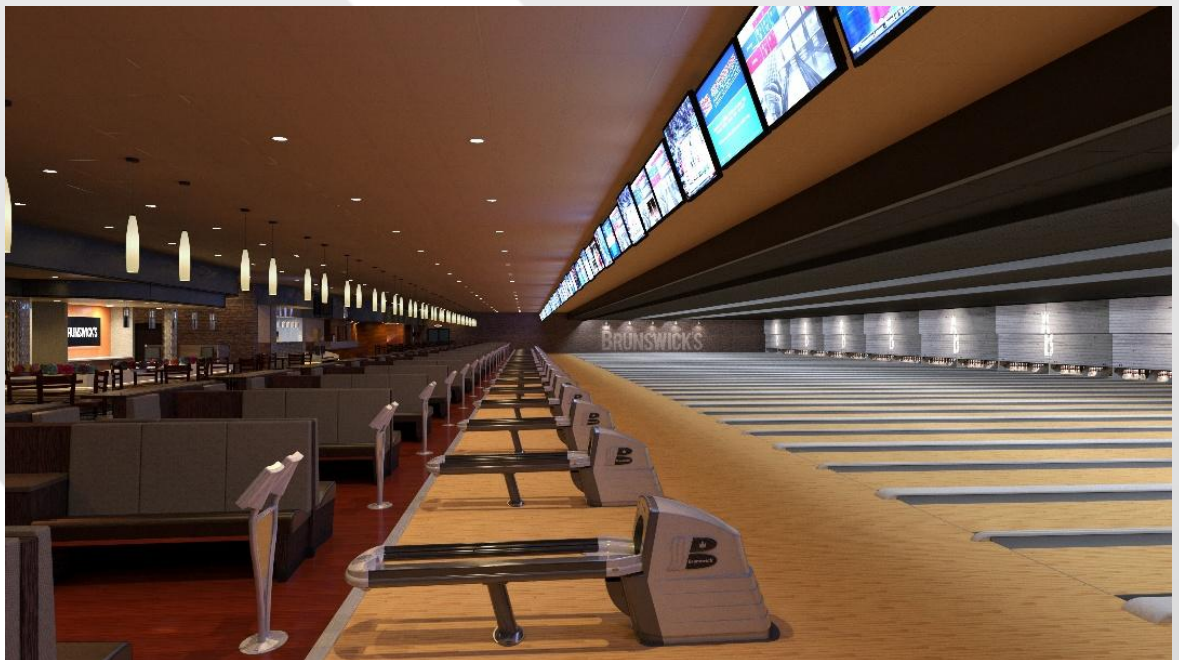***George Matos was sold on BOXX workstations, even before he enlisted them to power the virtual reality in Blue Marble 3D's EON Icube***

By John Vondrak
www.boxxtech.com

Whenever George Matos made the rounds of a major tradeshow like Autodesk University, he was able to engage potential customers in discussions surrounding digital technology—from photo-realistic rendering and panoramas, to full-motion computer animation and interactive virtual reality simulation. His knowledge made him a sought after consultant, but with each new prospective client, there would be that odd moment when he presented his business card which read George Matos, VP/Technology & Visualization, Chipman Design Architecture. The term "architecture" was a bit of a curveball. "We had a good, knowledgeable consulting arm," says Matos, but because our name included "architecture," we were always on the receiving end of a funny look that said, 'So what do you know about this kind of stuff?"

The puzzled looks, however, were not the soul impetus for creating a subsidiary of Chipman Design Architecture known as Blue Marble 3D. In fact, Chipman had already been considering the development of an entity outside of the architectural community itself. In the autumn of 2012, Matos had an idea that he kicked around with others at the firm about what it could mean if Chipman were to form a separate visualization company. This was some muddy water they were getting into, since It would mean that there was the possibility of doing different work for other architectural firms and (even though these would not be direct competitors to Chipman), how would that work in regard to billing and other business matters? What about actual space? How much would be required?

It was an admittedly slow process, especially when the company began its foray into virtual reality (VR) which Matos had already been providing for one of Chipman's other clients. Matos experience with the technology began when Chipman created renderings for a national restaurant chain. The corporation wanted to take advantage of VR technology in the redesign of their restaurants and tasked Matos with finding a virtual reality facility. "They asked me to research and then advise them on a selection," Matos recalls. "After some study, I told them that EON Realty was the way to go." Matos then worked closely with EON (located in Irvine, California with other locations throughout the world) on the project, so by the time that Blue Marble 3D was ready to launch, Matos had already been working with EON for over a year.

