

SensoryX

Startup Case Study

*“Can a small VR hardware startup be successful
in the land of the Tech Titans?”*

ETH Entrepreneurial Investments Course

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SensoryX – pushing the limits of immersive VR

The early days of Virtual Reality

Virtual Reality (VR) as a concept has had its ups and downs during the past few decades. In the beginning of the 1990's, the general public was, for the first time, confronted with VR devices, especially in the fields of arcade games and machines. Major gaming companies like Sega, Nintendo and others started rolling out VR devices such as goggles and headsets which could do realtime immersive stereoscopy, impressive 3D visuals and stereo sound. The release of VR arcade machines from the Virtuality group in 1991 and the release of the movie "The Lawnmower Man" in 1992 gave a lot of traction to VR. Virtual Reality as a whole looked to be on the dawn of becoming a mainstream phenomenon. Especially Sega wanted to ride the hype from this freely available marketing and launch a sleek looking Sega's VR headset. However, in the years to come, the hype would not become a mainstream reality, and the project became a major flop.



Figure 1: First Sega VR Headmount and game

Since its inception, VR has had its share of problems. VR is nothing but an illusion in which one can totally immerse their senses and move from one reality to the other. However, because reality is something we are all too familiar with, emulations always felt like cheap reproductions. This was also true for the case of Sega; the experience was not truly immersive. Apart from not being able to release the device on time due to technological issues, users also experienced headaches and dizziness when using the demo versions. The graphic capability of consoles was limited to very low resolution and it was not possible to fix these issues. The company was simply ahead of its time, and needed advanced technologies that were simply not available yet.

Even though the technology was still unavailable, the dream of a truly immersive alternative reality was still alive. With the dawn of a new century, technology began to invade the lives of an increasing amount of people. This resulted in a rapid expansion of the power of our devices; processors became faster, dedicated expansion hardware became the norm, and devices became more user-friendly. With these new technological capabilities, the possibility of a truly immersive VR experience seemed to have become a reality, leading several tech giants to release state-of-the-art headsets. A resurrection of VR seemed to be inevitable. However, even with all the efforts of the past ten years to bring VR into the mainstream, it has still not reached a solid foundation within the industry. This raises the question, can VR become a mainstream technology, and what would be needed to become more than a product for a small group of enthusiasts?

Filling in the gap for a more immersive experience

During the early days of the second wave of VR applications, young entrepreneur and scientist Dr. Rolf Adelsberger was working on his Master's thesis on full-body motion capturing at the Massachusetts Institute of Technology and Mitsubishi Electric Research Laboratories. Adelsberger recognized the potential of the technology he was working on, and the impact it could have on some applications within VR. Could he use the technology he was working on to develop a more immersive VR experience? However, he quickly realized, the field of VR was still young and definitely not advanced enough to sustain a new startup. Instead, he decided to start a PhD in the Computer Graphics Laboratory at ETH Zürich and work on his passion project in his spare time. A few years after the internship at MIT, Adelsberger was presenting the state of his work to an audience where Dr. Fabian Wenner, a financial analyst with a PhD in economics from the University of St. Gallen, was also in attendance. Wenner quickly realized the potential of what Adelsberger was proposing, and approached him for a possible collaboration. Leveraging the underlying research from Adelsberger's presentation, the two decided to commercialize the emerging Intellectual Property through founding a startup together – and then SensoryX was born.

Building SensoryX's wireless VR gloves

The pair was convinced that for a truly immersive experience there was one thing missing, a way to naturally interact with the virtual world. For this to work, you would need sensors that capture the movement and gestures of the user, and the feedback to visual display should be immediate. They looked at existing technologies: controllers that were not only unnatural but also often came with cables that had the user tripping over them, or cameras that allowed the user to move naturally but had problems when vision was occluded. They therefore came up with virtual reality gloves that were equipped with sensors that accurately measure hand and finger movement. They felt that this was the most natural, precise and mobile solution to the problem at hand. To ensure accurate readouts, the gloves are paired with a small head mounted device, directly attached to the VR device worn by the user. This allows them to determine the relative position of the hands with respect to the user's eyes without any external references.



Figure 2: 3D Rendering of SensoryX's Wireless Glove Product called VR Free

The product they developed is easy to use, durable and wireless; the gloves can be washed by hand since the sensors are covered with a waterproof coating, and the transmitting device can be detached from the gloves. Instead of working together with only one manufacturer, SensoryX decided to make their gloves interoperable with the most popular virtual reality displays on the market. An international patent for the concept of usage and positioning of the sensors has been submitted for the European as well as the American markets.

A Challenging Market Environment

Despite a generally strong public interest in virtual reality, 2017 sales of corresponding hardware such as Samsung Gear VR, Oculus Rift, HTC Vive or Google Daydream didn't just stagnate, but often even declined compared to 2016 according to a report by SuperData Research. The same report also states that investments in immersive technology increased 40% in 2017, but more than half of the money went into Augmented Reality (AR) and Mixed Reality (MR), pulling ahead of VR for the first time. On the other hand, the virtual reality market alone was expected to be worth almost \$34 billion by 2023 at a CAGR of around 34%. That, however, includes both hardware and software products, with software being expected to dominate in terms of overall revenue within a few years – yet another piece of bad news for companies invested solely in the development of VR hardware.

