Project Deliverable G: Business Model and Economics Report

Professor: Rubina Lakhani

Submitted by: Section A02, Group 04
Yendra Yogarajan - 300239233
Gurjot Grewal - 300263760
Brian Bulitka - 300248903
Matej Mincev - 300056451
Kevin Zhang - 300104907

November 20, 2022
University of Ottawa

Table of Contents

List of Figures

List of Tables

1.0 Introduction

Although it is important to properly design a product, it is also key to look at the business and financial aspects if one aims to start a company. With this deliverable, our team will assume that we have started full production of our final prototype and are getting ready to sell it. To envision our potential company, we will start by discussing our ideal business model, and then generate a business model canvas based on the nine main building blocks. Our team will also describe the key assumptions that we made when developing the business model canvas. After this, we will also explore the economics aspect of the company, which includes developing a 3-year income statement, determining the break-even point and conducting market research. Finally, our group will also present an updated version of our project plan on Wrike.

2.0 Business Model

In order to commercialize our product, our team feels that the razor-blade business model would be the best fit. The razor-blade model occurs when a company sells one product at a lower price, in order to improve the amount of sales of a distinct, complementary product. This business model gets its name from Gillette, an American company that was able to sell its razors for cheap, but then made massive profits off of the consumable blades that were purchased by customers.

In our case, we would sell the main frame for a cheaper cost, while the clamps would be sold at higher costs to increase profit margins. Based on the model name itself, the razor can be compared to the main frame, while the blade is similar to the clamps. The clamps would be the ones that allow for the entire prototype to function, since they allow for the connection of the bike to the wheelchair. Therefore, these connections may be seen as the complementary portion of the final product. The main structure of our device is reliant on the clamps, and the connections would likely need to be replaced more often with wear and tear. As a result, we believe that the clamps would be the principal source of revenue for our company, as they would generate the most sales.

Furthermore, we believe that the social aspect of the razor-blade model would be beneficial when commercializing our product. Since the base product would be offered for a smaller fee, this would lower the barrier to purchase it. Furthermore, other similar products that achieve the same result at us, do it at a substantially higher price. As a result, we feel that people would be more inclined to buy the frame and then follow that up by paying more for the necessary accessory that comes with it. This would therefore produce a stable revenue stream for the company, and we predict that eventually the profits generated from the clamps would override any losses we may incur from the selling of the frame. Looking at it from a social aspect, we would also hope that our prototype creates a lot of value for the customer so that they purchase our manufactured clamps out of a regular and consistent habit.

3.0 Business Model Canvas

A business model canvas is a template that is used to visualize how a business would operate, market itself and generate profits. It was invented by Alex Osterwalder, and it consists of the following nine building blocks: value propositions, customer segments, channels, customer relationships, revenue streams, key resources, key partners, key activities and cost structure. A filled-in business model canvas for our proposed company will be presented below, and it will portray how value is created for the customer by explaining the how, what, who and how much of the business model.

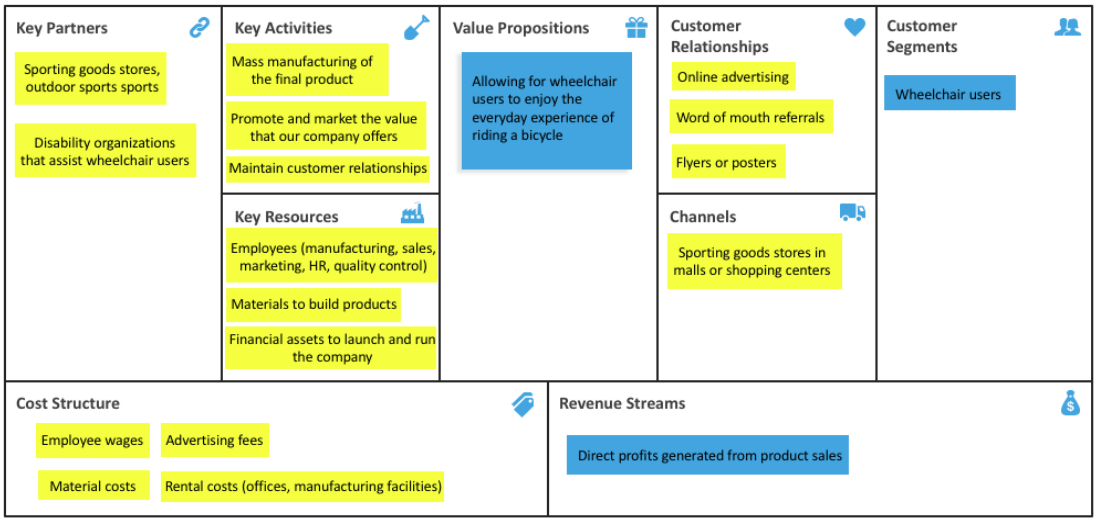

Figure 3.1: Filled-in Business Model Canvas for our Proposed Company

4.0 Core Assumptions of Business Model Canvas

For every business model canvas, there is always a set of core assumptions that need to be made. Every building block that gets filled out on a business model canvas is an estimation and we do not know if it is actually true. This is why it is important to reach out to our target market to test and validate the assumptions that we have made. After validation, we may go back and change some elements of the canvas: this means that this process is iterative and may go through many different variations!

