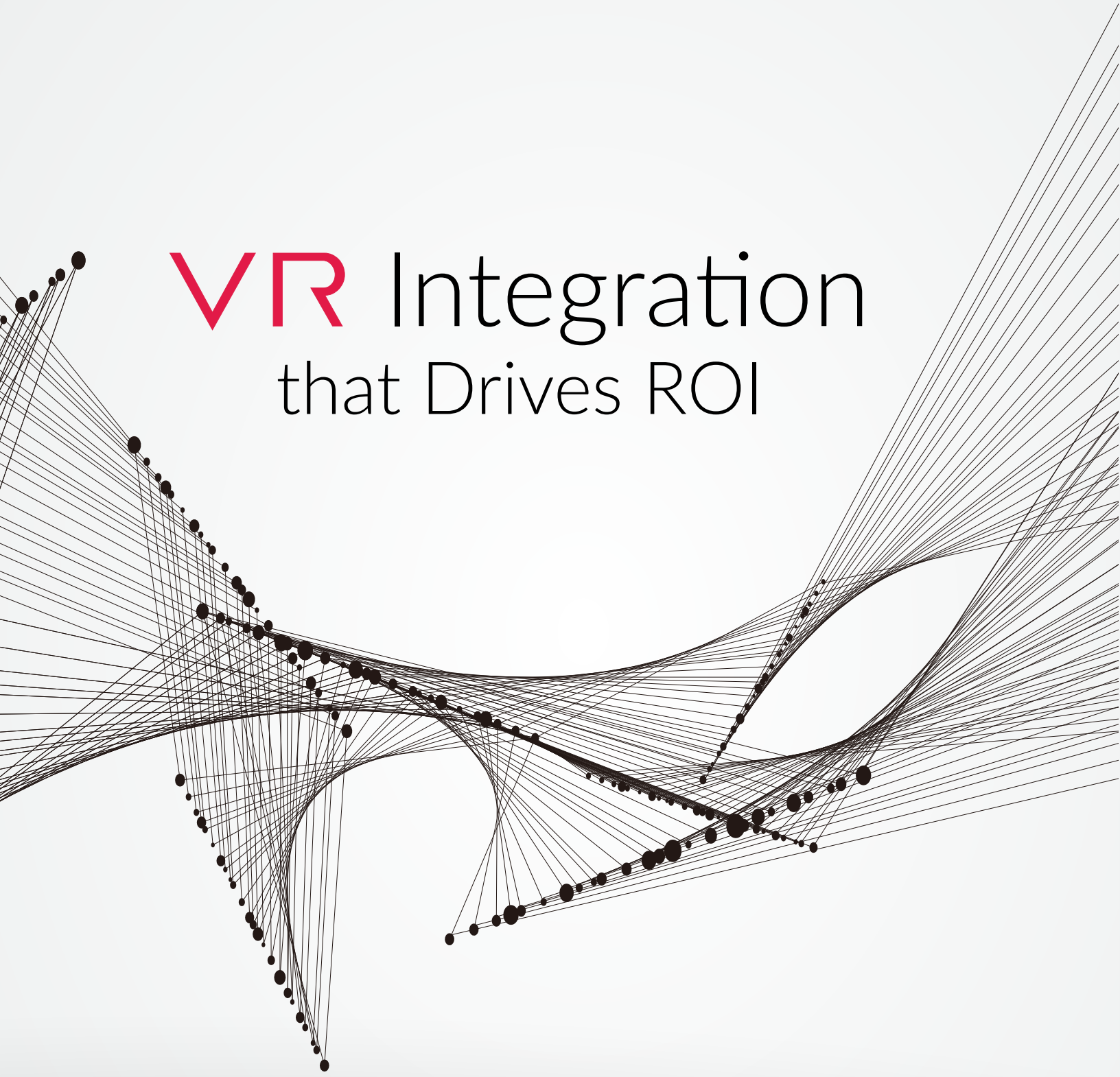
VR Integration that Drives ROI



YULIO VR

VR Integration that Drives ROI

Immersing your clients in a space is the goal of VR, but to be its best, the level of immersion needs to be as frictionless as possible.

Introduction

The promise of VR as a ubiquitous technology has been on the horizon for decades. But the move to mobile VR, with inexpensive headsets and widely adopted smartphones is poised to make it less novelty and more reality through 2020 and beyond. VR is moving beyond entertainment, and into everyday business.

At Yulio, through early 2017, we've seen design and architecture firms move rapidly from having no knowledge or experience with VR to having experimented with the technology and even having VR experts on staff. The question now isn't so much whether VR will enter the design space, but how will it be used to greatest effect and ROI. The design industry is an obvious fit for VR - most humans, even those working in the design field, are challenged by visualizing 2D or 3D drawings in real space. VR is the first solution that unambiguously translates a designer's vision for collaborators and clients. It is the move from obvious fit to everyday tool that firms are grappling with today.

