

CatsVision Project Research Logs

This document gives a timeline and evolution for the CatsVision smart contact lenses project for low lighting vision solutions. The team was formed on Day 1 (04/02/2019) of the class to work towards the final project for ETM 555 - Technology Marketing coursework.

After week 1 class, the group was tasked with coming back with project proposals for week 2. Each team member decided to research a few topics to use for project proposal. We as a group decided to meet on the weekends to discuss the predetermined agenda.

The following projects were discussed in first meeting:

1. Smart contact lens (Verily company): Systems will shrink so small that they can be embedded into an electronic contact lens.
2. Bio-nano materials for plastics manufacturing: Manufacturing degradable plastics from natural sources like plants. This plastics can even be used for 3D printing.
3. Floating Photovoltaic Power plant: Floating solar generate more electricity than ground-mount and rooftop (solar) systems because of the cooling effect of water. It also reduces reservoir evaporation and algae growth by shading the water. The floating platforms are 100% recyclable, utilizing high-density polyethylene which can withstand ultraviolet rays and corrosion.
4. Camera instead of mirrors for cars: By combining our phones with cameras so less time needed by small cameras for taking left and right mirrors position in cars. It is in near future. It is a revolution for aerodynamics of the cars.
5. MESO (magneto-electric spin-orbit). New technology for creating transistors. MESO architecture could reinvigorate performance and power scaling. It could dramatically reduce switching voltage, switching energy, and allow for superior density scaling. Time to Market ~10 years. Intel plans to bring it in AI and IOT domain. The advantages in this project is defined customers and brand name of Intel.
6. Boston Robotics: Very agile and varied movement in robots. Capable of vary fine movement.
7. Detecting Premature babies

The projects were discussed on the potential and stage of the technology along with the pros and cons for each project. The team felt all the topics were equally interesting and compelling with lot of potential to execute learning exercise for the class. The resources for information on the projects are present in appendix A.

The team believed in democratic process to make decisions as an effective way to handle conflict whenever the discussions did not lead to a clear winner among alternatives. Voting matrix was used as a method to shortlist the top 3 ideas the team would discuss with the professor in class to pick the best option. The tie were resolved in second stage of voting. The voting results are shown in appendix B.

After presenting the shortlisted projects in class in week 2, we discussed the projects in detail to determine the project that could offer us ample opportunities to learn along with challenging us. We discussed and agreed to move ahead with the smart contact lenses project for the purposes of the class. We then scheduled meetings regularly to complete the project on time and with good quality work. The schedule we worked with is attached in appendix C. We decided to take meeting minutes but later started assigning sections and owners to be completed for discussions at weekly meetings. Sample meeting minutes attached in appendix D. The actionable items were assigned after discussion to be reviewed in the break during class or carried over to the next meeting.

We then started using steps as provided in class to iron out the marketing plan. We decided to document details in the steps documents and brought out points to the presentation to work on both simultaneously.

Appendices E to contain our work as we made our way through the step by step process to create our marketing plan.

Step 1: Characterizing product and company

During Step 1 we decided to incorporate professor's feedback to not be an university developing the product and decided to be Samsung for developing the marketing plan for the smart contact lenses for night vision. We completed step 1 by defining and characterizing the product and its features. We also came back with a list of potential target segments for the product. We also worked on researching Samsung and tried to make value proposition for Samsung to be in the product segment. Appendix E has the detailed discussions, consideration and assumptions made at this stage of the market plan development.

Step 2: Finding a Market

At this stage we looked into the potential markets as presented in mid-term slides. We also determined that the smart contact lenses project can be used to augment the home entertainment business for Samsung. We revisited the discussions from previous week and we continued to determine the needs and wants of the people who would buy and/or use the product. At this stage we were looking for anyone that can be remotely interested to try our offering. Appendix F has notes and resources collected during this stage.

Step 3: Market Segments

We defined tiers in our segments; primary segment which we defined as the direct fit for the current offering and secondary segment which we defined as the ultimate value proposition for Samsung to be in this product segment. This is important step for our project because Samsung is a big company and a new product segment development would need management support and R&D budget. Appendix G has the market segments as presented in mid-term presentation.

