MAXIMISE YOUR PROFIT MARGINS WITH DESIGN COLLABORATION

How to extract maximum value from your BIM investment

AUTODESK.

The state of BIM in Europe

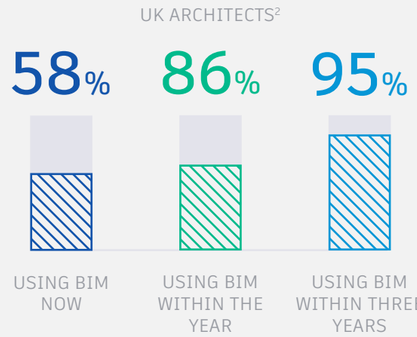
BIM (Building Information Modelling) is a given. Even architects, engineers, and associated stakeholders not working in BIM now will be impacted by the BIM process in the near future as adoption grows worldwide. The building industry has supported a move to BIM processes in order to improve accuracy and efficiency in the design phase, increase productivity, and combat shrinking margins on projects.

The level of investment in design collaboration is directly correlated to successfully delivering a project, as evidenced by this data.

At the same time, building design professionals may find themselves challenged to make the most of their investment in BIM not only to realise a positive Return on Investment (ROI), but also to improve their bottom line.

BIM ADOPTION RATE IN NORTHERN EUROPE[1]

UK ARCHITECTS[2]



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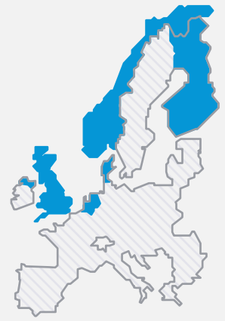
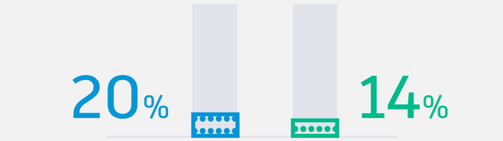
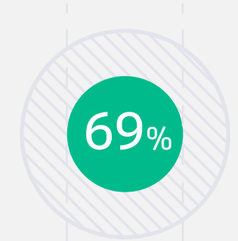
EU MEMBER STATES CAN RECOMMEND, SPECIFY OR MANDATE THE USE OF BIM FOR PUBLICLY FUNDED CONSTRUCTION AND BUILDING PROJECTS IN THE EUROPEAN UNION AS OF 2016



