2018 SOFTWARE IN ARCHITECTURE REPORT

Exploring an Architect's Increasing Reliance
on Software: **A Breakthrough Study.**

MODELO

eBOOK

CONTENTS

EXECUTIVE SUMMARY

'Software is making an impact in the AEC industry' is a remarkably unremarkable headline! Like many of my colleagues, I am sure you will agree that this fact is overwhelmingly expected in today's fast-paced, competitive design world. However, what is especially noteworthy, and what this report seeks to detail, is the pace at which these changes are occurring. The manner in which AEC professionals complete tasks and workflows today is virtually unrecognizable from what it was, even just three years ago. New software applications, communication, nimble design review, VR, and BIM have all heralded revolutionary changes to design processes, while more traditional applications, such as CAD software, have continuously added new features and functionality. These changes have manifested themselves in the form of more daring designs, clients who are more engaged, even excited, throughout the design process, and AEC professionals

are setting themselves greater challenges to respond to client expectations.

To more comprehensively understand the impact software is making within architecture firms, Modelo conducted a benchmark study into how architects and other professionals at AEC firms use software and the applications they rely on most heavily, and the results are telling. Most notably, the vast majority of respondents (98%) indicated that they believe the architecture industry is becoming ever-more reliant on technology. New software tools such as virtual reality, BIM, and communication platforms have seen an increased adoption within the design process.

Additionally, 75% of respondents agree that software should save time and create efficiencies, highlighting the importance of a multifunctional platform. Further, 95% of architects predict that BIM's impact on industry professionals will be valuable, demonstrating the shift towards

a more software-reliant industry where applications make information more readily available. Ultimately, designs will be driven by the creativity of the architects and designers who are responsible for them. However, software plays a critical role in that process.

As an architect myself, I am very excited to witness how technology will continue to positively impact our designs, work, and communication. For now though, I invite you to explore how your peers use software today.

Regards,

Qi Su
CEO, Modelo

This e-book, Emerging Software Trends in Architecture, was developed by Modelo based on the responses of 508 AEC professionals from different company sizes.

INTRODUCTION

The AEC industry has been rapidly changing due to advancing digital technology tools. Buildings are being made smarter, teams are arriving at design decisions faster, and project stakeholders are able to communicate much more clearly. As a whole, architects, designers, engineers, and builders overwhelmingly agree that a reliance on software has positively transformed the way organizations collaborate, build and design today.

98% of architects feel that technology is becoming ever more present in their workflow.

The extent to which a firm relies on technology is unique to their business needs. However, there are distinct advantages to employing software and hardware in an architecture practice, including opportunities to create cutting-edge designs, greater client engagement, and improved employee and client satisfaction.
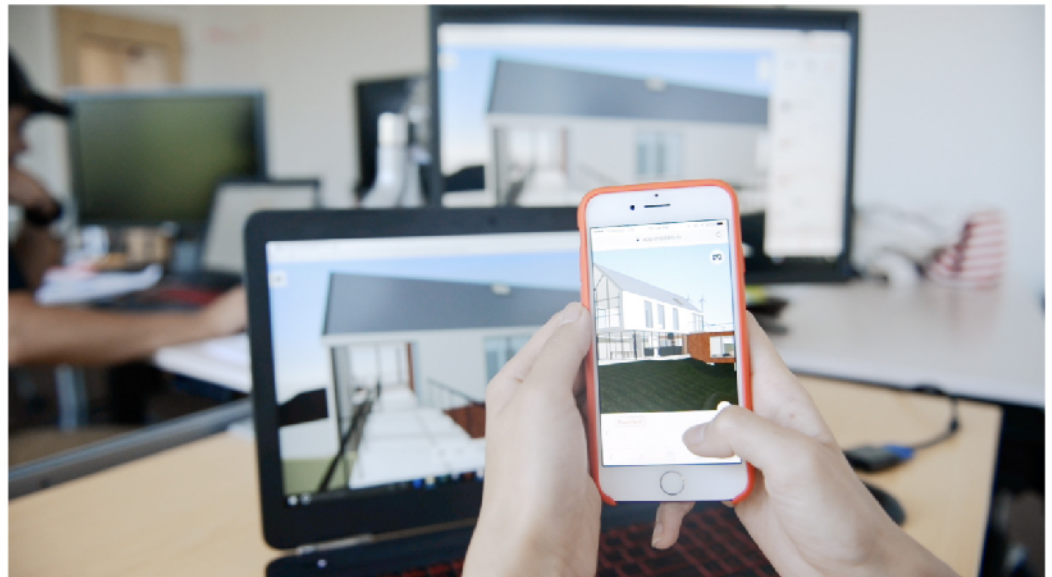
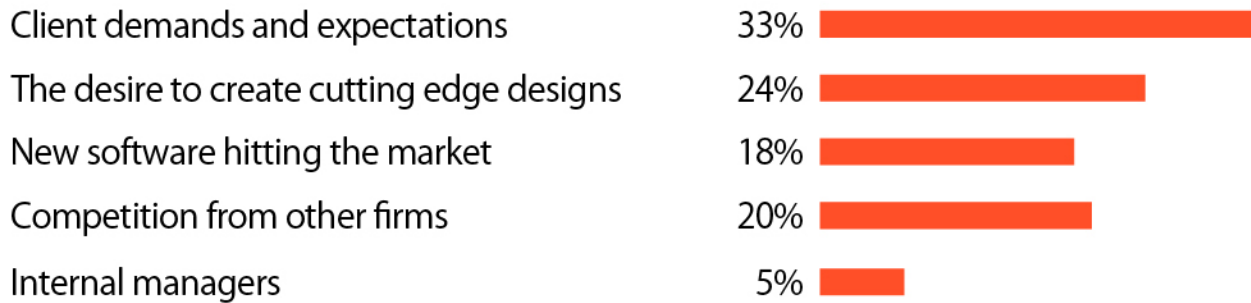**Achitecture is becoming increasingly reliant on technology**