At this point of time the project was mainly focused on the military use case.

Mid-term presentation

By the time we presented the project for mid-term, we were not confident on the military use case. We presented the data showing saturation in military equipment market as well as challenges like base country of company is also weighed in the military equipment buying decisions for most countries. During this phase the news cycle were discussing the challenges of Huawei with US. This also shaped our decision to steer off from the military segment to commercial drivers. The commercial driver segment looked promising as accident data shows most accidents occur in low-lighting conditions. We believed we could incentivize the drivers with lower premium for their vehicle insurances. However the discussion with professor during presentation brought out the critical flaw in using the product while driving; bright headlight of oncoming traffic.

Step 4: Primary Market Research

After presenting the project for mid-term presentation, we got good feedback from professor. We were now looking at 4 segments: Hunters and Wildlife Observers, Retinitis Pigmentosa People, runners and law enforcement. At this time we started looking into runners. The size of the market was reasonable big. A large number of people do run in low lighting conditions. Their main concern is safety and this is a major reason for people to not run outdoors at early morning and evening hours despite preferring it. However we could not make a compelling case for the product for this segment at the price point of a introductory product. We also looked at the segment with medical needs for the product that can aid them in low lighting conditions. All the references from the research are present in appendix H.

The niche market of retinitis pigmentosa and night blindness were the most promising segments but we decided to try and define and characterize the law enforcement. This segment was dropped after research showed that most police departments are on a tight budget and approximately 90% or more of the budget is allocated for human resources to combat shortage of trained law enforcement personnel. Also the equipments for law enforcement are sometimes resourced from military resources.

We then continued with the retinitis pigmentosa and night blindness as the primary segment. The 2 conditions are caused by different reasons but both the diseases have similar manifestation and are diagnosed by ophthalmologists , who prescribe an aid for their patients. After this we continued with the next steps to create the rest of the P's of the marketing mix.

Step 5: Market Characterization

After all the analysis and research over market segment. We thought of going ahead with Retinitis Pigmentosa disorder and night as our primary segment. Retinitis Pigmentosa is a rare genetic disorder which cause damage or loss of eye tissues. These eye tissues are light sensitive which can cause difficulty of vision during night or loss of side vision. This can relatively result to night blindness. This is not a age-related disorder. Currently they have traditional goggle to overcome this disorder. This disorder is so rare that 1 of 3,00 - 4,000 suffer from this. Laser operation an alternative to traditional goggle but people are not willing to go under needles. The operation is also very costly. So, we thought of introducing a smart lens for

Retinitis Pigmentosa people. We conducted a survey to know willingness of the patients over this smart lens through a doctor. Where 2 out of 5 people are willing to try this lens, 2 out of 5 were neutral and 1 is not willing to try. But 4 out of 5 said that this product covers the need, i.e. around 80% people. They also said that if the product is offered through insurance then they would be happy to buy it. Another segment is night blindness where people face difficulty in seeing during night time or low light. This is very much similar to the Retinitis Pigmentosa people.

We were focusing on all sorts of people for vision correction than after discussing with professor we thought of concentrating on Cataract as a secondary segment. Cataract is an age-related disorder. Where patients can be cured through laser but its expensive and that is no permanent cure. Cataract contributes to 51% of total global eye disease, which is huge market. And as old age people are increase so there is much scope in this segment as well.

Also, the number of people switching from spectacles to lens are increasing. Forecasted number is 10.4% in revenue by 2023.

Step 6: Competitor Analysis

Key competitors for Samsung smart lens are Zeiss, Google, Sony, Alcon, Sensimed SA, Alcon, Verily. We did analysis on the basis of these competitors and their offering. All the competitors are segmented differently on the basis of their offerings. Their applications comprises of intraocular pressure monitoring, continuous glucose monitoring, and other applications. The other applications are sodium detection, cholesterol detection, and alcohol detection. The smart contact lenses on the basis of end users market are segmented into hospitals, home care settings and clinics.

