**Universal Mask Fitting**

Business model, costs & expenses, income statements and NVP analysis

Submitted by

GNG 2101-D01, D2

Kristen Janzen, 300107082

Kelly Shigeishi, 300130179

Shaun Ruddy 300018735

Yi Shi 300116571

Date: 21/03/2021

University of Ottawa

**Abstract**

The objective of this report is to outline the business model and draft a business model canvas for the company if the Univeral Mask design project were to be perused as a business, outside of GNG 2101. The company would have the e-commerce business model as the products would be sold through an online retailer. In this report the online retailer business model, a NPV diagram as well as a statement of income will all be presented.

**Table of Contents:**

**Abstract**  **ii**

**Table of Contents**  **iii**

**List of Figures**  **iv**

**List of Tables** **v**

1. **Introduction** **1**
2. **Business Model**   **1**
   1. **Business Model Canvas 1**
   2. **Core Assumptions**  **3**
3. **List of Costs and Expenses**  **3**
4. **Three-Year Income Statement**  **3**
5. **NPV Analysis**  **4**
6. **Economics Report Assumptions**  **4**
7. **Conclusion**  **6**
8. **Appendix**
   1. **Rough work and estimations of costs given quotes from suppliers. 7**

**List of Figures:**

**Figure 1:** Break even graph **5**

**List of Tables:**

**Table 1**: Business Model Canvas **2**

**Table 2:** Types of costs and possible costs to be incurred by the company starting the business **3**

**Table 3:** The Statement of Income for 3 years of Operation **4**

1. **Introduction**

The prior report outlined the final design and development of the product based on the feedback acquired in the second client meeting. This led to a prototype being developed to test the overall concept of the product and whether the silicone would adhere to the face effectively. Previously a decision matrix was created after brainstorming to development the most feasible solution and sketch it. In the first report the client needs and wants, a problem statement, a set of metrics and target specifications were generated in order to be able to best satisfy the client’s needs while developing the product. Then the team met with the client to obtain feedback and the feedback received by the client concerning the first prototype created was used to further elaborate on the development of the second prototype.

The product being designed has the goal of increasing the visibility of the user while wearing a mask, the low visibility is due to an accumulation of condensation on glasses due to respiration. This makes navigating the pandemic situation difficult for glasses wearers. In order to best solve the problem and satisfy the client’s needs a solution has been designed and will now be tested and improved to meet the client’s needs.

This report reports on the economics behind continuing this project and analyzing what would be expected to happen if it were established. First, a business model was determined, and a business model canvas was created. Then costs and expenses were listed and sorted in order to draft and estimate a three-year income statement and a NVP analysis. Finally, the assumptions used in order to effectively generate these reports were detailed.

1. **Business Model**

The business model for the universal mask fitting project would be the E-commerce business model. This will allow for the company to set up a webpage to sell the product and for the customers to order and purchase the products.

* 1. **Business Model Canvas**

The business model canvas is a management technique to help develop a new business, and to understand the target audiences and work that will be required to establish this business successfully.

**Table 1**: Business Model Canvas

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Key Partners:**  Kristen Janzen  Shawn Ruddy  Kelly Shigeishi  Yi Shi  Medical grade silicon supplier  Medical grade adhesive supplier  Wire supplier  Magnet supplier  Mould supplier  Customs Agent | **Key Activities:**  Develop website for online store  Development of final product.  Hiring and training of production staff.  Obtaining business space, materials, insurance and other supplies.  Gain funding from outside sources to cover some Startup costs. | **Value Proposition:**  Addressing the issue of the fogging of glasses when individuals wear masks. This will also lead to addressing the reduction of anxiety in people navigating the Covid-19 pandemic. | | **Customer Relationships:**  Customer relationships would be developed through online interactions, the customers can email the company with questions concerns or requests. Reviews from the costumers will also be reviewed to help improve the product to establish a better reputation and to ensure customers feel heard and appreciated. | **Customer Segments:**  Glasses wearers are the most important clients as the product is designed for them as they cannot function to their full capabilities in the pandemic situation without their vision. We also wish to reach the elderly and more at-risk demographic to help reduce their anxiety in navigating the pandemic. |
| **Key Resources:**  Skilled Employees  Maneuverable Website | **Channels:**  Sold on “Shopify” website, future plans to have chain/department stores distribute the product. |
| **Cost Structure:**  Technological setup and running costs.  Salaries to permanent employees.  Advertising and marketing costs.  Rent and utilities expenses.  Amortization (patents).  Credit card fees. | | | **Revenue Streams:**  The business will make money from sales from the website. The pricing would be set by determining the cost to create each product individually and then marking up this price by 200% to turn a profit. | | |