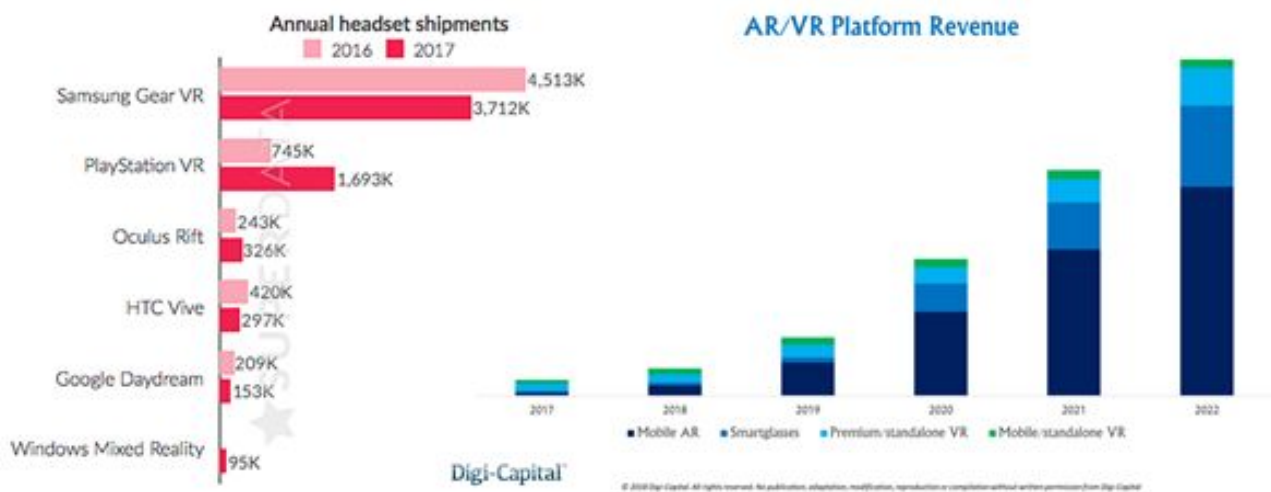


Figure 3: Current market and future AR/VR platform revenue prediction

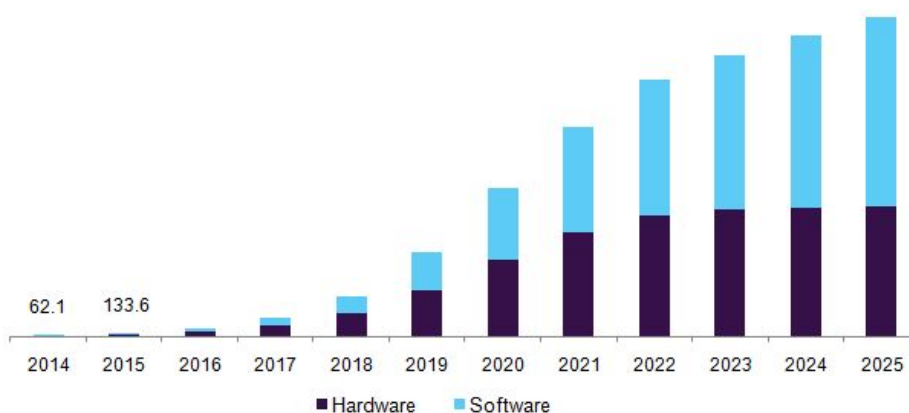


Figure 4: U. S. Virtual reality market by component 2014–2025 (Mio USD Million)

Fabian Wenner was aware of the situation and assured that, given the appropriate software support, SensoryX's technology was easily adaptable for use in AR applications and that they were already planning to set up a field office on the US West Coast to augment their capabilities on the software side of things. This would also allow them to get a foot into other market segments such as medical, military or aviation instead of just VR gaming and entertainment, as was the case back in the beginning of 2018. However, considering the monetary requirements for such an expansion combined with a quite uncertain short term ROI SensoryX still needed to gain a better validation of their product against the mounting competition in order to attract more capital from investors and leverage potential opportunities in Silicon Valley.

SensoryX is by far not the only ones working on Gesture Recognition Technology (GRT) in general, and so-called Gesture Tracking Devices (GTD) in particular. In fact, by 2017 the number of competitors in this market segment had grown well into the double digits, including big players like Microsoft, Sony, HTC and Facebook. Even though SensoryX's VR gloves excel in terms of tracking accuracy and latency, the lack of any haptic feedback during use is a clear weak spot of their product as it limits the depth of immersion achievable in virtual environments significantly. To make matters worse, a number of other start-ups are already working on similarly advanced hand tracking systems providing haptic or even force feedback, with some of them being very close to market or even on sale.

How to prove that the SensoryX technology is superior?