The main competitor to Samsung for its Catsvision smart lens is Zeiss.

Zeiss - It has come up with an i.scription technology which can help improve the vision for consumers at night and low light conditions with reduced glare effects, more vibrant colors and improved contrast perception for driving at night as well.

Google - It is an American multinational technology company which received a patent from the U.S FDA for smart contact lenses in November 2015. Google is partnering with **Norvatis**, which is a pharmaceutical company to develop smart lenses that can track diabetes by measuring blood glucose levels in tears and fix farsightedness.

Sony - Sony has created smart lens that is capable of recording video which can be controlled by user's deliberate blinks.

Sensimed SA - The SENSIMED Triggerfish smart lens captures spontaneous changes in the eye from day to night for continuous ocular monitoring system that helps physician in glaucoma treatment for patients.

Verily - Verily has partnered with **Alcon** to create smart lens that can measure glucose levels for people living with diabetes to help manage this disease.

As these companies are coming up with new technologies incorporated into smart lens, they can become a big threat to the Samsung's Catsvision product in near future. So to be ahead in this market, Samsung should be capable in adding new smart features in par with the features provided by the available competitors.

Step 7: Promotion and Branding Strategy

On the basis of our previous segments we thought of doing the promotions in a way where we will provide the lens to the military people. But then after discussion with the professor and showing her our survey result. We thought of concentrating on Retinitis Pigmentosa people. Ans as survey states that the 80% of people agreeing to go with this product but that too through insurance once doctor will recommend them.

So, doctors are the key partners to reach our target customers. We are planning to follow the "Go-To-Market" strategy. Where we will first educate the academia/ doctors/ professionals about the smart lens. By providing them free samples, pamphlets and brochures. This will help them understand the technology and its usage. Academia/ doctors/ professionals will do their respective research and publish the same in their conferences, research and papers. And that's how we will reach the masses. Also, posters to display in ophthalmologists examination room to bring awareness and recognition of the innovative technology to meet our goal to create ingredient branding for the technology. This would bring awareness to more people even when they are not the primary customers. Than the academia/ doctors/ professionals will educate the patients/customers by providing them free samples. This will helps us in getting feedback which can help us improving the smart lens in right direction. Once the samples gets approved from academia/ doctors/ professionals and patients/customers we will launch the product. An advertisement can be published on social media, in newspapers and magazines to reach out the potential market segment so that the customers should to know about this product. Day time television ads can be included to increase the magnitude of our promotion and to reach maximum population. Than the doctors will prescribe these lenses to the customers/patients and they will buy it through insurance.

Samsung is brand for itself. But to retain that brand value is very important. In addition, good branding increases the value of a company and makes it easier to bring in new customers. A brand not only represents its logo, more importantly it embodies how people perceive the company. We believe that ingredient branding by branding the technology used in CatsVision product. We would use the success and goodwill generated from the primary segment to create awareness and recognition for the family of smart contact lenses products. This would help Samsung create awareness and reach a wide variety of audience. It can be leveraged to reduce barrier to entry in secondary markets.

Step 8: Pricing and Distribution Channels

We did a lot of analysis to determine the price of smart lens. Firstly we thought of keeping it \$ 1000 depending on the price offered by the other competitors. But after our survey results were out, we thought of increasing the cost to \$ 1.500. The calculation behind the this price was basically the number of people are promising to but this product over the cost of investment into this product. So, as the Retinitis Pigmentosa is a rare disorder which roughly affects 1 out of 3500 to 4000 people. On the basis of our analysis, there are around 2 M ill

people in the world and 110 K people in US (population is 328 M). US primary full market size is approximately \$ 165 M for US roughly. Also there are three types for eliminating the illness: Therapy, "Helpers" like dogs, sight lasers etc. and Surgery Option. Assuming, 90% of ill people are willing to use any options. This Assumption makes Market Demand 110 K people to 100 K, and \$ 148.5 M. And that's how we finalized the price. But during final presentation, professor asked us to increase the price as we are rightly focusing the needs of the segment. Although the segment is small but the product is very promising. And people will buy it at any cost as they don't have to go under needles or laser. So, than we thought of finalizing the price to \$ 3000 for pair, and one single lens for \$1500.

