Virtu-Dream

From Society® Inc.
A Dream Recorder to a VR Headset

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Table of Contents

1. Project Definition (What? / Why?)

1.1. Background

The purpose of this project is to bring your dreams to life. Have you ever had a dream that you wished you could show to your friends and family but couldn't do so because it was just too difficult to explain? Well that's where Virtu-Dream comes in. We want your imagination to run free without having to worry about forgetting what happened. Virtu-Dream can store up to 750 dreams at once which will allow you to share all of your most amazing (or horrible) moments with your friends and family! We want everyone to see just how creative and imaginative you can be.

The original inspiration came in the form of a dream that I once had. I'll do my best to explain it, but you'll see from my explanation exactly why we decided to make this product. It began after me and a friend had been transported to another friend's backyard. What I mean by "transported" is that there had definitely been moments in the dream that occurred prior and that I did not recall when texting my friend about it at 2:26 AM. As I'm looking around, what do I see, but an abnormal dog. Imagine a yellow weiner dog, who's body is then curled up like a slinky or a contortionist. I turned to my friend, and mentioned it, and when I turned back, there were two, and they were steadily advancing towards us. My friend calmed me down, by reminding me that they were just some TV show reference, after which they slinky'd backwards over the fence. Now it may be difficult for you to imagine what this looks like, which is why we decided to come up with Virtu-Dream. With Virtu-Dream, I wouldn't have to describe this to you, you could simply rewatch my dream and know exactly what I am talking about.

Virtu-Dream is a product unlike any other. After developing The Social Network and The Social Translator, Society Inc. takes another huge step in advancing our mission of helping people understand people through the relatively new medium of virtual reality. Virtual reality headsets have been available for consumers since as early as the 1990s, and the last decade has seen a boom in the market for this technology after Facebook (now Meta) purchased the Oculus VR company for $2 billion. Today, many companies have already or are currently developing their own VR headsets, such as HTC, Google, Apple, Amazon, Microsoft, Sony, and Samsung. However, none of these VR headsets can compete with what Virtu-Dream can offer with our

dream recording and replaying technology.

We are already ahead of schedule on this project, as our prototype is already complete. That process took a little under two years, and we hope to begin production by January 2023 and have it ready for consumers by September 2024. We will go into the technical details later, but our product will be able to detect when the user starts dreaming, accurately record said dreams, and then display these dreams through a VR headset with options for speed, playback, and perception. Our goal is to eventually make this technology universal with other popular VR headsets on the market as we continue to expand in this new and exciting future for Society Inc [6].

1.2. Objectives

The specific goals for this project are that we want our customers to remember and live out their dreams. Dreams are stories and images that our minds create while we sleep. Dreams can be entertaining, scary, fun, thrilling, and bizarre. We want people to have the opportunity to experience what they dream about because only about 10% of people fully understand and remember their dreams. The "activation-synthesis hypothesis" states that dreams don't mean anything, they are brain impulses that pull random thoughts and images from our memories. Therefore, the emotions attached to our dreams are real, and our goal is to allow customers to see these in real time, because to some, dreams have true meaning [1].

In terms of health, another specific goal is to give people a product that makes them less stressed. Knowing that they will eventually see their dreams in the morning, people will be more willing to sleep for the recommended amount of hours, while also feeling relaxed and comfortable in R.E.M sleep, where sleep is the deepest and most important [3].

1.3. Specifications/Constraints

The performance specifications is that the product must accurately and without error record the dreams of the consumer. We must also make sure that there are no issues inserting the Dream Chip into the VR Headset. As this is new technology, this may be difficult to do, and so we must make sure that there are no malfunctions, as the consumer's safety is our number one priority. Finally we need to ensure that we get advertising out early, so that when Virtu-Dream

finally comes out, people will flock to the stores to buy our product [3].

Our largest constraint is money. The research and development of the Dream Chip will take up much of our budget. We need to be able to pay our researchers as well as provide them with the foundations needed in order to achieve our dreams. Because the Dream Chip will be an entirely new technology, we will also be in need of money to mass produce our product before it goes out onto the shelves [4].

