I’VE SEEN THE FUTURE

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“Virtual reality was once the dream of science fiction. But the internet was also once a dream, and so were computers and smartphones. The future is coming.”
- MARK ZUCKERBERG, Facebook post, March 25, 2014

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By Tyler Hay, Chief Executive Officer

Recently, a client of ours, who works at Bellevue-based Valve Corporation, invited me to experience something that’s likely to have a revolutionary impact on the human race. Valve is the coolest company that you’ve never heard of, partially because it’s privately held and partly because they enjoy the anonymity. Valuing the company remains elusive, but in 2012, Forbes estimated it had surpassed Electronic Arts (EA) in net worth. At the time, EA was considered the leader in software game development. Today, EA has a market cap of $19 billion, leaving it to anyone’s best guess how much Valve is worth. My suspicion is it’s more than EA by a wide margin.

Valve’s culture is intentionally Darwinian. You won’t find bosses, standard corporate hierarchy, monthly performance updates, or a dress code. Employees work on projects that interest them and are reviewed annually by a team of their peers. In a self-adjusting way, employees must work on projects where they add value. Therefore, ineffective employees, or ones who misallocate themselves to projects where help isn’t needed, receive poor scores. In talking with employees, you get the sense that this process is both appreciated and efficient. The collection of Ivy League geniuses and computer prodigies that work at Valve don’t seem to view what they do as a job; instead it’s more like they are a part of a movement toward the greater good.

In its infancy, Valve was a game developer. During my youth, I was one of their early adopters playing a game called Counter-Strike, sometimes in unhealthy doses. Whenever, I tell a Valve employee that I grew up on their games, I expect them to judge me (after all, “serious investment people” should have had their heads continuously buried in some financial textbook, right?). Their reaction, however, is exactly the opposite: They seem to like that I’m different than most of the financial people they have met, and they also revel in the fact that they, too, are different.

Today, their roots are still in games; however, a few years ago they decided to pursue a momentous undertaking. Valve chose to build their own console dubbed Steam to compete with Microsoft’s Xbox and Sony’s PlayStation. Even more recently, they’ve tackled an extremely ambitious challenge: virtual reality (VR). In partnership with HTC, they’ve developed a new VR platform, called Vive.

They are not alone. Sony’s PlayStation 4 and Facebook’s Oculus Rift are also attempting to crack the virtual reality space. However, Vive is unique because it’s the only VR experience that allows users to physically move around, while the others are a stationary experience. In addition, Vive allows players to use specially designed controllers that help users perform a number of functions in the virtual world from controlling player movement to engaging objects.

None of the systems are without drawbacks. Vive and Oculus require the user to wear a headset that's tethered back to a PC. Trying to avoid stepping on this cord as you alternate between different realities can be annoying. I admit that I have not tried the other competitors but the goal of this piece isn't to compare and contrast VR experiences by manufacturer. Instead, it's to announce the emergence of VR into realm of mainstream technology and explore the positive creative disruption it's likely to trigger.

Virtual reality as a concept is not new. It was originally called Sensorama, which I personally think is a bit catchier! It's a classic case of life imitating art as science-fiction has long been forecasting its arrival. The term "virtual reality" was coined in the 1982 novel by Damien Broderick, *The Judas Mandala*. Despite being imagined for decades, it wasn't technologically feasible until recently. Breakthroughs in both display quality and computer processing power have now made it a viable mainstream technology, enabling the creation of these new digital realities. Interestingly, it isn't big software companies lining up to develop the first ways in which users will experience this rich new medium. The reason is simple economics; the installed base of VR systems will initially be too small to warrant a sizeable investment. Therefore, it will be left to small garage companies that will really pioneer the direction of development. The big boys will sit back and wait to see which types of VR uses take off, then break out the checkbook to make some unshaven millennial a billionaire. Given what I saw at Valve it won't take these small developers long to catch the attention of the bigger players.

It was during my VR experience that I started imagining the vast diversity of its application. While I can only speak from my experience at Valve, I truly felt as though I was in another place. It was a collision of realties. In one reality, I knew what was happening. I was in a 15x15 room six floors up in a downtown Bellevue office building wearing goggles with cords attached to a PC that was creating a digital world for me to experience. At the same time, my mind left that building and suspended what I knew to be reality. During one of the simulations, the clash of realities occurred as one of the demos took me to a dangerously high platform inside a warehouse. The floor around me began to crumble and I found myself moving off the collapsing portions to the area of the floor section that remained stable. Why?! I should have known that the floor beneath me was the office environment I had witnessed before putting on the goggles. The experience they've been able to create is more than enough to get the brain confused as to which reality to follow. I felt truly a sense of presence in that virtual world.