THE UK, NETHERLANDS, DENMARK, FINLAND AND NORWAY ALREADY REQUIRE THE USE OF BIM FOR PUBLICLY FUNDED BUILDING PROJECTS

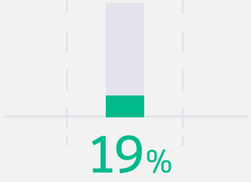
CHALLENGES TO INCREASING PRODUCTIVITY





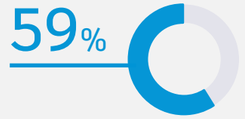
69%

ORGANISATIONS HAVE USED ONLINE INTER-ORGANISATIONAL PROJECT COLLABORATION TOOLS



19%

SAY THESE ARE USED ROUTINELY THROUGHOUT THE ORGANISATION

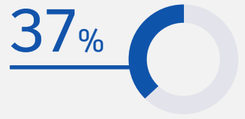


59%

CONSIDER THEMSELVES AN “EARLY ADOPTER” OF NEW TECHNOLOGIES THAT CAN IMPROVE PRODUCTIVITY

73%

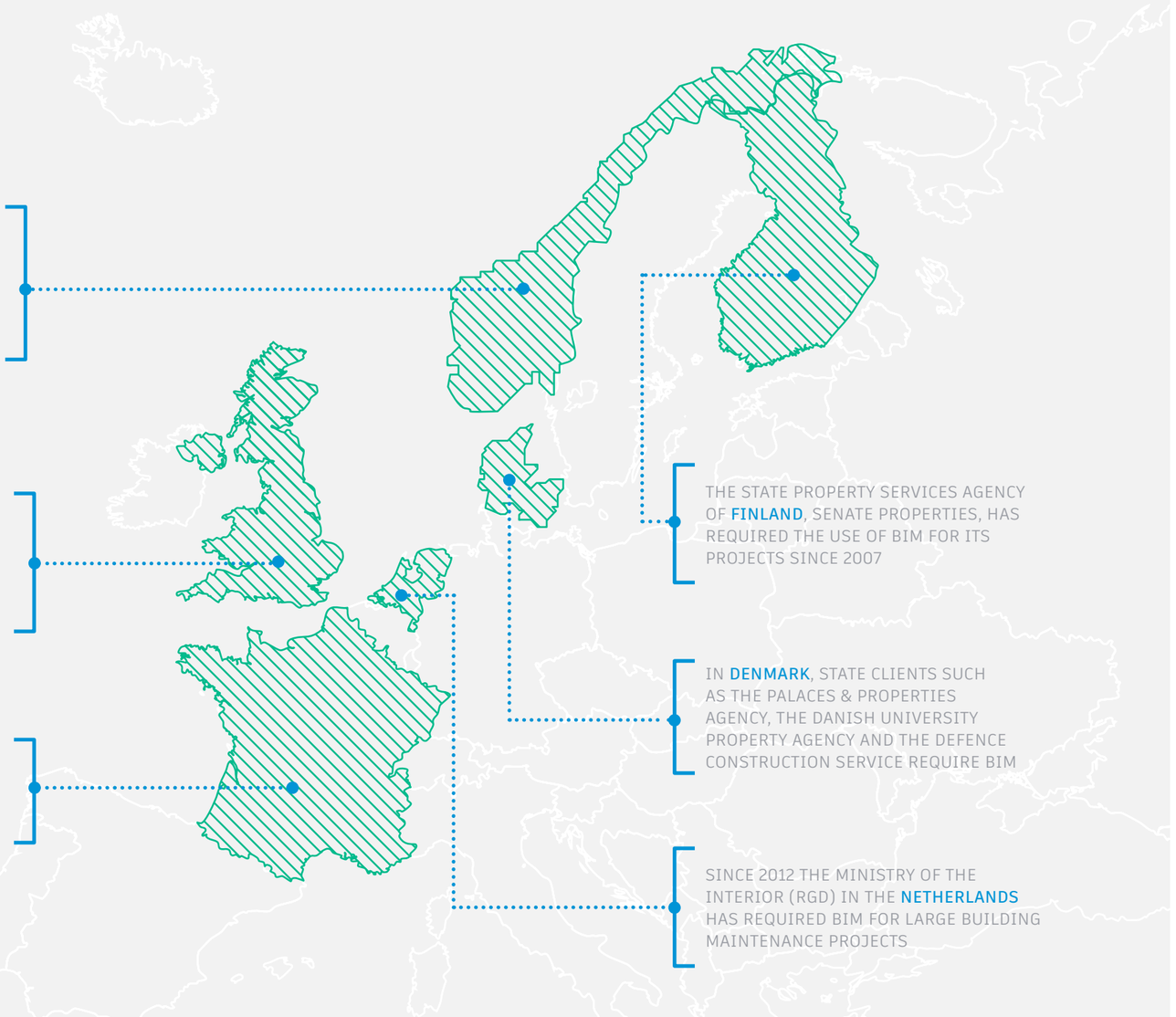
SAY THERE IS ROOM FOR PRODUCTIVITY IMPROVEMENT IN THE DESIGN-BID-BUILD STAGE



37%

SAY MORE RAPID UPTAKE OF EMERGING TECHNOLOGIES BY CONTRACTORS, SUPPLIERS AND CLIENTS OFFERS THE GREATEST POTENTIAL FOR IMPROVING PRODUCTIVITY[5]

THE GRAPH BELOW SHOWS THE CURRENT LEVELS OF ADOPTION IN YOUR MARKET[6]



IN NORWAY, THE CIVIL STATE ORGANISATION STATSBYGG DECIDED TO USE BIM FOR THE WHOLE LIFECYCLE OF ITS BUILDINGS. THE NORWEGIAN HOMEBUILDERS ASSOCIATION HAS ALSO ENCOURAGED THE INDUSTRY TO ADOPT BIM AND IFC

THE UK GOVERNMENT HAS ANNOUNCED A COMMITMENT TO BIM LEVEL 3 IN GOVERNMENT PROJECTS OVER A FIVE-YEAR TIME FRAME, AND IS MANDATING BIM LEVEL 2 FROM 2016 ONWARDS.

FRANCE HAS A PLAN, ANNOUNCED IN MARCH 2014, TO DEVELOP 500,000 HOUSES USING BIM BY 2017

THE STATE PROPERTY SERVICES AGENCY OF FINLAND, SENATE PROPERTIES, HAS REQUIRED THE USE OF BIM FOR ITS PROJECTS SINCE 2007

IN DENMARK, STATE CLIENTS SUCH AS THE PALACES & PROPERTIES AGENCY, THE DANISH UNIVERSITY PROPERTY AGENCY AND THE DEFENCE CONSTRUCTION SERVICE REQUIRE BIM

SINCE 2012 THE MINISTRY OF THE INTERIOR (RGD) IN THE NETHERLANDS HAS REQUIRED BIM FOR LARGE BUILDING MAINTENANCE PROJECTS

Investment in design collaboration

BIM is much more than a technology and a process. It is a sociotechnical system, the “combination of man-made technology and the social institutional consequences of its implementation in society”.[3] The technical core of BIM can on its own facilitate collaboration between practitioners, but it’s the addition of the social parts of BIM - the coordinated work practices and the institutional and cultural frameworks - that comprise its full value. Three quarters of design professionals report a positive ROI on their BIM investment, with a higher return correlated to a higher level of BIM adoption.[4] And research shows that BIM saves more money as the team gets more collaborative. It’s the difference between lonely and social BIM.

THE FOUR TRENDS DRIVING COLLABORATION IN BUILDING DESIGN

SO HOW DO YOU ENSURE YOU ARE MAXIMISING YOUR INVESTMENT IN BIM?

START WITH UNDERSTANDING FOUR TRENDS AFFECTING THE AEC INDUSTRY

TREND 1:
The AEC industry is entering an era of connection

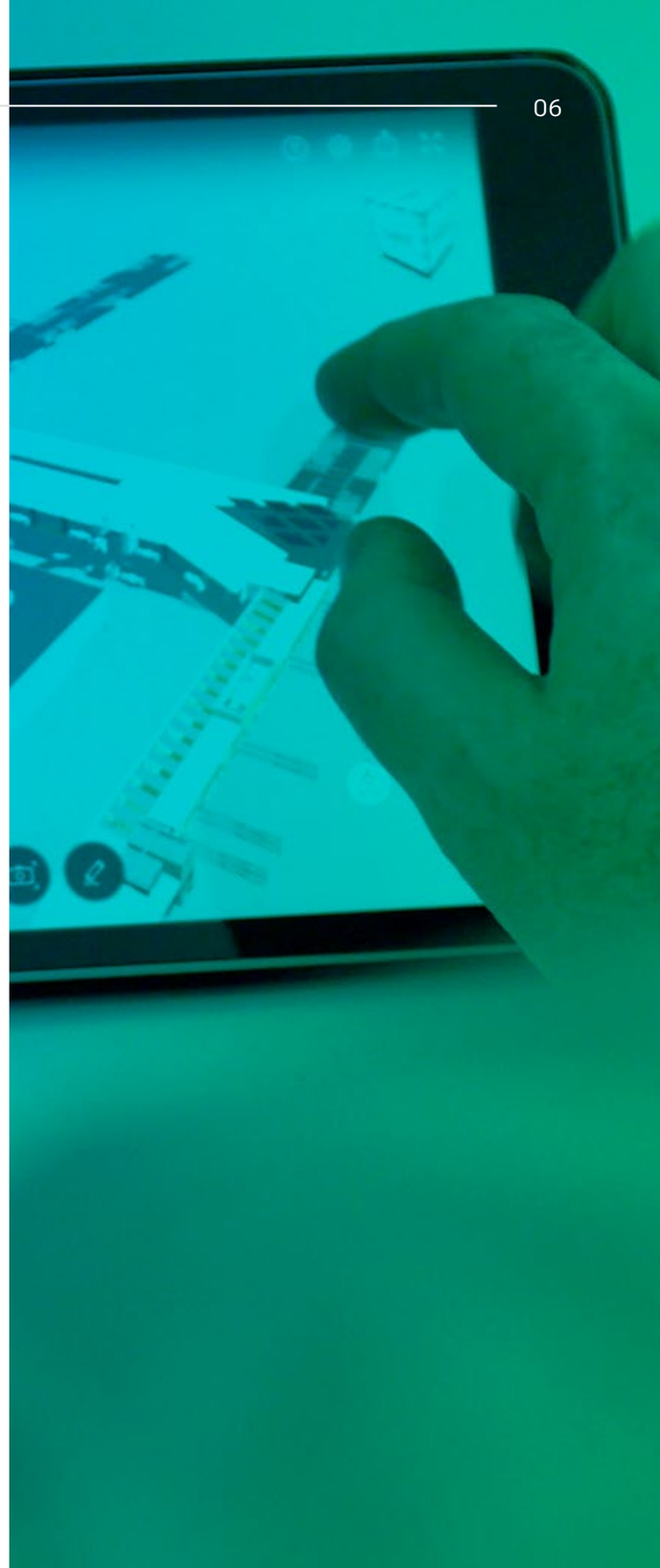
Historically the focus has been on the ‘M’ part of BIM (‘modelling’). There is now a rapid shift to focus on the ‘I’: ‘information’. This concentration on information, and the effective sharing of that information, is enabling project teams to work together in ways never before possible.

