: The Cornerstone of Construction Cost Control with Jake Williams
- Optimization: The Construction Cost Management Superpower with Josh Cheney
- Your Mission: Transformation through Business Intelligence with Chris Fish

Use this Playbook to provide insights into the key areas that impact cost control. Use it as a study guide to support and improve your cost management tactics and strategy. Use it to build cost control as your new superpower.

Together, the lessons and the industry professionals teach effective and improved cost management as the essential step towards project efficiency, maximizing profits, minimizing project costs, and establishing accountability.

This Playbook is yours to keep and share with your team.

Now, you've got the tools for success.... get out there, and level up your game.



LESSON 1

Effective Construction Cost Management

The Ball is in Your Court with Esteban Corrales

Welcome to your first cost control lesson, where we will be advancing construction cost management.

I'm glad you're here. This lesson will take about 6 minutes. Let's jump right in.

My name is Esteban… I have been in various roles in the construction industry- field engineer, project engineer, assistant project manager, and, ultimately, project manager.

When you're the project manager, you worry about many different issues. You are on the line for project success. You want visibility of everything that's happening and the ability to see everything that is possibly going to come up and impact your bottom line. This is a tall order.

It seems unavoidable: problems happen on a project site every day.

- Silos and lack of connection cause mistakes.
- Mistakes cause delays in schedules.
- Delays in schedules add cost to the project.

In my opinion, there are five specific reasons these mistakes happen, and we lose margin:

1. Siloed data
2. Information barriers
3. Inefficient processes
4. A lack of visibility
5. A lack of accountability

If you don't have the information in the right location, if you can't communicate efficiently, if processes are taking too long, and you don't know who's supposed to do what… what happens? You won't be able to visualize the risk that is coming and be able to make sure you're hitting your margin.

ESTEBAN'S TIPS

You need a place where you can see all the information, and how that information is connected.

These five points are completely connected: you can see how one provokes the next.

So, when you're thinking about your budgets and you're thinking about your cost management workflows, what you truly need is a place where you can see all the information, and how that information is connected.

After this lesson, you will walk away with a few key takeaways:

1. Be able to accelerate and understand data centralization, standardization, and connection
2. Know essential ways to advance your cost management practices
3. Drive improved,connected,and integrated workflows on all projects using effective cost control

To begin, let's talk about centralization. And why it's important.

Centralization: makes cost control effective

It's a challenge to eliminate silos of information. Centralization is really the solution to the process.

One of the biggest reasons why teams struggle on a project and why mistakes happen is we're using the wrong information, and we burn energy and time trying to find the most up-to-date solutions.

The most important way to solve this problem is to have a common data environment.

ESTEBAN'S TIPS

Common data environment: where all information is collected, controlled, managed, and distributed.

What does that mean?

It's a single place where all project information is collected, controlled, managed, and distributed.

With spreadsheets and paper-based processes, it's easy to lose track of information. A common data environment makes tracking items and their status easier and seeing how they progress and impact the budget.

Centralized cost management also addresses decision-making, enabling quick and effective decision-making.

And this is another fundamental reason for centralizing your data: suddenly decisions can be made anytime, anywhere by the right people with all the key information readily available and at their fingertips. On the site? No problem. In the office? Just as easy. Anything to avoid stopping or delaying a project is good news, right?

By centralizing your data, you can streamline your processes to save time and money.

Think about escalating an Issue or a RFI that might have a cost impact to potential change order, immediately starting the change process. Being able to connect how that change order lived from the question and the answer all the way back to when the foreman realized that there was a possible problem, took a picture on a mobile device, and created that item is how you will ensure your margins. This is only possible when information is centralized, and workflows are connected.

Power to the people, the right people.

Access to information is important for all team members on site. But every project manager knows that having the right level of access to the right information for your people is also just as important.

ESTEBAN'S TIPS

Give access to information to the right people so they can make decisions anywhere, anytime without delay.

A system that allows you to grant specific permissions to specific people is critical when it comes to sensitive information like cost... You need to be able to get as summarized as you'd like or get as granular as you'd like to make sure that teams have access to what they need and not have access to what they shouldn't.

Ok, are you with me? You've got cost management covered, and so far, we are going over the ways to advance, or level up, make it better, if you will, by explaining what you need to do and why.

Your toolbox is now equipped with knowledge on the why and how of connected workflows, centralized data, and a common data environment. What's next?

Maybe today you are still trying to track issues and steps to resolving those issues in a spreadsheet?

You still use spreadsheets?

Let me assure you the problem is that spreadsheet! And trying to keep all your different platforms and methods up-to-date and accurate. It's an impossible task.

ESTEBAN'S TIPS

Something better than a spreadsheet has come along... Take control of cost and learn to use an integrated cost management system to transform your projects, make greater profits, and be risk averse.

While you've used spreadsheets and printed reports for ages and you are used to it—this is using many different tools rather unifying all of this into one system that allows for the management of all cost activities, connecting those workflows together and having an automatic audit trail.

With spreadsheets the whole process is broken, fragmented, and scattered. I remember when I was a project manager, I was almost Frankensteining things together. I had a spreadsheet on one screen, my ERP system on another screen, a report printed out on my desk. And I was looking at each one trying to have a visual of the health of my project.

Why you want it: Centralized Cost Control.

Once you centralize your cost activities in one, single, integrated cloud-based platform—your cost management system suddenly is an advanced and improved system.

- Everything is in one place
- Everything is connected
- Every step is trackable
- The entire process from start to finish is documented

You can perform your different cost management workflows and let the system update the connections between those different items so that by the end of the project, and at every month, when you're forecasting, you have a visual into the success of how much money you had in your pocket versus how much money you're spending on every single line item. That's centralization. That's connected workflows.

Centralization is a pretty basic concept that makes a monumental difference in your quality of work and management. Now let's talk about visualization.

ESTEBAN'S TIPS

Having a meeting with your boss about the financial situation of a project, stressful. That same meeting with an accurate, up-to-the-minute visual representation of the financial health of that same project, a game changer!

Visibility: Get the ball rolling on seeing and believing

Visibility into what's happening on the project is crucial.

All teams need visibility into progress, documentation, and reference information to make sure that teams are cohesively working together and reaching the end goal, which is making a project successful. And an essential piece of this is stakeholders having 'real-time' visibility of all cost information to see budget impacts, forecast, and track progress against their plan. This is crucial for decision-making and being able to keep a project on budget.

Accountability: It's a good thing

When teams have visibility into what everybody's doing on the project, that will create accountability to ensure that everybody's aware of what they need to do and when, and have no excuses truly to say, "Oh, I didn't know that I needed to do that." This is key in moving processes forward and keeping your budget on track.

