The Development and Market Failure of the Nintendo Virtual Boy

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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Introduction

In 1995, Japanese video game developer Nintendo was in dire straits. Compared to the overwhelming market share of the home console market that they had maintained during the 1980's, the company was beset on all sides by new competitors entering the video game industry, namely Sega and Sony, two other Japanese companies. With their flagship next generation console, the Nintendo 64, set to release nearly two years after these competitor's consoles in 1996, Nintendo needed a stopgap console to satisfy investors in the company. Thus, the Virtual Boy was proposed by Gunpei Yokoi, creator of the Gameboy, Nintendo's most successful console at the time.

Despite novel aspects of the console, such as its virtual reality (VR) stereoscopic visuals, and an extended advertising campaign intended to appeal to an audience craving new experiences, the console would fail to take hold of any significant contemporary audience, selling far below expectations. The Virtual Boy would remain in production for under one year in any given region and sell only 770,000 copies worldwide (Zagal & Edwards, 2024). This failure begs the question: *How did the various groups that developed the Nintendo Virtual Boy, primarily those on the development and marketing teams, interact in such a way as to promote and sell a commercially unsuccessful product?*

Considering the resources available to Nintendo and the creator's previous work, one could reasonably expect the console to be a success commercially. Examining the factors that lead to the perceived market failure of the Virtual Boy is a useful metric by which to evaluate the potential market success or failure of other products. With a better understanding of these factors, I intend to apply the lessons learned over the course of this paper to other products to avoid the pitfalls encountered by these developers.

Background & Context

During the mid-1990's, video game enthusiasts all rallied around the next big thing: 3D graphics. With improving and cheaper computer hardware, this once novel technology was becoming more and more accessible. By the end of 1994, some of the first mainstream 3D polygonal video game consoles, the Sony PlayStation and the Sega Saturn, had been released. Such consoles render polygons across a 3D space, showing an interactable and fully 3D world on a TV, as opposed to the 2D pixel-based and vector-based graphics associated with previous game console generations. In contrast to Sony and Sega, Nintendo would be unable to release their 3D polygonal console, the Nintendo 64, until 1996, nearly 3 years after the first commercially available consoles were sold in 1993 (Zagal & Edwards, 2024). To cater to the interested video game enthusiasts, the marketing of the time focused greatly on the innovation in the realm of graphical fidelity. As such, Nintendo's investors disliked the prospect of not having a commercially available 3D console. To satiate the stakeholders in the company, Gunpei Yokoi proposed a stopgap console to fulfil consumer and stockholder desires during the development of the main 3D polygonal console. Yokoi, the lead developer of the Virtual Boy, wanted to take an alternate approach to developing 3D visuals in video games, proposing stereoscopic 2D images to provide the illusion of 3D.

Stereoscopic visuals have technically been in use since the early 1800s with the stereoscope showing two distinct images to both of the user's eyes to emulate 3D depth, immersing the user in a world viewable to them and encapsulating their entire line of sight. Another example of stereoscopic visuals are 3D glasses, which give depth to images on an independent screen. In contrast to many of the previous implementations of stereoscopic visuals, Yokoi sought to combine the initial concept of a stereoscope, restricting the view of the outside

world, with modern LED displays, providing moving images for the Virtual Boy (Zagal & Edwards, 2024). Yokoi pursued this advancement to allow for complete immersion within the world of the video game, providing motion to the stereoscope's purely static world. This was done using a pair of goggles mounted onto a stand, where two independent monochrome LED screens housed in each lens of the goggles resided, shown in Figure 1 (Amos, 2012). The monochrome screens could only output shades of red, providing the Virtual Boy with another unique characteristic of its identity. Nintendo extended this red theming to the casing and cartridges of the console, all of which came in red and black packaging.

Nintendo would support a 25 million dollar advertising campaign for the console, emphasizing the revolutionary aspects of the console to diversify it from game consoles like the Sony PlayStation. Such advertisements focused on the immersive aspects central to the initial concept of the project, promising a novel experience that was unable to be replicated anywhere else. To fully convey the novel aspects to potential customers, Nintendo provided the console to Blockbuster locations across the United States in an attempt to allow as many people to see the console in action as possible, with approximately 40,000 trying it nationally each day in the weeks after the start of the program in mid-1995 (Zagal & Edwards, 2024).