VR technology isn't mere novelty, available to help you stand out during pitches by being an early adopter. It allows you to share design in a truly immersive way. It is the difference

between seeing something, and experiencing it. And those experiences will create ROI for your firm by enabling faster collaboration, shortening the design cycle and reducing iterations, reducing the back and forth with clients prior to sign off and helping eliminate expensive late stage changes. All of that is possible when ambiguity is removed from your conversations. Immersing your clients in a space is the goal of VR, but to be its best, the level of immersion needs to be as frictionless as possible. To make that happen, you need a practical way of incorporating VR into your workflow. Choosing the technology which will deliver the greatest ROI is challenging in an area filled with hype like VR is today. This white paper aims to help you adopt a virtual reality solution that adds the greatest value to your operations — and to integrate it as smoothly as possible into your business workflow while keeping the VR viewing experience as positive as possible for your clients.

05 The Value of VR

VR eliminates the gap between a designer's vision and client's perception in ways that blueprints or 3D renderings cannot. Being immersed in a virtual space engages viewers in a visceral way and allows them to instantly understand what you're proposing.

Meanwhile, collaboration tools let you explore that space together with your clients, whether you're sitting around the same table or on opposite sides of the world.

Those benefits translate to meaningful results, from wowing potential clients with a VR-enabled online portfolio, or reducing revisions and approval timeframes because clients can truly see how a design will look, right from the word go.

We believe that the novelty factor of VR will wear off over the coming months and it will be part of standard presentation practice, as evidenced by end user clients who are beginning to write VR presentations into their RFPs. For our design clients, Yulio aims to make VR a practical, everyday business tool that helps share and iterate great design stories - not one that masks those stories with novelty.

Getting Started

Yulio recommends you choose hardware and software based on the criteria of how well they fit with your desired design and storytelling workflow. Start your investigation by considering your business objectives. This will lead you to understanding the capabilities your VR system will need to have. For example, is your vision to use fully immersive VR at trade shows or in your own boardroom for major presentations? Or do you believe VR has a place in more levels of iteration? What about internal collaboration and pitching? How do you want to share your VR designs with clients? How can you use your VR designs for lead generation? Those questions will help determine your hardware needs as we outline in the following sections. Naturally, your budget is a key factor in your decision-making process, so we provide some thoughts on that as well.

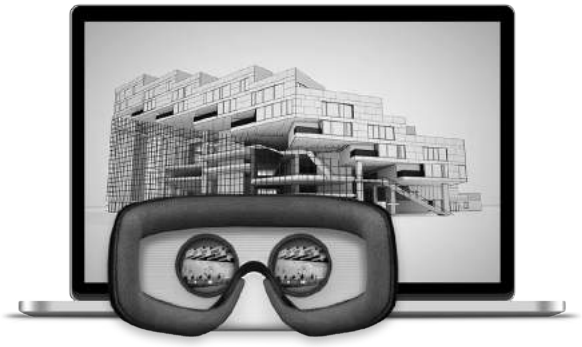
Finally, you'll need to think about how you'll produce your VR designs. That's both a software issue as well as a workflow issue, and we'll walk you through those considerations in the final section of this white paper.


STATISTICAL DATA

Understanding the hardware options

When it comes to choosing a virtual reality setup for your business, you've got a number of hardware options to choose from. These range from very simple and inexpensive to highly sophisticated setups that cost thousands of dollars.

As we describe below, VR systems fall into four basic categories:



Fishtank VR

Description: A "lite" version of VR that allows anyone with a computer, tablet or smartphone to view an image or space in an approximation of three dimensions.

Hardware requirements for viewing:
A computer, tablet or smartphone.

Pros: Viewable remotely by anyone with a screen — no headset required. For that reason, there are no special hardware costs. Depending on the software you use, real-time collaboration may be possible. A good option for highly motion-sensitive people to get an approximation of VR.

Cons: Because it's not fully immersive, fish tank VR lacks the impact of true virtual reality. It's also harder to get a sense of scale and distance with this approach.

Best for: Publishing on websites or in any situation where you want to reach a broad audience and can't assume they'll have a headset. It's also a good option for quickly making and sharing designs, without the need to share on a headset (especially while headset ownership isn't ubiquitous). Fish tank VR is viewable by anyone, anywhere and so can be a good option for an online portfolio or other lead generation activities. At Yulio, we've also found it effective to share what a viewer is seeing with a larger group. Fish tank can have a role in removing some of the isolation from individual viewing experiences and be broadcast on a screen to a larger team.