Transparency: Building Trust

There is no reason why we shouldn't have transparency on a project site. Transparency and clarity create accountability, and that will bring success to any project.

Everything that happens on a construction site is going to affect your margin.

For a project manager, having visibility into what's happening on the project and being able to easily translate that into risk mitigation is the key for financial success.

If you can't easily track and understand what's happening and what's going wrong or what's going right, you can't make decisions about avoiding future mistakes. And if you can't do that, you run the risk of losing margin.

If you are centralizing and connecting your data, you're about to cross the goal line… but let's keep going, it's time to talk about, "integration."

ESTEBAN'S TIPS

If you know what happened yesterday, what's happening today and what's most likely to happen tomorrow that's cost control guiding you to detect, identify and address issues… before they become *issues*.

Integrate. Integrate. Integrate.

Let me say it one more time: "integrate." It's that important.

The integration between your enterprise resource planning (ERP) system and the cost management tool is vital to your projects' financial health.

Being able to transfer the information and connect both your budget line items to your accounting system, transferring cost management items from one place to the other and having actual costs come in from the ERP system into the cost management tool to do forecasting is essential.

To have effective cost control, you have to have those integrations, both native and to third party applications to make sure that you're successful with having the right level of visibility in how your project is doing from a financial standpoint.

ESTEBAN'S TIPS

Clean it up! Start the journey! Have an appointed champion who will lead the way to standardization of data: a person who works to ensure data is accurate, complete, and consistent.

What to look for when evaluating cost management solutions

An effective construction cost management tool allows you to have:

- Customization
- Standardization
- Automation
- Integrations
- Visualization

You want it? You got it! Customize, change, act.

One of the most important pieces that companies and project teams need in a cost management tool is for it to be customizable and flexible. Whether you're dealing with change requests or change orders, your team will define the naming convention of the different workflows and the cost management tool—this is your standardization process and your creation of your common data environment. Do this and commit to it. You will be glad you did.

Lesson 2 will cover standardization in more detail.

ESTEBAN'S TIPS

Consistent data is as simple as deciding on one spelling for a company name, person, or address, etc... Discover and create standardizations and implement!

ESTEBAN'S TIPS

Every construction project creates, generates, and has the potential to collect data. Use this data right—use it to manage and analyze projects, use it to make good decisions.

Power of automation

When you can bring automation to typically time-consuming processes, like the ability to create rule-based approval workflows for contracts, payment applications, and change orders, not only does it save time, but it allows for consistency and transparency of company-defined processes across projects.

Be all in. Be fully integrated.

Connected workflows reduce data loss and increase access to critical information. And by synchronizing critical financial data between accounting and operations the risk of liability issues reduces, and processes become streamlined. With actual cost data automatically flowing into your Cost Management system, teams can improve forecast accuracy to ensure maximum profitability.

Diversity, inclusion, and collaboration? All your devices need to be doing this, too.

It's the next essential step. Your data and your devices and your software—all of it—must be connected to be effective and be running the same platform. This is creating meaningful and essential connections and inclusions between crucial information that is then used to make your decisions.

If you recall from earlier in this lesson, we call this your common data environment and it's another step to advancing your cost management.

Connected Construction: We are all on the same team

Connected construction means everybody has their finger on the pulse, that we are all informed in real time.

There's no disconnect between the accounting team and the project management team.

Everybody is connected.

Make it better.

Now you've got the background, this is your slam dunk.

How your cost management relates to all of the above and how advancing your cost management brings greater value to your cost control and makes it better is going to be your tour de force.

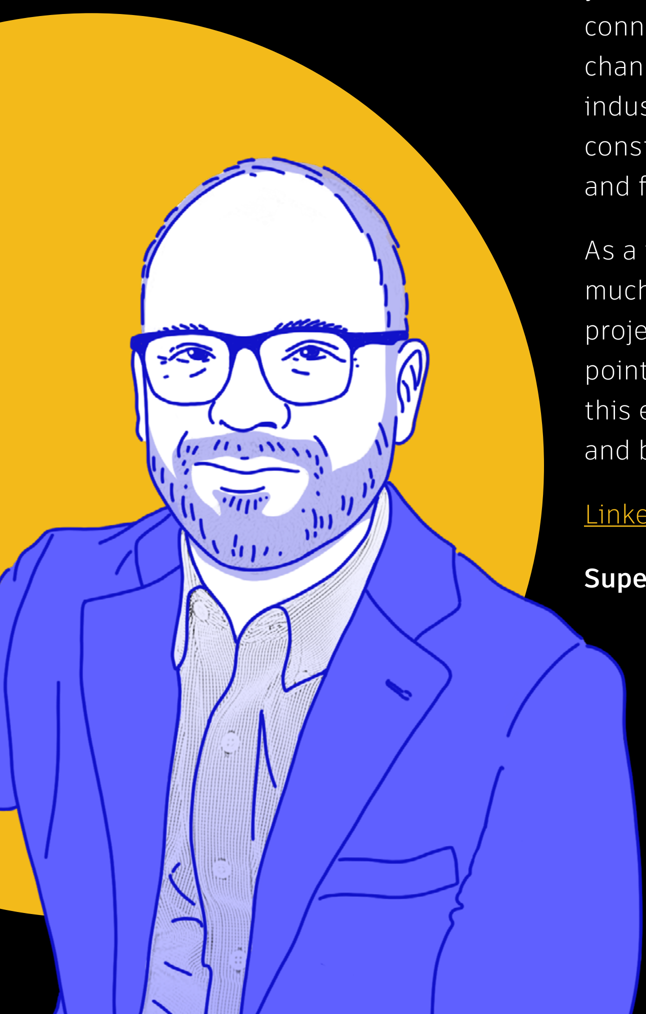
Having an up-to-the-minute ability to see the financial health of a project is an amazing way to reimagine, rethink, and recreate how to move forward. Once you get this set up right, you will transform your projects.

By going through this lesson, you have increased your knowledge and understanding of construction cost management. You have the tools and the increased proficiency and expertise to take your cost control to the next level.

1. Centralize 2. Customize 3. Standardize and, then 4. Connect

Your goal in this journey is for every stakeholder on a project and the project life cycle to work together, coordinate, and be successful in every project and venture that your company might work with. That, in itself, is admirable.

Reach out to me anytime and we will connect you with an Autodesk expert who can answer your questions. Until then, here's to working hard with purpose and passion.



ESTEBAN CORRALES

Manager of Technical Solutions, Construction

A little about me: A little about me: I'm Esteban Corrales. As a manager of technical sales here at Autodesk, every day, I work with our current and future customers—that's people just like you—to understand what works for you and what you need to be competitive in this industry. I stay closely connected with my network of customers—keeping up-to-date with the changing issues and challenges, needs and goals of the construction industry. I am here to support you in your exploration of Autodesk construction technology. My purpose is to help you with both your existing and future workflows.