Finally, Nintendo released the Virtual Boy in July 1995 for Japan and August 1995 for North America. Although boasting an innovative and unique approach to visuals, the product only sold 770,000 units between Japan and North America before being quietly discontinued in August 1996 in America and December 1995 in Japan (Zagal & Edwards, 2024). In no region was the console in production for more than a year. For comparison, Sony's PlayStation sold 7 million units over the same approximate period (Zachara & Zagal, 2009).

Figure 1

Nintendo Virtual Boy and Controller

Note: The Nintendo Virtual Boy's stand, pictured above, required users to bend their neck in awkward ways, leading to many reviews criticizing the device's ergonomics and complaints about uncomfortable play sessions. From Wikipedia "Virtual Boy", photograph taken by Evan Amos, 2012, https://en.wikipedia.org/wiki/Virtual_Boy.

Literature

The development of the Virtual Boy is relatively well documented, with much literature commenting on the reasons behind the failure of the device. One well-discussed reason is somewhat ironically cited as the extensive advertising campaign. As noted in the background and context section, a portion of this campaign allowed potential customers to use the console in

person before the release. Steven Boyer argues that this aspect of the advertising campaign highlighted the contrast between Nintendo's claims and reality by placing the actual device in the hands of users (2009). Interest in virtual reality devices existed for decades before, but more so as a novelty. Those interested in this aspect were unlikely to purchase a $179 console with $50-$70 games, especially when their desires may have already been satisfied with the trial experience from the Blockbuster campaign. This sentiment may have also been made stronger due to the hardware of the Virtual Boy having some undesired aspects: namely the bright red monochrome screen and the uncomfortable to use stand, noted by many reviewers at the time (Zagal & Edwards, 2024). Although the monochrome screen was so closely tied to the Virtual Boy's identity, these aspects may have made long-term play uncomfortable. Additionally, to Nintendo's more hardcore audience, those who may have been willing to accept the downsides associated with the Virtual Boy's hardware, the experience may have only felt half complete, as general consensus was that the console lacked a "must play" title.

Scott Gallagher and Seung Ho Park argue that the Nintendo's Donkey Kong franchise provided a "Killer App" for the NES, driving interest in the 3rd generation console nearly single-handedly (2002). The Virtual Boy lacked such a killer app to drive interest in the system, further failing to appeal to the main marketed audience. This indicates a fundamental misunderstanding of what Nintendo's core audience desires from their consoles: the gameplay experience. Hardware only comprises one half of the equation.

During the 1990's, Nintendo promoted the veneer of cutting-edge technology through its marketing, while still being unable to adapt to the new technological developments that their competitors were. A key example of this is the hesitance to adopt disc-based storage for their consoles, instead keeping the more restrictive cartridge-based. Being a proprietary system,

Nintendo believed that this would reduce risks of piracy of their games. José Zagal and Benj Edwards note Nintendo's reluctance to change business models despite their willingness to adopt more novel technologies. They claim that Nintendo took some steps to change, most notably in their willingness to rely on Blockbuster for marketing, but that their fundamental business model wouldn't shift, specifically citing the use of cartridges (2024). Nintendo's promotion of innovation in their products can only do so much if their product sales are being facilitated by an outdated model that does not fully consider the threats posed by competitors and desires of their consumers. Such an examination of the development delves closer into the core of the reasoning behind the failure, but a yet more holistic approach can provide insight that may not be attained by examining solely individual factors.

Although much of the justification for the device's commercial failure holds merit, focusing on the sum of these individual elements implicitly overlooks how many of these aspects are results of misaligned groups of people and resources. By analyzing the development of the Virtual Boy through the lens of Actor Network Theory, I can relationally align the relevant stakeholders, or "actors", to better understand how the end result of the Virtual Boy came to be.

Analytical Framework

To help answer the question of how the Virtual Boy was a market failure, I employ the framework of Actor Network Theory (ANT) to examine these actors and the interactions between them. ANT can be defined as a method of analyzing sociotechnical system through the lens of the network, or a system maintained by a network builder who organizes various human and nonhuman actors into assisting in the accomplishment of a specific goal (Cressman, 2009). Here, misalignment represents an actor who fails to fulfil the goal of the network. All of this

occurs in the local sociotechnical system, which encapsulates the interactions between the various actors. For this paper, I analyze the sociotechnical system that is the development of the Virtual Boy, with the marketing and development teams and the consumers serving as human actors, and the Virtual Boy itself serving as a nonhuman one.