The era of connection is characterised by a holistic project-centric process. The project is at the centre from the start, not the individual files and applications. Technology is enabling teams to become more connected, and have access to a wealth of information from anywhere. The cloud for instance connects data, systems, projects, and teams, so that everything and everyone can be in constant communication, with instant access to the latest files, designs and project activity. In the ‘always on’ era of connection, project collaboration can occur in real-time and international teams can ‘follow the sun’, with a part of the project team always working.

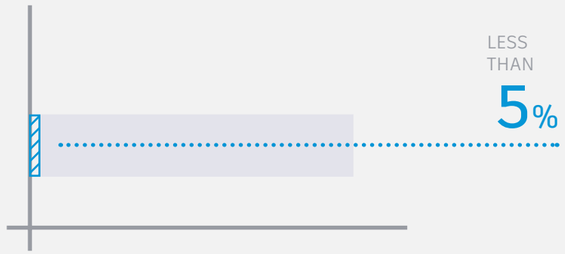
TREND 2:
Project delivery is becoming more collaborative

With increasing demand, collaborative project delivery types such as Design-Build, Integrated Project Delivery (IPD), and Public-Private Partnerships (PPP) are gaining traction. Beyond the design phase, building product supply chains are more likely to be international, and potentially global.[7] As a result, design firms in AEC are facing requirements for joint venture arrangements, the need to co-locate, shared server requirements, version control, and centralised feedback systems.

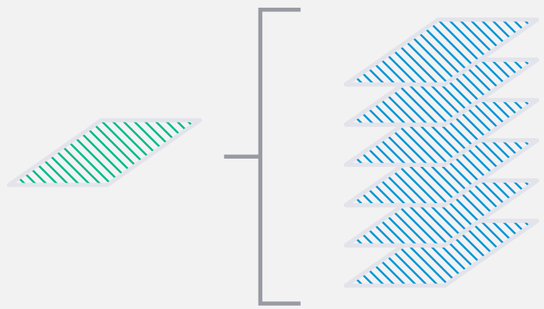
This sort of collaborative project delivery in the design phase requires architecture and engineering firms to communicate and share data easily to support efficient decision making. As collaborative project delivery types become standard practice, technology solutions to support this way of working are being developed to help AEC professionals deliver.



NEW PROJECT MODELS
ARE NEEDED



LESS THAN **5%** OF PROJECTS ARE CURRENTLY DELIVERED ON TIME AND ON BUDGET[7]



AEC FIRMS ARE SIX TIMES MORE LIKELY TO BE AWARDED THE CONTRACT WHEN BIM IS USED DURING TENDERING[8]

TREND 3:
Cloud-based collaboration is increasingly enabling BIM processes, new project delivery models, and the desire for connectivity

Collaboration in BIM is about more than information. It includes the people who comprise project teams and their need to work in a shared space in real-time, so that decisions, updates and communications are simultaneously and instantly applied, flagged, and tracked. Reflecting a trend towards a more integrated approach to design and construction, the industry is prioritising the development of collaborative processes with external parties and investing in communications infrastructure. A solution which takes communication beyond email trails and creates a unified space and record can optimise BIM's collaboration capabilities. Using the right cloud solution means workflows are integrated across the project lifecycle of planning, design, construction and operation, and barriers to communication are removed so project collaboration can occur in real-time. Cloud-based collaboration tools can help minimise design downtime and rework.

TREND 4:
The cloud has come of age

The AEC industry is embracing the benefits of cloud technology, the use of collaboration and data management solutions. The cloud has become ubiquitous in all aspects of our lives. It's second nature to us to be in constant communication, and to have constant access to information and data from wherever we are. Cloud solutions enable us to work from wherever inspiration strikes us.

HOW CONNECTIVITY, COLLABORATION, AND CLOUD IMPACT DESIGN PROFESSIONALS

The four trends are clear to the AEC industry, but the impact on the way design professionals carry out their work and take advantage of these trends is still evolving.

Collaborative design models need a different work style. No longer are professionals tied to a workstation, studio or desk. Untethered by technologies that enable access to data and information from anywhere, more AEC teams are working together remotely, whether from multiple offices of the same firm, home, or the local coffee shop. Not requiring teams to be located in the same physical space can help bring together integrated project teams, incorporating all the disciplines needed for the building design process. However, virtual teams need a centralised collaboration solution to work most effectively in a way that includes remote contributors.

Leaders in the AEC industry are embracing cloud technologies which make remote data management processes possible. The modern design environment centres on real-time information that can be shared, tracked and archived in the cloud - everything, from 3D model data to project communications (emails, live chats, annotations). It is essential that team members can access this information anywhere, on any device. Collaboration needs to occur between the building owner and every project team member: architecture firm, engineering contractor, and all other stakeholders. Every member must be able to contribute in a design-agnostic, shared workspace, wherever they are based. This opens up the opportunity for collaborative teams to include specialist partners from anywhere in the world. Anywhere, anytime access means teams can reduce the need to value-engineer elements out at a later stage, because data frictions are identified earlier on, and the team can collaborate on a mutually approved solution earlier in the design process. By enabling these practices, collaboration solutions which are accessible from anywhere facilitate cost savings.