We thought distributing the lens through insurance company. We did analysis to find the difference in cost when offered through insurance and without. Where, we observed that we end up paying double if we buy it without insurance. So, we as a company will collaborate with insurance company. So, the patients/customer will buy it through insurance once recommended by doctors.

Appendix

Appendix A

Resources for initial project proposal list:

Smart contact lens (Verily company)

<https://verily.com/projects/sensors/smart-lens-program/>

<https://www.computerworld.com/article/3066870/why-a-smart-contact-lens-is-the-ultimate-wearable.html>

Bio-nano materials for plastics manufacturing

<https://www.sciencedirect.com/science/article/pii/S246821791830042X>

<https://rastgar-co.com/wp-content/uploads/2017/01/The-Future-of-Plastics-and-Nanotechnology-by-Imtiaz-Rastgar.pdf>

<https://www.sciencedirect.com/science/article/pii/S0144861718310919>

<https://www.scientificamerican.com/article/is-plastic-from-plants-good-for-the-environment-or-bad/>

<https://www.bbc.com/news/business-42973529>

Floating

Photovoltaic

Power

plant:

<https://www.sciencedirect-com.proxy.lib.pdx.edu/science/article/pii/S1364032116304841>

<https://patents.google.com/patent/US4364532A/en>

<http://go.galegroup.com.proxy.lib.pdx.edu/ps/i.do?&id=GALE|A564931236&v=2.1&u=s1185784&it=r&p=AONE&sw=w>

Camera to replace mirrors on cars:

<https://spectrum.ieee.org/cars-that-think/transportation/advanced-cars/cameras-instead-of-mirrors-not-so-fast-says-experts>

<https://asia.nikkei.com/Business/Companies/Toyota-to-replace-side-view-mirrors-with-cameras-in-new-model>

<https://www.autonews.com/article/20180912/OEM04/180919888/lexus-dumps-side-mirrors-for-sleek-digital-camera-on-next-es>

MESO (magneto-electric spin-orbit)

<https://www.extremetech.com/computing/286163-intels-fundamentally-new-meso-architecture-could-arrive-in-a-few-years>

<https://news.berkeley.edu/2018/12/03/new-quantum-materials-could-take-computers-beyond-the-semiconductor-era/>

<https://venturebeat.com/2019/02/21/intels-meso-transistor-promises-vast-leap-in-ai-processing-power/>

<https://venturebeat.com/2019/02/21/interview-with-leaders-of-intels-meso-chip-this-will-happen-faster-than-you-think/>

Boston Robotics:

<https://www.bostondynamics.com/spot-mini>

<https://www.bostondynamics.com/>

Detecting Premature babies:

<https://www.technologyreview.com/s/612931/a-simple-blood-test-to-predict-premature-births-could-save-babies-lives/>

Appendix B

	Bio-degradable plastic	Contact lens	Floating PV cell	camera	Premature baby	Intel	Boston
Poonam	2	3	1				
Chaitali	1	3	2				
John		2	3			1	
Mert	3					1	2
Neeti	3	2					1
	7	6	6			6	5

Fig: The voting sheet for picking the project.

Appendix C

A	B	C	D	E
Week 3	Finalize the topic	Identify the product and value proposition.		
Week 4	Internal Environment Analysis	Identify the customers	Define the Goal	
Week 5	External Environment Analysis	Identify Competitors	Define the industry and market	
Week 6	SWOT Analysis			Presentation
Week 7	Define Strategy to achieve goals	4 P's - Product, Place, Price and Promotion plan		
Week 8	Supply Chain Strategy			
Week 9	Performance or Financial Plan			Presentation
Week 10	Iron out slides based on feedback and prepare final report.			Presentation
Week 11	Finish up report and submit			

Fig. : Schedule for the project

Appendix D

Meeting minutes 04/21/2019 >

Neeti Verma <neetiverma09@gmail.com>

Sun, Apr 21, 8:56 PM

to John, Mert, Chaitali, Poonam, Neeti ▾

Hi,

The meeting is decided to be conducted on Sunday at 8-9 PM.
Chaitali has sent the meeting invite.