Since Wenner and Adelsberger knew they needed to make sure that the proof of concept was established by having a fully demonstrable prototype, they financed their first version of the product themselves. In May 2017, SensoryX got the first round of investment from StartAngels, an investment company. Apart from the finances, StartAngels also provided them with invaluable advice in other fields of the business by joining the board of SensoryX. The funding was used to secure patents, make marketing video material and move the office to a central location in Zurich. They subsequently grew the team by adding two more developers.

Betting Big in Las Vegas - Showcasing the Product at CES

After the initial development of the product, the team decided that it was time to reveal their product to the masses at one of the most important exhibitions in consumer tech, the Consumer Electronics Show (CES) in Las Vegas. During four intense days, SensoryX presented their product for the first time and over a thousand visitors were able to test the prototype at their booth. The response was tremendous from visitors and the press alike. Not only did people like the gloves, even their competitors asked for licensing possibilities for the usage of the exceptionally precise tracking - thereby giving Wenner and Adelsberger the validation they needed to push things forward with their ambitious funding goals and a potential Series A funding round.

SensoryX's Winning Plan? - A Breakthrough Application

Before going ahead for asking investment from VC's, Wenner and Adelsberger want to make sure that there is enough traction for SensoryX since they still needed to prove the market demand to potential investors. Since the reaction at CES was very good, they decided to roll out the product for a select few consumers using the crowdfunding platform Indigogo. The founders did not focus on thinking that the crowd-funding as a means for directly raising money for their long-term operation, but solely for enabling the first production series of the product, prove the market demand, and get a real first product in the hands of lots of early adopter customers. For this purpose, SensoryX is collecting emails on their website, from interested people. Through

Indigogo, Wenner plans to raise 50k CHF and provide around 150 devices to the customers – thereby getting the money upfront as a means of financing the first production run of the product. Adelsberger is very confident that once the Indigogo campaign is started, they would be able to provide the VR gloves within 8-12 weeks time and then they can begin to get lots of customer feedback and generate the real data points that they need to convince investors of the opportunity within such a crowded and noisy market like VR.

Pricing is a key issue in the VR market. All the other competing consumer devices, are in the range of 200\$ to 400\$. Even though SensoryX VR gloves provides much better features compared to its competitors, they need to set the price within the competitions range. Hence the consumer version shall be priced around \$350 range. The corporate version, with a better quality cloth for the glove and a few more goodies included will be priced at \$900.

In the end, the success or failure of SensoryX comes down to finding the breakthrough application that lets their advanced technology shine. As for their early adopter strategy, Adelsberger is mainly focused on the gaming and entertainment industry, since these companies were the first to pick up virtual reality as a platform and have acquired the most knowledge for building applications. In other industries, the state of current projects is not as advanced, although hospitals are experimenting with augmented reality for surgeons and visualizing fMRI scans. Another interesting application models an airplane's cockpit for a flight simulator in virtual reality, at a much lower cost than commercially used physical cockpits. Furthermore, B2B could be a bigger market for SensoryX when compared to B2C, due to heavy competition, the profit margins in B2C are low and the marketing costs are also higher. On the other hand, businesses like, theme parks, arenas, amusement parks and studios could be an option to enter the high volume market. Wenner was already approached by a South Korean theme park manager for a demo of the VR gloves. The volume they were requesting was 5000 units, which is an amount to break even their yearly burn rate. Another option would be to partner up with other device and content manufacturers so that the VR gloves are sold as a package. Wenner has tried this approach once and it did not work out because they did not have the right contract in place.

But for SensoryX founders, they believe their gaming-first strategy will be their winning strategy. One of the most attractive partners for SensoryX would be an award-winning gaming company like Ubisoft, who has yet to advance into the virtual reality segment. The combination of a fascinating game together with the versatility of SensoryX's supporting hardware would allow for free and natural interaction and could be the spark required to tip the VR market in SensoryX's favor. If only their IndieGoGo campaign and initial customer feedback can be solid enough to gain the interest of investors, Adelsberger's vision of finding that 'killer app' with a leading gaming company could have the chance of becoming reality.

Going All-in and securing VC Investment

Since speed is key for startups, especially in a big money emerging technology field like VR, SensoryX wants to roll out the crowd-funding campaign as soon as possible and after that, hopefully secure a Series A to the tune of \$15Mn for a 20% equity stake in SensoryX before the end of this year, giving a \$75Mn company valuation. Wenner knows this funding will be the make or break moment for SensoryX's future, and plans to soon fly to the US in the middle of May 2018 to meet some VC firms with an investment track record in the hardware and VR space. To be successful in courting investment partners, Wenner will have to navigate the tricky waters of proving out the market demand, communicating an impressive vision for the future of the product combined with a feasible pricing and sales channel strategy, and ultimately proving the

investment economics of the underlying business model delivers the returns and exit strategy demanded by VC investors.

CORE CASE QUESTION

Facing the headwinds of a yet-to-be proven customer demand for their VR gloves product, what will it take to convince investors to believe in SensoryX's superior technology enough to think that SensoryX can compete and be successful in the highly competitive and rapidly evolving VR Space?
