



A Room with a View: VR brings Architecture Designs to Life

LIKE THIS STORY:



5 LIKES SO FAR



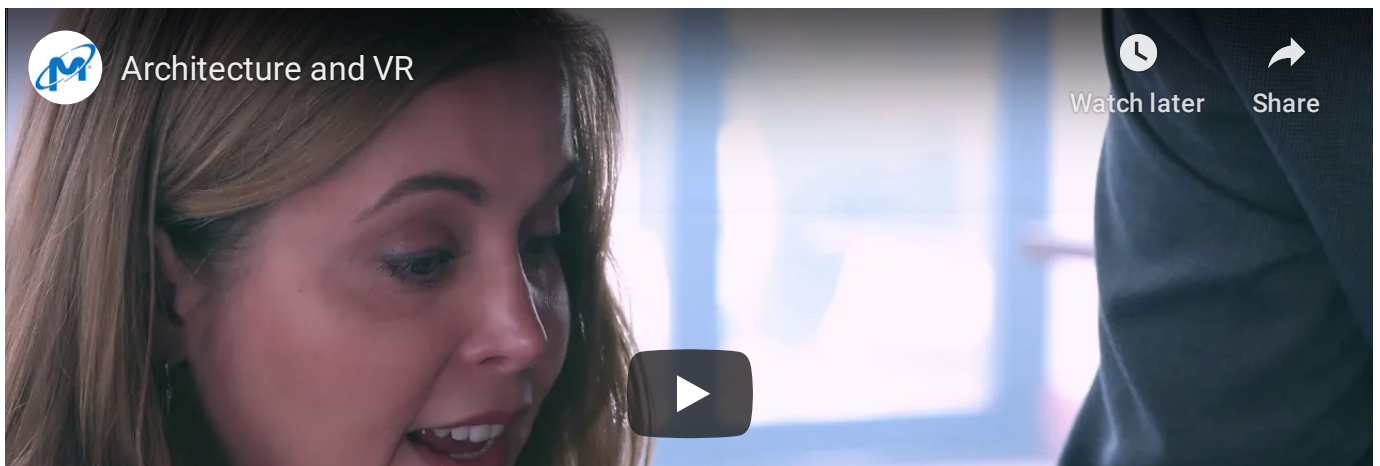
Architecture and VR

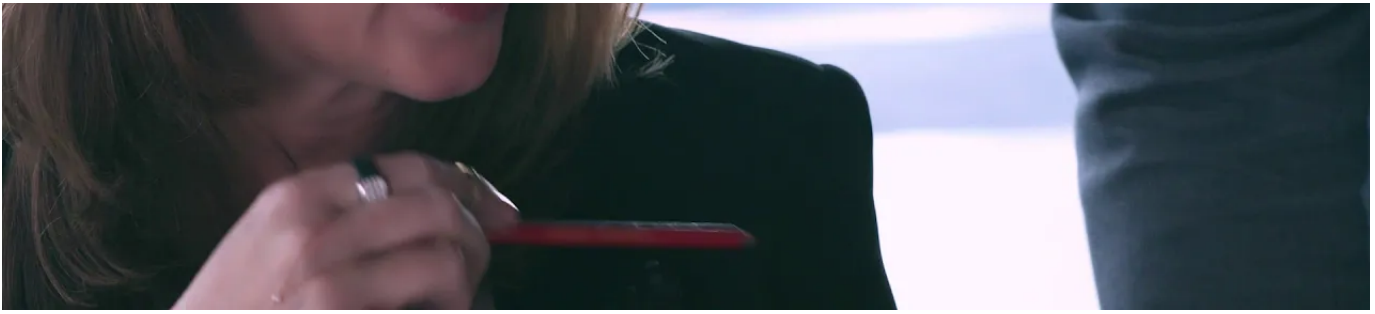


Watch later



Share





Imagine walking around in a building being designed for you before construction has even begun: the vaulted ceilings, light streaming in through the generous windows, the spiral staircase, or, if it's a commercial structure, the jostle and hum of customers crowding the aisles and assessing your merchandise.

But, you ask, will all this sunlight be too warm in the afternoon? North-facing windows might be best. Or the aisles in your store seem too crowded, so you ask to improve the flow. In a moment, the space around you morphs, accommodating your requests: a brick wall here, French doors there, smaller windows on this side of the house and an entire wall of them facing north, wider aisles.