Entry-Level Mobile

Description: A smartphone coupled with an inexpensive headset, such as a simple $15 Google Cardboard. This setup allows viewers to look up, down and 360° around them (something that's often called three degrees of freedom).

Hardware requirements for viewing: A VR-ready smartphone and a basic, inexpensive headset, such as Google Cardboard.

Pros: A reasonably priced way to create a highly immersive experience without the nausea and other drawbacks of a tethered VR system (see below). Entry-level mobile VR also enables anyone with a smartphone and headset to view your designs remotely. Depending on the software you use, real-time collaboration may be possible, allowing everyone to see what the viewer is seeing.

Cons: Viewers can't actually "walk" through the space. Instead, they're limited to experiencing your design from fixed viewpoints. And unless you invest in a dedicated smartphone (which adds significantly to the price), the immersive experience can be interrupted by incoming texts, calls, etc.

Best for: Face-to-face or remote meetings. Because headsets are relatively cheap, mailing one to each client or to qualified sales leads becomes a viable option when using this format for lead generation. Entry-level mobile is also functional for creating a shared experience, where you can walk clients through your design and present points of interest. The headsets will cost you $15-$20 each, available from the Google Store and some variations, like the Homido are on Amazon as well. To run them you only need a smartphone with a viewer app installed.

We recommend you consider dedicated smartphones to avoid potential interruption to the viewing experience from incoming messages, etc

Yulio Tip:

Paper or cardboard headsets are also brandable for client giveaways. You can also use them to engage viewers with your content, as a reward for newsletter sign up etc.


Google

Immersive Mobile

Description: A smartphone coupled with a higher-end headset. As well as letting you look up, down, and 360° around you, it can translate your head and body movements in a limited way. This is known as three degrees of freedom plus.

Hardware requirements for viewing:
A VR-ready smartphone coupled with a higher-end headset, such as GearVR or Google Daydream. The Daydream also includes a hand controller for interaction with different apps.

Pros: Although this costs a little more than basic VR, it's still reasonably priced at $100-$200 per headset. It creates a more immersive experience than entry-level mobile without the nausea, isolation and other drawbacks of a tethered VR system. And like entry-level mobile VR, anyone with a smartphone and headset can view your design remotely. Depending on the software you use, real-time collaboration may be possible, allowing everyone to see what the viewer is seeing.

Cons: More expensive than cardboard style mobile. Viewers still can't actually "walk" through the space. Instead, they are limited to experiencing your design from fixed viewpoints. And unless you use a dedicated smartphone (which adds significantly to the price), your immersive experience can be interrupted by incoming texts, calls, etc.

Best for: Face-to-face interactions with clients and potential clients, including meetings outside your office. Ideal for creating a shared experience, where you can walk clients through your design and present points of interest. Our user testing has also shown that it is slightly better for motion sensitive people than the cardboard viewers.

Tethered VR

Description: A dedicated VR rig, such as an Oculus Rift or HTC Vive, where the user wears a headset, uses controllers and is tethered to the system with a cable.

Hardware requirements for viewing: A headset, controllers and a computer with enough speed and graphics processing power to handle your VR files. In the case of Vive, you'll also need tracking cameras.

Pros: Completely immersive, allowing you to move through the space, rather than being confined to fixed viewpoints. (This is known as six degrees of freedom.) Depending on the software you use, real-time collaboration may be possible. What many people think of currently when they think of "VR".

Cons: Expensive, several thousand dollars. Setting up the system may take hours and dedicated floor space, and viewing VR with a tethered system requires an assistant to make sure the viewer doesn't trip over the cables or move outside the active zone. Viewers may experience nausea — in some cases, to the point of vomiting. More minor but common concerns that create friction are whether the headset will affect the viewer's hair or smudge their makeup, and how sanitary the headset is. People without gaming experience may be intimidated by the technology.

Consider that your clients may feel foolish in front of colleagues, wary of being sick, or of looking ridiculous with messy hair etc. These apprehensions, along with concerns about not being able to manage buttons or controls etc. all take a person out of the viewing experience. The level of immersion is ruined by these distractions. As a result, we have removed all straps from our headsets, to give users a greater sense of control. Additionally, we work with 'gaze to go' movements to navigate a virtual reality scene, so there are no additional controllers and the learning curve is mere seconds.