Ease of use is the single most important factor for project design solutions. This is why cloud is so popular in Northern Europe, especially in the Nordics and Netherlands. These regions have a history of switching to cloud solutions across many industries, with the focus on as-a-Service and minimal capital expenditure on product.

Cloud solutions are easier to use in ways beyond anywhere-access. The percentage of files in an AEC project that are actually designs is probably about 50%; the rest can be made up of all kinds of communications including meeting minutes, customer contacts, pdfs, emails and chat logs. In the past these would all be stored in disparate locations across all the partners, with Collaboration for Revit, everything related to the project is in one place. This makes mobile working, not just access, possible.

Ives Veelaert,
Technical Specialist at Autodesk

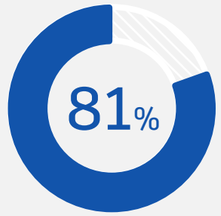
HOW COLLABORATION TECHNOLOGY ENABLES NEW WAYS OF WORKING

Effective collaboration is key to realising BIM's full potential. Autodesk's core authoring software for BIM, Revit® has a worksharing feature that enables simultaneous access to shared models by multiple contributors. Worksharing provides a complete range of collaboration modes from entirely on-the-fly, simultaneous access to the shared model, through the formal division of the project into discrete shared units, to complete separation of project elements or systems into individually managed linked models. This allows the team to choose the best way to collaborate and interact based on their workflow and the project requirements.

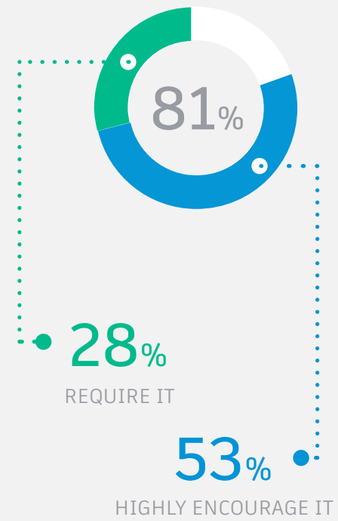
This collaboration at the model level is central to BIM, but requires that participants be connected via a shared server. Building project teams need more flexibility to include project participants, including multiple site access, multiple company access and more mobility. A true collaboration for design solution eliminates these hardware requirements and obstructions caused by firewalls, meaning that worksharing can happen remotely, across independent networks.

AEC has become more outward looking, with a focus on true collaboration with external parties, and on implementing the required technology infrastructure. Developing collaborative BIM procedures with external parties has been an investment priority for AEC for some years, and more companies are now seeing the benefits of better project team collaboration. In a recent study, the number of those who said they saw these benefits rose from 31% in 2012 to 49% in 2014.[9] Developing collaborative BIM procedures with external parties was a significant investment area, growing from 33% in 2012 to 54% in 2014.[10] 'Lonely BIM' does not deliver the same ROI as a truly collaborative BIM process. Investment in communications infrastructure to improve model sharing, optimising collaborative modelling workflows and practices, and making them available anywhere, anytime is happening alongside BIM implementation itself.

THE ABILITY TO WORK IN A COLLABORATIVE CLOUD ENVIRONMENT MAKES YOU AN ATTRACTIVE PARTNER TO OTHER AEC ORGANISATIONS[11]



CONSIDER THIS AT SOME LEVEL WHEN MAKING PROJECT TEAM SELECTIONS



WHY CLOUD FOR DESIGN COLLABORATION?

Project teams are implementing technologies that help streamline their design processes and improve their bottom line.

Design teams are increasingly focused on developing more efficient methods for design iteration and project delivery. Through a cloud-connected BIM design process, they are able to deliver more projects within, or under budget, through faster, more direct collaboration with the entire project team. This ultimately enables the team to extract more value from an investment in BIM.

NINE WAYS CLOUD-ENABLED DESIGN COLLABORATION CAN HELP INCREASE BIM PROJECT PROFIT MARGINS

THE BENEFITS TO A CLOUD-CONNECTED BIM PROJECT TEAM ARE QUANTIFIABLE. HERE ARE NINE WAYS THAT BETTER COLLABORATION IN THE DESIGN PHASE CAN IMPROVE YOUR BOTTOM LINE:

BENEFIT 1:
Reduce project error and minimise data friction

With the cost of rework at the construction phase ranging from 5% to 15% of a project's total cost, reducing errors in the building-design environment is a goal of all AEC firms.[12] The use of BIM itself reduces project error, and improved collaborative processes help amplify this benefit. McGraw Hill's SmartMarket report on the "Business Value of BIM in North America" reported that 57% of architects surveyed rated reduced document errors and omissions as a top benefit of BIM. The avoidance of rework by reducing errors and omissions early on through the use of BIM is one way to significantly cut costs and boost earnings. According to the McGraw Hill report, "reducing rework is a tangible outcome of the top-ranked benefit [of BIM] of reduced errors and omissions in documents", with 45% of architects citing it as a top BIM benefit.

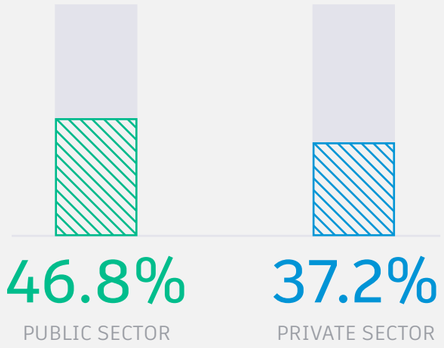
However, in the new reality of distributed teams and joint venture projects, it can be harder for project teams to fully realise every benefit of BIM. With multiple team members spread across different locations, a cloud-based collaboration solution can be the differentiator that helps teams reap the benefits of BIM by facilitating the necessary real-time communication and data sharing. 33% percent of AEC professionals have found that accessing the latest set of documents, and having the most current information is a challenge in completing a project, and 32% worry that someone will use the wrong revision.[13] With a cloud solution that has a real-time project communication log and version history tracking, that exact revision is flagged to all parties, as well as being updated in the master model that everyone is working with. Contractors can take advantage of access to the model to run clash detections earlier in the process. Detecting a clash or error costs thirteen times more in the construction phase than identifying a potential issue in the design phase of a BIM project.[14] Solving a clash in BIM is much cheaper than on-site, costing approximately €80 versus €1,000.[15]