Additionally worth noting, I utilize the ANT concept of Translation, first posited by Michel Callon. This theory examines the formation of actor networks, splitting their formation into four distinct categories: problematization, interessement, enrollment, and mobilization (Callon, 1986). Problematization first defines the problem being solved, interessement then allocates the roles needed to solve the problem, enrollment defines the relationships between the various roles/actors, and mobilization attempts to consolidate the network so that it may be viewed as a single entity.

Methodology

To support my argument regarding the reasoning behind the Virtual Boy's market failure, I apply evidence about the state of the company during and prior to the release and the public's reception of the console. To map out the actor network, I require perspectives from three actors: the Virtual Boy's development team, the Virtual Boy's marketing team, and the intended consumers. The perspectives of these groups are taken from a retrospective interview, a company press release, and a prospective console review, respectively.

To apply ANT for this evidence, I analyze the sources with the intent to determine the relevant human actors' relations to the other human and non-human actors in the network. After reading each piece of evidence, I process the text by noting how certain comments from an individual relate to concerns and approaches of the other groups. With this procedure, I distill

and compartmentalize the most applicable evidence to map out the network. By noting contrast in the various sources, network misalignment becomes more easily recognizable.

I intend to use three pieces of evidence, each representing an actor in the network. Limiting the evidence drawn upon inherently requires generalizing certain groups to a single perspective, meaning that some nuance may be lost over the course of this analysis. Generalization overlooks how each individual in the console's intended audience could have had a variety of reasons to or not to purchase the product. Even inside the company, the disparity and conflicts present among the employees may have varied significantly from person to person. That aspect of the development is already difficult to fully encapsulate due to the limited number of primary sources detailing the time inside the company, mostly coming from a handful of key figures at Nintendo. Although I have chosen pieces of evidence which I believe represent common consensus among the groups analyzed, there will always be dissenting opinions among any group. A more thorough analysis could provide insight which I do not account for in this paper's limited scope.

Results

As stated in the methodology section, I require three pieces of primary evidence to represent the intended consumer, company/marketing, and developer perspectives on the Virtual Boy's development. To serve in these roles, I have chosen the following: a consumer review from the magazine Next Generation in March 1995; a press release before the public announcement discussing the potential public interest in the console; and a translated interview with the lead developer, Gunpei Yokoi, discussing the intent behind the virtual boy's design. With these, I can compare and contrast a representative perspective from each group.

The Next Generation prerelease review, titled “Nintendo Pins Hopes on Virtual Boy”, features discussion on the capabilities, hardware, and games of the Virtual Boy presented at the 1994 Sho Shinkai Software Exhibition in Chiba, Japan. The author presents all of this in a critical tone, positing questions about the intended audience for the device and claiming that “[i]t's awkward to use, it's 100% antisocial, it's too expensive and the VR (i.e. the 3D effect) doesn't actually add to the game at all: it's just a novelty,” (“Nintendo Pins Hopes on Virtual Boy,” 1995). Although this is only one review of the console and its games, there exists several other publications who remain similarly critical of the device, as noted by Zagal and Edwards (2024).

Next, the Nintendo press release was published the day before the unveiling of the Virtual Boy at the Sho Shinkai Software Exhibition. The intention behind this was to offer shareholder’s confidence in the company’s endeavors, outlining expected sales figures as three million in Japan, significantly higher than the actual global sales of 770,000 (Nintendo Co., Ltd., 1994). Nintendo details many of the same statistics regarding the Virtual Boy’s hardware as the consumer review, alongside some other information such as pricing and the release schedule of games exclusive to the console. Nintendo of America Chairman Howard Lincoln claims to be very confident in the market potential of the Virtual Boy and its exclusive technology, while Nintendo President Hiroshi Yamauchi says, “It will transport game players into a 'virtual utopia' with sights and sounds unlike anything they've ever experienced,” (Nintendo Co., Ltd., 1994). Ultimately, this press release was made to onboard stockholders to maintain faith in the company, so positive affirmation is expected, but this measure of confidence indicates that the reality of what happened fell far below expectations.

Lastly, the interview with the Virtual Boy's creator, Gunpei Yokoi, was conducted by Kenji Eno, a prolific game designer in his own right. The interview took place in August of 1996, eight months after the Virtual Boy had been discontinued in Japan. Several days after, Yokoi would leave Nintendo to form his own software company, Koto. Although the latter half of the interview discusses Yokoi's and Eno's projects more generally, Eno focuses on the public reception of the Virtual Boy and the design philosophy from Yokoi going into it throughout the first half. Throughout this section, Yokoi claims that the Virtual Boy was not intended as a traditional game console, and that classifications like the naming scheme (being similar to that of the Game Boy) and being released with traditional marketing for the video game sphere tainted the perception of gamers to the console (Eno, 1996). As such, he argues that being so closely associated with Nintendo linked the device to these ideas, inviting comparison to other such devices rather than taking the experience of the Virtual Boy something unique. By positioning the traditional gamer as the intended audience, Yokoi claims the dissonance they felt turned away other audiences. Although this advertising toward this more casual audience has its own downsides, namely convincing an audience unfamiliar with gaming pricing conventions to purchase a product that is effectively useless on its own without software, the console very well may have been more willing to be received by this audience.

Discussion

With the evidence laid out, I can make some generalizations about the developers, marketers, and consumers by focusing on these key figures. Looking into the development team, Yokoi prioritized immersion during the Virtual Boy's development. This methodology concurs with the design intent of transporting players into a "virtual utopia" noted in the press release.

His desires for novelty were not satisfied by public reception of the console. Indeed, the aspects of the console so cherished by Yokoi and Yamauchi, were quickly derided by their intended audience, the group advertised to during the previous console generations, who had a specific understanding of what a game console should look and be like.

Approaching the network from this understanding, the initially ambiguous definition during the development led to design decisions which contradicted the desires of the audience: the final product was seen as uncomfortable for long play sessions, antisocial, and expensive from the perspective of many. With respect to ANT and the concept of translation, this misalignment of actors can be associated with the problematization and enrollment stages, where proper definitions of the ideal audience became muddled and largely disregarded until it was too late to salvage the market prospects of the device. By failing to appropriately define the problem in problematization, specifically not defining a shared target audience, Nintendo failed to execute all subsequent stages of translation. This dissonance in the marketed and ideal audiences would go on to result in a failure to achieve proper mobilization, in which all actors perform their duty as if they were of a single entity.

Although I only discuss a limited number of perspectives, I want to emphasize that none of these individuals can be taken as a monolith for their respective groups. Indeed, the console underperformed in both Japan and the United States, despite different marketing teams for the culturally different regions. To examine every individual perspective would be impossible in a system as large as this one, so focusing on the different key figures in and out of the company provides a wider variety of perspectives than simply assuming Nintendo, the monolith, created the Virtual Boy.

In this section, I have shown the interconnected web that ties the various relevant groups together, emphasizing the dissonance between the various groups at Nintendo and in the audience. Other scholarly sources, such as those discussed in the literature section, also demonstrate an understanding of the dissonance between these groups and the consequences directly related to that. For example, Boyer claims "inconsistency between marketing and technological development within Nintendo ultimately meant that consumers did not receive the expected experience," (2009). As I already agreed with almost every argument made throughout the literature section, and my own findings align closely with these preexisting arguments, I am not proposing any radical shift in the understanding of the consequences or decisions associated with the Virtual Boy's development. Instead, I am providing a more complete and nuanced understanding of the console's market failure under the lens of ANT.

Conclusion

Over the course of this paper, I have demonstrated some of the underlying reasoning behind the Nintendo Virtual Boy's market failure through the application of ANT, namely the dissonance between the marketed audience and the idealized intended audiences of the development and marketing teams. Although the argument I have presented overlaps greatly with the arguments presented by much of the literature reviewed, the examination of ANT in this context provides a more applicable understanding of the factors that lead to the Virtual Boy's market failure. ANT, being robustly defined and commonly understood as a scholarly framework, can be applied to any sociotechnical system. As such, a plethora of examinations under the framework already exist, making comparison with other cases more streamlined than they otherwise would be.

The analysis conducted above is ultimately limited in the number of relations examined and may fall short in fully communicating the nuance that exists in such a sociotechnical system. I don't claim to be providing an entire view of the system, but instead some highlighted aspects which I believe hint towards a more comprehensive picture than what already exists. A more thorough and complete analysis under this framework that considers new perspectives may provide yet more insight into the topic. One such analysis would be examining the differences between various groups of consumers, which this paper has largely overlooked nuance in to focus more closely on a developer-oriented perspective.

Although a limited analysis, lessons about organizing sociotechnical systems can be taken from this case and applied to other scenarios. Of note, the varying values and intentions held between the marketing and development teams can be seen to correlate to many other subsequent problems during the console's development, additionally noted throughout the literature section. In establishing and maintaining similar such systems, sharing a consistent and informed understanding of the intended audience could be the difference in landing into or avoiding the pitfalls seen in the case of the Nintendo Virtual Boy.

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