

## **The demise of 3dfx Interactive**

3Dfx Interactive, Inc. (3Dfx) was the most popular and successful 3D graphics hardware company in the computer industry of the late 1990s. For instance, 3Dfx earned 87% of the U.S. retail sales for add-in 3D-only graphics accelerator cards in the 1997 calendar year. (3dfx Interactive, Inc. 1998) 3Dfx also claimed that its products were used in more than 700 personal computer (PC) games and more than 20 titles for arcade games. (US Bankruptcy Court (Judge Roger L. Efremsky) 2008, 6) Though in the matter of a few years (1998-2000), the company lost substantial market share due to problematic acquisitions which bled out its cash reserves and eventually caused the demise of this very innovative Silicon Valley technology firm. This case study will review the history, challenges, opportunities and complexities of 3Dfx as a company. Also, recommendations are presented, with the benefit of hindsight, for the sake of speculation. 3Dfx was subsequently absorbed, including nearly 100 employees, technology patents, and other assets into what is today's multi-billion dollar graphics behemoth: Nvidia Corporation. The brief era in which 3Dfx existed (1994-2001) was cutthroat. It was and is a very competitive ecosystem and at that time experiencing a hyperactive moment in computer graphics and gaming platforms history. From personal computers (PCs) to home console video game systems, the changes of the late 1990s and early 00s were substantial.

### ***The organization***

3Dfx Interactive, Inc. (3Dfx) was a publicly traded semiconductor company incorporated in 1994. 3Dfx was founded to “design, develop, market and support 3D graphics chips, graphics boards and [application programming interface (API)] software for the interactive electronic entertainment market.” (3dfx Interactive, Inc. 1997) They saw their goal as making entertainment and simulation

more realistic and useful through enhanced computer rendering on PCs. 3Dfx wanted to bring the quality computer imagery of Pixar quality to the home computer.

The company saw a meteoric rise from obscurity to the position of the dominant maker of 3D graphics accelerators for PC and some arcade systems. A leading innovator in the PC 3D graphics hardware space in the mid-to-late 1990s, 3Dfx was known for their Voodoo line of graphics accelerators. These graphics cards pioneered real-time computer rendering of motion blur (through the T-buffer process), anti-aliasing (which reduces the jagged edges of polygonal lines and surfaces, and high resolution texture mapping. 3Dfx produced multiple iterations of their Voodoo graphics chip/accelerator card which competed against rivals Nvidia, ATI Technology, S3, and Intel in the same market. The Voodoo line was quite successful though eventually outperformed by Nvidia's popular GeForce graphic processing unit (GPU). The company lasted a short seven years before being absorbed by Nvidia.

## ***Challenges and Opportunities***

There were many challenges and opportunities for 3Dfx in its short history. The amount of competitors, Moores law, and the complexities of integrating acquired companies into the workflow and vision of the company all played a part in the demise of the company. Though, the company also had many opportunities for success and growth. I will discuss a few of these in the following paragraphs.

### **Sega Dreamcast Development**

Among 3Dfx's opportunities was a to enter the lucrative realm of the video games console through a contract with the Sega Corporation. In 1997, Sega was in the midst of its own financial burdens with lackluster sales of its Saturn console system, especially in the American market. Though the Saturn was released in the May 1995, Sega of America had already begun exploring options for the

next console before 1997 and decided to set up development teams in both America and Japan. 3Dfx won the contract to be the graphics hardware designer and manufacturer for what was internally known as the “Black Belt” at the time. Good progress was made on the development of the hardware for Sega, which was a modification of the Voodoo graphics chip architecture. It seemed Sega, at least its management in America, was leaning toward 3Dfx's option as 3dfx approached its initial public offering in April of 1997.

### **Initial Public Offering**

3dfx submitted their initial public offering (IPO) on April 17, 1997 (3dfx Interactive, Inc. 1997), in which many details concerning their business arrangement with Sega were laid out. These details were previously unknown to the general public nor the industry and in fact their being made public seems to have been a surprise to Sega, which subsequently cut off the deal between the two. Sega then decided to go with VideoLogic's (of Japan) PowerVR2 chip for what would become their next eventual Dreamcast console system released in 1998. 3Dfx then sued Sega for breach of contract, with an accusation of unfair competition. 3Dfx believed Sega was leading them on about the contract when it knew full well that VideoLogic had already been selected. The two companies would eventually settle the case with confidentiality statements governing the aftermath.

### **CEO Greg Ballard Resigns**

3Dfx CEO Greg Ballard resigned suddenly in October 1999, amid the company's failure to secure its share of design contracts with PC makers against the likes of ATI Technology and Nvidia. According to CNET News:

Because of the low cost of even cutting-edge graphics chips, deals with large PC manufacturers can determine whether a graphics chip company will make a profit. 3Dfx has lagged behind its competitors in signing these key deals, analysts say.

"3Dfx was at the top of the heap. Then they missed a design window. Then they missed another design window," said Jon Peddie, president of Jon Peddie Associates, a Tiburon, California-

based consultancy. "This is a totally unforgiving market." (Kanellos 1999a)

These inadequacies built upon the failure to keep the Sega contract. 3Dfx had the popular Voodoo2 to market but it was expensive and primarily available at retail store, which again pointed to the fact that they were failing to be incorporated by PC manufacturers. The previous August (1999) 3dfx reported losses of \$11.5 million for the quarter whereas the year before they posted a \$9 million profit. The momentum of their Voodoo line was beginning to wane by this point.

### **3Dfx appoints Alex Leupp as CEO**

In November 1999, 3dfx appointed board member and semiconductor veteran Alex Leupp as their next CEO. Leupp was reported to be a pragmatist, someone who got things done. In the CNET News article on his appointment, this aspect of his experience is discussed:

If anything, Leupp could bring a greater degree of practical operations skill to the company, said Peter Glaskowsky, graphics analyst with MicroDesign Resources... "Other chip companies deliver chips more rapidly," he said. "Innovation is important, but there is no point to it if you can't get chips out."(Kanellos 1999b)

3dfx had previously focused on the quality of the imagery/graphics, which won them substantial praise, but the pace at which ATI Technology could push their product had demoted 3dfx as the dominant player in integrated accelerators in pre-built PCs. Leupp inherited this state of things, a struggling company, which he sought out to salvage . It appears he took issue with some of the previous management's decisions, such as the merger with STB Systems, Inc.

### **3dfx Merger with STB Systems, Inc.**

Before 1999, 3Dfx was known as a “merchant chip” manufacturer—it designed and sold 3D graphics chips to a variety of companies that then implemented these chips in their own products. 3Dfx eventually sought to expand into the computer retail space by manufacturing their own graphics cards.

This decision led to their acquisition of STB Systems, Inc. (STB), a Texas-based graphics board manufacturer with a plant in Juarez, Mexico. Former 3Dfx CEO Alex Leupp later reminisced that acquisition of STB was a “mistake.” (US Bankruptcy Court (Judge Roger L. Efremsky) 2008, 7) The acquisition of STB was completed in August 1999 and subsequent integration of employees and assets led to a delayed release schedule for the Voodoo cards. Since 3Dfx was now in the business of manufacturing their own graphics cards, their new business model alienated their original equipment manufacturer (OEMs), who were now placed in direct competition with 3dfx as a graphics card manufacturer. Nvidia's Jon Peddle, an industry expert, commented on this fact:

This change in 3dfx's business and product offerings brought it into direct competition with companies that had previously been major customers. Although this decision was intended to simplify the design process and shorten product cycles by putting its chips in a single board design... 3dfx's transition from a merchant chip company to an add-in board company undermined 3dfx's customer relationships and reduced its sales. (US Bankruptcy Court (Judge Roger L. Efremsky) 2008, 7–8)

Following the merger, many engineering positions were combined to make the chip design and board manufacture processes more efficient. Though, as a result of this vertical integration, 3dfx lost two clients who had accounted for 58% of its total revenues for fiscal year 1998. STB sales also decline because they no longer could sell boards which incorporated anything other than 3dfx chips. Combine all of these factors with the loss of the licensing deal with Sega and 3dfx ended 1998 with a severe handicap in the computer graphics space.

### **3dfx Merger with Gigapixel Corporation**

Then in July 2000, 3dfx completed another merger with Gigapixel Corporation (Gigapixel). This acquisition was reported to have had the purpose of increasing the amount of engineers within 3dfx. 3Dfx also sought to gain a closer connection with Microsoft and the X-Box, Microsoft's first foray into the console market which was in development at that time. Gigapixel was also known for their innovative approach to chip design. (US Bankruptcy Court (Judge Roger L. Efremsky) 2008, 7)

Relationship between 3dfx and Nvidia

3Dfx and Nvidia had developed quite the rivalry by the time of 3dfx's financial troubles. Though 3dfx was essentially bleeding out cash by day, they still maintained quite a dedicated fan base from the Voodoo2 days and respect from their peers in their engineering accomplishments. This is evident in the fact that Nvidia sought to bring as many 3dfx engineers it could as part of the acquisition of 3dfx's assets in the December of 2000.

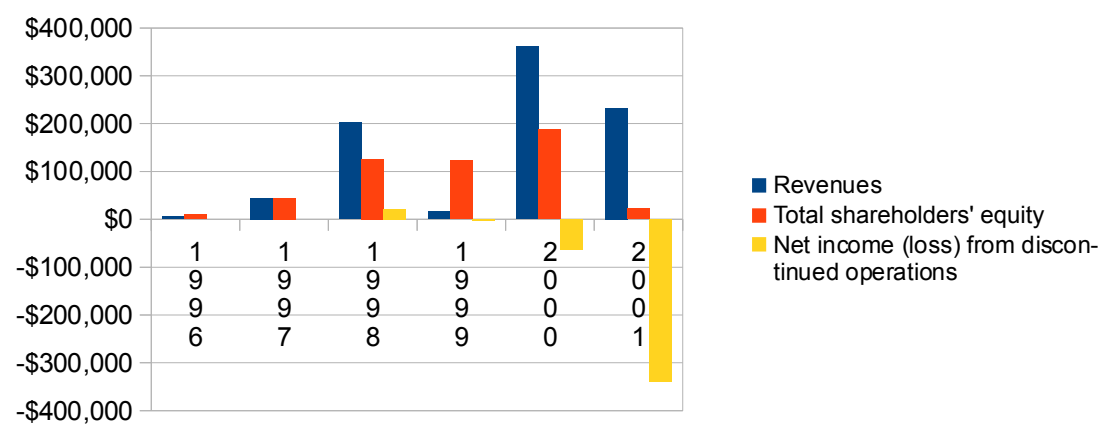


Fig. 1: A quick glance at 3dfx's finances (3dfx Interactive, Inc. 2001)

Also of note was the fact that 3dfx and Nvidia each had lawsuits against the other in the final years of 3dfx. The complaints were primarily about patent violations, a common litigation among technology companies. These lawsuits served as distractions to the deeper burdens that were becoming more apparent.

Analysis

The video and computer game markets were shifting rapidly during the period of 3Dfx's inception and subsequent demise. Both markets were hotly contested by a slue of computer software and hardware companies from around the globe. Each company negotiated a complex ecosystem of design, manufacture, distribution and sales which particularly in the case of the console makers

spanned the oceans of the world.