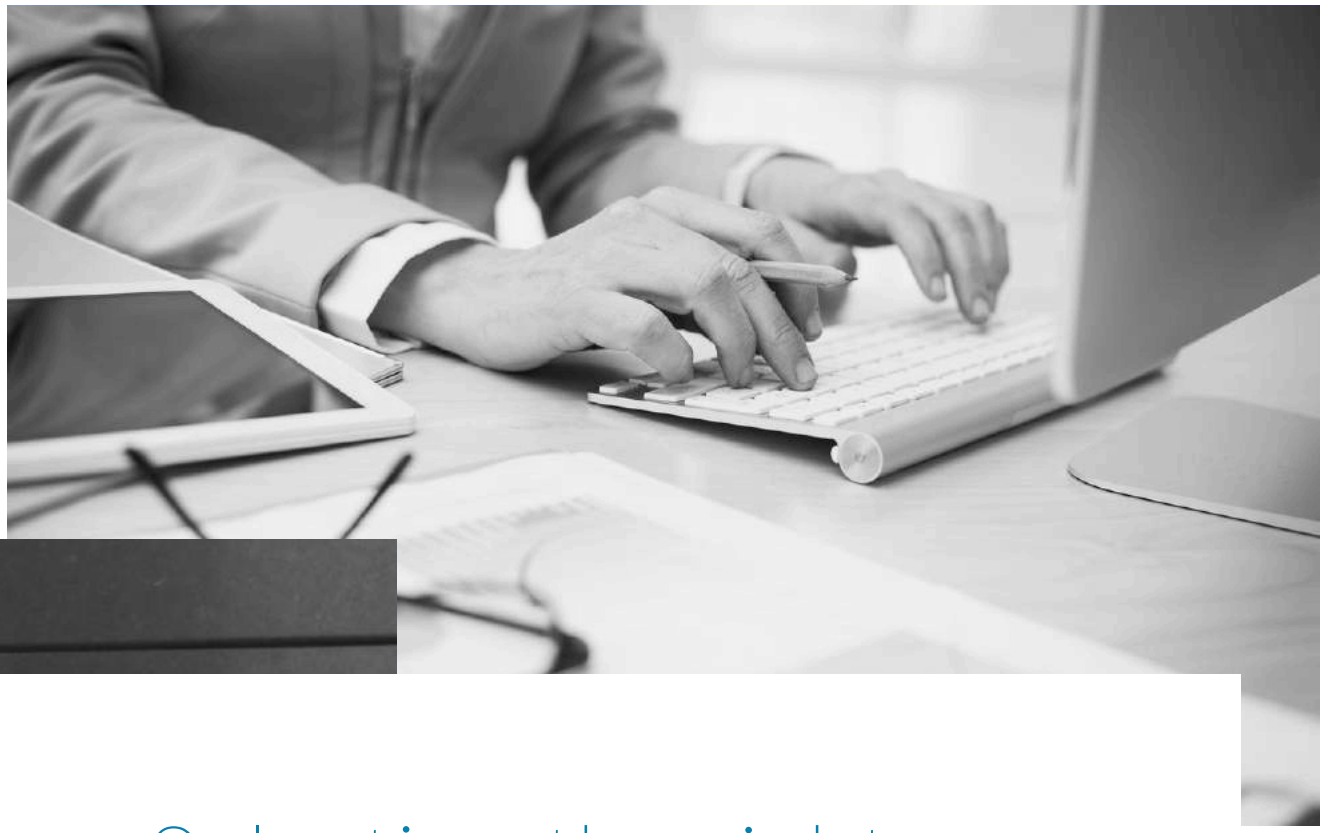
Best for: More permanent setups where the audience comes to you: at your office, in a kiosk or at a tradeshow, for example. Definitely the most immersive, providing the truly wow factor for VR

At Yulio, our user testing showed that people reluctant to wear the headset (both male and female, for the record) had a lot of anxiety around being essentially blindfolded.


htc
VIVE
VIVE

Summary at a glance

	Fish Tank	Entry Mobile	Immersive Mobile	Tethered
Ease of Integration	High	High	High	Low
Immersiveness	Moderate	Good	Very good	Best
Best Used for	Portfolios, Lead Generation and distance clients	Remote or in person when clients don't have access to headsets or when you're testing a concept or pitching	In person, in your office or the client's, and for collaboration	Trade show or showcase in your office, major project designs
Ease of setup	Best	Good	Good	Poor
Ease of viewing	High	High	High	Need assistant to ensure safety
Ability to share and view remotely	Yes	If viewer has a headset	If viewer has a headset	No
Risk of negative viewer experience	No	Unlikely	Unlikely	More likely
Cost	Minimal	Low	Moderate	High

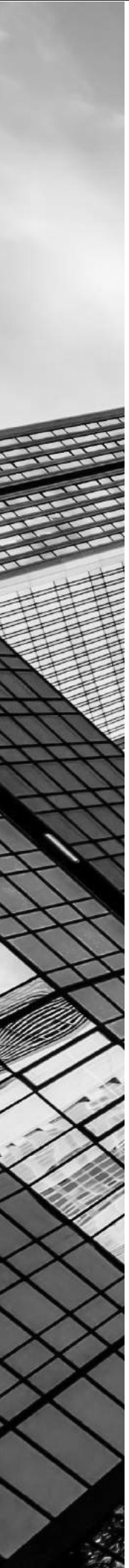


Selecting the right authoring software

Once you've chosen the best hardware options for your budget and desired uses, your next step is to choose a software system to create your VR experiences which can be viewed on your hardware.. There are a number of options available that enable you to transform 3D renders into VR.