Agree	98%	
Disagree	2%	

Fragmented Attitudes Towards Software

There are multiple drivers for an architect's reliance on software. Certainly, when working on a new building project, the desire to meet, and hopefully, surpass client expectations is a powerful driver. Additionally, there is a desire to create cutting-edge designs that are not only functional for the client, but ones that breakthrough barriers to achieve personal goals and satisfy an architect's intrinsic drive to create a space for people to connect, come together, and share moments, from the intimate to the mundane.
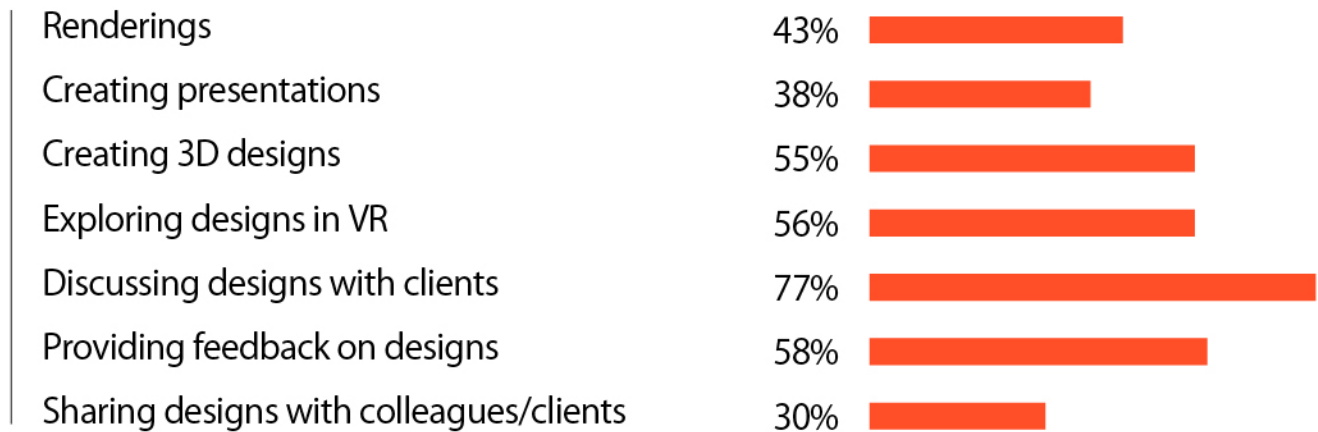
Drivers of the reliance on software

Client demands and expectations	33%	
The desire to create cutting edge designs	24%	
New software hitting the market	18%	
Competition from other firms	20%	
Internal managers	5%	

Cutting-edge design visions and meeting client demands are the primary drivers behind an architect's use of software.

As design visions become more ambitious, AEC professionals are seeking to be more transparent with their clients, and through that, improve client engagement and satisfaction. To achieve this goal, the most technologically-advanced professionals are combining their creative intuition with software, particularly web-based technologies, that allows for designs to be easily reviewed and shared with clients.

Biggest efficiency gains from using software

Renderings	43%
Creating presentations	38%
Creating 3D designs	55%
Exploring designs in VR	56%
Discussing designs with clients	77%
Providing feedback on designs	58%
Sharing designs with colleagues/clients	30%

Architects expect the software they use to complete many functions.

When many functions are achieved in one multifunctional platform, efficiency and productivity from software reaches new heights.

Over the last several decades, the biggest software-powered efficiency seen by the architecture community has been brought about by being able to create 3D designs. However, while industry-changing when it was first introduced, its ubiquity throughout the industry has meant that this functionality has now become the industry norm. New technologies, such as multifunctional software applications that allow you to render, markup, present, and share your designs with clients and colleagues from the same platform are quickly redefining how software drives efficiency within the AEC industry.

Software makes it harder for cross-discipline designing

|	
Strongly agree	12%
Agree	12%
Disagree	38%
Strongly disagree	38%

76% of architects surveyed believe that software makes cross-discipline designing easier.

Software is being widely used in the AEC industry to promote collaboration efforts among different industry professionals through streamlined communication and design review workflows. Using collaboration software, professionals are able to communicate directly on the design and work together to achieve the shared vision for the project.

Most important features you look for when using software?

1. It gives me an option to explore new ideas/tools

2. Accessible on all devices I use

3. Familiar user interface

4. Saves time / create efficiencies

5. Allows me to complete all tasks in one software application

54%	43%	40%	75%	34%
1	2	3	4	5
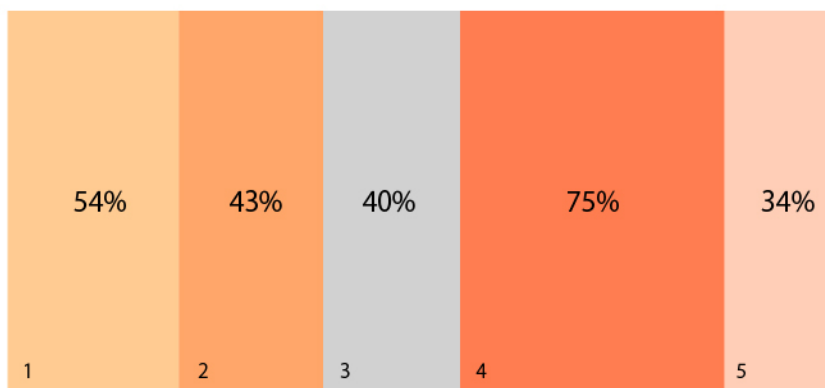
75% of respondents agree that software should save time and create efficiencies.
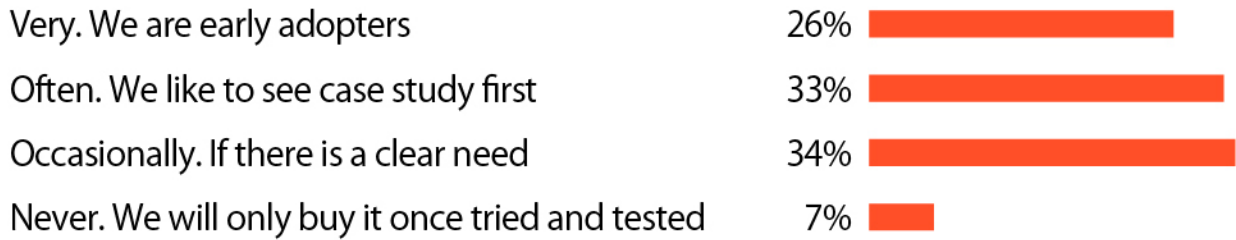
By taking advantage of interoperability between software applications, AEC professionals can design seamless and more productive workflows. New technologies mean that individuals no longer have to worry about working in numerous platforms at the same time to reach a desired communication outcome, permitting them to spend more time designing.

One key theme that emerged in the research is the importance and desire of interoperability between platforms to make for a seamless workflow. The variety of software applications used by architects and other stakeholders can make for cumbersome design reviews and communication. Limited access to specific programs such as Revit, Rhino, or SketchUp, the inability to access files when traveling, and the client's unfamiliarity with CAD software are all familiar problems. Leading architecture firms address these problems by using an integrated platform to conduct design reviews, ensure accessibility to the design for all project team members on all devices, and keep communication centralized.