2. Methodology (How?)

2.1. Feasibility Analysis

Conducting our feasibility analysis study will allow us to make decisions that help with the success of our product launch. There are many different approaches that our feasibility study will include. First, we need to observe the market size and if people are willing to purchase our product. While everybody loves to dream, we don't know if customers will be willing to pay for such a design. Not only researching the market size, but also the demographics of the market size, meaning the specific people we want to target. Right now, we want to target any male or female ages 16 and up who are eager to share and experience their own dreams.

Secondly, for this feasibility study, we need to have a strong approach on who our competition is. Currently, we don't know anybody that is creating a product relating to dreams. If we do release our product to market, then we have to watch out for big tech companies with lots of resources and money, including Apple, Microsoft, Amazon, and Google. Also, since our dream recorder is used with virtual reality, we have to watch out for Oculus, the top virtual reality company. They are the best in terms of virtual reality, so not only do we have to beat them in terms of product value, but we have to show customers why our product, both the dream recorder and VR headset, is better than our competitors.

Lastly, the cost structure of our analysis is important. This means not only the cost of the individual parts needed to build our small dream recorder chip, but also all the electronics involved to make the dream chip work. Added on to that is how much we will have to spend to purchase these parts, meaning we determine who our main suppliers are and what price they

offer. Also, we need to calculate our cost projections and what our monthly/yearly revenue would be if we release our product. The goal is to always be making a profit as we never want to be losing money. With research on the specific costs, we want to map out anything that will lead to the highest gains of profit.

2.2. Proposed Approach

In order to meet all specifications and constraints, we underwent a thorough approach. First, we had to understand what the potential market for a product such as this would be, since we knew that any investment into the world of virtual reality would be a heavy one. We surveyed a sample population of 2,345 people across multiple different demographics if they would be interested in viewing their dreams in VR, and then further surveyed those who answered "Yes" or "Unsure" how much they would be willing to pay for such a product.
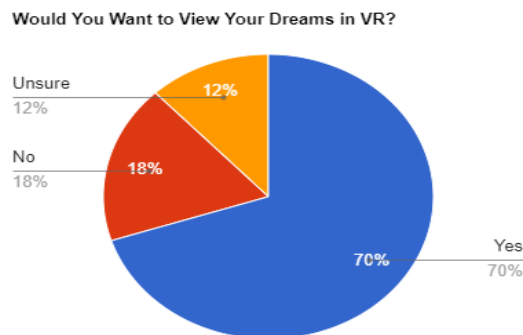

Figure 1

Of the sample size, 1,642 people responded that they would be interested in viewing their dreams in VR, with another 281 responding as unsure. Of these 1,923 respondents, 54% said they'd pay at most either $600 or $400, which is our target price range once this gets to the market.

Maximum Money You Would be Willing to Spend?

- $1000
- $800
- $600
- $400
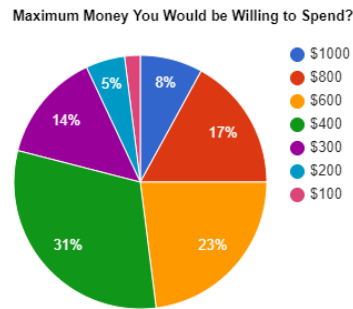- $300
- $200
- $100

8%
17%
5%
14%
31%
23%

Figure 2

To follow our schedule for each task, we first have to test out the market size and conduct sleep/dream research. By targeting people aged 16 and up, we feel like we are able to sell our product to a large group of people without it being unwanted for certain households. Concurrently, we need to conduct research specifically on R.E.M, which is where dreams occur. In R.E.M, sleep is the deepest and eyes move in random directions [2]. In this, the muscles relax and blood pressure / breathing drops. During this deep sleep is when the brain is processing memories and information. As we have started researching, we have learned that the brain is very active in R.E.M sleep. In R.E.M, there is an increase in the levels of acetylcholine, which accounts for the fact we experience "real life" things. In contrast with this, there are low levels of adrenaline during R.E.M, which accounts for why we can't remember these experiences when we wake up [1].

Following our schedule, the first task of the Dream Chip is to be able to detect when the body enters the REM stage of the sleep cycle. When first powered on, the Dream Chip will have only one functionality: repeatedly checking the body for signs of REM. Once the signs mentioned above have been detected, the CPU of the chip will throw an interrupt, activating the rest of the chip. The thresholds for throwing this interrupt include the user's breathing being 30% slower than what it was 5 minutes previously, with this data being recorded by the chip everytime it checks for REM. Another threshold to reach is eye movement being detected above the average REM eye movement speed of 15.9 eye movements per minute [2].