You'll also need software to handle the storage, distribution and viewing of your VR files. You can satisfy those needs with separate pieces of software, or find an authoring package that includes all those features. If you opt for separate software, you'll need to ensure the different elements work together seamlessly, and that each solution is integrated into the appropriate part of the workflow.

When you're choosing a package, consider the questions on the following page.



Does it work with your current CAD software?

Most authoring software is designed to work with one or more of the main CAD packages. Whether you use SketchUp, 3Ds Max, Revit or Rhino, a simple plugin should allow you to work with your favourite program — but you'll want to confirm the level of integration for this before you commit. Check on the frequency of updated from the software as well, and how they handle version control of the CAD solutions and their plugins.

Can the resulting file be viewed on different operating platforms & headsets

To maximize the value of mobile VR, you'll want to ensure your clients and leads can view your files, regardless of what particular smartphone and headset they're using. Look for a software solution that makes your designs accessible across as many devices as possible. If a solution is fully integrated with a given hardware maker, it could be problematic as we expect significant churn in headsets through 2017 and 2018. Ideally, any software you are using will have a plan for dealing with technology releases on their product roadmap. Ask about the compatibility with different smartphones and headsets, and how they plan to keep pace with launches of new apps and VR viewers. Ideally, you want a solution that works across devices, and is hardware agnostic.

You don't want to have great designs you cannot view if the hardware they were created for becomes obsolete.

You also want the VR experience you are presenting to be consistent across devices so that it maintains design integrity and quality, so also check on how the software handles multiple sign ins across devices. And, because there likely won't be a standard for viewers for some time and your clients may be using many different devices. You want a VR partner to be staying abreast of the changes in hardware, so that you don't have to.

Is it intuitive to use?

The more intuitive the technology is to use and the more easily it integrates into your existing workflow, the less disruption it will cause and the less training will be required. Ultimately, that translates to a lower total cost of ownership. Managing software integration when there is a significant change to workflow is challenging and typically requires longer runway and more check ins to ensure staff are using the solution. There is no substitute for actually using the interface and plugins in your own environment, so look for a partner who can offer you a trial so that you can assess how intuitive it is. With your own designs and machines.

Does it enable collaboration?

One of the most powerful ways to use VR is as a tool for collaboration. Does the software you're considering allow different people to view your VR experience at the same time? (And if so, how many?) Are there tools for directing the viewer's attention, e.g. pointing out features and marking up changes?
At Yulio we have seen architects notice issues with design in VR and comment that they would never noticed the issue in any other format.

Does it provide the security you need?

Access control and protection of your intellectual property are critical, and like any enterprise class solution,

you should expect a VR provider to be suitably world class in its security and controls.

If you're looking at a cloud-based system, make sure the files will be stored securely. You will also want to have author and viewer control so that clients are not accidentally exposed to designs that are not for them. It →

will likely make sense for you to be able to set levels of access by function - authoring vs. editing and viewing etc. Yulio recommends our clients each have their own software seat to prevent accidentally sharing files across clients. Each client facing representative should be able to control the content on their own device, not only so that they can control their presentations, but to ensure client NDAs are not violated. You should also ask about downtime, client response commitments and other details around the provider's Service Level Agreement (SLA).

Does it offer analytics?

At Yulio, we believe VR should be an everyday business tool for design firms. For it to be that, measuring the impact and ROI and reporting on the value of ROI in lead generation and client conversion are important. Whether you're posting VR files on your website, emailing links to your immersive designs to targeted prospects or sharing your creations over social media, look for software that tracks how many viewers have opened a file, where they viewed it and for how long. Even a high level of analytics will provide you with insight into popular design styles and may help you have meaningful conversations with potential leads to improve your sales process.

Be aware, however, that this kind of tracking must comply with the privacy regulations in whichever jurisdictions you're targeting.

How much support is available?

Make sure you can access help when you need it. A VR coach and launch specialist are critical when you are first integrating VR into your firm. Use them to help you get the workflow right and get those first VR experiences created so that people feel comfortable continuing to trial the new software. At Yulio, we have found that the most successful stories come from designers who experiment at different levels of fidelity and executions, so the design team needs to be comfortable with the process early in adoption. You want VR to enhance your design story, not create technical stumbling blocks. And you want the support available every time you are authoring a project after those initial experiences are created.