KEY USES FOR SOFTWARE
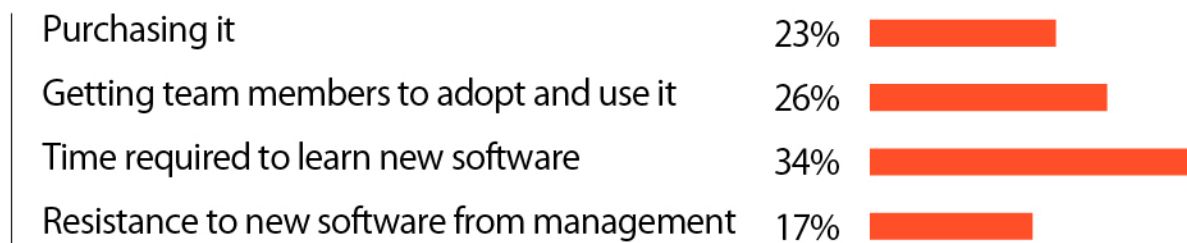
How willing is your firm to use new software

Very. We are early adopters	26%
Often. We like to see case study first	33%
Occasionally. If there is a clear need	34%
Never. We will only buy it once tried and tested	7%

Over ⅔ of architecture firms are willing to use new software on the market.

New digital software tools offer many advantages to design and build workflows. Most firms are inspired by these new tools and are eager to adopt them into their design process to start saving time and creating efficiencies early on. Ultimately, firms must use the right software in the right way for their organization.

Biggest Challenges When Adopting New Software

Adopting new software can be a challenge if the firm does not see the value of investing in IT and software. Therefore, to overcome these challenges, it's important for AEC firms to embrace the digital changes throughout the organization in order to evolve with the industry.

Biggest Challenges When Adopting New Software

|	
Purchasing it	23%
Getting team members to adopt and use it	26%
Time required to learn new software	34%
Resistance to new software from management	17%

34% of respondents agree that the biggest challenge when adopting a new software is the time required to learn it.

It's no mystery that a day in the life of an architect is filled with deadlines, meetings and long hours. Therefore, new software tools should be straightforward and multifunctional. Or, better yet architects should adopt a platform that has a robust onboarding process to guide them in the early stages of implementation.

Communication Software

Do you use task management software

| Yes | 46% | 54% | No |
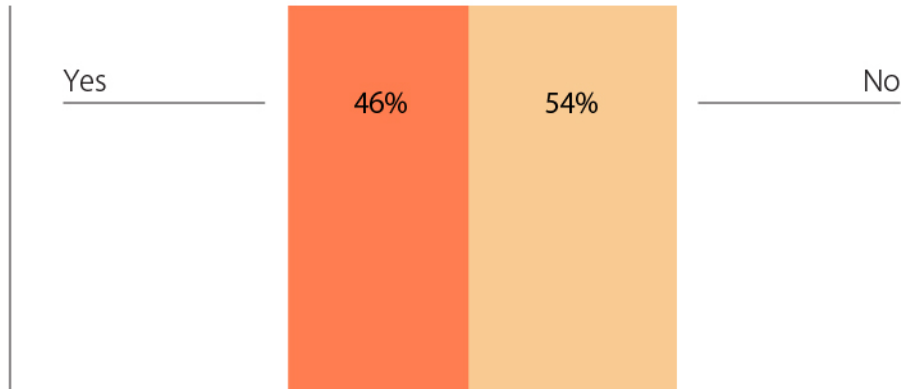
About ½ of respondents are using task management or communication software, while the other ½ are managing their tasks another way.

A day in the life of architecture professionals is extremely busy and demanding, which requires organization, prioritization, and most importantly, communication. How architects choose to stay on top of their tasks is up to the individual, but communication platforms that enable task management have been proven to make an architect's working life more manageable. Ultimately, communication software can also be task management software.

On Creating Client Presentations

How many client presentations do you create per project?

4-6 34% 16% 7-10

1-3 31% 6% 11-13

13% 14+
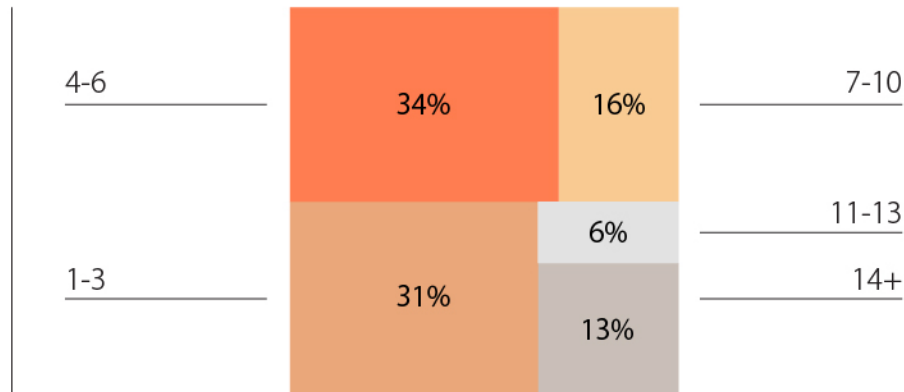
65% of respondents create between 1-6 client presentations per project.

Architects who delivered multiple client presentations, usually at the conclusion of each milestone in a project, report that client engagement and satisfaction increases. During the designing process, presentations do not need to be highly rendered works of art; rather they can be simply and easily rendered in a web application, and only the part of the design that is ready to be viewed needs to be shown. Additionally, principals are increasingly leaving presentations with clients, usually via a URL, for later access and review.

Time spent on presentation preparation

Preparing the design and important complementary information to communicate design intent or vision, like renderings or floor plans, takes time and patience. On average, 27% of respondents spend somewhere between 3-8 hours preparing client presentations per project.

| 6-8 hours | 27% | 23% | 3-5 hours |
		12%	1-2 hours
		19%	10+ hours
		19%	A whole day
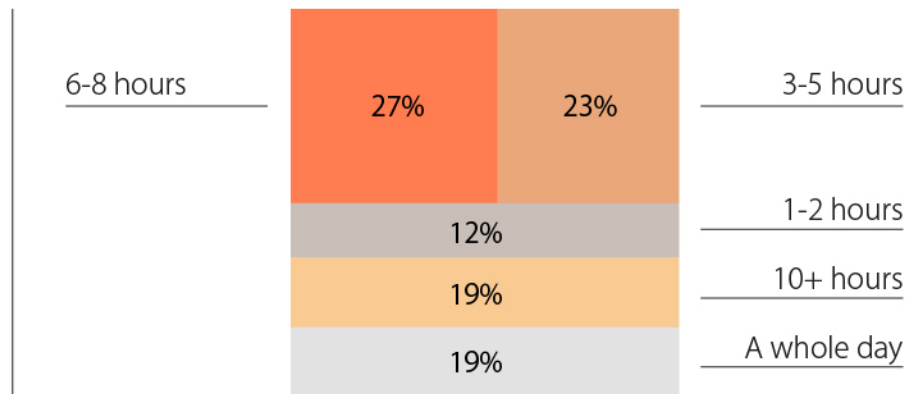
50% of architects spend between 3-8 hours preparing presentations per project.