As a former project manager for a large national construction firm, I spent much of my career on Commercial and Industrial Renewable Energy projects. This background gives me a unique understanding of the pain points a company goes through on both a project and company level. With this expertise, I work to find ways that will help you achieve your project and business goals.

LinkedIn Account

Superpower: Telepathy to read minds… in addition to effective cost control

LESSON 2

Standardization: The Cornerstone of Construction Cost Control with Jake Williams

I'm Jake Williams. I've worked in construction my entire career. From early on when I worked to set concrete framework to later becoming an operations manager with joint leadership responsibilities, my range of experience from hands-on, on-site to in-the-office has allowed me to see decades of transformation across our industry.

Above all, ours is a field I have watched change tremendously over the years. I have witnessed the greatest improvements from the use of integrated technology.

In these last several years, construction businesses that have fearlessly gone all-in and adopted integrated systems have grown and thrived, becoming more competitive and driving more profit.

It's probably one of the most exciting times to be in construction. We have access to the tools to implement big change and deliver huge positive impact.

In this lesson, we are going to talk about why you need to standardize and why standardization is the cornerstone of construction cost control.

This lesson will take about 6 minutes.

Standardization is one of those improvements to your cost management system that will accelerate and advance your cost control.

More than that, it is the foundation of your cost control.

When you have one, efficient, effective way of doing things that is shared with and allocated to the responsible parties, everyone knows what to do and when to do it—it's like a pattern, repeatable, predictable, knowable, trusted. That's standardization.

In a construction zone, that simplicity of standardization can make everything move efficiently, allow everyone to be more productive—and most importantly, manages risk, alleviates a huge amount of stress, provides some much-needed peace of mind, and avoids delays.

Standardization has a significant impact on construction cost management and intersects with every aspect of cost control.

JAKE'S TIPS

Go all in. Adopt an integrated system. Grow and thrive.

JAKE'S TIPS

Have one, efficient, effective way of doing things. Share it, allocate it, and create a pattern, repeatable, predictable, knowable, trusted.

JAKE'S TIPS

Establish clearly defined processes and procedures.

After this lesson you will walk away with a few key takeaways that I encourage you to apply to your cost control knowledge:

1. Standardization is essential to efficient construction cost management.
2. Standardization delivers insights about the past, the present, and the future.
3. Standardization measures improvements and helps establish Key Performance Indicators.

All of this translates into your company becoming more profitable.

Create a structure. Evaluate. Repeat.

Construction depends on processes that are collaborative, repeatable, and replicable to be successful.

If you can't create a set of procedures that can be repeated, with results that can be measured, you simply won't have a way to tell how well you and your team are performing—and each project team will be making their own decisions in their own silos, leading to straight-up errors, poor data quality, mis-communication, and confusion.

What does it mean to "standardize"?

If you like the ideas of alignment, productivity, efficiency, improvement, reliability, and profitability, and being able to prove with data that a positive impact is happening, you'll like the idea of standardization.

Standardization means establishing clearly defined processes or procedures to get something done from start to finish.

Once in place, these standards are then used with regularity and repetition.

You use them in everything from:

- Submission forms for bidding
- Bid leveling
- Terminology
- RFI/Submittal/Change Order submission forms and process
- Approval review flows
- Document templates for contracts and payments
- Forms, quality/safety checklists, and daily report templates
- Reports and dashboards
- Issue categorization
- Planning and scheduling to worksite tasks.
- Equipment maintenance checklists

The rationale here is that everything needs to have a clear method and process.

Each step has a team member or members designated to handle it so processes run smoothly from start to finish. Eliminating the risk of miscommunication, response delays, lack of documentation, or information not making it into the appropriate hands.

What standardization does

- Establishes repeatable processes to measure performance, gain insights, and improve your organization
- Aligns your organization from team members to tasks and ensures information gleaned from your data is accurate, reliable, and current
- Reduces the time and cost of a project and lessens the chances of rework
- Helps when your company begins to scale—with company growth, having processes in place smooths transitions, and enables progressive growth
- Ensures company defined processes are followed across all projects
- Controls and creates efficiencies in workflows
- Reduces errors and points out potential mistakes giving you time to fix missteps and issues
- Makes your use of data and your connected, integrated system work efficiently, so you can work proactively
- Improves communication between team members ensuring responsive and timely communications and quick access to data

You're getting the gist: standardization is the key to all your workflows, your integrated system, and your connected construction platform working as it should.

JAKE'S TIPS

Standardization is the key to all your workflows, your integrated system and your connected construction platform working as it should.

Without standardization, processes and workflows are dragging behind in a never-never land of chaos and silos: your costs are rising, your processes are not streamlined, and communications between team members are rife with mistakes and lack of connections. You have no consistency to your workflows and Every day is another chance to watch costs soar and risk take over.

Yes, standardization is that important.

Your timing could not be better because you now have access to an efficient cost management system that will take care of all of this in the blink of an eye.

How to get started: Steps to success

Now, you are ready to set standardization up in your system.

I recommend the following steps as your guide. Use this as a checklist.

1. Project setup and participants
    - Identify past or current projects and processes where desirable outcomes were or are being achieved.
    - Identify good proven processes and those that need improvement.
    - Brainstorm with key stakeholders on how to improve broken processes and refine as needed so a good baseline set of processes can rolled out in initial pilot projects.
    - Determine what projects you want to use standardization on to begin.
    - Decide who creates projects within the system and fully train those team members.
    - Define the expectations of the collaborating teams: have clearly defined goals and expectations as to who will collaborate in the system, write these down and make them accessible to everyone.
    - Everyone needs to know what teams and team members need to work together —everyone is onboard from the start.
2. Establish field technology goals and uses
    - What are you hoping to accomplish with the project? Reduce costly rework by keeping a single current record set? Increase communication between owner, architect, and contractor? Reduce reproductions or costs in a specific area?
    - Identify these goals, prioritize these goals, and delegate who will be responsible for these tasks during each project phase.
3. Assign responsibilities and permissions
    - Select responsible team members and designate permissions for each project step
    - Who needs access to documents and plans?
    - Who is ultimately responsible for the success of the project and has the final say in conflict?
4. Develop workflows
    - How will you share information and how will it be accessible to the team?
    - Invite team members from all levels to contribute to the conversation—gather team input, build trust, and get buy-in.
5. Apply standardization to your tools and all workflows
    - Different teams need to use your systems and processes the same way your team does—keep it uniform.
6. Align hardware and software
    - Make sure all your hardware and software are integrated.
    - Train everyone to use the devices you work with.
7. Establish project deliverables and metrics
    - Know how you'll measure success – have specific goals, like a goal to reduce rework by 50% by keeping everyone on a single, current set. You'll be able measure the success of this goal.