The first main assumption is that our value proposition resonates with a large enough target audience. This means that we hope our company provides enough value to a lot of people so that we can make our customers satisfied, while also generating a steady and consistent revenue. If we were to test this, we would do further market research, gather survey data and conduct face-to-face interviews to determine if our value proposition is relevant to a decently sized customer segment. Next, we have also assumed that we will be able to partner with retail sporting goods stores. Since biking is a common outdoor sport, we envision our product being sold at well-known shopping centers and malls. This would be a two-way street, as we could successfully promote our prototype at these stores, while also having them benefit from the sales of an additional product. We think that the privilege of selling our product at well-known stores may be more challenging to obtain, as we lack the necessary relationship to do this: hence, this is one of key core assumptions. Furthermore, we have also assumed most wheelchair users enjoy the leisure of bike riding. Our value proposition, as well as our product, is based on this assumption being true, so we would need to validate it to confirm this. In the future, this may be done by interviewing many wheelchair users face-to-face, or having them subscribe to monthly newsletters related to our product and seeing how many positive responses are received. Finally, in terms of logistics, we have also assumed that our company would have the necessary resources to get started and to eventually expand greatly. These would include acquiring the necessary financial assets, having enough employees at the beginning and being able to hire more, renting out the required manufacturing facilities and being capable of procuring the materials to produce our final prototype in mass numbers.

Overall, we are confident in our business model and believe that it has a good feasibility. We think that our company could manufacture our product at a relatively low price while still having a long service life, since it would be made of materials that are easily available and have great durability and sturdiness. By appealing to our target customer segment, we thus believe that we can generate large profits by using the razor-blade business model. Our main frame can be sold for cheap, but the consumable clamps would be sold at a high price and this would account for most of our revenue stream. We believe that our idea is therefore feasible since it is similar to the successful model employed by Gillette about one hundred years ago. As a result, our business would provide great value to consumers, while also making the right amount of profits to keep the company at a consistent growth rate.

5.0 Variable, Fixed, Direct and Indirect Costs

The manufacturing and sale of our product will have four main types of costs, variable, fixed, direct and indirect costs. Variable costs are things that could change with our production output, whereas fixed costs will be the same set amount regardless of production output. Direct costs relate specifically to our wheelchair bike attachment production, while indirect costs are things that we would have to pay that do not directly affect the product.

These costs will vary greatly from our initial prototyping costs as mass producing products require the purchase of material at higher quantities to save costs. Furthermore, while prototyping can be done at a lower budget to create a proof of concept, manufactured components need to be fully operational and ready for the consumer. Bulk manufacturing will save the company money, but also increase profit margins. Thee costs we expect to have are outlined below:

Variable Costs

1. Electricity consumption
    a. The amount of electricity consumption would depend on the amount of orders we receive to produce products.

    b. This cost would mainly rise from the use of machinery to fabricate the steel frames and the carabiner clamps.
    c. The steel frames would have pieces that would have to be cut to size and then either an automated process, or more likely a human, would have to weld the components together.
    d. Following the razor blade model, the clamps would have to be mass produced and at a low cost for the business to be profitable. Therefore the clamps would have to be automated and would require large amounts of electricity to run continuously.
2. Raw materials
    a. Raw material costs are always changing.
    b. It is in our best interest to buy raw materials in bulk to save money.

Fixed Costs

1. Building rental
    a. Fixed price in the lease, which is most likely a month to month cost
2. Loan repayment
    a. Fixed minimum repayment plan

Direct Costs

1. Raw material costs
    a. Materials would fall under both direct and variable costs
2. Salary
    a. Paying employees for their work is directly related to production output
3. Staff Training
    a. We would have to pay to have our staff trained on the correct components

Indirect Costs

1. Machine maintenance
    a. We would have to pay licensed professionals to perform regular maintenance on the machines to ensure they do not break and last their expected lifetime.

6.0 Three Year Income Statement Estimate

	Sales	1,900,000	
	Cost of Units Sold	750,000	
Gross Profit			$1,150,000
Operating Expenses			
	Marketing	50,000	
	Salary	600,000	
	Rent	75,000	
	Utilities	250,000	
	Depreciation	30,000	
		Total Operating Expenses	$1,005,000
Operating Income			$145,000
Interest Expense		$25,000	
Earnings Before Tax			$120,000
Income tax (25%)			$30,000
Net Income			$90,000

Table 6.1: Three year income statement estimate

Note: This 3-year income statement is a rough estimate based on current market conditions and the costs are subject to change as costs change.