To get the most value out of a new technology like VR, it's also helpful to have access to an online community of users to share ideas and best practices. Creative uses and business integrations are changing frequently in the space and keeping up with the trends will help you maximize your investment in VR.

Finally, make sure the solution you've chosen will continue to update their product and support the platform and CAD software you work with, and has a product roadmap for continuous improvement in the rapidly changing space.

Is it priced in a way that fits your firm's needs?

Prices — and pricing structures — vary significantly between different packages, but typically follow software patterns, based on either users or projects. Look for something that gives you the best value now and will continue to be cost-effective if your use expands. Keep in mind that project-based pricing may keep your costs lower in the short-term, but it discourages experimentation and discovery of best practices. We recommend you look for a pricing structure based on users, so that experimentation is unlimited.

Budgeting for VR

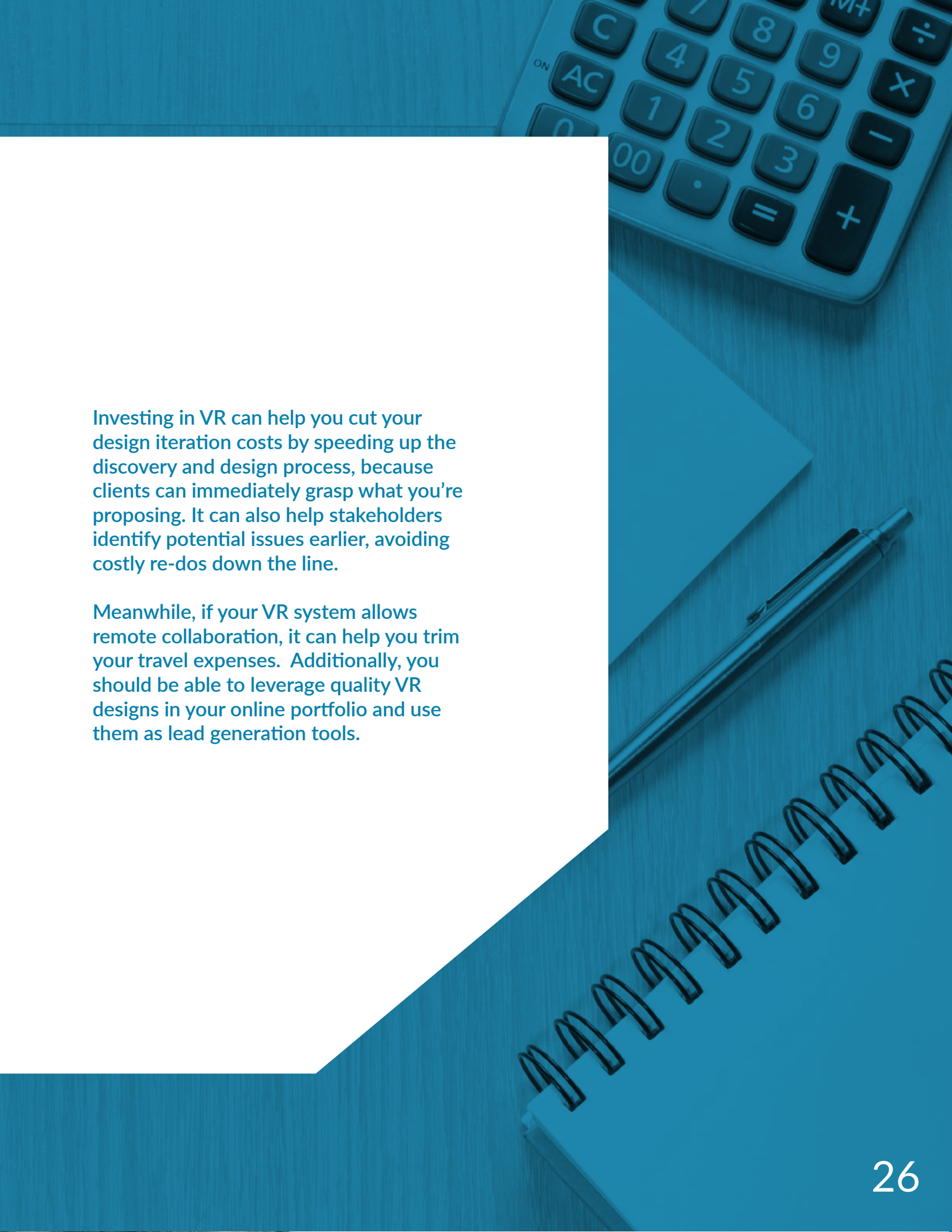
Introducing any new technology or process into your business creates new costs: hardware, software, training and extra workload. However, if you choose the right system, it should also create a significant return on investment.