This detection process is the most important part of our design so far, because if we don't have a way to confidently know when to start recording dreams, consumers will get a blank screen when they go to view their dream, or there will not be anything to view at all. For our

testing process we hooked up a rudimentary chip to subjects that would light up an LED once the interrupt was thrown from REM being detected. Throughout the month of August, 2020, we gathered over 500 volunteers to help with this detection process, and our system was able to accurately detect REM sleep within 1 minute of entering the stage for 485 of these volunteers, good for an impressive 97% accuracy.

Once our testing process was complete, we moved on to programming the chip for what it will do once the interrupt is thrown. Through a combination of analyzing brain waves and eye movements, our chip is able to record what we dream with both audio and video feeds, storing the recording in the chip to be used later.

Since interaction with the hardware is the most important part of software, our design timeline for this overlapped with the software design timeline. The biggest part of our hardware was making sure that it could store at least one week worth of dreams. Through testing of our software, we were able to conclude that a dream is on average 85.3 Megabytes worth of data. One week of dreams will take up 597 MB, leaving us with just under 1.5 GB of RAM left for storing other data for monitoring and detection purposes, which is why our chip will have 2 GB of RAM available. Being able to fit all this in addition to a strong CPU and circuitry was a big challenge, which is why both software and hardware development took three months each.

The Society Headset VR design is 64 gigabytes, which is good for up to 2 years, and it can hold up to 750 dreams. In the top middle part of the design, right between where both eyes go is where you can insert the dream recorder in. On the Headset VR, there are dials where you can adjust the volume, color scale, depth perception, and scrolling through the dream. We hope to work with other virtual reality companies to make the Dream Recorder available to all types of headsets, not just specifically ours. However, what our headset has to offer is the ability to actually "feel" like you are in a dream, because our headset is equipped with 3D and 4D technology that will make you truly have a blast with whatever you're experiencing [1].

Our Dream Chip will have a microscopic latch that is pulled once inserted into the slot in our VR headset. Once the chip is inserted and the VR headset is turned on, a menu will appear with options to select any dream stored on the chip, as well as the option to upload dreams from the chip to the headset. We plan on having talks with companies such as Meta and Sony in the future about adding a Dream Chip slot in their headsets to make our product more universal.

The production of our first working prototype began very slowly. We had many

difficulties at first, and had to go through many different design iterations. This included making sure that the chip fit well on the head. We also worked towards developing a skin safe adhesive in order to keep the Dream Chip on your head throughout the night, without having any removal issues in the morning. After many attempts and many late nights of brainstorming, we were able to come up with a prototype that everyone involved was satisfied with.

Because our product is unlike anything else that currently exists and will likely change the future of the entertainment industry, we are looking for an investment of $500 million for a 4.2% stake in our company. Much of this money will go towards the mass production of Virtu-Dream as well as the salaries of our employees. Society Inc. is a great investment for anyone interested in a new and growing company. On top of that, our company is environmentally friendly and we make sure to pay our employees fair wages while also giving them ample vacation time, so you know that you're investing in a great cause. So please, help us make your dreams a reality!

When we start production, we have to make sure that we do it efficiently since the pieces are going to be expensive. That means that we can't mess up on a lot of designs, even if the designs are small. Also, we have to develop virtual reality headsets so our dream recorder can fit into it smoothly. That essentially means we are creating two products at once. Using our project personnel into action, we need our engineers and administration to work together to get production done correctly, especially the first release of our product to the market. As we reach a sufficient amount of finished products that we are happy with, we will release them to the stores and investors that we previously talked to before production, so customers can start buying them. Since we believe this product will be super successful, we pitched to investors and stores to make our product visible in the front and center of stores so that customers are drawn right to it. By spending a lot of money on advertising, we are guaranteed to get a good investment in our product at first. As the first round of customers buy our product, we would love feedback so we can go back and improve when we start more rounds of production.