7.0 Break-Even Point Analysis

We decided to have the market price at $130 per one main frame and $50 per one set of clamps; each main frame has a manufactory cost of $90, and each set of clamps has a manufactory cost of $12. According to our business model, a reasonable estimation is made that a main frame would usually be purchased with 5 sets of clamps

per customer in a year on average, so one unit here is defined as one main frame and 5 sets of clamps. A unit has a market price of $380 and costs $150. A 5% interest rate is considered.

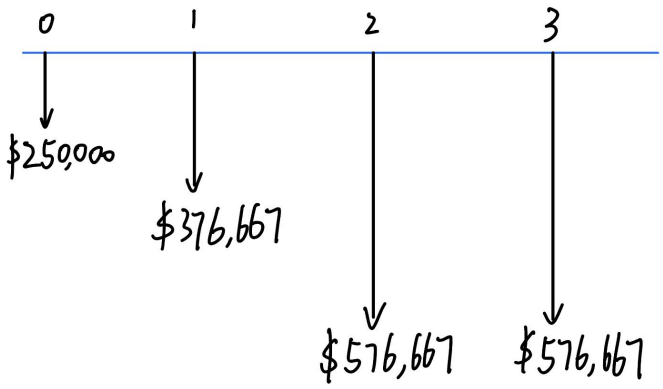

Figure 7.1: Cash flow for expenses

NPV of first year's expense = $\$250,000 + \$376,667/(1 + 5\%)^1$ = $608730

NPV of second year's expense = $\$576,667/(1 + 5\%)^2$ = $523053

NPV of third year's expense = $\$576,667/(1 + 5\%)^3$ = $498147

Total expense NPV = $1629930

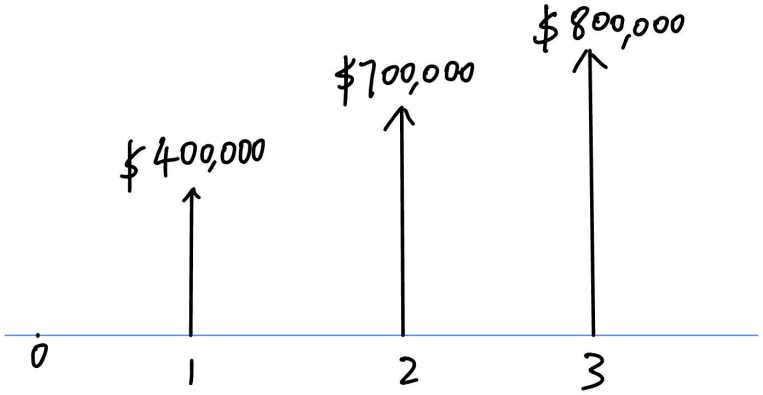

Figure 7.2: Cash flow for incomes

NPV of first year's expense = $\$400,000/(1 + 5\%)^1$ = $380952

NPV of second year's expense = $\$700,000/(1 + 5\%)^2$ = $634921

NPV of third year's expense=$\$800,000/(1+5\%)^3$ = $691070

Total expense NPV= $1706943

NPV of first year's profit = $380952 - $608730 = -$227778

NPV of second year's profit = $634921 - $523053 = $111868

NPV of third year's profit = $691070 - $498147 = $192928

Break-even point = $(\$115910 * (1+5\%)^3 + \$400,000 + \$700,000)/\$380$ = 3248

According to the calculation, the break-even point occurs in the third year, specifically, it occurs when the NPV of third year's profit is $115910. This means when the 3248th unit is sold, the break-even point will be reached.

8.0 Assumptions

For our economics data, we set a list of assumptions in order to develop our report. This was done by conducting research on the current market for our product's pricing strategy and market share. The first assumption made was in relation to the quantity of units sold for our product. We assume that we are able to sell slightly less than 1700 units per year. This will allow us to meet our 3 year gross profit. The demand for this quantity of product was calculated due to the scarcity of such an attachment. The higher the scarcity of a product, the higher the product could be sold for and the greater demand for it. Since biking is an outdoor sport, this market is a very large market to cater to. Next, we assumed that we would have an average employee count of around 5-10. This would allow us to manufacture the right quantity of our product to sell. These employees would have a direct relation to the gross profit per year as well as they are responsible for the manufacturing. Finally, we also assumed that all of our manufacturing and marketing would be done from a rented facility in Ottawa. This allows for a lower rent cost as opposed to starting a company in Toronto. All these assumptions played an important role in calculating our revenue and expenses for a 3 year plan.

