Member Communication Experience

How Cloud Collaboration Is Transforming - and Safeguarding - All Industries

Written by: Jim Quanci, Sr. Director, Autodesk

AS MORE COMPANIES SHIFT TO CLOUD COLLABORATION, ENTIRE INDUSTRIES - FROM CONSTRUCTION TO MOTION PICTURES - ARE BEING TRANSFORMED BY THIS DIGITAL REVOLUTION.

Back when Y2K was a major concern in the digital realm, it might've sounded like a far-off prophecy that people could one day work together on a project, from their own computers, from opposite sides of the world, simultaneously. But that time is here. Welcome to the age of cloud collaboration.

Cloud computing is the peak of the digital transformation journey. As companies increasingly migrate to the cloud, it will:

» Enable better, faster decision making

» Power the creation of better performing products - from machines to buildings to entertainment

» Increase creativity and innovation by eliminating time lost on low-value activities

» Dramatically increase sustainability and reliability of products

The cloud can enable real collaboration: enterprise-level collaboration. Sharing the right data with the right people accelerates workflows and creates better decision-making and greater value across the organization.

Let's take a closer look at cloud collaboration - where it's been, where it's going, and how it's driving the future of work and transforming industries.

WHAT IS CLOUD COLLABORATION?

Cloud collaboration is the ability for people to work together as a virtual team from the same source of information - the single source of truth - in one virtual space accessible from a website, a mobile app, or desktop software. Whether it's used to realize a design, project, budget, or analysis, cloud collaboration enables easy data access for the right people at the right time, early and often, regardless of the tool used to author the data. An architect can share a building model; an engineer can review a drawing; or a film editor can upload a cut for the director to review.

Cloud collaboration:

» Uses digital instead of paper workflows

» Enables information access and sharing at any time, from anywhere

» Creates a single source of truth

Cloud collaboration is much bigger than just sharing files: It's about sharing data. Project- and team-based cloud collaboration are just the first steps. The real "ah-ha" moment comes through enterprise collaboration, which means everyone in a company works together from a single source of information, dramatically improving a company's value-creation for its customers.

HISTORY OF COLLABORATION: THE MOVE FROM DESKTOPS TO THE CLOUD

Picture the way people used to work together. It was manual, clunky, and inefficient. Long before the cloud was on the horizon, companies often had document-control departments. If you wanted a drawing or a file, you'd give a document number to request a printout. And if there were team members in a different location, you raced against the clock to get the files or blueprints to FedEx on time.

Collaboration became easier with the advent of PDF and JPEG files. However, one still had to save the files on a computer and email entire files to colleagues, who then needed the right software to open them. And the data was locked in these proprietary files. Engineers couldn't just send a new design to the purchasing department for sourcing. They had to plot out a PDF or print a drawing that almost immediately became an outdated, alternate source of truth. If someone made revisions, they had to save a new version. It got confusing fast, with labor spent sorting through multiple incarnations to find the most recent version and making sure everyone was working off the right one. We've all been victims of "version control hell." We were in information silos and workflows that, well, didn't flow.

Then, collaboration software arrived that enabled teams to work together, like building information modeling (BIM) tools. Digital transformation started to happen as companies learned to use the internet to quickly share information. But this created the "N 2" problem as information was replicated as it was shared quickly with many more people, resulting in an "accelerated version control hell." The cloud was the answer. In the early 2000s, Amazon and Google released early versions of consumer and corporate clouds. Then over time, Microsoft, IBM, Alibaba, and others joined in. Suddenly, data had a place to call home. Cue the 2020 pandemic: Cloud collaboration accelerated like a bullet train as people were forced to work remotely

almost overnight. For many companies, the cloud quickly went from a long-range goal to a must-have business strategy.

» In 2012, only 20% of companies had made major shifts to the cloud.

» Cloud spending peaked at $410 billion in 2021, a figure that was to be surpassed by $80+ billion in 2022 according to Gartner. In 2023, cloud revenues are predicted to reach $600 billion.

» By 2025, it is forecasted that 85% of companies will have shifted to a cloud-first business strategy.