After the Blue Marble 3D division was created, Matos and John Chipman flew to Irvine for a visit to EON Reality headquarters. Matos had worked with EON on their virtual reality facility construction, but John Chipman had yet to experience a virtual reality cube or cave. As far as Blue Marble 3D offering VR, Matos admits that he wasn't expecting to do it right away. All that changed however, once John Chipman met EON CEO Mats Johansson, took the full tour, experienced the technology, and in a matter of days, wanted to include virtual reality within Blue Marble. "So now, in addition to what we had already been doing," Matos recalls, "we would be expanding into something completely new."

By September of 2013, with six Chipman employees coming on board, Blue Marble 3D was ready for business and despite its other services, much of the talk surrounding it would center on the EON Icube, their virtual reality solution which, for those in the architectural design world, can translate into serious cost-savings for clients. For example, if a restaurant chain wants to create a new interior design look for their stores, building an actual, full-size, physical mock-up can cost between $200,00-$300,000 depending upon the size—and that's before requested changes. "The client typically builds a portion of the restaurant," says Matos, "like the front of the house, the counters, or a portion of the seating area.

But if they want to make a change, lighting fixtures, for instance, it can really drive up the cost." Virtual reality on the other hand, lets the client experience how the space will look and feel without actually physically creating it and making tens of thousands of dollars' worth of changes.

Creating for Virtual Reality

The Blue Marble 3D team tries to do all design work in Autodesk® Revit® which can sometimes be a challenge when working with clients. "We want to try and have everyone in Revit," says Matos, "and if they're not, then we'll do it ourselves because it benefits them in the long run. Being in Revit has a direct correlation to the virtual reality experience. If it's just two dimensional drawings from CAD, then it's not real construction data. With Revit data, if we're inside the cube and discover some aspect of the design is not right, then we also know that it's not right in the Revit drawing and we can change it."

When asked if he encounters many clients who are not working in Revit, Matos says that it simply depends. "Half of our firm is CAD and half is Revit," he says. "So it's really driven by our clients. Sometimes the work is already done in Revit and other times we have more to do. One customer has gotten to the point that we do all the work for them, then we send the file down to them, and all they have to do is hit 'play.' They don't need someone to actually put it into the EON software—we do it for them. Sometimes we give it to them with materials on there while other times, they just want the

model. It takes us half an hour to an hour to take the Revit model, pop it into the EON software, send them the file, then they go in to look around and see things. In those instances, the customer discovers that they now see things they were not seeing merely with Revit itself (plans, sections, elevation) because now they can virtually walk through the space."

Following the Revit work, rendering is done using Autodesk® 3ds Max®. "All renderings are done in Max," says Matos."But we do have to make the model more optimized for virtual reality. It can't be a very high poly count, because if it is, the VR doesn't work very well."

For those unfamiliar with VR, this may seem contradictory at first, but Matos points out that virtual reality is different from photorealistic renderings. "We had done both rendering and 3D renderings before," says Matos, "and those are photorealistic. But they're on a wall. It's like going to an IMAX theater. You're not immersed in it like you are with virtual reality."

From 3ds Max, the renderings are transported to the EON software. "3ds Max is a conduit to EON's VR software," says Matos. "On either the architectural or construction side, we can bring you in to experience VR, but the interesting thing about this technology is that it's not going to look photorealistic. That's not what this is about. It's about the spatial awareness and being able to look around. For example, we can pre-program aspects of the design so that we have five different flooring samples, two carpet choices, three tile, different wall coverings, lighting fixtures, and furniture. We have designers, branding team members, and company executives virtually walk through two different seating layouts with the options triggered as they move through the cue line, or go to the counter to pay, etc. and with the flick of a button, do it again with a completely different seating layout."

Virtual Reality, Real Advantages

Matos also mentions that the advantages of VR are not just about aesthetic considerations. Sometimes it's about mechanical features like HVAC and soffit conditions, which, because they can see it, enable the client to make the right decisions or adjustments. VR is also critical when the space in question has to be optimized for functionality,

such as in healthcare construction. "When you're doing a prototype of an operating room," he says, "we can mock up what that room is going to be. VR gives you the ability to move things, so instead of looking at a flat representation with no sense of space, you actually feel like you are in there. In fact, it's seems so real that when you step inside our cube, we have a spotter to ensure that you don't run into the three walls. You can't tell where the actual wall is."

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Because change orders are such a critical (and costly) aspect of the design process, VR can be essential in keeping construction costs low. Matos relays an experience involving a client's renovation of a Washington, D.C. hotel. The client had an architect on the project, but was also intrigued by the possibilities of VR. The project was a 12 story hotel featuring rooms positioned around a main floor atrium—and an 8-story chandelier. They gathered the entire team from all over country and through virtual reality, Blue Marble 3D was able to "place" the group at ground level and balcony levels, and let them look up and out at the chandelier. The experience proved to be most instructive. "From the main floor looking up, the chandelier looked great," recalls Matos. "But what they discovered through virtual reality is that from the higher floors, it looked too small. With the software, they asked us to make it bigger. We told them we couldn't stretch it, but we could move it. We raised it up two stories and when they looked at it again, everyone was pleased. So, thanks to the virtual mock up, they were able to tell the architect that the eight story chandelier needed to become a ten story fixture. This is a clear example of how we are able to mitigate the cost of change orders after the fact."