Preparing the design and important complementary information, like renderings or floor plans, to communicate design intent or overall project vision takes time and patience. There are a number of efficiencies that architecture firms can gain by better employing software to create interactive 3D presentations with 2D attachments to not only save time, but keep everything organized.

Walkthrough Animations

Visualizing a design with a cinematic experience helps not only bring the design to life, but to ultimately make informed design decisions quicker. In fact, 59% of architectural designers create in-house animations of designs.

How many animations do you create per project?

1-3	72%	
4-6	17%	
7-10	7%	
11-13	3%	
14+	1%	
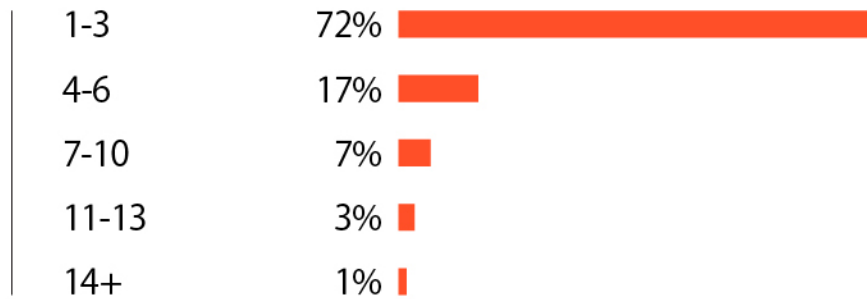
72% of them spend 1 to 3 hours creating walkthrough animations on average per project.

Animations are extremely user-friendly and engage all project collaborators in the digital design from a different perspective with an authentic mini-movie. Essentially, architects are able to bring their design to life and walk through a design before completion to illustrate design intent. By creating animated walkthroughs, architects are able to make informed design decisions faster by exploring the design before it's finalized.

How long does it usually take to create animations?

1-2 hours — 20%

18% — 10 hours +

22% — A whole day

3-5 hours — 21% | 19% — 6-9 hours

There is no clear trend in the number of hours that it takes AEC professionals to create each animation.

The time duration ultimately depends on the individual project, how much detailed work goes into the animation and which software they are using to create them.

Virtual Reality

Although the AEC industry may have initially been slow to adopt Virtual Reality (VR), it is now becoming a staple in the industry, allowing various disciplines to work together in order to understand designs better. When VR is used both internally and externally during design reviews, all project stakeholders are more involved and communication is clearer.

Do you use Virtual Reality to explore your designs?

Yes — 37% | 14% — No

No, but would like to — 49%
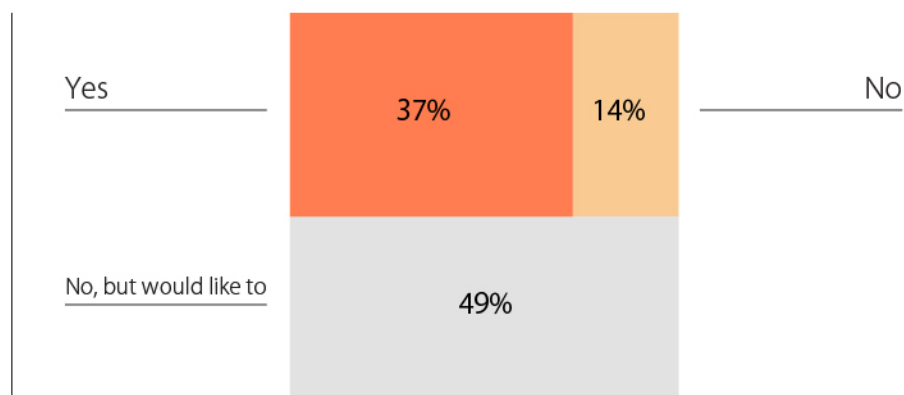
63% of respondents do not yet use VR to explore their designs but would like to.

Those architects who indicated that they are using VR as a presentation tool indicated they are doing so during the final client presentation. However, VR is helpful throughout the entire design process. Virtual reality can not only be used to explore designs more fully internally, but to also communicate design intent and vision to external stakeholders and clients to cultivate involvement, collaboration, and ultimately, decision.

The Benefits of Using VR in Design Workflows

1. Saves valuable time
2. Makes client presentations more interactive
3. Enhances collaboration efforts
4. Helps communicate design visions better
5. It is a great sales tool
6. Great way to explore designs during design reviews

31%	75%	30%	61%	43%	43%
1	2	3	4	5	6
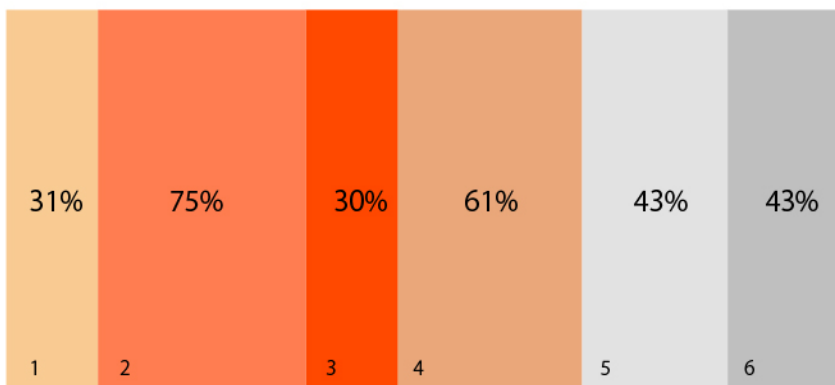
# Most notably, 76% of respondents would agree that VR makes client presentations more interactive.

Clients can truly be immersed in the design visualization and get a different perspective rather than only looking at a 2D rendering or even a 3D model on a screen. This goes hand-in-hand with the fact that 61% of respondents agree that VR helps AEC professionals communicate their design vision better.