Top 10 Benefits of Cloud Computing and Collaboration

The cloud is revolutionizing work, business, and entire industries. Here's how.

1. BETTER PRODUCTS

Easy access to information, from most any device, early and often, and by the right people gives collaborators full visibility, enabling them to make better decisions at every stage of the process. The result is a more reliable, higher-performing product.

2. HIGHER ENGAGEMENT AND PRODUCTIVITY

The cloud is an open field with no limit to the number of users. This inclusion empowers people to connect, contribute, and be a part of the collaborative effort, which has a direct impact on engagement and productivity.

3. INCREASED SUSTAINABILITY

A cloud-first strategy means sustainability experts can access information early and often, resulting in more sustainable outcomes. The whole team learns and gets a better understanding of how its decisions impact embedded and operating carbon, energy use, and waste.

4. GREATER INNOVATION

Cross-functional teams can work together on projects in real time from any location. Collaboration spurs new ideas, so it's no surprise that innovation will soon account for 75% of

the cloud's value. The irony is the pandemic likely reduced innovation among previously face-to-face teams - but cloud collaboration then dramatically increased the size of the teams and innovation by enabling experts to contribute from around the world.

5. LOWER COSTS

The cloud is a more efficient way to work. It consolidates teams, centralizes information, and sheds excess steps, saving time and money. A few other ways it reduces costs include:

Less Waste

Cloud collaboration allows an exchange of information that yields better decisions and fewer mistakes/less rework.

Shorter Lifecycles

The end-to-end project lifecycle is shorter with cloud collaboration, which reduces labor costs.

6. FASTER TIME TO MARKET

Wait times are nonexistent in the cloud. People have access to the data they need, whenever they need it. The real-time capabilities move along production and decisions at a faster clip.

7. INCREASED SAFETY

Whether it's on the shop floor or a construction site, having full visibility at all times enables project managers to better assess risks before production and improve safety during production.

8. SCALABILITY

The cloud can easily accommodate business growth and scale as a company gets bigger. Plus one can quickly reduce costs when business hits a slow period. Aligning costs and value creation is a powerful financial benefit for any business.

9. MEETING AND BEATING DELIVERY TIMES

With greater efficiency and faster time to market enabled by better, faster communications and decision-making, companies can meet (and even beat) deadlines and hit those delivery targets faster than ever.

10. CUSTOMER SATISFACTION AND SUCCESS

Getting better products to customers faster is great for business. It means happier end users and greater customer retention. By passing along the benefits of cloud collaboration, you're also contributing to customers' success.

All these benefits culminate in the ultimate goal: higher profitability. MIT Sloan revealed that companies in the top 10% of the digital transformation have double the revenue growth of companies in the bottom 25% of that spectrum.

How the Cloud Can Help Transform Industries

For individual companies, digital transformation can lead to greater resilience and a competitive edge. But collectively, digital transformation will revolutionize industries. For example, as governments around the world create BIM mandates for public projects, companies are accelerating their digital transformations and diving headfirst into the cloud, which is changing the entire architecture, engineering, and construction (AEC) industry. Here are the way digital transformation and cloud-first strategies are benefiting AEC, design and manufacturing, and the media and entertainment industries - including examples of individual companies that have found great success using the cloud.

THE ARCHITECTURE, ENGINEERING, AND CONSTRUCTION (AEC) INDUSTRY

Large construction projects can run 20% over schedule and 80% over budget, often due to poor communication. Cloud-based platforms can change that narrative. With cloud collaboration, people have access to the information they need when they need it, which reduces time and cost overruns.

The design-build process is a collaborative journey with many stakeholders requiring design data. Let's say a customer hires an architect to design a commercial office space. The architect creates a 3D model with the design specs and then shares it with the structural engineer to determine the optimal building structure. The mechanical, electrical, and plumbing (MEP) folks offer critical input that positively impacts energy usage. The operations team can have a say in the building's control systems. Finally, the customer can track the design and build process in real time. All of this collaboration happens before construction begins.