Let's start with hardware costs. Different VR systems come with significantly different price tags, so think carefully about what type of setup will create the greatest benefit for your firm. Along with the headsets, think about the cost of any dedicated smartphones or computing power you may need. While these costs may be optional, you should consider them as part of the total cost of ownership. When you're looking at system costs, don't forget to build in a budget for regular upgrades to your hardware and software.

Next, balance those costs against the return on investment. Many firms think of VR as a marketing tool — and there's no question that if you jump on the bandwagon early, VR can set you apart from your competitors, helping you attract new clients and win more bids. However, in time the novelty factor will wear off and you'll want to consider other opportunities for leveraging your VR integration.

Investing in VR can help you cut your design iteration costs by speeding up the discovery and design process, because clients can immediately grasp what you're proposing. It can also help stakeholders identify potential issues earlier, avoiding costly re-dos down the line.

Meanwhile, if your VR system allows remote collaboration, it can help you trim your travel expenses. Additionally, you should be able to leverage quality VR designs in your online portfolio and use them as lead generation tools.



Integrating VR into your operation

You've done your homework, chosen the right system and invested in the appropriate hardware and software. Now how do you go about integrating VR into your workflow as seamlessly as possible? We lay out the considerations.

Creating/authoring

Essentially, creating a VR experience should be a simple additional step that happens once you've produced your CAD renders. Workload considerations: Creating VR experiences will increase design workload, a little, but if you are using a seamless plugin to your CAD authoring software, this can be a few clicks and a few minutes, depending on rendering speed. Additionally, because VR spaces are 360-degree environments, designers have to account for the fact that the viewer can turn around. While not all views need a full design, you don't want to leave your audience looking at white space. As a result, you may need to add design elements to close those gaps and ensure an immersive experience. Additionally, designers may need to link their renders to show multiple areas or viewpoints. This can only be done in software that offers hotspots or other links

Training considerations: This varies significantly, depending on your choice of software. Some authoring software literally requires just a click of a button to convert a CAD rendering to VR. Others require your CAD operators to acquire more technical expertise – potentially including 3D program, considering polygon counts and much more.

Storing & distributing

Confirm with your software provider how your files are stored. Are they created on the user's local machine? If so you'll want to create a library for firm-wide usage. If there's a cloud solution, you'll want to understand the security of the servers and the privacy of your intellectual property. And how can you grant access to the files for remote viewers and for your website?

Viewing

You can't wow clients with your VR experience if they can't open the file. To make your fish tank and entry level mobile VR designs as viewable and shareable as possible, the file format should be something that everyone knows how to view, like URL links and should be shareable via channels they're familiar with, like YouTube, email, and social media. For immersive mobile, you'll want to make sure the file format is compatible with any brand of headset. For tethered VR, you'll need to set aside enough floor space: plan on a minimum of 6x6 feet.

Budget considerations: For mobile VR, consider how many headsets you'll need. One for each member of your sales team? Cheap Google Cardboard headsets you mail to every client or qualified lead? For tethered VR, don't forget to budget for computer power and be aware you'll need staff person present to keep viewers from tripping over cables or straying outside the active zone.

Training considerations: To ensure clients have the best VR experience possible, your salespeople need to know how to guide them through the process. This means being familiar with the headsets, controllers and the process of navigating through a design, and potentially being able to guide people through this in a boardroom in front of a team, or remotely. If they're using a tethered setup, they also have to know how to keep clients safe.

Collaborating

VR takes collaborating and iterating to a whole other level, helping you avoid potential misunderstandings or miscommunication. To take full advantage of this potential, look for software that allows real-time collaboration. For example, some software allows your client and design team to view a VR file simultaneously and to use pointers to draw attention to whatever feature you're discussing.

Training considerations: Everyone involved in collaboration — such as your designers, clients and sales team — will need to understand how to use the tools. You will also want client facing team members to have a good script for guiding clients through the design, and for capturing feedback for the design team.

Next Steps

Deciding which setup to use can feel intimidating, but asking the right questions and taking the time to explore the possibilities will ensure you find the best solutions for your firm.
Start by meeting with your team to discuss your objectives. Identify what capabilities your VR system will need from both a hardware and software perspective. Think through the implications of integrating VR into your operations on things like your budget, workflow and training requirements. Then investigate software options which offer trials or other ways to road test the integration. Great and seamless VR authoring should help you create immersive experiences with limited time invested. Finally, use the trial and investigation phases to experiment. Virtual reality is a powerful technology, and this industry is only just beginning to understand its full potential. Best practices and success stories will come when your team trials this, but at its simplest you can consider the power of VR in any place you are currently using visual images in your practice.