Building Information Modeling (BIM) has been around in the building industry for 20 years and has had a huge impact on the way industry professionals work. 60% of architects predict that BIM's impact on industry professionals will continue to be highly valuable, again highlighting the shift towards a more software-reliant industry that employs technology for tangible, and often groundbreaking, benefits.
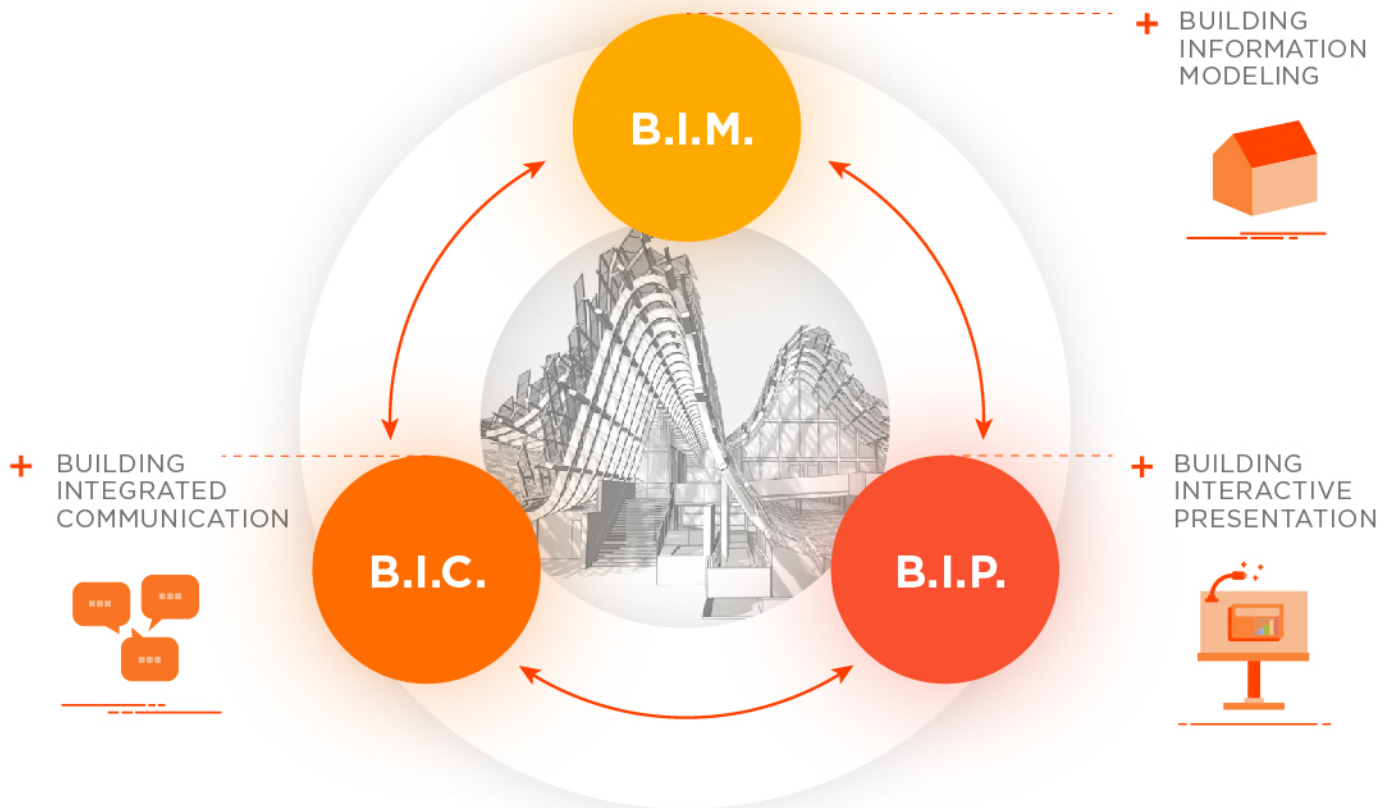
Expectations for BIM's impact on industry professionals?
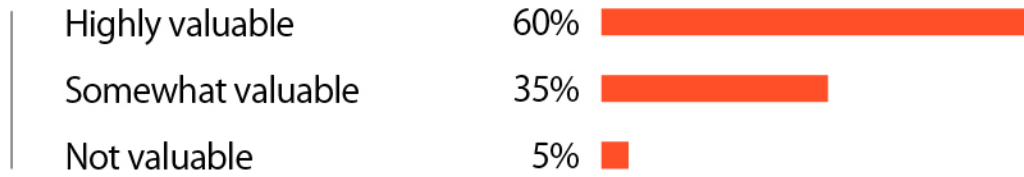
Highly valuable   60%

Somewhat valuable   35%

Not valuable   5%

95% of architects predict that BIM's impact on industry professionals will be valuable, demonstrating the shift towards a more software-reliant industry.

Although Building Information Modeling (BIM) has been important to the building industry for the last 20 years, it is expected to make an even bigger impact to the way industry professionals work in the future. This belief is driven by the expectation that the software supporting BIM practices will advance greatly in the coming 5 years.

We want to take this idea a step further by saying that the industry is moving towards a BIP+BIC+BIM workflow, meaning BIM does not solve all of the problems of the building industry despite how powerful it is. BIP = Building Interactive Presentation, and BIC = Building Integrated Communication thus when combined with BIM is ultimately the most powerful solution. When BIM is paired with BIP and BIC, collaboration and presentation processes reach new heights in a process we have termed Design Asset Management (DAM).


B.I.M.

+ BUILDING INFORMATION MODELING

B.I.C.

+ BUILDING INTEGRATED COMMUNICATION

B.I.P.

+ BUILDING INTERACTIVE PRESENTATION

True architectural masterpieces stand the test of time and last for thousands of years because they successfully adapt to changing environments, like Italy or Greece. When you think about the countries, cultures, and regions with the best architecture, what comes to mind? While we asked this question for a bit of fun, and obviously the answer is very subjective, the top four countries that respondents chose were Spain, USA, Japan, and Italy - do you agree?