Challenges

Because much of our conversation centers on design firms as clients, I ask Matos if that was where most of Blue Marble 3D's business derived, or did it come from retail customers—restaurants, hotel chains, hospitals, and the like. "It's a mix," he replies. "We obviously have our existing clientele that we still do work for—rendering and other things, but we also have new clients—even on the Chipman side. When we create proposals, we submit them as Blue Marble to include renderings and virtual reality. This is an option now. In addition to that clientele, we have those who we are finding on our own that have nothing to do with Chipman.

Regardless of where the clients originate, once they experience VR, they're sold. Sometimes however, the challenge is first getting them *to* experience it. "What we find is that it is often hard for them to integrate virtual reality into their current offerings," Matos admits. "They want to use it, but are trying to figure out how. Sometimes it requires finding the right project to justify the cost. Some clients ask if they can experience it remotely and we are trying to work through that. The other key piece, with construction teams coming here, is that often they work on projects all over the United States. The cube is physically here, so the problem can be getting them here. They have to be willing to travel. But for those who do take advantage of the opportunity, once they leave, their minds are spinning with ideas of how they can integrate it and use it. I recently emailed a BIM manager for a major hospital and told him, 'It might be worth it for you to come out here and look at this because you're going to be able to see your project a different way,' which he did."

Although virtual reality has been in existence for a number of years (mostly in the domain of universities and some private entities), Matos insists that Blue Marble 3D is offering it now because he sees it as technologically improved and more affordable than ever before. "Yes, it is expensive," he admits, "but it's more affordable than it was five years ago. It looks

better, it's more realistic. In three years, I think it will be even more economical, but it's a different way of thinking and you have to let your mind adapt to the fact that you're not in the physical world. You're in the virtual world and that can be difficult. We let clients sit and move around in the cube before we move them with the controller. We let them get acclimated at first. You have eight feet that you can physically move around in inside there, so we can then use the controller to move you virtually beyond those eight feet."

Becoming a BOXX Shop

The Blue Marble 3D EON Icube features four projectors, each one powered by its own BOXX Technologies' 3DBOXX 4150 XTREME workstation, the company's liquid-cooled, overclocked, Intel® Core™ i7 workhorse. Each workstation features an NVIDIA K6000 graphics card. "The GPU is how the image gets synced and loaded into the cube," says Matos.

Prior to BOXX (and prior to Blue Marble 3D), Chipman relied on HP workstations, but that changed based on a recommendation from former Autodesk 3ds Max manager Shane Griffith, who now serves as product marketing manager at The Foundry. "He said I should be looking at BOXX, so we bought one machine for evaluation," recalls Matos. "My premise is that I always let the users evaluate it because I'm the CTO, the tech guy, and not the actual end user. When we got the first one, I didn't have the visualization team yet, so I brought in my Revit guys to 'spec out' a machine that I could compare to an HP. We set the specs, a high price point, installed everything, gave it to three different users to test, and in minutes they said, 'This is far better.'"

That spec became the Revit standard workstation at Chipman as the company added more 3DBOXX models: 3970, 4050, and 4120. "They noticed the difference right away," says Matos, "especially the responsive time. The specs were the same, but they noticed when

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flipping between the viewports and rotating around the model, that they no longer experienced any lag. It was the quickness, flipping between things inside it, it didn't matter—same model, two different machines, and the BOXX was just

that much quicker. There wasn't even lag with multiple programs open or switching between Revit and Adobe® Photoshop® or Revit and CAD. There were no issues at all."

Once Blue Marble 3D came into existence, Matos needed 3ds Max workstations for his new team and selected 3DBOXX 4920 XTREME GPU, a liquid-cooled, overclocked Intel Core i7 workstation optimized for the most demanding 3D scenes and engineering assemblies. Just like with Revit, the Blue Marble team noticed a remarkable difference with BOXX. "With Max, we can load up to four GPUs. Our users have anywhere from two to three per system—it just depends on how they use Photoshop and other applications. It gives them the ability to do a little rendering, but when they really need to kick it off, they can send it to the render farm where we have both five GPU and seven GPU systems."

Where larger firms have projects that may extend for months, Blue Marble 3D jobs typically last from one to three weeks and with the addition of BOXX workstations, they probably last even less. "BOXX has really accelerated our efficiency," says Matos. "We're no longer waiting for files to open, or when moving between viewports. Our users are more efficient and we're saving money. ROI is hard to say, but probably as much as 1.5 hrs a day."