9.0 Conclusion

To conclude, we have chosen that the best business model to use would be the razor-blade business model. This will allow us to sell the frame for a cheaper cost while the clamps will be at a higher price. Furthermore, we believe that the social aspect of the razor-blade model would be beneficial for us when it comes to commercializing our product. While making the business model, we had to assume that the value proposition resonates with a large enough target audience, that we will be able to partner with retail sporting goods stores, and finally that most wheelchair users enjoy the leisure of bike riding. We have decided that the best market price for one main frame would be $130 and $50 per clamp. With these values and with research on the Internet, we were able to create a three year income statement and our net income after three years would be $90000. Finally, we have calculated our break-even point would occur in the third year. We would break-even when our 3248th unit is sold.

10.0 Updated Project Plan

Below is an updated version of our project plan on Wrike.

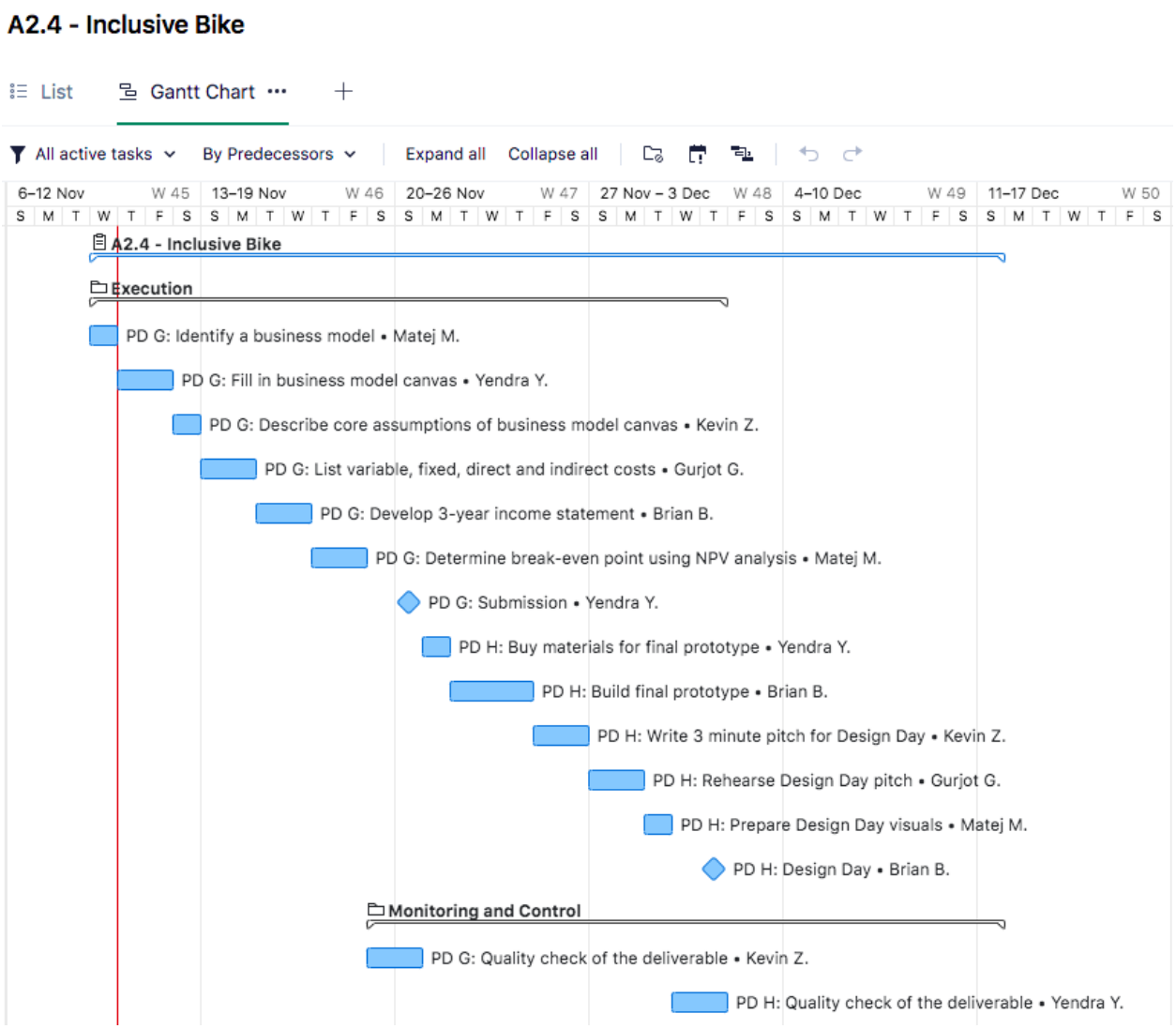

Figure 10.1: Updated Project Plan using Wrike