Bye, bye, blueprints. Architecture is changing, thanks to digital technologies, and it will never be the same. No longer will customers need to squint at lines on a page and try to imagine the spaces they define. No more will change requests send architects back to the drawing board, racking up hours and driving up costs — because those changes can be made with a few clicks or even instantaneously, as soon as the customer asks, with no action required at all.

Virtual reality (VR) and its cousin augmented reality (AR) are [already transforming](#) not only the experience of having a residential, commercial or industrial building professionally designed, but also the act of designing itself. “We can use VR to explore a house or building before the first shovel of dirt gets turned,” says Amy Gile, CEO of Silverdraft Supercomputing. Her company’s Demon and Devil supercomputers drive new and emerging technologies, including VR, AR and artificial intelligence (AI) for industries such as architecture, engineering and construction (AEC).

A Matter of “When,” Not “If”

With [40 to 80 percent annual growth rates](#) in VR and AR use expected in all sectors over the next 10 years, customers are going to demand these technologies, and AEC industries will have no choice but to provide them. But those in AEC stand to benefit immensely, too — by reducing errors and their concomitant cost; by creating a smoother, more coordinated workflow; and, in many cases, by relieving designers from the most tedious aspects of their professions. With technology doing the grunt work, [designers can actually design](#).

Gile sees Building Information Modeling (BIM) software — which uses VR, AR, data analytics, the cloud, and soon artificial intelligence — as the next logical steps in the AEC timeline. “First it was paper and pencil. Then architects shifted to digital technology with AutoCAD and Revit for 3D design,” Gile says. “Each iteration makes it easier for the client to understand the vision that the architects, contractors and engineers are creating.” VR- and-AR-driven BIM software, she says, “is just another evolution of that tool to get everybody on the same page and collaborating.”

The Benefits of VR and AR

If you've star-gazed in distant galaxies or lounged on the beach under a virtual sun while the snow falls outside your door, you already know that VR is fun. If you've walked through the Parisian medieval palace [La Conciergerie](#) using a Holopad to view the feast hall now, overlaid with how it appeared in the 10th century, you know the educational benefits of AR. In AEC, these technologies offer the same benefits, plus many more, for industry professionals and customers alike.

But just how are AEC projects enhanced by VR and AR capabilities during the design process? These technologies provide benefits before, during and after construction.

Bye, bye, blueprints. Architecture is changing, thanks to digital technologies, and it will never be the same.

Before Construction

Winning proposals: For AEC, the benefits of VR begin before a prospect even becomes a client. Being able to literally [walk interested parties through a proposed design](#) by putting them in a pair of VR glasses can provide a distinct competitive advantage over those still using screens to show their ideas. And if prospects spot a problem, being able to resolve it right before their eyes can indicate a level of responsiveness that non-VR users cannot provide. For time-critical projects or those with other challenging aspects, using VR can mean the difference between clinching the deal and walking away empty-handed.

Streamlined workflow: Although satisfying to many professionals, drawing blueprints could take weeks and entail many revisions, slowing a project and driving up its price. VR- and AR-driven BIM software can [cut the time from visualization to design](#) to just a few hours — and produce a higher-quality rendering to delight the client.

More accurate analyses: Cost overruns and missed deadlines could become relics of the past as BIM software sorts, sifts, and analyzes all the data associated with a project for more accurate cost estimates and scheduling.

Enhanced collaboration: Using VR, architects, engineers, interior designers, contractors and clients can virtually inhabit the same space at the same time — before the space actually exists — to discuss materials, terrain, techniques, design and other aspects of a project. When the various parties on a project can work together regardless of their physical location, everyone wins, especially the client.

Silverdraft's Gile used her company's hardware and VR BIM software to design her house, and she found that the ability to make changes in the virtual environment preconstruction saved hundreds of thousands of dollars on the project's ultimate cost. As Giles said, "Pixels are easier to move than dirt."

Better community support: Sometimes, projects are controversial simply because they're misunderstood — and with good reason. Not everyone is visually oriented or able to crack the code that blueprints or even 3D models

present. For gaining community support, VR can really shine.

Large public projects, in particular, can sound alarm bells among community members fearing change. One firm offered passengers at Waterloo Station, the U.K.'s busiest train station, VR glasses to provide a [sneak peek of station terminals](#) after a planned renovation. In another incident in [Dunedin, Fla.](#), “adamant” public opposition to a plan to replace two causeway bridges faded after residents got an immersive, 360-degree VR view of the finished project as envisioned.