2.3. Non-technical Aspects

While we will begin production in the United States, eventually we will build towards becoming a worldwide company, with goals of having offices in the UK, Germany, and Japan,

before expanding even further. The production of the Dream Chip is very environmentally friendly and will create a whole new market for entertainment. Rather than taking years to finish the production of a single two hour long film, all it takes is one night's rest. Instead of rewatching a movie you've seen a million times, you can get together with a few friends and just watch each other's dreams. Eventually, if we are able to achieve our biggest dreams, we can distribute these chips to movie companies, who can then put them onto the big screen. This will save a lot of time, money, and energy in the future.

Society Inc. recognizes that some ethical issues may arise when recording dreams, and for that reason we have associated ourselves with the International Association for the Study of Dreams (IASD) and will be following their ethical rules. The IASD supports dreamwork and dream sharing in a way that allows for a dreamer's dignity and integrity to remain intact. We firmly believe that it is of utmost importance to remain truthful, while also being open to change, when it comes to new ideas regarding dreaming. It is also important for us to provide our consumers with privacy and confidentiality when it comes to what is recorded on their Dream Chips. Society Inc. does not have any access to Chips that have already been purchased, and it is up to the buyer to decide what they want to do with their chips [5].

3. Administration (When? / How Much?)

3.1. Major Tasks

Name	Primary Responsibilities	Tasks
Jacob Bruck	Feasibility Analysis	Analyzing potential options for design and how economically and socially feasible they are
	Marketing	Marketing product/plan to potential investors to increase budget
	Misc.	Survey potential market of product and how much consumers would be willing to pay
Ricky	Dream Chip Design	Designing Dream Chip to work as efficiently as possible while maintaining small size
		Designing Society Inc.'s own VR headset to work

Stanton	VR Headset Integration	with Dream Chip while also working with VR companies for future integration
	Misc.	Develop overarching plan for project
Matt Topolewski	Dream Monitoring	Work on monitoring REM sleep cycle and how to accurately detect when the body enters it
	Feasibility Analysis	Analyzing potential options for design and how economically and socially feasible they are
	Misc.	Continue research on how to improve upon design

3.2. Schedule

Task	Month/Year											
	4/20	5/20	6/20	7/20	8/20	9/20	10/20	11/20	12/20	4/22	1/23	9/24
Survey Market	■											
Sleep/Dream Research	■											
Develop REM Monitoring System		■	■	■								
Test REM Monitoring System					■							
Dream Chip Software				■	■	■						
Dream Chip Hardware					■	■	■					
Society VR Headset design						■	■					
Dream Chip integration							■	■				
Refine Prototype									■			
Pitch to Investors										■		

Start Production										🟩	
Make Available to Consumers											🟩

3.3. Budget

	Cost:
Research & Development:	$125,000,000
Production:	$350,000,000
Advertisement:	$40,000,000
Yearly Employee Wages:	$25,000,000
Contingency Budget:	$40,000,000
Total Budget:	$580,000,000

3.4. Facilities and Resources

Society Inc. main facility is located in Philadelphia, PA. The main headquarters is a whopping 630,000 square feet location, and will include a working space to build the product, innovation labs to design and come up with new ideas, and mixed-use common spaces for our employees. The main headquarters is right outside central Philadelphia, where it is right next to a new performance art center and community park. Since Society Inc. is a growing technology firm, we also have other smaller facilities in Boston, New York, Pittsburgh, Charlotte, and Tampa Bay, ranging in size from 150,000 square feet to 300,000 square feet. Our expansion will allow us to grow our technology workplace and support new talent that joins the company.

Since our facilities are of a large size, we are able to have talented project personnel with specific tasks to get the job done. The following table is our main project personnel:

Chief Executive:	Oversees the whole company. Pays the salaries of the employees and meets with other businesses to discuss ideas
Project Managers:	Develops product objectives and specifications. Collaborates with the engineers and administration.
Computer Engineers:	Oversees and writes the code and algorithms of the product and develops the computer hardware and software.
System Engineers:	Oversees the engineering, business, and management aspects of the specific parts of the product and makes sure that all the parts properly work together
Administration:	Works on the important tasks outside of the actual product. Human resources oversees the ethical behavior of the company. Finance and accounting oversees the money involved with the company. Legal section provides the rules and makes sure everything within the company is legal.

4. References

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