Project delays and cost overruns are often due to human error, caused by a lack of communication and poor project, data, and documentation management.[16] Human error is greatly reduced by using one collaborative building design solution, where analysis can be run frequently and accurately. Collaborative BIM technology reduces CAD drawings rework from 48% down to 2%.[17]

> *"BIM 360 Team has allowed us to have a collaborative design team. Folks are able to make an adjustment in the model that could happen in Denver, and then here in Portland we're able to instantly to see what the adjustment looks like."*
>
> Michelle Vo, Principal,
> Hennebery Eddy Architects

PROJECTS COMPLETED ON TIME[19]

PROJECTS COMPLETED WITHIN COST[19]



BENEFIT 2:
Finish projects faster

Over 60% of major capital programmes fail to meet cost and schedule targets.[18] Inefficiencies built into traditional project delivery processes can incur significant costs and time requirements. A more efficient BIM workflow can streamline project timelines and reduce overall costs, benefiting all project participants. BIM, coupled with a cloud-enabled collaboration solution, can save a project team time across the whole building design process. Designers can quickly iterate design elements to, for example, evaluate and optimise building performance, reply to client requests, or conduct analyses and simulations in the early design phase, editing out potential issues much earlier in the process. Cloud-based collaboration solutions that enable all team members to participate in real-time - whether they are working directly in BIM or viewing and approving the outcome of design changes - can dramatically speed workflows.

With routine design updates communicated to the team continuously via the cloud, in-person meetings can be dedicated to important forward-looking discussions rather than to every day logistics. You keep the benefits of collaboration, but move the day-to-day into the cloud. The cloud is just an evolution of traditional methods.

> *Collaboration for Revit is the ultimate communication tool. It enhances the flow of information in a way we've never experienced before and helps us get the job done faster. For example, on this project we reduced our turnaround time for models and drawings by more than 35 percent.*
>
> Enrique Sarmiento, VDC Manager, McCarthy Building Companies

BENEFIT 3:
Work from anywhere

The ability to draw on vast amounts of remotely stored data from cloud services, and the proliferation of mobile devices and feature-rich mobile applications, mean that the project team can access all project data wherever they are. Communication features that push instant updates to all members working on a project are revolutionising the BIM process to ease communication with stakeholders who need to be aware of or approve project updates real-time, and enable the extended project team to work in a truly collaborative way.

By enabling the team to stay productive even when they are not together or in the office, efficiency gains can be realised that can positively impact the bottom line. Almost four out of ten AEC professionals say that online access to all documents on any device platform is one of the most important factors in increasing their company's productivity, or in reducing costs.[20] People want to be able to work from anywhere, and that requires apps that are optimised for mobile working.

> *As a joint-venture project, we needed to determine how we were going to handle communication being split between two offices. BIM 360 Team and Collaboration for Revit allowed us to work as one office.*
>
> Claudia Cozzitorto, BIM Manager, Moriyama & Teshima Architects

BENEFIT 4:
Spend less on IT

Cloud solutions get users up and running more quickly and offer multiple advantages over on-premise IT system options that take time to set up. On-premise systems also require upfront capital investments, and carry operating expenses to cover IT personnel to manage them. Workarounds, such as using an FTP, can result in heavy traffic on your network, as well as duplicate data on your servers. Nearly a third of AEC professionals said using multiple software tools during a construction or design project caused duplication of data.[21]

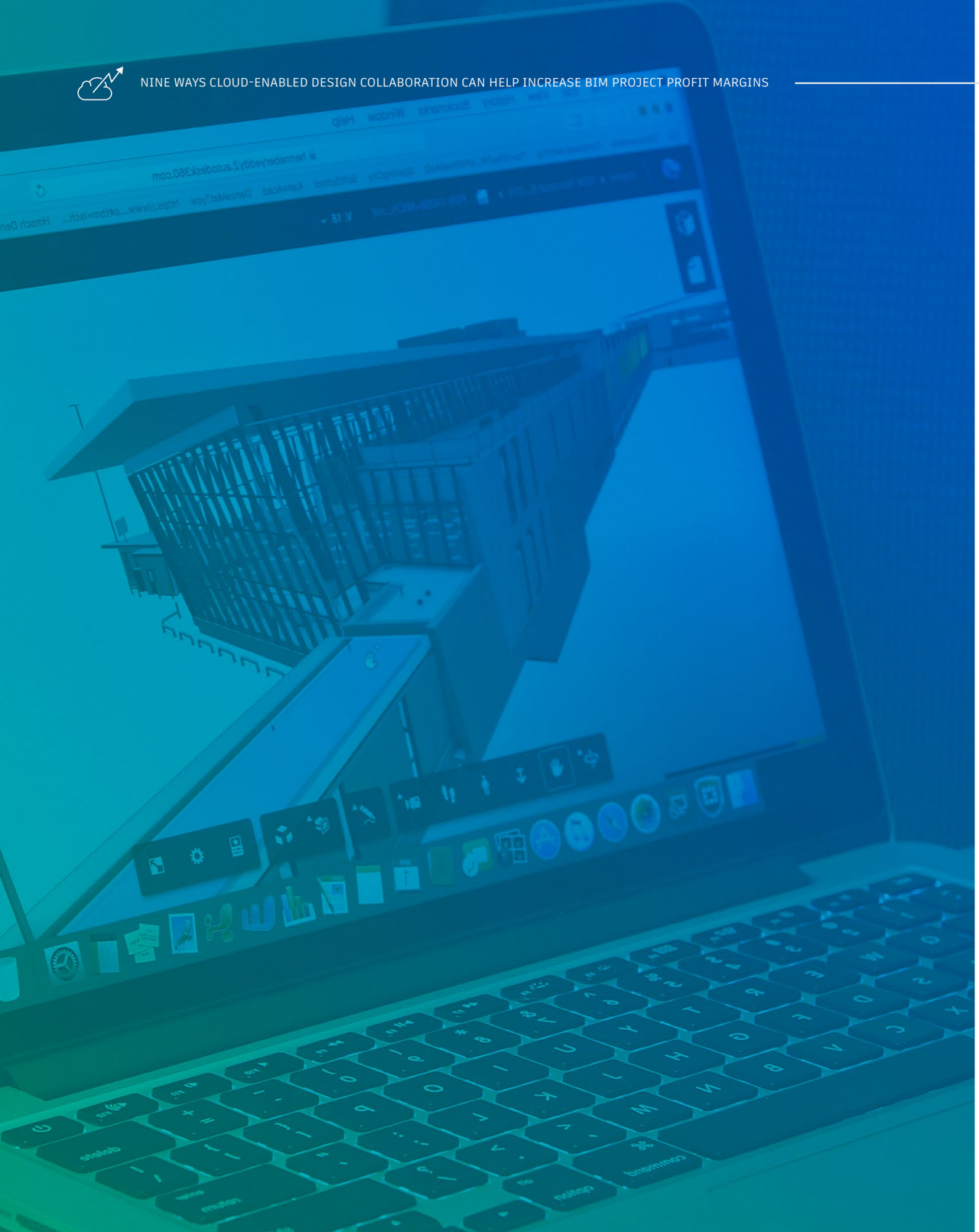
Cloud collaboration solutions can be deployed almost instantly, and can be scaled up or down depending on the size of the project and the associated team. Hosting the workspace in the cloud makes real-time, synchronised design possible for your next or current project.
BIM projects that run solely on on-premise solutions can face challenges when it comes to making joint edits, because team members who are not on site struggle to access the model. Architects, engineers, and contractors may all use their own servers, but it has to be decided who will host the central model, assume responsibility for the database, and how the associated costs will be split. Poor synchronisation of the 3D model across servers and workstations can waste time and money.