At this point, having seen the steps to get started, what's holding you back?

Maybe you're thinking what you have now works, why fix it if it's not broken?

Or maybe you think that if you standardize processes, you become like every other company—just the same?

Or your company's way of doing things, your reputation in the industry, or even your methods that have worked for you for years would be obliterated?

Maybe "standardization" feels counter-intuitive? Construction is inherently connected to design and both to innovation, creativity, and individualism.

How, you might ask, are we standardizing when we are in an industry that thrives on ingenuity, creativity, and ground-breaking originality?

"If we standardize our processes and our methods, our workflows and our systems, how will we preserve what is uniquely ours and the reputation of our organization and our people?"

"Isn't the way we do things what makes us… well, us?" And if you've been doing things this way, for a long time, maybe you don't see a point to changing.

And, last but not least, there's the element of time. "This is just one more thing to take up my time" or "I don't have time to do this, it's too much work."

I hear you. These are good questions and relevant points.

Don't worry—the data that your integrated system is turning into invaluable information is still unique to you. It is still your methods and your processes, but better.

JAKE'S TIPS

Your data is unique to you.

Now it's improved. Streamlined. Seamless.

Standardizing your processes, workflows, systems is only going to make your projects more efficient, more productive and more profitable.

Your image and your reputation will only be enhanced as you'll be able to add productivity, efficiency, and skilled proficiencies to your repertoire. What client wouldn't appreciate that?

And, time? It is likely that you do not need to overhaul the entire system of the company. It is likely that you already have a lot of exceptionally good processes that just need to be identified so they can be standardized allowing all teams and projects the same Jedi tools. As our industry shifts to technology to make projects more efficient, more profitable and work more productive, not to mention sites safer and the in-process built environment less stressful, you really cannot 'not afford' to not do this. That is, like, a triple negative… so really, you can't not do this!

Putting in the time and effort now will save you enormous amounts of time and effort in the future.

Think of it as deferred gratification: get this done now, implement standardization, start using efficient cost control today and the future is suddenly very, very bright. Put it off and you just get more and more entrenched in yesterday's methods, clunky non connected workflows, and inefficient systems.

Let's forge ahead. You've got a good grasp of how standardization will improve your organization and your work. Let's get back to our focus on cost control as it relates to standardization.

How does standardization affect cost control?

Well, first of all, with your efficient cost management platform, standardization is going to be easy.

You have centralized your workflows and integrated your accounting and operations systems.

This crucial step will help you move through projects from start to finish with improved quality and cost control. By digitizing your workflows and centralizing your project data you cut down on redundancy and increase accuracy.

Standardization will help your team control processes and when issues arise it enables them to find answers quickly and with ease—they will know where to go.

Communication in construction is one of the most important pieces of creating successful project outcomes.

JAKE'S TIPS

Communication is essential to creating successful project outcomes.

Standardization plays a big role in improving communication. Pulling all workflows under one umbrella streamlines and simplifies the process because it requires each member of your team to communicate using the same format, the same language, and the same tools.

Standardization also enables teams to capture high quality actionable data that's accessible for you and the team to look at in a system with user-friendly configurable visualizations like graphs, dashboards, and reports.

This flexibility is essential to cost management so you can slice and dice the data to meet your needs.

This creates transparency within your team and an effective way to speed up information distribution—every future project benefits from the project and cost data collected from each past project and informs documents, timelines, and status updates.

You can now compare 'apples to apples' across your different projects across the company.

And really what standardization is going to allow you to do is to stop looking back at how to fix mistakes.

Instead, you'll be able to start looking forward at how to avoid them, giving you the insight that you need to mitigate risk.

Tracking what happens on a project and how it affects your budget provides many benefits:

- You will ensure your margins,
- Understand how different cost items have turned into change orders,
- And, how that references back into your budget line items
- Know whether budget transfers have been performed
- And by filtering the information that you need in your budget, you can get appropriate contracts created.

By referring back to your budget line items, when you execute contracts and execute your subcontractor change orders, you don't have to manually go back to some spreadsheet and update that information.

You see where we are going here?

Already your standardized processes and workflows are delivering insights into your project and team performance, not to mention helping you improve productivity, efficiency, and accuracy.

Having consistent processes actually generates reliable, accurate, and up-to-date data that lets you make informed decisions.

Back to the Future: Standardizing cost control lets you use data from the past to see the future

When your workflows are standardized and organized this also reduces the possibility of rework, improves the quality of all work done, and controls your costs.

Let’s take a moment here and talk about a few examples of cost control benefiting from standardization.

- **Clear and structured approval workflows** for contracts, change orders, and payment applications. A common reason why things get delayed is because it was in the wrong person’s hands for approval. By being able to structure the process on the system back end and defining who the appropriate team member(s) are to review these different workflows, it avoids those mistakes. Streamlining the process ensures each team member who has an approval, or a question gets the response quickly, accurately, and from the right person.
- **Formal change order submission process and clear status visibility.** Dealing with an informal submission and tracking process will drive anyone crazy. Not only will unnecessary time be wasted but the risk of a change order falling through the cracks is high. By standardizing the submission process and information requirements the change process will run smoothly right off the bat. The context needed to make an informed decision quickly is radially available and status/ball-in-court clearly visible.

Standardization, in the beginning takes effort, planning, and consistency, not to mention determination and grit.

Keep at it.

When the numbers come in and you can see improvement and increased profitability, based purely on making things standardized, you’ll see the benefit.

Here’s to repetition with purpose.

Jake Williams

Technical Sales, Construction at Autodesk

A little about me: I'm Jake Williams. Let me tell you a little about myself. My life passion and purpose is grounded in the construction industry—it's in my DNA. I started young—as a kid working for my dad in his small commercial construction company. It was hard work but I loved it. I worked as a laborer and eventually as a carpenter doing small jobs. A few years passed, I grew up and I joined a carpenter's union. I was fully immersed in the industry knew by this time that in construction was where I belonged. I soon started work for Okland Construction setting concrete formwork. From this professional starting point, I worked my way getting deeper and deeper and increasingly knowledgeable. Twenty-five years later, I had experience as a field engineer, a project engineer, a superintendent and eventually as an operations manager with joint leadership responsibilities for the entire company supervising work and teams across 3 states.

I was lucky. I learned early that I wanted to work in the construction industry and I knew from the onset that this was where I would stay and grow a fascinating career. Today, I am thrilled to be able to share my knowledge with you and support you as you navigate your way to doing better and transforming your organization with the advantages of technology and data.

It's a great field we are in and no better time to be in it.