## **The Sega SNAFU**

The loss of a potentially lucrative contract with Sega was an untimely blow to the public debut of 3Dfx. In responding years later to the IPO that potentially cost 3Dfx its console opportunity, GameSpy writers commented:

Unfortunately, 3dfx made a ridiculous mistake that cost it the deal. In a filing with the Securities and Exchange Commission regarding its IPO (initial public stock offering), 3dfx completely disclosed the details of its pending deal with Sega, which would have it powering the graphics of Sega's next-generation console. Of course, when filing for an IPO, a company is expected to release every detail of its business so the stock can be appropriately valued. However, it's perfectly legal to conceal any sensitive information so long as a few key parties know exactly what's going on. So, it's unclear why 3dfx did something very foolish: In its filing it reproduced the entire contract it had drawn up with Sega and was very close to signing. (GameSpy Staff 2003)

This of course contributed to Sega pulling away from the proposed agreement and choosing the NEC/VideoLogic option for what would become the Dreamcast. GameSpy, a longtime media commentator on video games, and its readers ranked this debacle as one of the “25 dumbest moments in gaming.” It is interesting to see the American side of fandom take issue with an American graphics company for “dropping the ball” so to speak.

## **3dfx becomes a direct competitor**

3dfx expected to increase their presence in the retail space with the acquisition of STB. In so doing, they became a direct competitor with their existing customers who also manufactured graphics cards. I think this was a really poor choice. It is no small task to move from being a merchant chip manufacturer to original equipment manufacturer (OEM). This is evident by the delays 3dfx experienced in getting their product to market.

There was confusion over roles in the company following the STB merger, which led to inefficiency. STB was also no longer producing boards with other accelerator chips. This combined

with the delay in vertical integration with 3dfx meant that the merger kept product from the shelves.

## ***Recommendations***

What if 3dfx was around today? It seems likely to me that with a few changes in the history of the company, there could still be a healthy competitor to Nvidia in the current computer graphics ecosystem. Amidst the many unfortunate turns 3dfx took, the following are my recommendations for the company. It is with the benefit of hindsight that I can offer any of these recommendations.

### **Sega Recommendations**

3dfx should not have revealed the details of their agreement with Sega to the extent that they did. I think 3dfx could have consulted with Sega more fully to avoid outing, what was at that point, a confidential development schedule for the Dreamcast. While there is an obligation to potential stock owners to reveal all the variables in your business, the degree of openness with which 3dfx revealed their agreement with Sega seemed almost like pandering. I suppose they could be rightfully proud, though in the end the move was a bad one.

### **STB Recommendations**

3Dfx should have doubled its investments in OEMs and worked with software vendors to promote PCs that included Voodoo-based accelerators. If 3dfx would have focused on improving their penetration in the OEM market, they could have held their ground against Nvidia's increasing ubiquity. Nvidia was extremely successful at getting their product integrated into the production stream, including the Microsoft Xbox, Xbox 360 and a license for their hardware in the PlayStation 3. 3Dfx should not have acquired STB Systems, Inc. The cost to responsiveness in the corporation's output of new products and the alienation of OEMs in the process of becoming a board manufacturer substantially affected the future of the company.



## **Gigapixel Recommendations**

3dfx should have engaged Microsoft more directly, especially following their merger with Gigapixel. Gigapixel's purchase was partly a strategic one based upon their ongoing relationship with Microsoft. It seemed 3dfx had the intention of becoming a provider for the Xbox hardware. If 3dfx could have at least licensed its technology or even participated in the manufacture of the Xbox's hardware, it would have proven a huge boon to the company. Console gaming during the era of Xbox and its successor, Xbox 360, exploded in terms of profits for all those involved in the enterprise. This opportunity was of course not realized and could have provided a substantial revenue stream for 3dfx.

## **Conclusion**

The story of 3dfx is primarily disappointing to the reader. The company was a revolutionary in its time though it also squandered multiple opportunities for growth. With the loss of the Sega Dreamcast, bungled delivery of product and missed opportunities with OEMs and Microsoft's Xbox, 3dfx slid from prominence to ruin. Thus, 3Dfx may have made what I consider substantial mistakes in its management of resources and long-term goals but I think it is ultimately another casualty of competition in Silicon Valley, one who's remains carry on in Nvidia to this day.

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