Providing access to a model hosted on an on-premise solution is not an ideal solution for sharing with a project owner or stakeholders who don't work directly in BIM, and who may not be trained to use the software to read a technical plan. This set up can delay feedback. With a cloud collaboration solution, however, these extended team members can log in and view the 3D model in a more accessible viewer, improving the speed and accuracy of their feedback.

Newman Architects found that its VPN workaround was slow and expensive, creating a frustrating experience for designers, and causing a significant strain on IT resources.

What we really needed was a scalable solution that would not pose an undue load on our own IT resources, and would satisfy the financial constraints of management as well as the performance needs of our project.

Leo Gonzales, Architect and BIM manager, Newman Architects



BENEFIT 5:
Co-locate virtually

A core benefit of BIM is the ability for multiple contributors to simultaneously work in the same model. Hosting the shared model in the cloud is one way to enable virtual, cloud BIM worksharing. A cloud collaboration solution with mobile access to the shared model provides a critical access point for those within or outside of the Revit environment.

The physical co-location of project teams sometimes required by clients or public agencies can be extremely expensive. Often travel costs associated with co-location have to be declared upfront in the tender process, meaning that the project team can end up footing the bill if these run over.[22] Firms have to dedicate full-time employees (usually co-located on a project site) for the duration of the project. Co-location can require an investment in hardware and IT infrastructure, along with the design and fit-out of office space for the team. A digital solution for virtual co-location, therefore, can be a huge financial benefit to the project as an alternative solution.

With cloud-based collaboration, teams can simulate ‘war rooms’ to allow everyone - the mechanical, electrical, and plumbing engineer (MEP), architect, contractor, and structural engineer - to work through project checkpoints effectively. This alternative eliminates the need to fund physical location, food, and travel for an entire project team.

> *Through the technology that we have put in place on our project, BIM 360 Team and Collaboration for Revit, we’ve been able to essentially virtually co-locate the offices, instead of physically co-locating the offices.*
>
> Michelle Vo, Principal, Hennebery Eddy Architects

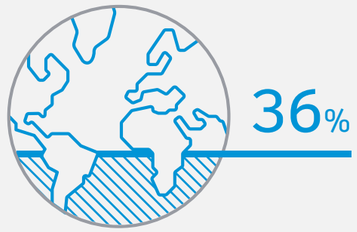
BENEFIT 6:
Spend less time coordinating, more time designing

Building design professionals are most effective when they can concentrate on their area of expertise. With traditional design processes time is wasted figuring out how to get updates into the 3D model, or waiting for the latest file version from other parties. Nearly one in three AEC professionals say that cloud technology tools that are not specifically designed for the AEC market can make completing a project on schedule a challenge, and using multiple software programmes causes IT redundancy and wasted staff time.[23]

A real-time collaboration environment reduces employee downtime by ensuring that everyone always has access to and is working with the latest version of the design. Teams are better able to work effectively, and deliver cutting-edge, award winning, trend-setting buildings, when they can concentrate on the design rather than worrying about versions or updates.

> *Communicator for Revit makes it easy for our designers to collaborate and communicate with each other, and without leaving their design environment. They don't have to open their email or pick up the phone. They can stay engaged in their design environment and the design process.*
>
> Kal Houhou, Director of Technology - Martinez + Johnson Architecture

TECHNOLOGIES AND MANAGEMENT STRATEGIES THAT HAVE THE GREATEST IMPACT ON IMPROVING PRODUCTIVITY[26]



BIM

ONLINE INTER-ORGANISATIONAL PROJECT COLLABORATION TOOLS

BENEFIT 7:
Win more work

Improved collaboration technology is driving international partnerships, and the increased internationalisation of building design is driving further technology innovation. The advent of improved collaboration processes has made it easier to work with specialist partners based anywhere in the world. It is simply not feasible to get everyone in the same room on a regular basis if they are spread across the world. This tendency for AEC players to be more global in their project outlook has driven the development of cloud technology designed specifically for this purpose. With cloud collaboration solutions for BIM, physical location is no longer a barrier to participating in a project, no matter where it is located.

New collaboration technologies are opening up opportunities for partners who otherwise may have been too small to participate in projects.[24] In the past, they might not have been able to justify the investment in the IT infrastructure necessary to collaborate with larger partners on the model, but with the low capital expenditure of cloud solutions there is a lower barrier to entry. Cloud collaboration for design is an equaliser. Smaller firms can be more competitive because they can access the same high-quality solutions as their larger competitors, on scale that suits, to grow the business by bidding on joint ventures with larger partners.