LinkedIn Account

Superpower: All-around sight to keep track of important events and changes on projects to be able to quickly focus on needs.
But I rely on data to fuel my cost control superpower!

LESSON 3

Optimization: The Construction Cost Management Superpower with Josh Cheney

I'm Josh Cheney and I am going to be taking you through lesson #3.

Give yourself about 8 minutes for this lesson; and settle in because this is going to be a good one.

I've worked extensively in the field of cost management and construction technology solutions, and this information has been pivotal to my career.

I've also seen, firsthand, how the entire construction industry benefits tremendously from efficient workflows for smoothly running projects and a well-organized, productive site. Not to mention increased profit, thousands of dollars saved, and countless hours of time not wasted.

In lessons 1 and 2, you covered being proactive to advance your cost management, and you moved to the importance of integration and standardization.

After this lesson, you'll be armed with enough information to make more major improvements to your cost management processes.

And by now, you know all of this innovation relies on a cloud-based, centralized, single cost management system to collect and analyze your organization's data.

Your data is connected, integrated, and standardized. You are ready to level up.

This next step follows in logical progression—with the collection, centralization, and integration of your data and then the steps you took to standardize, now it's time to talk about the optimization of your workflows.

Let's start by clarifying some of these terms.

What, exactly, is a construction workflow? Do I need to think about time and motion?

I'm glad you asked!

It's simply the passing of tasks, information, or documents from one person to another with the outcome being an action (i.e., something gets done from concrete being poured to bills being paid).

JOSH'S TIPS

Check-in: is your data connected, integrated, and standardized? If you've been following along with the lessons, you are on your way.

There is a consistent, defined flow to every task. Or, at least there should be.

Workflows are super important because workflows allow the coordination of tasks between people and integrate data between systems.

This, ultimately, improves organizational efficiency and profitability.

What does "Optimizing Cost Management Workflows" mean?

Optimizing: you can think of it as working with technology and your data to make the project and your workflows the best they can be through automation and analytics.

Optimization is the fine tuning, if you will, or the alignment you need to do with your cost management system to make sure it achieves peak performance for your projects, your teams, and your organization.

Just like a world-class athlete's training schedule, even project workflows and cost control need optimization for peak performance.

While you're not going to be training for strength or speed, you are going to be examining your workflows and finding ways to make them better, improved, customized, and more effective.

JOSH'S TIPS

Optimization. It's all about the best, being perfect, effective, amplified for function.

What constitutes "the best or better" and what is "more effective" in construction?

Reducing costs, improving efficiency, and workflow automation is the name of this game. And we both know this industry is galvanized by time and cost.

Or, think about it this way. On all of your projects, how do you:

1. Create workflows that make sure tasks are done right?
2. Provide workflow lay out to make sure teams are adhering to company defined processes across projects?
3. Determine if you're running over budget?
4. Connect information between accounting and operations to ensure no discrepancies?
5. Prevent teams from over purchasing material, labor, equipment, etc.?
6. Compare budgets and actual costs per project?
7. Track costs for every aspect of the job to determine impact on overall project cost?
8. Manage documents through the approval process?
9. Track approvals to ensure payment is within the right terms?
10. Manage change orders and ensure timely responses?
11. Manage backup documents?

12. Integrate cost and schedule information?
13. Control cash flow and forecast accurately?
14. Contend with some projects flowing so smoothly and others getting way behind schedule?
15. Find the perfect workflow for the bidding process? How about your responses to RFI's?
16. Prevent your team from wasting time by doing unnecessary physical paperwork—i.e., completing manual spreadsheets or putting together PowerPoint presentations?

Cost optimization will be the solution to all of the above questions.

Cost optimization drives the measurement of progress, the evaluation of success or failure of plans, and offers information to drive what actions can be taken to change course when necessary to put a project back on track.

Cost optimization also addresses collecting and measuring the data that gives you information about the cost record and work progress.

Once you take some time to optimize your workflows, the improvements to your cost control give you the ability to anticipate and plan for tasks that previously would crop up mid-project and cause costly delays.

Sounds great, doesn't it?

Yet, how on earth do you measure the success of minimizing cost? How do you keep within budget and within what parameters? And, how do you find the perfect workflow?

Is your head in the clouds? A cloud-based platform, that is.

To optimize your cost management workflows, your systems and data must be connected and integrated; and the data must be housed within a single, cloud-based construction management platform. That way it is customizable to your unique needs and business—and all that customization and integration is carried throughout to connect every process, every aspect, every account, every project.

The data collected from your fully integrated system is what you will use to learn from past and present work to predict and make decisions about the future to improve your business.

Being in the cloud also means the people—from project managers on-site to accountants in-the-office who have the permissions to access the data—all work within a secure, centralized data warehouse of information.

Changes that are made are made across the board and the system updates to reflect this new information instantly.

When information flows efficiently through workflows, teams can post photos and documents in real-time, sharing key information with

JOSH'S TIPS

Information flow becomes seamless, unobstructed, instant.

unhindered communication and everything is linked. Delays are avoided, processes are streamlined.

That is, fundamentally, why a cloud-based workflow is an ideal solution—it lets teams collaborate anytime, anywhere at any stage of the project and all have the same, accurate, up-to-date information.

It is collaboration at its finest.

Connected yet distinctive: every business is unique, every workflow your own.

Before your workflows were optimized by your connected, cloud-based cost management platform, you weren't able to view the financial health of your company. Now you can.

With your data saved in one, integrated place you see where efficiencies in workflows need to happen to create efficient and balanced cash flow. You get real-time information on any changes that are confirmed, accounted for, and, now easily, paid on time.

When you want to have a real-time summary view of budget and cost items, contracts and pay applications, you have instant access to a detailed view of revenue, costs, forecast, and variance related to each item.

You can drill down to receive details on cost items and view an activity trail for your change orders. And, your change order workflows are now streamlined with tracking of all cost changes and budget impacts.

All of this information is specific to your organization because it relies on your data to make these assets available to you and your teams.

What to do next…

Build a strong foundation: Optimize best practices

If you're wondering how to get started and what to do next, you're at the right place.

- Make sure you're working with good, clean, usable centralized data, and your team is onboard
- Start by evaluating your current workflows
  - Look for how your workflows function, what mistakes/delays or issues happen.
  - Look for changes that have 'rocked your boat'—what's affecting your workflows adversely? Organizational changes? Team members leaving/arriving? Changes in processes?
  - What sort of problems are you dealing with that you see directly impacting your workflows?
- The goal is to become an organization with agility, flexibility, efficiency, and resiliency able to be fiercely competitive… the goal is to win but also to be good, and to be better. Write down your goals and discuss with your team.

Once you have defined your current workflows, you can begin to see patterns, inconsistencies, and labor inefficiencies.