Countries with the Best Architecture   *Flag icons are designed by Freepik from Flaticon

Country	%
Spain	20%
USA	19%
Japan	18%
Italy	17%
UK	8%
UAE	6%
China	6%
Germany	6%
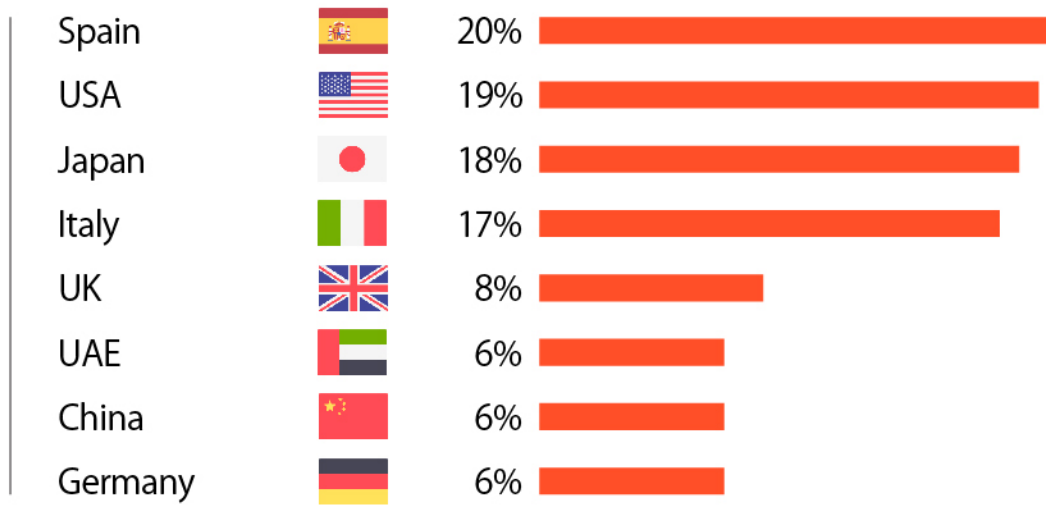
20% of architects believe Spain has the best architecture, 19% believe it's the USA, 18% chose Japan and 17% chose Italy.

When thinking about which country embodies the best architecture in the world, what comes to mind? True architectural masterpieces stand the test of time and last for thousands of years because they successfully adapt to changing environments and benefit those who live there or travel distances to see them.

Buildings and infrastructure shape the world's cities, attract eager visitors, and have a deep connections with their users. Architecture, engineering, and construction are so powerful because they are intentional, calculated, and emotionally impactful on the lives of people everywhere. Put simply, they are environments for people to come together and share experiences.
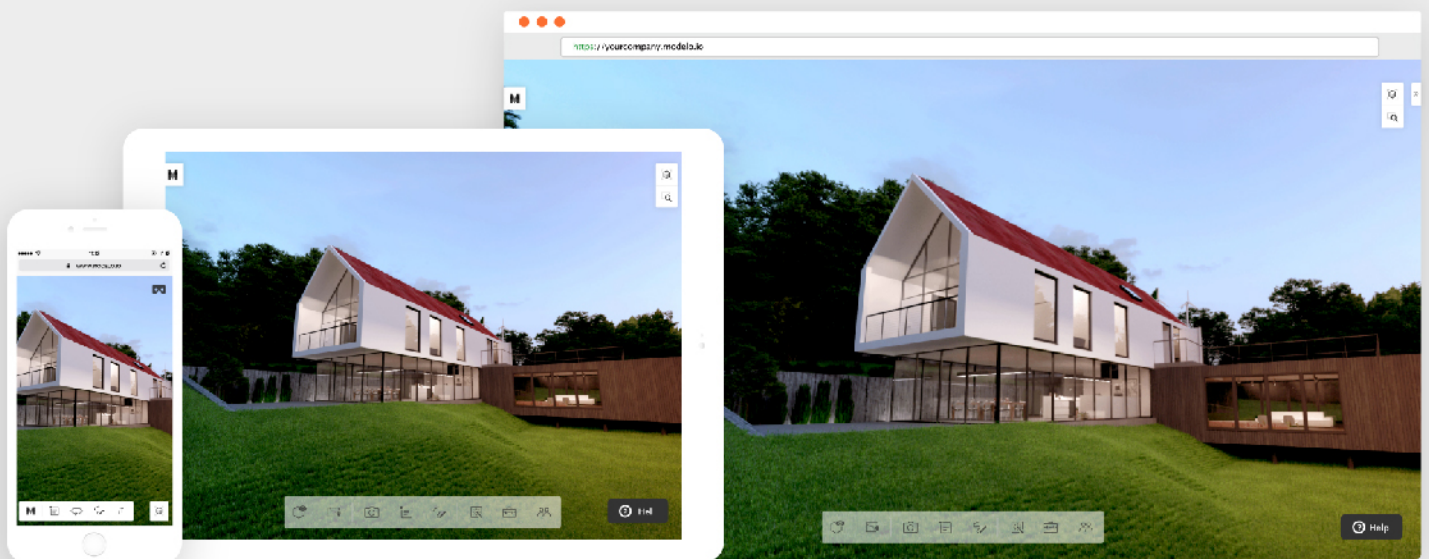
A lot can happen in five years in any industry due to technology's nonstop advancements. The AEC industry is not immune to these advancements and rapid growth in the use of technology is occurring. Software and digital design have contributed to this growth and the way architects, designers, engineers, and builders communicate, design, build, and deliver projects. It is anticipated this growth will continue into the coming half-decade.

In the coming years, industry professionals will increasingly rely on software applications to communicate their vision and create smart, beautiful, and functional buildings that help environments thrive. Anything is possible when the power of technology is paired with forward-thinking designers and builders in the right context.

Predictions for the industry regarding software

1   Design Asset Management (DAM) and BIM practices will continue to positively impact AEC professionals' workflows by driving enhanced collaboration, including BIP and BIC, and reduce costs. The process will become more integrated, immersive, and data-driven to create smart and beautiful buildings.

2   VR is the sidekick every AEC professional needs to truly communicate the design vision and design intent. VR will continue to grow and it will be used throughout the entire design review process, not just for final presentations. VR will be a powerful tool to use both internally to understand designs better, and externally to collaborate with clients and stakeholders.

3   Collaboration software will continue to be important in order for disciplines to work together to reach a common project goal, make informed design decisions, manage tasks and prevent costly changes later on. Designs will be made available in collaboration software that all stakeholders - architects, construction teams, and clients - can all access.

4   The role of the IT Director and BIM Manager at architecture, engineering, and construction firms will continue to grow and be more common. This role will be important for adopting new technologies and supporting firms to stay ahead of competitors to create cutting-edge designs and increase productivity.

Becoming involved in the digital technology transformation for AEC professionals is crucial for evolving with the industry changes and ultimately flourishing. Investing in IT and BIM and spreading digital skills throughout an organization will prove to be beneficial for ROI, client engagement and satisfaction, winning new clients, and spurring exciting innovation. When organizations are adopters of software, they can positively shape the future of buildings and infrastructure for the generations to come.
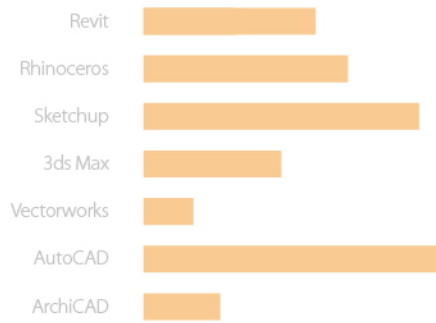
Frequency of Software Usage

There is not a clear trend in software usage among architecture professionals.