One Size Does Not Fit All

But it wasn't smooth sailing when Matos first switched to BOXX, forcing HP to try and keep them in the fold. "I remember a group call with eight people on the phone," says Matos. "It was a half hour disaster. Their argument was that Intel only allows you one overclock and my response was 'That's not my problem—it's BOXX's. BOXX will take care of me if the thing overheats or burns up.' Our Revit workstations aren't overclocked, but the Max ones are and the overclocking has never been a problem."

"The tier ones have one script they work off of for everybody," says Matos. "When we were looking at workstations, Dell and HP wanted to put dual processor motherboards in there whether we needed it or not—plus it raised the cost significantly because on the Max side, when we do GPU renderings, we needed more cards in a single machine to create our little render farm and Dell and HP wouldn't offer that. The power supply wasn't there and the board wasn't big enough to support four GPUs. What Blue Marble does is very unique. BOXX recognizes this and offers that difference, that uniqueness. It's been great ever since we adopted BOXX for all of our workstations."

And as Shane Griffith had done for him, Matos recommended BOXX to EON Reality, which had also been an HP shop. When we started talking to EON about what we had, I said you need to look at BOXX because their machines will destroy HP for running the cube. EON followed up with their own testing, and went with BOXX as well. I always say the proof is in the pudding."
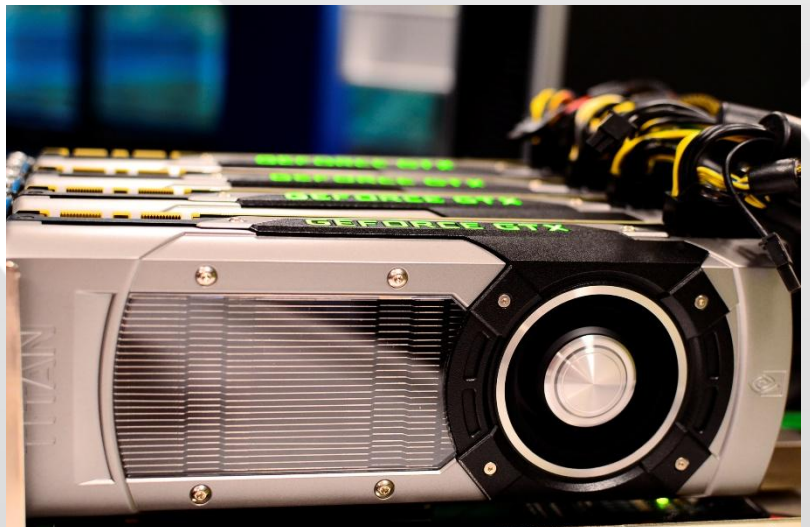
Legendary Support

In addition to BOXX performance, Matos is also impressed by the advantages of BOXX customer support. "When I call (BOXX sales consultant) Rich Petit and I need something, he gets it. He can deliver the quote right away or if I need an answer I'm not finding on the website, he knows it. If it's something that requires even more tech expertise, he'll get me the answer and it's a quick turnaround—an easy, smooth transaction. No time wasted and I'm not pushed around from person to person to person. Rich is there to take care of it."

When the topic turns to technical support, Matos admits that he hasn't had to rely on them for much, but when he has, he's equally impressed—especially by their efficiency. "We had a memory stick go bad one time," he recalls, "and BOXX technical support knew what it was through the blue screen code. We had the new stick first thing in the morning the next day. We had a hard drive issue one time and a replacement drive arrived the next day. When we call BOXX tech support, we speak directly to a professional located at their headquarters, who is easy to communicate with. And if we need something, we get it right away."

As Chipman and Blue Marble 3D continue to grow, Matos says that they will continue to stick with BOXX. He recalls that when he first started introducing BOXX at Chipman, there was a fair amount of envy and anticipation involved since Revit users were given BOXX workstations before the CAD users. "There was jealousy over who had a BOXX workstation," he laughs. "Everyone wanted to know when they got theirs, but Revit users took priority since it was a more compute-intensive application."

Between Blue Marble 3D and Chipman, the companies have purchased over 45 BOXX workstations in less than two years, along with a pair of renderPROs as well. "We have those because we're starting to do some things that are CPU intensive," says Matos. He adds that there are still a few lingering HP computers on the floor but says they are quickly disappearing. "BOXX is our choice for workstations," he says matter-of-factly. "And we look forward to continued growth with them, as well as all the exciting BOXX technology still to come."

More about BOXX workstations

www.boxxtech.com/products/workstations
Speak to a performance specialist at **512-835-0400**

More about Blue Marble 3D

www.bluemarble3d.com