By using a cost management platform and analyzing where you are at this point, you can begin to notice what workflows look like at your firm today, and if you know the personnel who is assigned to each task...or not.

You will see who can access information and where delays happen (such as when needing to share information with external team members).

You will quickly recognize gaps, inconsistencies, and where improvements need to be made.

You have become a master optimizer of your workflows!

JOSH'S TIPS

See what works, know what needs to change. Be better.

"Ok, it's my new superpower, but is it working?" Pause and evaluate.

Let's return to my athlete comparison. I see this endeavor to optimize your cost control and your workflows as being in training to succeed, to be better, and to beat the competition.

This is a marathon, not a sprint. You are in this for the long run. It needs commitment and dedication to work.

Picture the athlete: after the event, following the competition, there is a period of rest, recuperation, reflection.

You'll to want to do the same thing… often and with consistency—monthly, quarterly.

Stop and evaluate if what you are doing is actually working.

JOSH'S TIPS

Stop. Look. Evaluate. How is it working?

For example, your workflow optimization goals probably went a little like this:

- Eliminate and reduce inefficiencies and ineffective workflow practices
- Redundant tasks? Streamline them, and figure out if they are necessary
- QA QC: make sure you are improving quality, and implementing higher quality… everyone loves quality-from your clients to your team

When you look at your cost management workflows, optimizing the following workflows will make a big impact right off the bat:

- Procurement
- Change management
- Budget management

Analyze each according to how it can improve when you have applied optimization:

- Streamlining change order tracking to transparently track all cost changes and view budget impacts
- Automation of contracts and markups so that teams can create, edit, and view supplier contracts in a centralized system
- Getting a clear, big picture as well as a detailed view of income, expenditure, costs, forecasts, and variances in every contract

Every workflow is an opportunity to do better and make positive, profit-increasing change.

I encourage you to look at and think about each and every one.

Involve and bring your team along with you. Ask for their input. Their understanding, buy-in, and participation in this improvement process and change is key to success.

By sharing this information and working together to improve, you also improve the strength of your team and help train them to work better and more efficiently.

And while change asks anyone to push their limits, and to get out of their comfort zone, there has never been a better time to change and to improve.

We'd love to talk with you more about the significant potential of optimization. Reach out anytime—my team is here to talk with you.

Optimization is your new superpower.

Use it well, it's a powerful tool.

Here's to better workflows.

Josh Cheney

Senior Manager, Strategic Alliances at Autodesk

A little about me: Hi. My name is Josh Cheney. I work with Autodesk Construction Solutions and my specific focus is on Integrations and ERPs. I have over 18 years of construction/construction tech experience. Within this field, the nucleus of my work has been with the Engineering News Record's Top 400 Contractors.

I originally cut my construction teeth designing and managing building components (wall panels, roof trusses, and floor joists) plants for 84 Components and ProBuild. When the Great Recession hit, I moved on from industrialized construction to Viewpoint Construction Software to exclusively focus on construction software. I was also pursuing an MBA at the same time, which made for a perfect marriage between finance/accounting and software to support construction finance teams. Viewpoint provided a great foundational path to all things related to construction accounting. The rest is history.

I have worked with construction-specific Viewpoint Construction Software, international specialty subcontractor, ISEC, Inc., Procore Technologies and BuildingConnected where I gained deep experience with bid management software as well as construction management and project lifecycle management software.

LinkedIn Account

Superpower: Ability to make time stand still. And cost management.

LESSON 4

Your Mission: Transformation through Business Intelligence with Chris Fish

It’s great to be here with you. I am excited to have this opportunity to talk with you about transforming your data into actionable business intelligence. This is a subject I am passionate about having worked in the financials and operations aspects across a range of business types throughout my career.

Gleaning business intelligence from your data will transform your business. It’s that successful when you do it right, and it’s pretty simple.

I’d like to go over a few key ideas in this lesson:

- What we mean when we say “business intelligence” or BI
- Why business intelligence is important… and why you want it
- How business intelligence makes a difference

This is our last lesson in the construction cost management and cost control series.

Maybe we saved the best for last. The transformative nature of using data to gain actionable business intelligence can, and will, take your cost control to the next level.

Over the last few weeks, this series of courses touched upon the advantages of advancing your cost control understanding and gaining new depth for your cost management process.

By now you are in the thick of thinking through standardization, centralization, optimization, visualization, and creating a common data environment.

You are well on your way to efficient cost control. These are the days of being integrated and connected and this is key to your insightful BI journey.

This next step will bring greater meaning to why integrated construction cost control is the future and why your break-away from the insufficient and antiquated processes of the past is setting your organization on the path to mitigated risk and greater profits.

CHRIS' TIPS

You work hard, your data needs to be working hard, too.

Business Intelligence or (BI) is such a vital and transformative concept so let's start with a deeper dive to learn:

1. How to get started using business intelligence
2. What business intelligence to look at
3. What business intelligence to look for

My goal is for you to learn all of this in the 10 minutes it will take you to read this lesson.

What is business intelligence in construction?

BI is simply analyzing the data your organization is collecting, ideally, via an integrated and connected platform that creates data visualizations (e.g., dashboards and reports) to help your team make informed decisions and strategic plans.

When all your data (quality data that is), is available in a single system specifically designed to create actionable insights, it is readily available to you anytime, anywhere and you can keep up with immediate changes and turn lagging indicators into leading ones. Big result? Cost savings.

This method also reinforces existing leading indicators that are already working to keep your organization and your people with boots-on-the-ground, building projects while maintaining, and excelling with a competitive advantage.

I want to mention it can also future proof your projects by letting you learn from past and present projects and apply that knowledge to forecast insights and predict outcomes.

Let's keep it simple and straightforward: this is a way to gain an industry competitive advantage and position your firm to create new value helping owners, collaborate more efficiently while working with more productive teams, and, my favorite, generate greater profitability.

Let me explain.

CHRIS' TIPS

Got data? If it's usable, accurate, and connected, analyze it and that BI becomes your secret weapon, your MVP.

In construction, BI provides daily reports; identifies industry trends; gives insights to decision-making on-site or in-the-office; tracks, manages, and controls ordered materials keeping waste to a minimum and reducing costs; manages risk and avoids cost overruns by allowing you to stay ahead of potential problems and change orders.

BI provides ways to visualize data pertinent to built projects as well as projects in the design phase and during construction.

You can use it to optimize project schedules, organize labor, and minimize cost. There's so much more… from building more accurate cash flows and forecasts, to minimizing costs and maximizing profits. In addition, you will create insightful cost models that will optimize your projects and business.

There's nothing not to like.

Why do I need BI? Deeper insights drive better results.

If you have standardized your data and implemented an integrated cost management platform that integrates with other solutions like accounting systems, you are in an excellent position to begin gaining actionable business intelligence from your cost data.

This is where the successes come in fast and strong.

With a central repository of data, you don't have to wait for reports to be generated or someone to track down numbers from different places.

With the most up-to-date information at your fingertips you have the power to drive better results through deeper insights.

It is now the time to start using your collected, integrated data to inform current and future projects, identify inefficiencies, control construction costs, and increase profits.

- With BI, you are able to easily provide accurate, up-do-date reports, project progress breakdowns, and track financials for owners/clients, stakeholders, and your executive leadership improving your client and team relationships and adding value and trust to the collaboration.
- BI provides instant visibility into project costs and identify potential cost overruns before they have a chance to impact profitability.
- BI makes it easy to track cash flow and keep tabs on variances between budget, work completed, actual costs, and forecast-final costs with the ability to drill down into details.
- BI allows you to easily share information with your executive leadership so transparency, accountability and responsibility is allocated.
- BI warns you well in advance of potential cost overruns and delivers the ability to re-forecast and change numbers before a project goes off-track. Now, you've got tight management over project budgets, and better management over labor and cost.
- BI improves efficiency and thereby improves productivity and, in turn, increases revenue.
- BI brings real-time data so no project delays are created, and risk is averted due to waiting for information to make fact-based decisions—information distribution is quick and easy-to-understand.
- With BI generated by a connected, integrated data cost control system, the collection, storing and analyzing of data can be instantly translated to visual graphical form, easy to understand and easy to explain to your team, you are free to focus on your professional expertise and not a spreadsheet.
- BI allows you and your organization to determine where your business focus needs to be—you determine questions you need answered, issues you need solved.

CHRIS' TIPS

Business intelligence: one-stop to assess, make a decision in real-time, act.

- BI even has a huge impact on site safety: implement predictive and prescription analysis and find precise possible injury areas using distances your team works, and make sure your on-site equipment is located to reduce accidents.

How do I find Business Intelligence and how do I use it?

This is the easy part.

If your construction cost management system is integrated, centralized, and connected and you are committed to collecting clean, accurate, and usable data, it is already there waiting for you. There's a dashboard in your system, clear and easy to read.

If you want to take it a step further, you could extract your data for customized use in robust business intelligence tools like Power BI.

Some systems have a direct connection with Power BI to automatically sync data and visualize updated dashboards in seconds.

Business Intelligence might sound fancy, and complex, and like you need background in MI5 or 007 after your name, but trust me, it's not and you don't (although Fish 007 has a nice ring to it).

Your BI is extraordinarily accessible and available to you, right now. You don't need to know code; you don't need to know accounting or even how to wade through the calculations of a spreadsheet.

What will business intelligence tell me and how does it provide actionable insights? Show me, don't tell me.

At this point, I know you are thinking, "ok, so this all sounds too good to be true."

And, if you are at all like me, you are also wondering, "how does this all come together and add value?" Or, in other words, "show me exactly what BI can do."

Here goes… a few examples.

- Think about this: you're working with a system that is fully connected, you are set up with effective cost management workflows. Things are looking up! So, now, imagine: knowing in real time, without a doubt, where your project stands financially. Whether you're making money or losing money.

- Be able to answer, here and now, what the actual projects costs are as of today, know if your project is on budget, know what your reworking costs are, know if your labor costs are remaining constant and your forecasted costs are as planned.

- What about being able to see potential cost impacts immediately in your budget and having the ability to drill down into details.

- Or what about being able to analyze variations in materials pricing from a variety of suppliers and use of those materials. Imagine if you could use this information to negotiate a better price, more favorable terms, and implement better inventory controls based on BI potentially saving your firm $100k's every year and keeping waste to a minimum.
- Think about labor and being able to adjust schedules to make getting to the work site through traffic congestion easier, or getting real-time updates on the state of construction equipment leading to a safer worksite resulting in increased productivity and improved worker morale.
- Suddenly all your data is in one place and the people on your team, who need to know can be informed and aware of changes working to turn time-delays into proactive actions and effectively completing projects faster reducing labor costs as well as less need for rework.
- With data available, BI will help you manage risk effectively and save money from better productivity and faster, better, more informed decision-making.
- It would be great to connect you with our team and talk more about the specific benefits of BI and discuss in detail how it can work for your organization. When you get to the end of this lesson, reach out and we will be in touch.

But, there's more.

How to get started: Using data to set business intelligence in motion

To get started, you must realize that to gain BI, your data is your gold.

To make good changes and decisions, you must first be collecting quality data. As long as your data is complete, accurate and timely, you are already in the right place.

As you continue to collect data, you will begin to see where data is missing or is duplicated. These issues will quickly be eliminated as soon as they are recognized by your cost management system.

Now, you are ready for data-driven decision-making.

All you are doing is providing insights using yesterdays and today's information to help you make powerful and effective decisions about tomorrow.

I am no historian, but I know that famous quote from British prime minister Winston Churchill who said, "Those that fail to learn from history are doomed to repeat it."

His words are relevant applied to BI.

If we don't learn from what we did before and even what we do today, we cannot improve, and we are doomed to make the same mistakes, the same inefficiencies, and the same redundant habits of before.

Our access to technology is so pivotal to improving the construction industry. I like to think of it as being the new frontier. And it is this technology that enables us to have Business Intelligence.

Before I sign off on this lesson, I want to say a few words about people—about you and your team.

Data is your gold. But people are your platinum.

BI delivers insights that your collected data reveals in ways that we, as people, cannot possibly do as efficiently, completely, and without error or forgetting some aspect. It's that vital. And it's that powerful.

And that's the beautiful simplicity of Business Intelligence. It is an intelligent algorithm that the platform applies to large set of information. And we don't need to worry about the advanced calculations because that is all done for us.

You get the pure benefit of easy to understand and easy to see Intelligence.

If you are wondering where to start. It's all about questions you already have or knowing issues you want to solve.

You know your organization best.

You know its strengths and weaknesses. We can help you with where to start and what questions you might be seeking solutions to.

Here are a few places to launch from:

- Start with the question you need to answer
- Ask what are "we going to change to fix this?"
- Write down three ways you want to use BI to improve, change or address issues, workflows, materials, labor, equipment, etc..

Then once you start, it is an exciting moment.

The power you have unleashed to transform your business now is immense, the possibilities are almost endless.

This can be your mission, should you choose to accept it.

On this journey, success comes from change—learning new ways to work, accepting new processes and being open to doing things not as before.

And success comes from everyone on your team, in your organization, working with you, collaborating with you understanding the benefit of data collection and the empowering nature of Business Intelligence.

Everyone on your team needs to understand the value this step delivers.

From getting information right that is gathered to learning data literacy, these are all the necessary steps to a successful BI journey.

This is most likely one of the most impactful endeavors of your construction career.

We are here for you on this journey. Let us know how we can help.

May the BI force be with you.

Here's to your good data driving your good decisions.

Chris Fish

Technical Sales, Construction, Autodesk

A little about me: My name is Chris Fish. I am passionate about cost control and in this series of lessons, I got to take on one of my keenest interests, business intelligence gleaned from data. I developed my fascination with BI early in the game—as an internal auditor in the banking and retail industries. By auditing financial and operational aspects of globally impactful businesses, I learned firsthand the monumental importance of cost management and control. Adding to this background, my career incorporates 15+ years at global jeweler, Tiffany & Co in the Corporate Real Estate Services with the Global Store Planning Team as finance director. In this capacity, I provided cost management and financial reporting for the company's global retail and corporate construction projects.

My experience delivers an understanding of the owner's perspective. I take this approach and forge strong and meaningful connections with my customers. I have worked extensively on long-range planning, capital planning and cashflow reporting and reconciliations as well as with fiscal health, budget and KPI updates. I have worked to create process flow and cost control procedures to mitigate project cost risk. This range of experience is enhanced by my work to implement two project management solutions for Constructware and Unifier, as well as a lease administration system for Lucernex.

LinkedIn Account

Superpower: See into the future—let your data work for you.

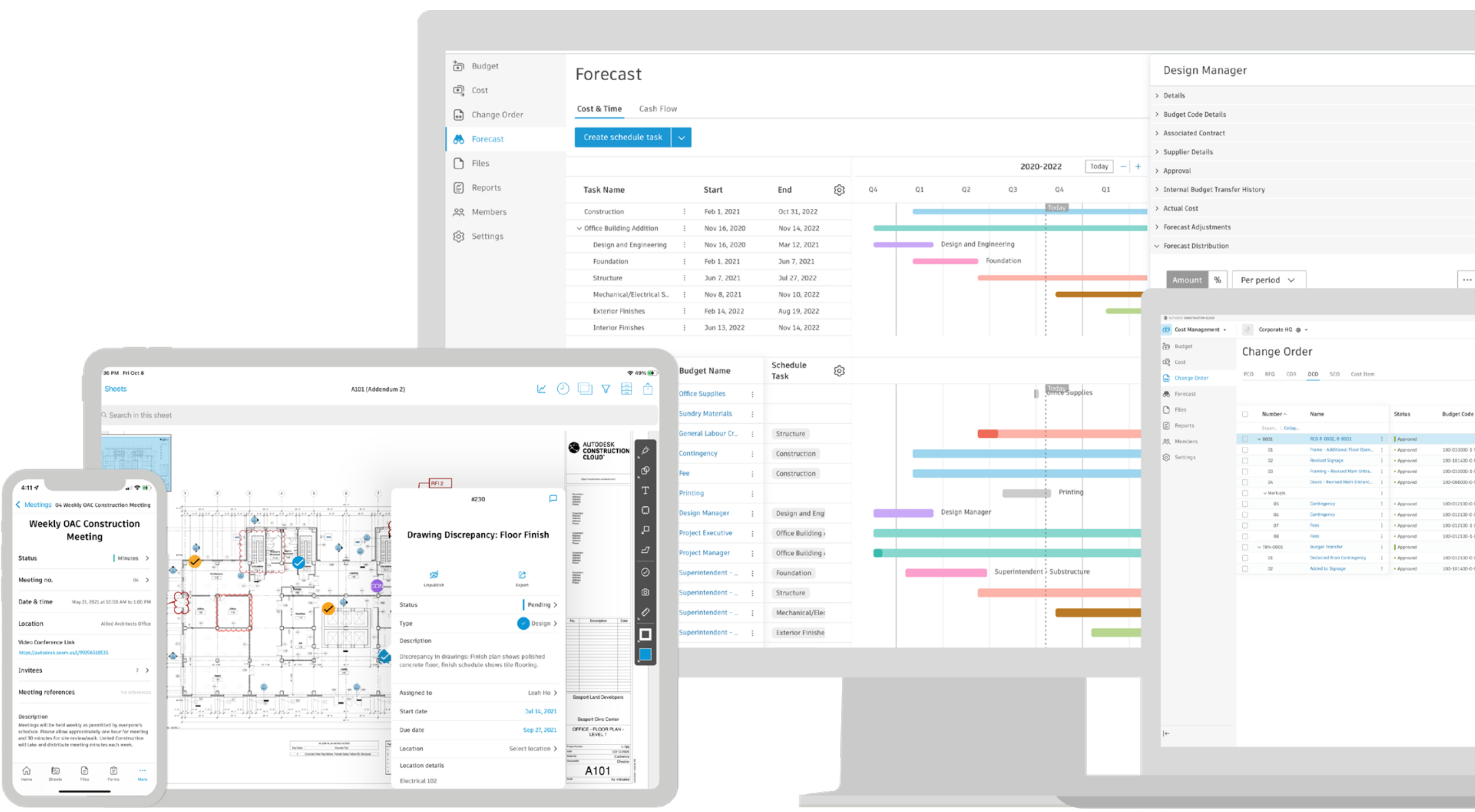
See the Future of Connected Construction

construction.autodesk.com

Our industry requires solutions that connect their information, teams, and technology—breaking down data silos and disconnected processes that hinder true transformation. As we navigate the ever-present push to do more with less, we need to uncover new ways of working, enhance connected digital workflows, and incorporate advanced analytics. To support us on this journey of transformation, we must lean into tools that connect construction—from design to plan, build, handover, and operations.

Built on a unified platform and common data environment, Autodesk Construction Cloud is a powerful and complete portfolio of construction management products that empowers general contractors, specialty trades, designers and owners to drive better business outcomes. Autodesk Construction Cloud combines advanced technology, a unique builders network and predictive insights to connect teams, workflows and data across the entire building lifecycle.

While the industry experiences unprecedented transformation, our mission remains the same: to help construction teams meet the world's rapidly expanding building and infrastructure needs while making construction more predictable, safe, and sustainable. And we've remained steadfast in our promise to deliver the industry's most compelling solutions, connecting data, teams and workflows from the field. This is our commitment to connected construction.



AUTODESK

With Autodesk software, you have the power to Make Anything. The future of making is here, bringing with it radical changes in the way things are designed, made, and used. It's disrupting every industry: architecture, engineering, and construction; manufacturing; and media and entertainment. With the right knowledge and tools, this disruption is your opportunity. Our software is used by everyone - from design professionals, engineers and architects to digital artists, students and hobbyists. We constantly explore new ways to integrate all dimensions of diversity across our employees, customers, partners, and communities. Our ultimate goal is to expand opportunities for anyone to imagine, design, and make a better world.

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