Because different projects require different software, day-to-day usage of CAD applications differs among architects depending upon their specific need and software capabilities. One noteworthy point is that the vast majority of architects frequently use two or more CAD software applications.
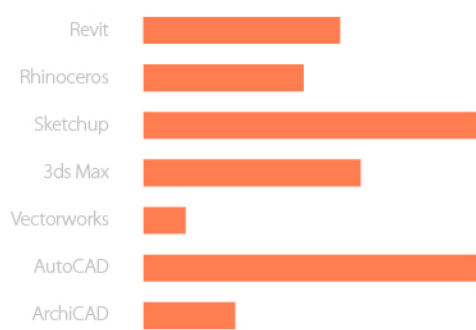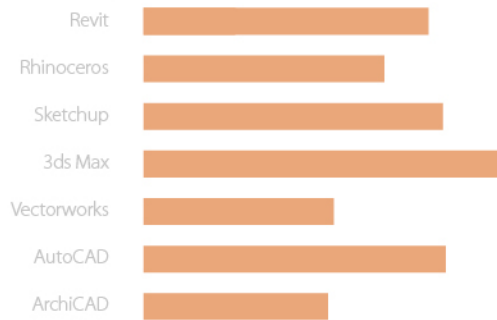
Everyday

Revit
Rhinoceros
Sketchup
3ds Max
Vectorworks
AutoCAD
ArchiCAD

Frequently

Revit
Rhinoceros
Sketchup
3ds Max
Vectorworks
AutoCAD
ArchiCAD

Project-by-project Basis

Revit
Rhinoceros
Sketchup
3ds Max
Vectorworks
AutoCAD
ArchiCAD

Once in a while

Revit
Rhinoceros
Sketchup
3ds Max
Vectorworks
AutoCAD
ArchiCAD

Never

Revit
Rhinoceros
Sketchup
3ds Max
Vectorworks
AutoCAD
ArchiCAD
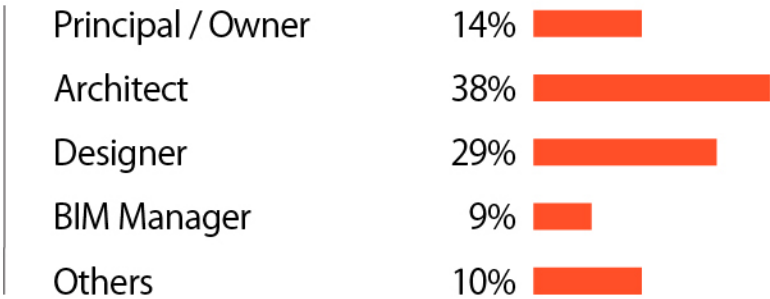
This graph illustrates that AEC professionals use different software platforms depending upon the types of projects they work on, or what sector the firm is in.

APPENDIX B- DEMOGRAPHICS

Job title

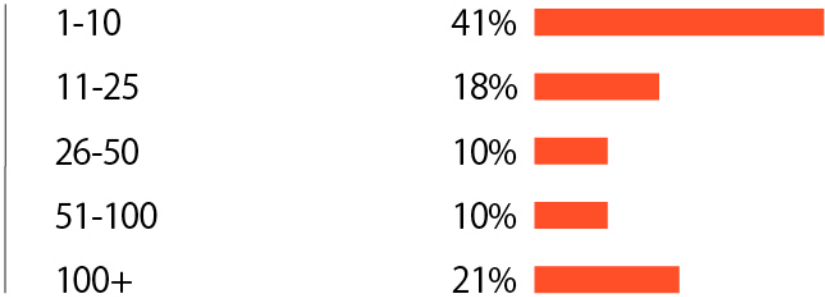|		
Principal / Owner	14%	
Architect	38%	
Designer	29%	
BIM Manager	9%	
Others	10%	

38% of respondents identified as architects and 29% identified as designers.

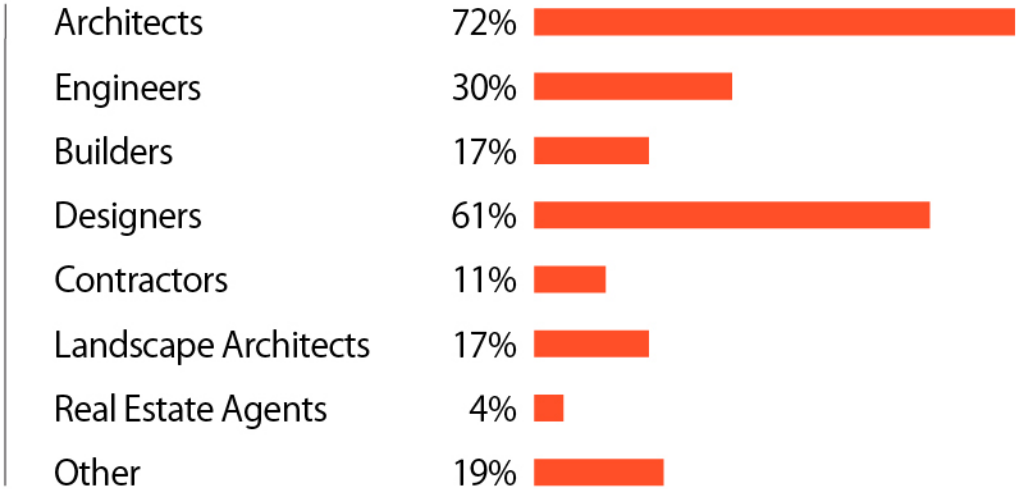All of the people who participated in the survey are professionals in the AEC industry.