> *In a large organisation, you have talent all over the place. You want to be sure you can utilise the most qualified resources for a project – not just the ones who are most available.*
>
> Craig Halvorson, Senior VP of Operations, ARCADIS [25]

BENEFIT 8:
Create project transparency and clarify approval lines

With conventional communication tools, sharing a 3D model with the building owner and non-technical stakeholders for review or approval was complicated and time-consuming. Exporting a model as a 3D PDF rendering and uploading to an FTP is inefficient and sending 3D PDF renderings often caused confusion with non-designers, and ultimately delay and errors in approvals or sign-offs. Coupled with this, the process was time consuming, and caused versioning issues within the project. The poor application of building design data coupled with the rise in highly fragmented teams costs the US capital facilities industry $15.8 billion annually, and the owner's burden is about two-thirds of those costs during ongoing operations.[27] And nearly one in four AEC professionals say that the use of multiple technology tools without streamlined integration negatively impacts project efficiency.[28]

With cloud-enabled design collaboration the speed of project approval can dramatically increase by providing real-time access to the 3D model as it is updated. The building owner can log in and check progress anytime. Cloud sharing removes a time-consuming administrative task on both sides, and helps improve the flow of communication, as well as increasing trust.

> *With BIM 360 Team, our projects are transparent and we are sharing that information with all people who should have access to it. We can't live without it.*
>
> Marin Pastar, Director of Innovations, Bates Architects

BENEFIT 9:
Recruitment – attract and retain the best talent

Attracting and keeping the best talent can be a real differentiator in your ability to compete. Making working from anywhere truly possible means that you can hire the best-qualified person for a project, rather than be limited to local resources. Cloud-based design collaboration is a great way of enabling distributed teams to function as a cohesive unit, even if they aren't in the same office.

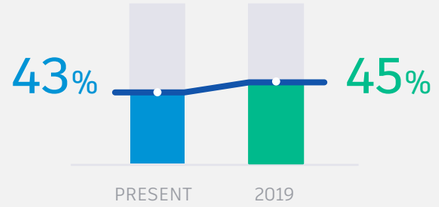
Top professionals increasingly demand positions with companies that offer a good work-life balance. In building design this means giving your team the bandwidth to concentrate on the actual design, and the creative and problem solving challenges around it, and offering flexible working options. They want to spend less time on admin and sorting through file versions, and more on design, including seeking inspiration out in the field.

Flexible hours may seem less possible in an industry with tight deadlines but, with cloud collaboration solutions, team members are able to participate from wherever they are, even 'on the go' thanks to mobile apps. This opens the doors to employees who are parents and carers, especially women, who are underrepresented in the industry.

The engineering profession doesn't have a great reputation for flexible working, which is perhaps why research by the Royal Academy of Engineering found that only 4% of female engineers in the UK worked flexible hours, and only 17% felt it played a part in their choice of career. Yet 79% went on to say that their colleagues and employers were playing an important role in helping them achieve work-life balance.

A perception change is needed.

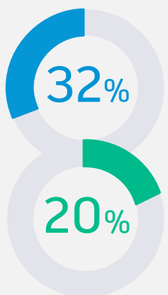
THE UK SKILLS SHORTAGE



THE LACK OF SKILLED ENGINEERING AND DESIGN WORKERS FOR AEC IN THE UK HAS ALREADY CAUSED FIRMS TO TURN DOWN NEW BUSINESS, THIS FIGURE WILL RISE[29]

64%

SAY A SHORTAGE OF ENGINEERS IN THE UK IS A THREAT TO THEIR BUSINESS[30]



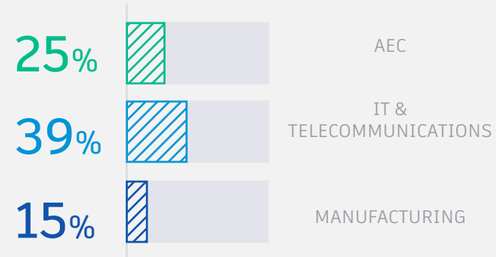
HAVE DIFFICULTIES RECRUITING EXPERIENCED STEM STAFF

FIND IT DIFFICULT TO RECRUIT ENTRANTS TO STEM[31]

36%

AEC PROFESSIONALS IN THE UK SAID THEY WOULD PREFER A MORE FLEXIBLE APPROACH TO WORKING HOURS OVER A 3% PAY RISE[32]

BUT ONLY A QUARTER OF COMPANIES IN THE INDUSTRY OFFER THEIR STAFF FLEXIBLE WORKING[33]

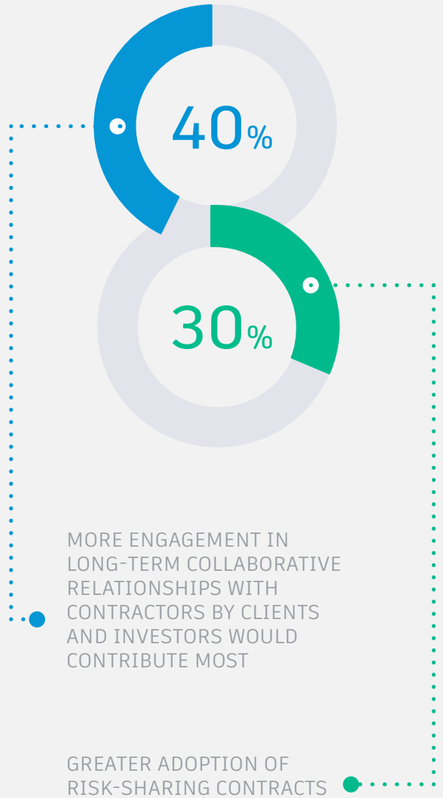


ONLY 18%

REALISED THAT THE UK GOVERNMENT ENCOURAGED FLEXIBLE WORKING, EVEN THOUGH ONE-THIRD WOULD TAKE A PAY CUT IN EXCHANGE FOR MORE FLEXIBLE WORKING CONDITIONS[34]

HOW CONNECTIVITY, COLLABORATION, AND CLOUD IMPACT DESIGN PROFESSIONALS

WAYS TO IMPROVE PRODUCTIVITY OVER THE NEXT THREE YEARS ACCORDING TO AEC PROFESSIONALS[35]



WHICH DELIVERY MODELS APPLY TO YOUR SECTOR?

The way that building projects are tendered, won and completed is changing. There is an increased emphasis on collaboration between multiple specialists to deliver the best possible result for the owner, including post-construction and into the lifecycle of the building. Unfortunately, a design contract doesn't solve the problem of communications between all parties. You need a communications plan beyond a legal agreement if you are going to work together effectively. A collaboration solution for design can help solve the practical issues around how you put your project communications plan into action. In practice the building owner will select the collaborative delivery model they desire, so design firms must understand how the models vary, and be prepared to adapt to work within the owner's desired framework.