The topic for the team project is "Smart Lens: Night Vision".
We would be completing Step 1 (shared in project Ideas folder) this week. The owners for each section are listed on the document.

The main project files are in the folder "Smart Lens".
https://drive.google.com/drive/u/1/folders/1BSKMeEGOELj_WfGFLmUpEhHdiPr3kFcf
The slides and the report would be placed in this location.

We are agreeing to work as per the schedule to hit the 7-step marketing plan by Week 10 for final presentation.

Fig: Meeting minutes

Appendix E

Step 1: Characterizing your preliminary product and your company

Characterize your product (initial description) Mert, chaitali

Have a close look at the product you want to research and brainstorm answers to the following questions:

What does the product do in principle?

The product is smart lens with night vision. Lens has two atom-thick layer of carbon called graphene coating which will protect eye from radiation as well as helps in maintaining the eyeball water level [1]. Night vision technology has been around for a while but when this technology collaborate with contact lens will fundamentally change the world. This product can be used for safety if you are walking home alone in dark [2]. And it can also be used at Military, Law enforcement, Hunting, Wildlife observation, Surveillance, Security, Navigation, Hidden-object detection, Entertainment [3].

What conditions need to exist for the product to function in principle (e.g. do users need particular skills or resources, complementary products, etc.)?

For night vision, there is no need for a battery-energy to use it. If the connection is a need to create with a smart device of course there should be wireless supporter and/or plug in device. The only thing is the protection of it while not using, with a lens case. On the other hand it is a need to use lense solution for eyes since it is non organic material.

(Can we use normal relevant references for normal contact lenses?)

What are the intended performance level of the product and what value would it deliver (e.g. is it faster, cheaper, better integrated, prettier,)?

Current night vision technology needs bulky cooling equipment to stop the detectors getting confused by their own heat radiation, but the graphene-based models can do the same job using just a few layers of the atom-thick material. From Michigan University Zhong suggests that the infrared-capturing graphene lenses could therefore be used for more than just night vision. The technology could help doctors monitor blood flow without having to move a patient or subject them to any scans, or be used by art historians to examine layers of paint underneath the surface. It's not quite X-ray vision but it's pretty damn close [2]. Hence the technology is promising for other purposes at the same time together.

On the other hand the lenses are not huge-mechanic things as night vision goggles so that it is easy to use. The vision quality is higher according to indicated reason and the relevant equipment is less rather than goggles as well.

Prepare a short description of the product (in general terms), based on your team's discussion. Target length is ca. 1 page, including pictures. (This will NOT be the final description of the product - as you learn more about customer needs, you will add or subtract features later. You will also think about what it takes to create a so-called "whole" product).

We will discuss and write

Value Proposition: directly added to the mid-term presentation.

Characterize your company Poonam, Neeti, John

Characterize the start up company or the unit in the company (e.g GE's medical imaging, Daimler's Truck Business) that you imagine to be a part of. You are writing the marketing plan for this company/unit.

What is its role/mission/reason to exist?

Mission:

Inspire the world with our innovative smart contact lens technology, meeting your needs with a deep understanding of your eyes. Samsung is committed in continuously planning, developing, testing, implementing and improving the technology to fulfill and meet our customers' needs.

Vision:

We understand how important your vision is to you and we've made it our mission to be the world's leading company for smart contact lens night vision, dedicated to creating products of the highest quality.

Samsung Electronics will welcome new challenges and opportunities with joy.

"Inspire the World, Create the Future". [4]

What needs does it fulfill or benefits does it provide? (Don't be overly specific (e.g. "we sell milking machinery") or too generic (e.g. "we are in the engineering business"))

Samsung has a R&D department in charge of developing, manufacturing, and testing smart contacts lenses for night vision. A main benefit will be providing US military with smart contact lens for night vision. Samsung is truly committed in working together with the US government.

[5]

We also identified other segments like runners (athletes), commercial drivers, emergency staff, archaeologists, rescue squad, extreme sports enthusiasts, etc.

What are the distinct competencies of the unit? (Don't list anything that applies to any competitor, that's not distinct)

Ease of use (lightweight and freedom of movement), graphene technology, ease of adaptability to incorporate new features, Infrared spectrum, bulky cooling feature. Integration with samsung features and products (samsung pay?)

Looking at the future - what things would you give serious consideration (e.g. moving into a new segment)?

VR in smart lens and compete with oculus, selling the same product to other segments (identified above), health care, camera/video features, enhanced for new type of cinematic experiences

(These pointers are based on Malcom McDonald: Marketing Plans, 6th edition).

Do online research. Discuss the answers to these questions as a team. Agree on assumptions you have to make. Agree on characterization. Document it in up to one page (not longer, a mission statement needs to be concise).

References:

<https://www.chemistryworld.com/news/graphene-coated-contact-lenses-bring-eye-electronics-a-step-closer/2500504.article>

<https://www.independent.co.uk/life-style/gadgets-and-tech/contact-lenses-with-night-vision-could-be-on-the-way-thanks-to-graphene-breakthrough-9208212.html>

<https://electronics.howstuffworks.com/gadgets/high-tech-gadgets/nightvision5.htm>

<https://www.samsung.com/us/aboutsamsung/vision/vision2020/>

<https://www.entrepreneur.com/article/233340>

Appendix F

Step 2: Finding a Market

Brainstorm a wide array of opportunities (i.e. groups of people who would benefit from using your product). Try to list at least 5 and up to 10 opportunities. For each opportunity, list the specific end user and the application (what they use the product for). In your team, discuss the following questions

- What do you know about each segment/group of a potential customer? **Answered**
- Are these target customers well-funded? **Answered**
- Could you reach these customers with your company's sales force? Or would this require a new channel? **John**

Samsung manages direct and indirect channels:

- Direct channels like: CRM software for sales force, website and company-owned retail outlets.
- Indirect channels: External retail outlets (Amazon, Ebay, Costco, Walmart, Target, pharmacies like: Walgreens, CVS, Rite Aid).
- Do they have a compelling reason to buy a new type of product? **Neeti**

Comfort and near natural vision experience.

- Is the product a complete solution for the customers that works more or less as a standalone? Or would you have to partner with other companies? How much of the total solution do you provide vs. other partners? **Mert**

There are 4 primary segments (Commercial Drivers, Hunters and Wildlife Observers, Retinitis Pigmentosa People, Soldiers / Army) these segments are not as big as secondary ones. On the

other hand, these are so close to major focus of product/technology itself. Hence, even the market is not so big, there is a better possibility in sales since technology covers major needs of these segment customers easily. The problem is density of customers in one segment may dominate the production capacity which may cause a customer dependency.

So that there is no need a close cooperation with other firms.

There are 4 secondary segments (Early / late performance sports (Runner, Cycling, Tennis etc.) Search and Rescue Teams, Medical Use / Patients' Blood Flow, Enhancement for new type of Cinematic Experiences - Audience). These segments are huge ones but our product is not covering major customer needs. Hence, potential sales seem limited and they are not promising in sales as much as primary ones. On the other hand, for these segments production can be more flexible and this means less customer dependency for the company. As a result there is a need a close cooperation with major companies here.

- Are there many alternative solutions to the customer problem? How fierce is the competition? Could the competition block you? **Poonam**

The smart contact lens can increase eyes exposure to electromagnetic waves which can cause problems like cataracts and dryness in eyes. These are the main concerns to the customers.

However, the graphene coated contact lens absorbs most of these electromagnetic waves preventing the eye from maximum exposure to these waves. It also retains the moisture in the eyes thus preventing the dryness.

The entries of companies like Google, Norvatis, Sony, Sensimed etc into the smart contact lens market is a big threat to Samsung smart lens. Daily new modification in the world of contact lens is experimented and developed which makes the competition in market more fierce and can definitely block you. Even though night vision is a great application of smart lens by Samsung and is aware of its potential customers, but adding feature like detecting diabetes and autofocus feature can help Samsung to sustain in the market of smart lens in a long run.

- If you win the customer segment, can you leverage it to enter additional segments? Or is this a dead end? **Chaitali**
 - Our primary market segment is the soldiers, Commercial Drivers, Hunters and Wildlife Observers, Retinitis Pigmentosa People
 - Yes, we will definitely leverage it to additional segments.
 - Secondary segment is the blood vessel and diabetics

Based on these discussions: cross segments of your list that do not appear promising. Initially, it is OK to do this based on a quick online search, your discussion, and your intuition as a team. For the 2-3 remaining segments, however, you will have to repeat this process based on actual research. The next sections will guide you through this process.

Appendix G

The market segments as presented in mid-term presentation are as below.

There are 4 primary segments

- Commercial Drivers
- Hunters and Wildlife Observers
- Retinitis Pigmentosa People
- Soldiers / Army / Law Enforcement

These segments are not as big as secondary ones. On the other hand, these are so close to major focus of product/technology itself. Hence, even the market is not so big, there is a better possibility in sales since technology covers major needs of these segment customers easily. The problem is density of customers in one segment may dominate the production capacity which may cause a customer dependency.

There are 4 secondary segments.

- Early / late performance sports (Runner, Cycling, Tennis etc.)
- Search and Rescue Teams
- Medical Use / Patients' Blood Flow
- Enhancement for new type of Cinematic Experiences - Audience

These segments are huge ones but our product is not covering major customer needs. Hence, potential sales seem limited and they are not promising in sales as much as primary ones. On the other hand, for these segments production can be more flexible and this means less customer dependency for the company.

Appendix H

Runner Stats:

Who runs and when

https://cdn.trustedpartner.com/docs/library/RunningUSA2012/RunningUSA_NRS_2017.pdf

<http://www.runningguru.com/SM/Demographics.asp>

Where do they run:

<https://www.runnersworld.com/races-places/a20820312/the-50-best-running-cities/>

Outdoor Activities: Most popular is running

US Trends

<https://www.clevelandmetroparks.com/getmedia/ecb07ec1-9081-444f-ad55-eee10e17ee73/Recreation-and-Leisure-Trends-Analysis.ashx>

Night Vision Needs People:

Cataract, Age related Macular Degeneration, Cataract, Retinitis pigmentosa

With age eyes lose more rod cells than cone cells leading to decrease in vision adjustment in low light

<https://www.nytimes.com/2007/03/13/health/13brody.html>

Vision related correction needs Stats (Govt): Night vision becomes poor due to age, onset of cataract or treatment complication post diabetic complications

<https://www.ncbi.nlm.nih.gov/books/NBK402366/>

<https://nei.nih.gov/eyedata/amd>

<https://nei.nih.gov/eyedata/cataract>

RP is considered a rare disorder. Although current statistics are not available, it is generally estimated that the disorder affects roughly 1 in 4,000 people, both in the United States and worldwide.

https://nei.nih.gov/health/pigmentosa/pigmentosa_facts

Retinitis pigmentosa. This rare genetic disorder affects young people, usually before age 30. A decline in night vision is often the earliest symptom. Some people lose all their sight. Others keep some vision.

<https://www.webmd.com/eye-health/night-vision-problems-halos-blurred-vision-night-blindness#>

1

Demographics of night blindness

<https://www.who.int/vmnis/database/vitamina/table1/en/>

<https://www.who.int/vmnis/database/vitamina/table3/en/>

Facts and terms:

Bright-Source Protection [BSP] – High Light Cut-Off

<https://nightvisionops.com/night-vision-101/night-vision-glossary/>