Working together on a cloud-based platform, teams can see input from others that might impact the design, helping avoid potential problems post-build. For example, if the MEP team decides to put heavy mechanical equipment on the 20th floor, the structural engineer can see the changes and reassess the column size needed to support that extra weight. The civil engineer can recalculate the thickness of the foundation and increase the number of pilings to accommodate this new information.

From the outside, it might look like too many cooks in the kitchen. But the cloud offers a way to congregate those stakeholders and orchestrate information. Companies that leverage cloud collaboration in construction can:

» **Spot errors sooner. The more that people have visibility and can provide input on the front end, the fewer changes they'll have to make later, reducing rework.**

» **Help each stakeholder zero in on the information needed to help things move faster.**

» **Save money. Upfront collaboration yields savings in the long run: reduced construction costs with less labor and less waste, quicker delivery times, lower long-term maintenance costs, and decreased energy usage.**

» **Save time on construction schedules, which means everyone—both the construction company and the building owner—makes a higher profit.**

Finally, cloud-native projects enable a seamless handover to building owners once construction is complete, so facility teams can access all of that valuable design data to optimize operations, which decreases costs and increases occupant satisfaction while meeting sustainability goals.

H4: Norconsult Forges Large Infrastructure in Norway

When design and engineering company Norconsult took on the construction of a $500 million, 19 km road through southern Norway with 2,000 people involved in the build, it knew that passing paper drawings around would severely slow down the project. Norconsult leveraged cloud-based processes to get input from all stakeholders to optimize the design, meet sustainability targets, make data and 3D models accessible from anywhere, and enable easy filtering of BIM content for the various project stakeholders.

Arcadis Upgrades Water Utilities in Ohio

Aging infrastructure is a major problem across the U.S. When Toledo, Ohio's 70-year-old water treatment plant was shut down for days due to toxic algae in nearby Lake Erie, it was obvious a system upgrade was desperately needed. Enter global design and engineering company Arcadis. The company used 3D scans to accurately model the site's existing condition to upgrade six basins and build two more. With these models living in the cloud, the architectural, structural, mechanical, HVAC, electrical, and the civil site teams all worked off one model, which ultimately saved 1,000 design hours.

THE DESIGN AND MANUFACTURING INDUSTRY

The basic premise is the same for manufacturing: the more people with visibility early on, the better the finished product. The design team can share plans with the shop floor so they can understand how to make the product. The fabricators can give design feedback to bring down the manufacturing cost. The purchasing department, which might be halfway around the world, can determine which materials to buy. The maintenance and services teams can give guidance to reduce service and warranty costs. The sales and marketing teams can develop their strategies based on this information and gather customer feedback to adjust future designs for better sales. It's all about giving the right people early access to what's happening up and down the supply chain. And this includes the customer.

For example, I recently had my car worked on at the dealership, and it was a whole new experience. I got play-by-play text messages on the inspection, with photos. Three hours later, I got another message with a problem they found, again with images. Suddenly, it's not a typical customer experience: The dealership had taken me on a journey. The mechanics gave me visibility into their process so I could make more informed decisions.

By extending collaboration beyond design and engineering across an entire manufacturing operation and to the customer, people can contribute information that optimizes costs and lowers carbon footprints. This means better products, lower costs, and greater sustainability.

Before modern browsers, high-bandwidth connections, and smartphones became ubiquitous, none of this was possible. But

with this level of data sharing, it's no longer optional: Cloud collaboration is a necessity that's ushering the industry into a more sustainable, efficient era. And as the Industrial Internet of Things (IIoT) and automation in manufacturing become the norm, the cloud can capture all of that data generated for better decision-making today and tomorrow.

Toshiba Customizes Elevator Design

When designing and building an elevator, it's essential to precisely fit the elevator into the structure and understand how it will be used. Previously, the team at Toshiba would have to go back and forth with its customers over several weeks to ensure the design worked in the overall space - an inefficient and costly process. Now, Toshiba enables its customers to configure their elevators on a web page, automatically creating 3D models on its cloud-based platform. Customers can see exactly what they will get in near real time and easily make changes. The uncertainty of the old process has been eliminated and replaced by customer confidence and delight.