In another example, I was asked to pull open a compartment of a machine that needed to be fixed. Out of the machine's engine slid a section that expanded like a kitchen drawer. Next, I was told to move to the other side of the machine. How did I move to the other side of the drawer? As our brains have been trained to do, I walked AROUND this virtual drawer. The audience at Valve laughed at me. To those not in the virtual world, they saw me carefully maneuvering myself around empty space, but inside the goggles, I saw a drawer that I needed to negotiate around. In the real world, we have to walk around things. In a virtual world, I could have simply walked through it!

It's important to realize just how early this technology is in its development. In fact, many of the challenges developers are facing were truly unforeseen consequences. For example, imagine being on a virtual treadmill bouncing up and down as you stride, a slight jolt occurring at every impact of your foot. Your mind and thinks you're running but instead you're standing in virtual reality room simply "experiencing" the feeling of running. As some of the early adopters learned the hard way, the human brain doesn't like the feeling of moving when in fact it is not controlling the moving. Nauseous users quickly forced VR makers to edit the experience before it got too

messy.

Another interesting thing has started to emerge in the VR world that surprised innovators. Users attachment to individuals within this alternate reality became more complex than the games we've previously known. Anyone who's played video games knows that there are times when your character becomes helplessly low on "life or health" and the player is better off committing "suicide" and starting over with a fresh start. During a VR demo, a player did this and all the other players stopped playing the game to condemn the act. Right or wrong, this has been a completely acceptable thing to do under prior gaming experiences. The attachment to the characters has become so rich that the bond developers are going to be able to create will change the experience. Today, Valve generates large sums of money selling accessories for in-game play. Think of a cool "digital" paint job in a car race. The "accessorizing" possibilities will become endless in a virtual world where players are more strongly attached to characters and objects.

Let's now examine some of the ways our lives might be impacted by the emergence of virtual reality as a technology. If you think I'm overstating, consider this statement by one tech blogger: "People will spend the majority of Waking Time in virtual reality by 2020." While that may be a stretch, it's coming faster than nearly anyone would expect. The diversity of application is why I think this blogger is on to something.

In no particular order, think of the effect of VR on the following:

FILM: Technological enhancement in animation took us beyond traditional cartoons and brought us films like *Toy Story*, *Cars*, and *Finding Nemo*. Storytellers from Hollywood, whether they know it or not, will soon be meeting with the garage VR techies in Silicon Valley as the film industry collides with this new medium. New companies will spring up from this unique marriage. Movie theaters themselves will likely have to change, as the viewing experience could be dramatically different. The days of being sedentary three hours while shoveling buckets of popcorn and sucking down 64 oz. sodas may be a thing of the past. TVs may become obsolete as viewers opt for VR goggles that allow a much more immersed viewing experience. I wonder how many investment portfolios today are built around that possibility.

Ten years from now, we will look back in awe at the effect VR has had on entertainment. Comparing a VR experiences to what we're used to today will be a bigger leap than even the evolution from silent black and white films to HD and Surround Sound. Imagine the scene in *Saving Private Ryan,* where they disembark from the landing crafts onto the beaches of Normandy, France. Bullets are flying everywhere; soldiers are falling wounded as waves of men attempt to overtake the cliffs above. With a VR headset, you could look anywhere you wanted to take in the scene. You could move around the beach to see different scenes of the battle. You could soar 50 feet up into the sky and take in a bird's eye view. Hell, (and it might literally feel like hell) you may even be able to pick up a weapon and join in the fight! Film will become more interactive, more liberating but also, potentially, more terrifying. Who knows? The VR cinematic experience might even help prevent future wars by giving viewers the sense of how awful they truly are.

Before we can get to that point there will be some interesting challenges which need to be overcome. For example, how do you get the audience to follow the plot of a movie if they can look or move anywhere in a given scene? Stories will be told and consumed differently. And while traditional movies are unlikely to become extinct at the arrival of VR, entertainment

experiences will certainly be available in a radically different form.