This business plan identifies the potential suppliers we must find, key activities for a successful business, the value of the proposed product, the relationship with the customers and how the company will turn a profit.

* 1. **Core Assumptions**

The core assumption made in creating the business model was that the user has access to a computer or cellular device to shop online. Given that this product was made for pandemic protection it is not an unreasonable assumption as many people have shifted to online shopping to reduce the number of unnecessary outings. Starting as an e-commerce business or business model also gives the company the opportunity to expand and eventually sell their products in local or chain stores to reach more or a greater variety of customers.

1. **Lists of costs and expenses**

Costs and expenses must be determined to run a successful business, without estimating the costs the business will take much longer to become profitable as the company would not be prepared and potentially not be able to stay afloat without having planned for the expenses of running a business.

These different costs and expenses can be sorted into four categories: fixed cost, variable costs, direct costs and indirect costs.

**Table 2:** Types of costs and potential costs to be incurred by the company starting the business

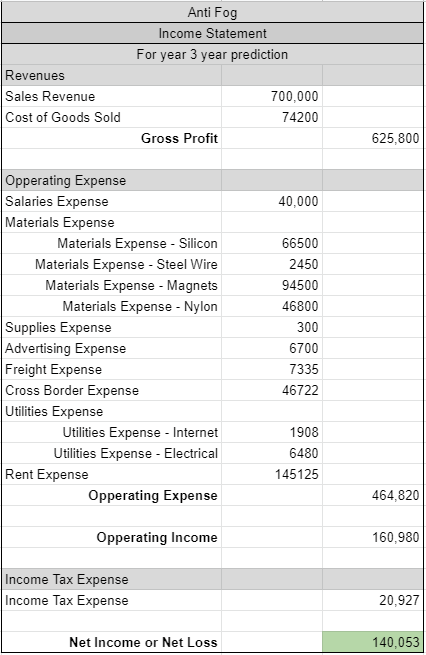
|  |  |  |  |
| --- | --- | --- | --- |
| Variable Costs | Fixed Costs | Direct Costs | Indirect Costs |
| Raw materials | Rent | Manufacturing costs/supplies | Rent |
| Interest Expense | Office Supplies |
| Production Supplies | Insurance |
| Depreciation |
| Credit Card Fees (on website for payment) | Salaries | Salaries |
| Utilities | Utilities |
| Freight out (shipping costs) | Amortization | Shipping costs | Freight out |
| Advertising | Marketing/Advertising |

Fixed costs are constant regardless of the quantity of services the company provides, whereas variable costs will change with the quantity of output or production. Direct costs are costs specific to a certain project whereas indirect costs are costs incurred that are not associated with a specific project.

1. **Three Year Income Statement**

An income statement is used to convey the details of profitability of a company, this statement is used to determine how well the company is turning expenses into revenues. This information will be important to the stakeholders or future stakeholders in the company. The three-year income statement will be used as an estimate and a projection of how the company will perform in the future (if it were funded and established).