Whichever mobile headset you choose, consider removing the strap so clients never feel anxious, disoriented or trapped (and don't need to worry about messing up their hair).

Summary of Key Considerations:

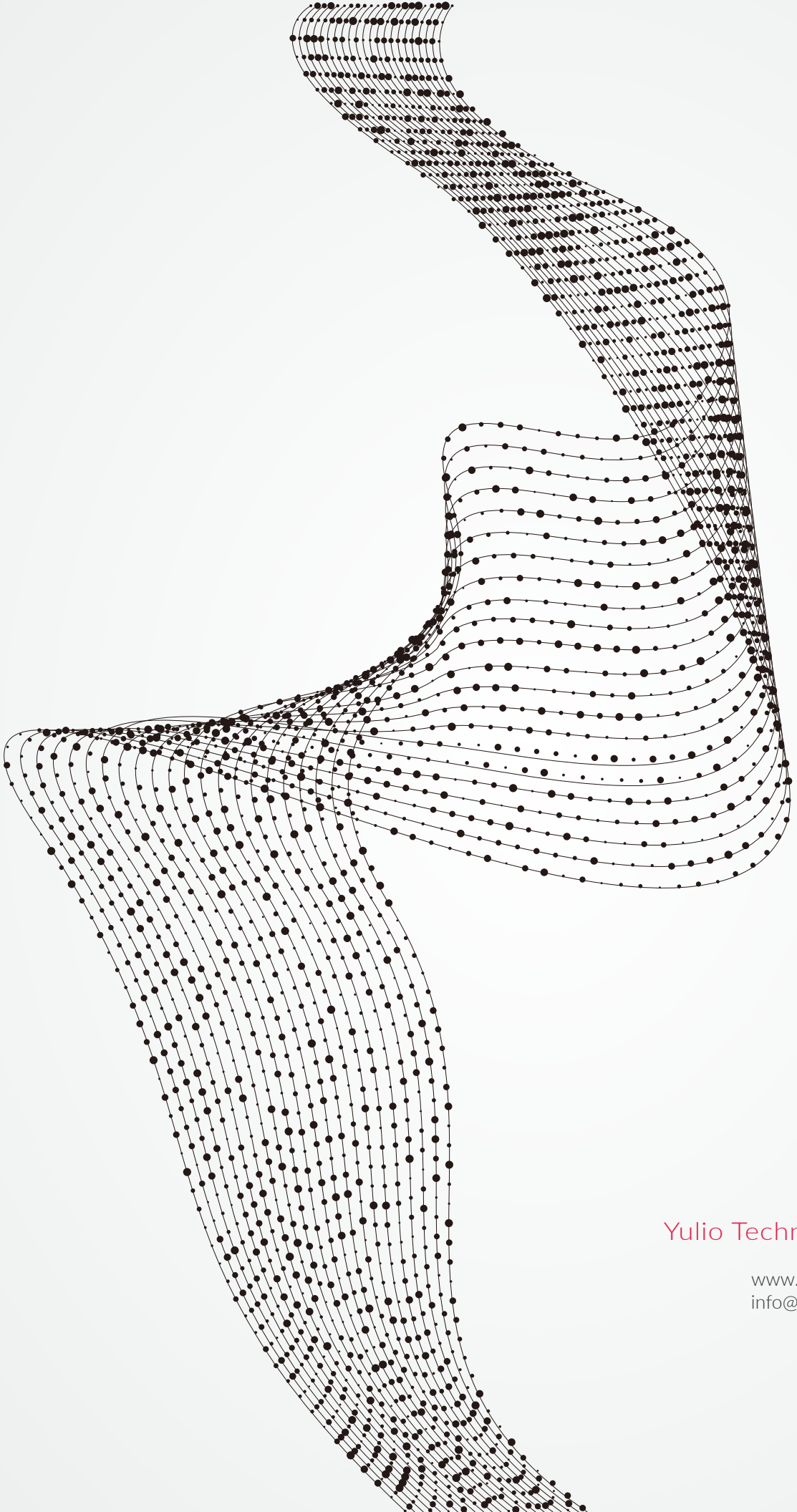
Hardware - which solution fits the way you want to present VR experiences - on a laptop with fish tank style, with a mobile solution or in full six degree tethered VR?

Software - find a solution that works with your existing CAD software, allows for collaboration and directing the viewer and which will show your designs on any type of hardware. Consider the value of an analytics component, and a solution priced to allow for experimentation.

Integration - how does the solution create the VR experience - how turnkey is the integration with my authoring software, and what is the learning curve on both authoring and viewing. Are the skills set you need all in house? How will you share the designs after authoring and how can you use them for lead generation?

We hope you've found this whitepaper valuable on your journey to integrating VR into your business.

Visit us to learn more at yulio.com



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