EDUCATION: Film is not the only industry that will be disrupted. The educational impact will be profound. VR can make us smarter, more efficient, and reduce socio-economic imbalances by making learning more accessible to all. The army can simulate battlefield situations in a much more realistic way, allowing soldiers to be better trained and prepared for real-life combat, thereby increasing their chances of survival. Doctors can be better trained as they are able to accurately replicate actual medical situations ensuring they operate with a steady hand and cool head because they've "been" there before. Online education will be enhanced. With the ability for students and teachers to move around virtual classrooms, the line between physical universities and online educations will blur. Imagine a world where anyone skilled in a craft can create VR classrooms and teach students. The barriers to knowledge will be lowered and the learning will be easier.

In one of the VR demos I experienced, I was able to manipulate body parts, move them, rotate them, expand their different elements. This may not be saying much, but I learned more about the human heart in 30 seconds of VR than all my high school and college health courses combined! Generational bonds will even be strengthened. Millennials, who are often called upon to help their boomer parents troubleshoot technological challenges, will now be able to use VR to make the experience less painful for both parties. The ability to physically demonstrate actions in real world environments will make instruction much more useful. All of this will mean a change for education companies, teachers, defense contractors, doctors, patients, and a myriad of industries that benefit as a result of easier communication through a VR world.

TRAVEL: The ability to see the world's most historic landmarks will no longer be limited to those with the means to physically travel to them. Already, they are mapping landmarks for people to visit and explore. In the demo they took me to, I "traveled" to the top of Mount Everest where I could walk around, throw rocks, and survey the neighboring mountaintops. Hotel companies will be impacted for better and worse. Those with tremendous features such as a beautiful lobby or lavish pools will be able to showcase these amenities as potential guests preview them through a VR experience before their stay. Those hotels who've mastered "photography" making rooms look far nicer than they are (think Chevy Chase in "National Lampoon's EuropeanVacation") will have a more difficult time deceiving unwitting guests. Imagine a world where tourist attractions like national parks, zoos, and museums, are able to generate revenue with physically non-present visitors.

SPORTS: Sports will also see radical and widespread industry change. The way they're played, taught, and watched will all change. Golf is a great example. This week the finest tournament in professional golf, in my opinion, is being played in Augusta, Georgia. Viewers watch from their couches and are restricted to whatever camera angle the producers choose. Imagine being able to physically move around the event. Chose your own angle. Kneel down to see the contour of the green before a player hits his putt. For those who play the game, being able to play VR reality courses will bring avid fans even closer to the game than ever before. Instruction, too, will change. Teachers are already leveraging smart phones and video to help climb the learning curve much more rapidly. This will accelerate exponentially as VR is incorporated. In Florida, a golf instructor with some downtime can make himself or herself available to teach an eager young student in Iceland as VR allows for a life-like interaction.

The possibilities are endless when we consider the impact and subsequent ripple effects. When the Internet was first invented, who would have guessed all the ways it would affect our lives?

From email, to Facebook, to videoconferencing, to shopping—it's literally changed almost every aspect of our daily routines. For investors, it will be critical to watch and monitor the creative destruction VR will bring. There are always those who prefer the status quo and wish Moore's law (which calls for ever-improving computing power advancement) weren't true. Those who favor this line of thinking should be comforted that not everyone thinks VR has arrived. A recent article in the *Wall Street Journal* by Wagner James Au says this is not the dawn of the next tech revolution. An evangelist of VR 10 years ago, Mr. Au has now become skeptical of its adoption, though it's hard to understand why he thinks this today aside from being burned by it in the past. Here's a link for those looking for a competing view point.

As a firm, we try to look for what we call asymmetrical risk/reward scenarios. It's a fancy of way saying we like investments where almost no one is expecting something. In these situations, the odds shift dramatically in your favor when you're willing to take a position dramatically contrary to the herd. When everyone is expecting something good to happen, the price is generally too high. When everyone becomes exceedingly negative, the price gets too low. And while it's admittedly hard to detect when an extreme is reached, sometimes it's staring you in the face. Recently, investors saw this with oil as it dipped into the $20s. The lower it went, the harder it became to find one person who thought it would stop going down. Today, VR isn't on many people's radar. Either people aren't aware of recent breakthroughs or they don't think VR is ready to go mainstream. Either way, if it does take off investors will be wondering how they missed it. Hopefully, readers who look to us to glean insights will already be ahead of the curve. At this point in time it's the Wild West on the VR frontier. The winners and losers have yet to be decided but to think there won't be massive disruption across all industries is naïve. If we are right, investors will need to successfully adapt to these changes by avoiding those companies who fail to adapt and owning those that can turn virtual concepts into real profits.

Tyler

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Likes__Dislikes

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