Greater flexibility: Using [ray trace technology](#), which tracks the path of light through a scene, VR can mimic the effects of changing light from the sun and other sources for designers and clients to view. Based on the results, designers can adjust accordingly.

During and After Construction

Fewer mistakes: By holding up a tablet or donning a pair of glasses to view instructions and materials, builders can see precisely where the nails go and even what kind of nails to use. They can see which materials they need on hand and how much. If there's a flaw in the design, they can see that, too, and tag it for review and correction, perhaps in real time. Soon, artificial intelligence could make these decisions instead. 3D printers onsite could produce trusses or other needed materials, as well. “The technology is endless,” Gile says.

A permanent model: Refurnishing, remodeling and even selling a home or commercial building will be much easier when contractors can use the AR and VR models created in the design process. Likewise, providing a VR model to realtors means that buyers can “try before they buy.”

“Pixels are easier to move than dirt.”

Amy Gile

CEO of Silverdraft Supercomputing

Challenges or Opportunities?

Change is hard, and naysayers can be quick to point out obstacles to VR and AI's full adoption in the AEC industry. Many others, including Gile at Silverdraft, see exciting opportunities ahead as these digital technologies come into their own. Despite these opportunities, there are still a few challenges to consider, including the upfront costs of the technology and the speed with which it is changing.

Cost: The price tag for all this fancy technology and the hardware to drive it is the proverbial elephant in the room. Costs can seem prohibitively high, especially for individual projects such as home design. But the savings in time,

reduction in errors and ability of technology to perform many more routine tasks may make up for — or even exceed — spending increases on the front end.

Keeping pace with technology: With innovations and improvements appearing at a breakneck pace, taking advantage of new technologies — and providing them to clients and customers in a timely fashion — can be tricky, to say the least. Instead of trying to be a “techspert,” AEC designers can partner with a trusted enterprise such as Silverdraft. Such partnerships ensure that professionals are working with the most current tools and offering the best value to customers. And since technologies tend to become more efficient with each refinement, workflows and costs could improve as well.

Speed Is of the Essence

For VR and AI, using the right hardware is key to providing a quality user experience. These technologies entail processing huge amounts of data in the shortest possible amount of time — literally at the speed of thought. “Your mind has to believe it,” Gile says. “In this virtual environment, you’re tricking your brain that it is real. Anything in this virtual world that inhibits tricking your brain ruins the experience. You need to have a certain number of frames per second, so speed is essential.”

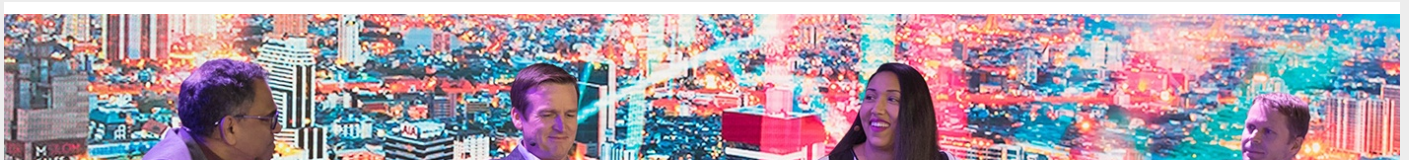
To make sure their supercomputer Devil servers and Demon workstations are literally up to speed, Silverdraft relies on Micron memory. “GPUs (the graphics processors required for visuals) are designed to slow down as they get warm, generally after about 15 minutes,” Gile says. “Most people are in VR longer than that. Once the system starts to cool itself and slow things down, it starts dropping frames.” Although the viewer may not notice a dropped frame, the brain does, and motion sickness can result.