BBi Autosport Makes Bespoke Racers

At BBi Autosport, the need for speed is alive and well. The company designs and customizes one-of-a-kind Porsches for the road and the racetrack. But in past workflows, different teams were working on different parts, separately and siloed even when collaborating on the same vehicle. They shifted to cloud collaboration and it was a game changer. Working together in the cloud streamlined all the moving parts and design data into one centralized hub that allowed simultaneous processes, helping teams reach the finish line faster.

THE MEDIA AND ENTERTAINMENT INDUSTRY

The media and entertainment industry (M&E) is powered by creative collaboration sessions that have long happened in person - in the writer's room, on set, or in the edit room. It's also been a linear process, which meant that any changes after the production phase was wrapped often required expensive re-shoots.

A month into storyboarding or character development, a producer might not like the direction of a specific character, forcing designers to scrap their work and start again. And sometimes a change might be due to technical issues, like

colors that don't work well on 70mm projectors or for future merchandising.

Digital, cloud-based workflows benefit M&E in several ways:

Full visibility across an entire production from the script to screen yields smoother workflows and fewer redesigns and reshoots by letting everyone be involved in the design and preproduction phase.

The cloud ensures tighter control over who can see what, where, and when, preventing leaks before the film or product release with better IP security standards.

Provides a platform to review information - like footage - in real time and make changes during production instead of after.

Aligns the often hundreds of people who work on a single production, game, or product.

Instead of bulky film or video, all data is stored in the cloud for more organized asset management and searchable files.

Amazon Studios Powers the Rings Remotely

With 10,000 visual effects shots created by 20 VFX houses, The Rings of Power series by Amazon Studios is one of the most complex productions to date - and it was accomplished by a remote, international workforce. M&E has long been an industry that relies on physical assets, like film reels and digital tapes. But to orchestrate a network of data on increasingly complex projects, Amazon is leveraging the cloud. Software streamlines handoffs from one department to the next and shares footage instantaneously with editors and executives for real-time story edits.

Jellyfish Pictures Collabs Globally for Over a Decade

The animation and VFX company Jellyfish Pictures is no stranger to the cloud. In fact, the company that has produced work for features like Star Wars: The Last Jedi and series like Stranger Things started using the cloud 10 years ago. The teams working in different countries wanted to create one virtual roof under which to work. At the time, there was a lack of quality tools designed for cloud collaboration. Today, Jellyfish uses cloud solutions like ShotGrid to assign tasks to different teams, break down silos, and coordinate work on shared projects.

What Is the Future of Cloud Collaboration?

Nearly 90% of companies are migrating their workflows to the cloud. That's a great sign, but most are still early in that journey and yet to realize the full power of cloud collaboration. Until now, collaboration tools have focused on teams and projects. Even Autodesk got its start with team collaboration software. But now it's time to think bigger with solutions like BIM 360 Docs and Autodesk Construction Cloud to align with the direction that cloud collaboration is headed: enterprise collaboration.

It's not just the design and engineering teams who need access to data. In fact, they're often just 10% of the total cost. Most project costs are for labor, materials, sales, marketing, overhead, and operations. Elevating collaboration from the team to the enterprise level means everyone works from a single source of information, from the onset of a project. From financing to marketing to sales to production, when people have access to the data they need early in the process, they have greater visibility to make better decisions that benefit the entire organization. It's a shift from local design optimization to global optimization for the whole enterprise.

This change from just helping the design-and-make process to empowering the larger enterprise is powered by platforms - connecting people, processes, and data.

On a project level, cloud collaboration means faster delivery times, lower costs, and greater sustainability. On the enterprise level it means a leaner, faster organization, happier customers, greater innovation, and higher profits. Cloud collaboration is the glue that makes this a reality for companies, their customers, and entire industries.

About the Author

Jim Quanci has spent the past 30 years developing relationships for Autodesk with leading technology partners around the world. He oversees an international network of more than 7,000 software partners who, working with Autodesk APIs, customize, complement, and extend Autodesk cloud and desktop technologies. With a BS in mechanical engineering and an MBA in international marketing, he is a frequent presenter and consultant to leading design and engineering-software firms.

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