Collaboration for Revit is a great solution for joint venture partnerships, interoffice collaboration, and staff who work remotely. Using the cloud to collaborate on our Revit projects is no longer on our 'wish list'. Instead, it's just how we work.

Kal Houhou, Director of Technology - Martinez + Johnson Architecture

Integrated Project Delivery

Integrated Project Delivery (IPD) is a method of project delivery employing a contractual arrangement between owner, design professional, and builder that offers the chance for all partners to adopt a share of the risk, so that all can benefit from the reward. It requires great collaboration to be successful.

Some global companies might undertake an IPD project, but there need to be strict contacts in place between teams, so you need different versions for each party according to their local regulations. In Scandinavia we're seeing more IPD, as the legal restrictions between the individual countries are a bit more open, but it remains a challenge for the UK.

In the UK, the context of the BIM Level 2 mandate means that although parties might say they are happy to work together on an IPD contract, the fact is that this kind of working requires a very high-trust environment. In reality, most organisations want to work on their designs in their own environment, and upload it to a shared workspace when they are happy with it. They don't want their 'work in progress' to exist in a real-time collaboration for the purposes of traceability. This way of working is less productive, and needs to be modernised in order to drive productivity in design.

Ives Veelaert, Technical Specialist at Autodesk

Teaming Agreements

In a Teaming Agreement (TA) firms with different expertise form a partnership to create a combined team that can more effectively compete in requests for proposals and design competitions. They align with collaborative design in that they focus on bringing together the best specialists for a project, and building the project around the key skills of the contracted parties.

The main benefit of the TA is to be able to win more work immediately, but it also gives your organisation exposure to more complex projects, and the chance to 'upskill' to become the prime contractor in the future, as well as sourcing partners who may funnel more business your way.

In the AEC industry, organisations are constantly working with new partners, in new combinations, on new projects. This means it is difficult to build a high-trust environment. At the same time, setting up new projects can be very complex. Finding a solution that helps build trust and simplifies communication is the way forward.

The main contractor working on the refurbishment of the Munch Museum in Norway was using Revit server alongside the other project partners, including a subcontractor based in Spain. By switching to Collaboration for Revit the team was able to cut the time to share updates to the model from 30 minutes to five minutes, and in the first week they saved half a day in time.

Accountability can be a bone of contention in teaming agreements, and in relation to cloud worksharing. With Collaboration for Revit, accountability is much easier to identify. For those working on BIM Level 2 projects, COBie drops and publishing records are all recorded in the communicator in real-time. All 'thinking history' is recorded and traced, and all uploads are versioned and filed.

Public-Private Partnership

A Public-Private Partnership is a contractual agreement between a public government body and a private sector entity. Through this sort of agreement, the skills and assets of both public and private sectors are shared in delivering a building for the use of the general public. In this agreement, each party shares in the potential rewards but also the risks associated with delivery of the building project.

> *We're seeing a change in project hierarchy in Europe. Teams are decentralising, and the spotlight is moving off the architect in terms of leadership. Many architects are happy to be able to focus on design rather than managing data. An easy-to-use, easy-to-implement, collaboration solution is the way to enable this.*
>
> Michelle Vo, Principal,
> Hennebery Eddy Architects

Autodesk solutions for better design team collaboration

Tools like Autodesk® BIM 360™ Team and Autodesk® Collaboration for Revit® are helping to provide design teams with a cloud-enabled, collaborative BIM environment.

Autodesk BIM 360 Team is a cloud-based collaboration solution that allows multiple design partners to collaborate as if they were one design team (without the need for co-location or physical file storage). The platform connects all team members (via web or mobile device) to the latest project information–2D drawings and 3D models, design mark-ups, activity feeds and version history.

When coupled with solutions like Autodesk Collaboration for Revit, a cloud service that works with Revit to enable multi-user co-authoring of BIM, design teams are able to simultaneously co-author models regardless of physical location. Design teams are freed from the requirement to physically co-locate or share a server. This is a major time and money saver since feedback is shared in real-time, and teams are able to resolve issues together quickly within the model, a process that may have previously taken weeks.

Leveraging BIM 360 Team as its cloud platform, Collaboration for Revit saves the model up to 'central' in BIM 360 Team, while creating a local cache file. If your internet connection goes down you can still work locally, and then upload it back into the joint project to ensure all changes are synced for the extended design team. The communicator feature will log that upload, and you can call out the progress made to the other partners, so they know what has changed. Communication really is the key to effective collaborative design, and reliable data exchange is critical.

This project delivery style requires a high-level of collaboration across multiple disciplines, and in some cases, multiple cities, states and countries. Instead of buying expensive physical IT infrastructure, teams can now deploy solutions like BIM 360 Team and Collaboration for Revit and be up and running as quickly as possible.

Take, for example, the Los Angeles International Airport Midfield Satellite Concourse project, which is part of a multi-billion-dollar modernisation program at Los Angeles International Airport (LAX). Highly complex, the delivery of this new major satellite concourse takes time, teamwork and partnership. Two globally-leading design firms have formed a joint-venture – Corgan and Gensler (contracted to Turner/PCL) – to design the airport of the future. Working as 'one team' in BIM 360 Team, all project information is centralised in the cloud with access given to all stakeholders who may need it–design version history, comments and mark-ups, project schedules, and most importantly, the Revit models themselves. The design team can then design concurrently, regardless of location, using Collaboration for Revit® to simultaneously work on the same model in the cloud. These technologies are allowing the team to work on a live model without having to send data back and forth which could account for lost time and data.

> *Collaboration for Revit was like a dream come true. As soon as we began using it, we knew it was going to revolutionise our collaborative design process.*
>
> Kal Houhou, Director of Technology, Martinez + Johnson Architecture

LEARN MORE ABOUT AUTODESK SOLUTIONS FOR CLOUD-ENABLED BIM COLLABORATION

AUTODESK® COLLABORATION FOR REVIT®

Cloud service that works with Revit to enable multi-user co-authoring of BIM models

www.autodesk.co.uk/campaigns/cloud-connected-teams

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AUTODESK® BIM 360™ TEAM

Cloud-based platform for design collaboration that provides centralized team access to project data

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