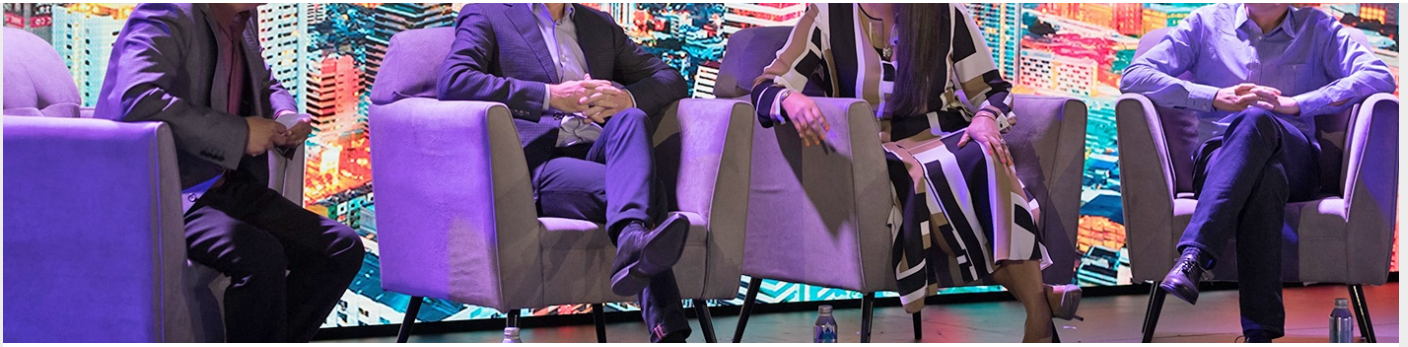
Silverdraft’s systems don’t have this problem, thanks in part to Micron’s superfast GDDR6 graphics memory, DRAM memory, and solid state drives she says. “The absolute best components that can go inside these systems are critical,” Gile added. “For the performance we get, we need the best — especially around virtualization.

“Collaborating with Micron and what they’ve enabled our architects to do, it’s incredible,” Gile says. “I think it’s number one.”

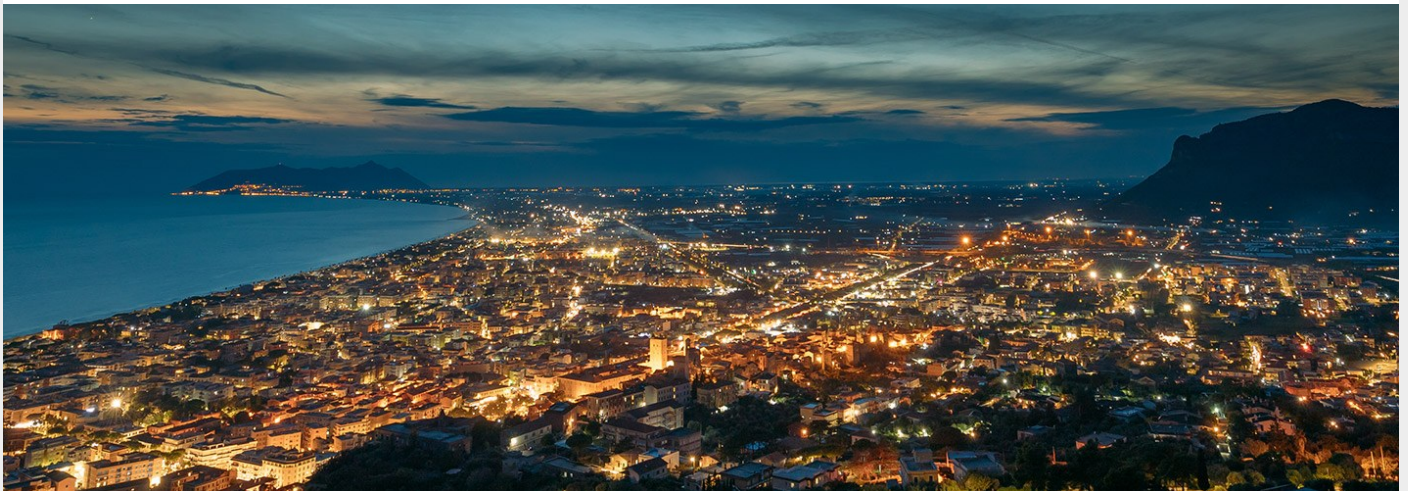


More Stories Like This





5G: Accelerating Intelligence at the Edge



Infographic: Solve 5G Data Challenges at the Edge





Staying Connected With 5G



[Products](#)

[Solutions](#)

[Support](#)

[Insight](#)

[About](#)

[Sales](#)

[Support](#)

[Contact](#)



[Legal](#) [Privacy](#) [Suppliers](#) [Careers](#)

©2020 Micron Technology, Inc. All rights reserved. Information, products, and/or specifications are subject to change without notice. All information is provided on an "AS IS" basis without warranties of any kind. Drawings may not be to scale. Micron, the Micron logo, and all other Micron trademarks are the property of Micron Technology, Inc. All other trademarks are the property of their respective owners.