**Table 3:** The Statement of Income for 3 years of Operation

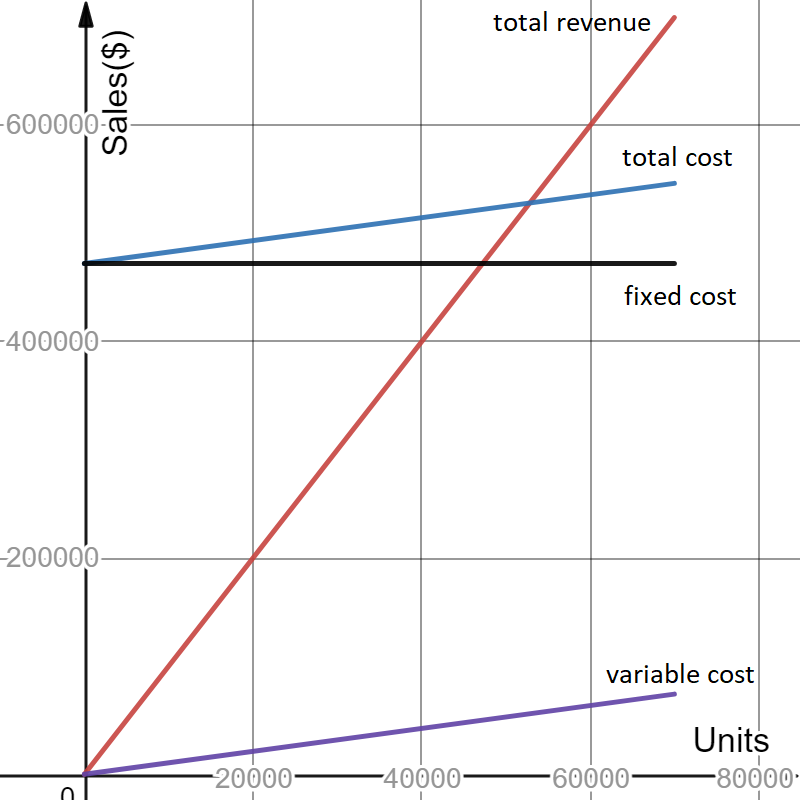


For the creation of this income statement all expenses were calculated and considered. Interest and depreciation expenses were to be ignored. The sales revenue was determined by calculating the sum of all expenses and determining a reasonable price for the product to generate enough revenue. The advertising expense was determined by calculating the cost for 100,000 impressions on a social media platform. Freight expense was calculated by considering the cost of shipping one full shipping container per shipment. Cross border expense was calculated by using the CBSA’s duty and tax estimator website. In the end, a final operating income of $160,980 was found. Once, the taxes were calculated a net income of $140,053 was found for three years of operation.

1. **NPV Analysis**

A NPV analysis or a net present value analysis is used to analyze the profitability of a company as well as the company's breakeven point. A positive value being obtained in the NPV analysis indicates that the earnings generated exceeded the anticipated costs, a negative value indicating the opposite.

Figure 1: Break even graph



In the chart above the values used were determined in the income statement. The marginal cost of the product is $1.06 and the price that it is sold at is $10.00. The total revenue equals the total cost at around 52 848 units, meaning once 52 848 units our sold the break-even point has been reached. When finding the break-even point, the total fixed costs are divided by the price of the product minus the marginal cost (8.94). Using that formula, the same break-even point as seen in the graphical representation was found. This shows that after 52 848 units have been sold the business will then be profitable, the profitable region on the graph is shown after the intersection of the blue (total cost) and red (total revenue) lines.

1. **Economic Report assumptions**

The economic report was constructed assuming that 0.5% of glasses wearers in Canada would purchase the product. This led to the assumption that 70,000 units would be sold in three years. Furthermore, it was calculated that a single unit of the anti-fog product would cost $1.06 to fabricate. To cover all other expenses and generate revenue it was determined that a retail price of $10 should be considered. It was also assumed that there were no other costs included that were not thought of or that there were no unexpected costs or delays in production. Furthermore, one order of products was assumed to fill up one entire freight container which would be used throughout the year. Rent expense was calculated by searching for a reasonably sized industrial lot within Ontario and calculating it’s rent for 3 years. Utilities such as internet and electrical were calculated based off average internet and electrical costs in Ontario. Minimal office supplies were assumed to be needed this $100 a year on office supplies was assumed. Finally, to maximize retained earnings, it was assumed that the four team members would be hand constructing approximately 40 units a day for 261 days out of the year. They would all receive a minimal salary to promote the growth of the business.