Firm size

1-10	41%	
11-25	18%	
26-50	10%	
51-100	10%	
100+	21%	

41% of people surveyed work at firms between 1-10 people.
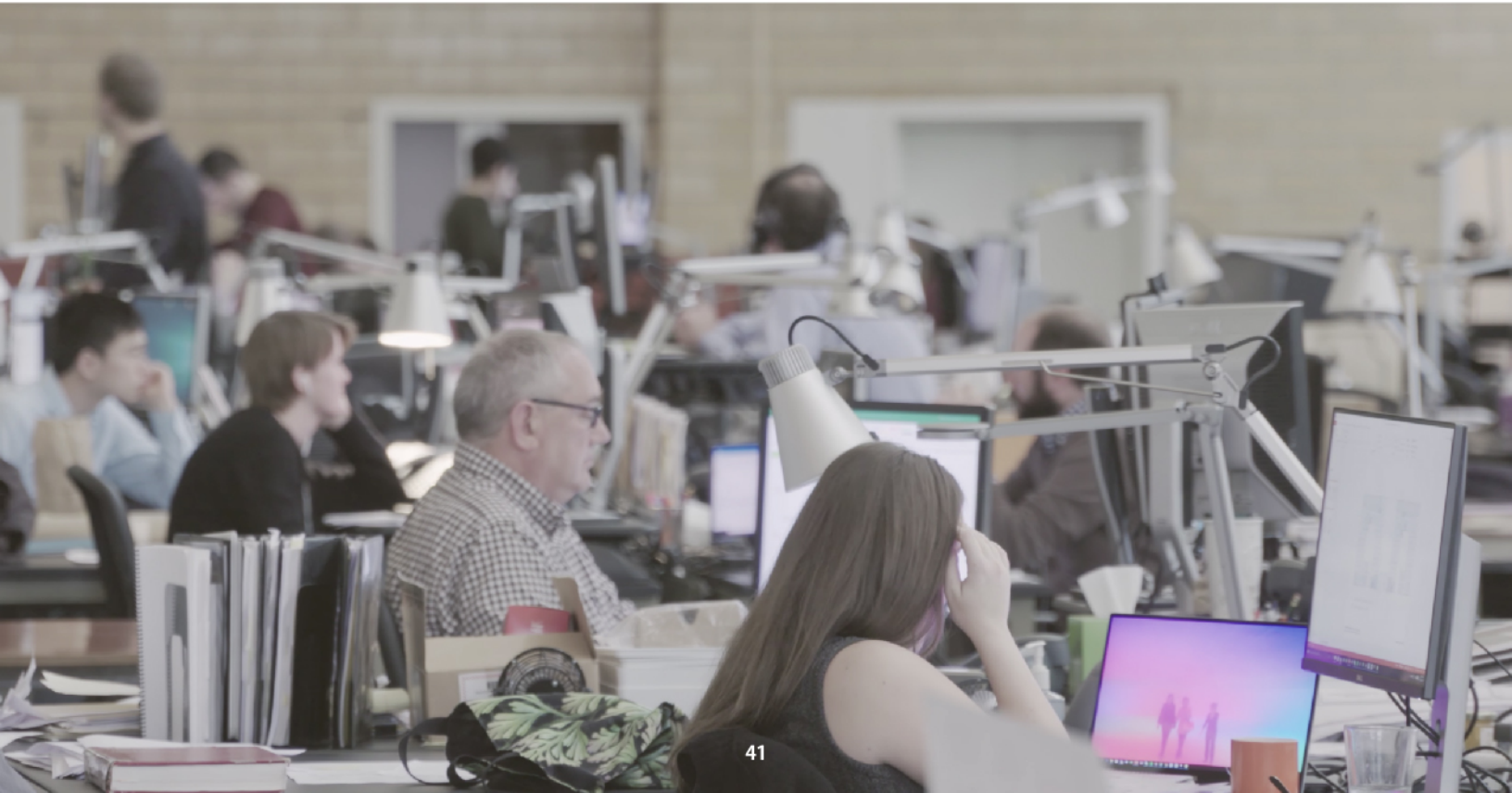
Type of professionals that make up the firm

Architects	72%	
Engineers	30%	
Builders	17%	
Designers	61%	
Contractors	11%	
Landscape Architects	17%	
Real Estate Agents	4%	
Other	19%	

72% of firms employ architects and 61% of firms employ designers.

Of the people surveyed, most work at firms with architects and designers, not usually real estate agents or contractors.

Type of Projects

Residential	27%	████████
Commercial	30%	█████████
Government	12%	███
Education	18%	█████
Healthcare	10%	███
Other	3%	█
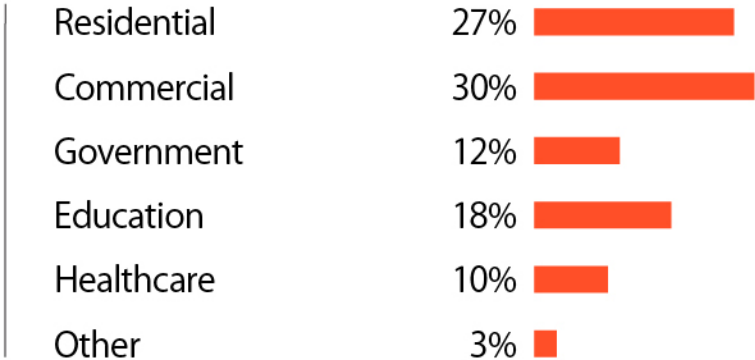
30% of respondents work on commercial projects, while 27% of respondents work on residential projects.

Overall, the types of projects that the respondents' firms work on differ depending upon their sector.

Types of Projects Worked on by Firms with 1-10 Employees

Residential	75%	
Commercial	58%	
Government	12%	
Education	18%	
Healthcare	10%	
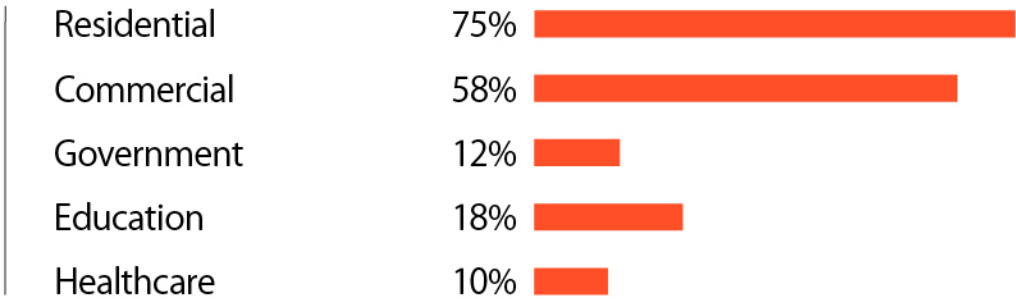
A clear trend we noticed is that most of the firms containing 1-10 people tend to work on either residential or commercial projects, indicating the strength of these sectors globally.

2018 SOFTWARE IN ARCHITECTURE REPORT

Exploring an Architect's Increasing Reliance on Software: **A Breakthrough Study.**

MODELO