1. **Conclusion**

In conclusion, through much prototyping, research, and comparison of prices, this team has been able to deduce a low manufacturing cost for the anti-fog product. The income statement was created to represent a full three years of operation expenses and overall income. It was determined that an ideal market price for the product would be around $10. This would ensure a sizeable amount of revenue that could then be redirected to into the company to help grow it further. Furthermore, the NPV analysis was also conducted, and it was found that the break-even point would occur once 52,848 units were sold so for a total revenue of $528,480.

1. **Appendix**  
   1. **Rough work and estimations of costs given quotes from suppliers.**

List of possible **Fixed Costs:**

* Rent
* Interest Expenses
* Insurance
* Depreciation
* Salaries
* Utilities
* Amortization (patents)
* Advertising
  + “Generally speaking, [a successful retail store](https://www.thebalancesmb.com/secrets-of-operating-a-successful-retail-business-1200743) will spend between 3% and 5% of sales on marketing. Spend more, and you'll be "dependent" on advertising. That means customers will only respond when they see an ad. Spend less, and your traffic will suffer because you may not be present enough. There should be a happy medium.”
* Equipment rental?

List of possible **Variable Costs:**

* Raw materials
  + Silicon
    - [Blue Med Healthcare (Shanghai) Co., Ltd.](https://bluemed.en.alibaba.com/?spm=a2700.12243863.0.0.34b13e5fVQhyoF)
    - 5,000 pieces at 0.76 USD a piece -> 0.95CAD
    - 1 piece/unit
    - 70,000 units x $0.95 CAD = $66,500
  + Steel wire
    - $1.75 per X amount of wire?
  + Magnets
    - $0.075 per magnet, or $15 for 200
    - 18 magnets/unit for a total of 1,260,000 necessary magnets
    - 1260000 x $0.075 = $94,500
    - Amazon
    - https://www.amazon.ca/Deryun-200pack-Magnets-Multi-Use-Miniature/dp/B085Y6B1S7/ref=sr\_1\_5?crid=8DEFNMXKSI3W&dchild=1&keywords=small+magnets&qid=1616292863&sprefix=small+mag%2Caps%2C201&sr=8-5
  + Nylon
    - [**Quanzhou Helun Weaving Co., Ltd.**](https://qzhelun.en.alibaba.com/?spm=a2700.details.cordpanyb.2.34df50d5mJqnh0)
    - 70-999 m for $6.44
    - 1000-2999 m for $4.10
    - 9cm = req length per unit
    - +3000 m for $3.90/m -> $11,700/3000m
      * Graphic customization on this option
    - 300,000cm/9cm = 33,333 units/roll
    - 70,000units/33,333 units/roll = 2.1 rolls ~ 3 rolls
    - 3 x $11,700 = $35,100
* Production supplies
* Credit card fees
  + Customers expect the option of **using** a **credit card**, though it can **cost** between 2.3% and 2.5% for **E-commerce** stores.
* Freight out (shipping costs)

List of possible **Direct Costs:**

* Manufacturing supplies
* Shipping/transport costs

List of possible **Indirect Costs:**

* Salaries: ~10% of retained earnings after 3rd year per employee (4)
* Rent
  + Leasing is a cheaper option. Office [rent in the Toronto GTA](http://www.commercialtoronto.com/Information/rent-calculation.html) area may range from $8.00 to $27.00 per sq. ft. net rent. Average rent in Vancouver in 2015 was about $1,674. Office space on Bay Street is very expensive, costing$68.87 per square foot. Renting office space on Burrard Street in Vancouver is costly, average rents are $58.47 per square foot. An office space on Calgary's Second Street S.W. is about $55.29 per square foot. Outside of this area cheaper rents may be found. Once again the lease price will be lower in less central locations.”
  + 1000 sq. Ft minimum
  + <https://www.spacelist.ca/listings/on/industrial#424135>
    - 4500 sqft
    - $10.75/sf/yr ~ $48,375/year
* Equipment depreciation
* Equipment maintenance ~ NONE????????????????????????????????
* Utilities
* Marketing/advertising
  + Advertising through social media: Cost per Impression (an impression is a time the content is shown to a person): $6.70/1000 impressions
* Office supplies ~ assume $300 for three years
* Freight out (shipping costs)
  + Shipping from Shenzen Port -> Toronto Port (by sea): $692 for 200kg/1cbm
  + By air: