GNG2101

Project Deliverable G

Submitted by

Group A2.5

Adriana Desylva 300238612

[TEAM MEMBER, STUDENT ID]

[TEAM MEMBER, STUDENT ID]

Date

University of Ottawa

Abstract

Through the process of building business model via brainstorming and analyzing, our group finally made our own business model. This was done through group discussion, as well as analyzing the pros and cons of each model with concerns to manufacture, structure, safety, and cost. We were able to assume the costs for each product through making our first actual prototype. We have welded and using mill to make a hole. And set up income statements expected for next three years and defined what will be the breakeven point of our business.

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Acronym	Definition
NVP	Net Present Value

1 Introduction

In this report, our team has outlined our business model and created an economics report that reflect our products future development in a marketplace. In the business model, we will analyze the type of business model we are, create a simple business model outline and highlight some critical assumptions about the model we have chosen. In the economics report, we have made a list of cost, developed an income statement and created a NPV analysis to find the break even point.

2 Business Model

When analyzing the types of business models, two stand out to commercialize our team's product.

Firstly, a brick-and-mortar business model describes the act of setting up a physical store to sell products. Since our product is physical, it is best to have users in a store to be able to see and purchase it. Additionally, it is not universal so as to fit all wheelchair and bike types, and therefore it would be beneficial to be able to have users come to the store to test it out.

Secondly, the business model of Uber represents one where the users are the ones who provide the infrastructure. This would be the case with our product; our product provides the connection between a bike and wheelchair. As such, we are not providing the wheelchair or bike, that is up to the customer to have. Therefore, this business model would be well suited for our product.

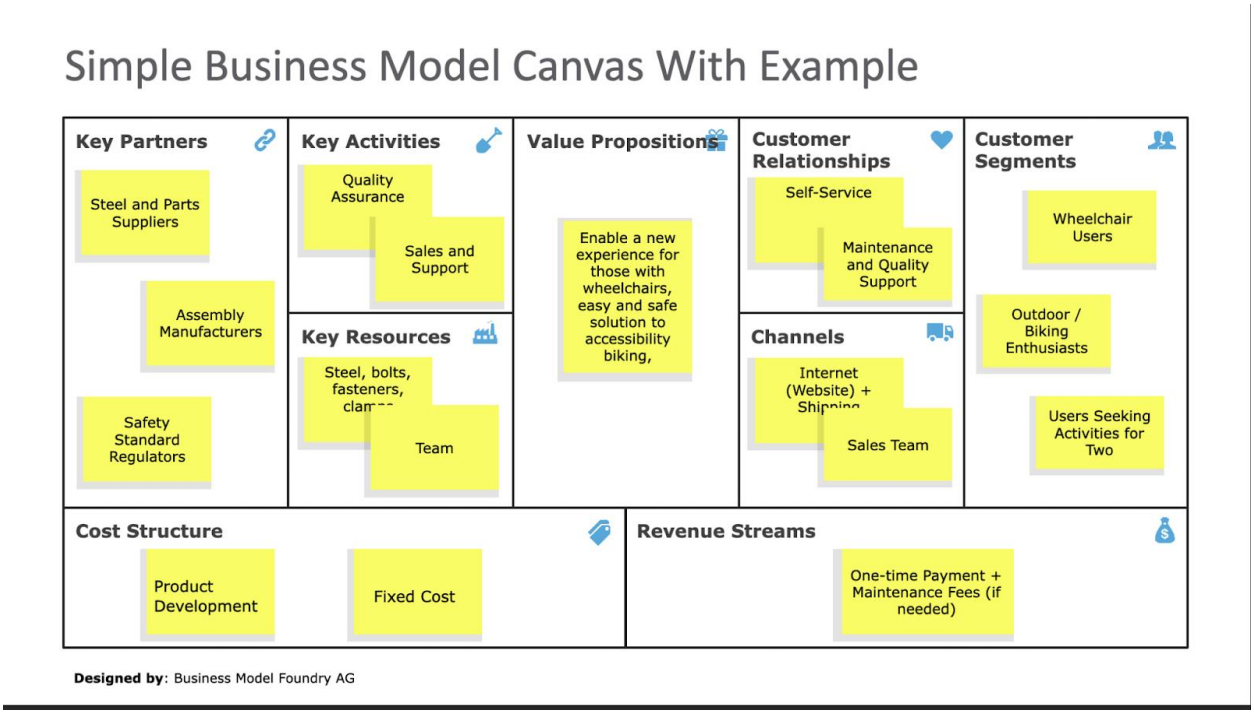

Figure 1 Simple Business Model

To properly develop a business model, some core assumptions must be made.

Core assumptions:

- Customers who purchase the product have a bike and wheelchair
- Users in the wheelchair will have assistance from the biker to attach and detach the product onto the wheelchair and bike before and after usage
- Users in the wheelchair will have someone who is capable of biking to drive the bike
- The wheelchairs being used have wheels meant for the outdoors
- The wheelchairs have a secure attachment point to attach the product onto
- The biker has the tools (wrench and screwdriver) to attach the product onto the bike
- Both users enjoy the biking experience, the outdoors, and joint activities
- Able to outsource production and procurement of metal and the assembly of the product

In regards to the feasibility of the business model, there are some comments to be made. Firstly, the assumption in the key partners of the business model is that we are able to acquire metal suppliers and outsource production of the metal. This can be tricky, since on a large scale, it is unfeasible to produce every product by hand. As such, it would be much more cost and time efficient to assemble and manufacture the product in a factory. This, however, may not be able to be done in Ottawa or in Canada, and therefore would pose the problem of transport, import and handling fees. Secondly, the product as it stands is not universal to all wheelchairs and bikes. For this to be the case, many more components would need to be added, which would increase the cost of the product. Therefore, currently, the product cannot be fit to all types of bikes and wheelchairs, and the business model approach to have it available to all wheelchair users is not realistic.

3 Economics Report

3.1 Costs

Variable Cost:

Direct Cost

- Steel Bar
- Suspension
- Attachment blocks such as nuts, bolts and screws
- Delivery fee if we had to ship the product to the client
- Machine rental as we need a horizontal bandsaw to cut the pieces and welding equipment to weld the pieces together

Indirect Cost

- Cost of labour
- Use of the lab equipment
- Workers Insurance
- Taxes
- Any loan payments for machines
- Rent payment for the office space/ building

Upon analyzing our variable costs, we need to ensure that our direct costs will be only the materials or if the machine rental and delivery fee is included. For the indirect costs we need to first figure out how many employees would be hired, what equipment would be purchased or rented, and where the company would be located.

3.2 Income Statement

Sales			$1 877 200
Cost of goods sold			$1 251 466
Gross Profit on Sales			$625 734
Operating Expenses:			
	Delivery Fee	$10 000	
	Machine cost	$50 000	
	Marketing	$15 000	
	Overhead	$40 000	
	Rent	$70 000	
Total operating expenses		$185 000	
Operating income			$440 734

Net income			$440 734

Table 1 Year 1 Income Statement

Sales			$1 877 200
Cost of goods sold			$1 251 466
Gross profit on sales			$625 734
Operating expenses:			
	Delivery Fee	$10 000	
	Marketing	$15 000	
	Overhead	$40 000	
	Rent	$70 000	
Total operating expense		$135 000	
Operating income			$490 734
Net income			$490 734

Table 2 Year 2 Income Statement

Sales			$1 877 200
Cost of goods sold			$1 251 466
Gross profit on sales			$625 734
Operating expenses:			
	Delivery Fee	$10 000	
	Marketing	$15 000	
	Overhead	$40 000	
	Rent	$70 000	
Total operating expense		$135 000	
Operating income			$490 734
Net income			$490 734

Table 3 Year 3 Income Statement

3.3 NPV Analysis and Break-Even Point

Total Cost			Year	Total cost	Present value	income	Present value	net	
Labour			0	185000	185000	1877200	1877200	1692200	<- Breakeven point
Material			1	135000	128571.43	1877200	1787809.52	1659238.09	
Marketing			2	135000	122448.98	1877200	1702675.74	1580226.76	
Electricity			3	135000	116618.08	4765200	4116358.92	3999740.84	
Overhead			4	135000	111064.83	4332000	3563947.12	3452882.29	
Depreciation			5	135000	105776.03	3898800	3054811.82	2949035.79	
			6	135000	100739.08	3465600	2586084.08	2485345	
			7	135000	95941.98	3032400	2155070.07	2059128.09	
Inflation rate:	0.05		8	135000	91373.31	2599200	1759240.87	1667867.56	
			9	135000	87022.2	2166000	1396222.91	1309200.71	

Table 4 NVP Analysis

3.4 Description of Assumptions

1. The product will be geared to more individual clients and not mass produced to larger corporations.
    - This assumes that individual clients in need of this product will reach out to us and allow us to take measurements of their wheelchair and create a more personalized product. Rather than having a larger company ask us to mass produce a generic size.
2. Payment will come by product and not on a consistent basis.

- This assumes that since we are making products for individuals. We would get paid per product sold, rather than having a consistent form of income. Thus, the more products we sell, the more money we can make

3. There will be no secondary suppliers and we will create the product ourselves.
    - This assumes that once we buy the materials, we will do the work ourselves, we will not employ a second company to build the products for us and supply it to us to distribute. We will handle the building and distributions.

4 Wrike Update

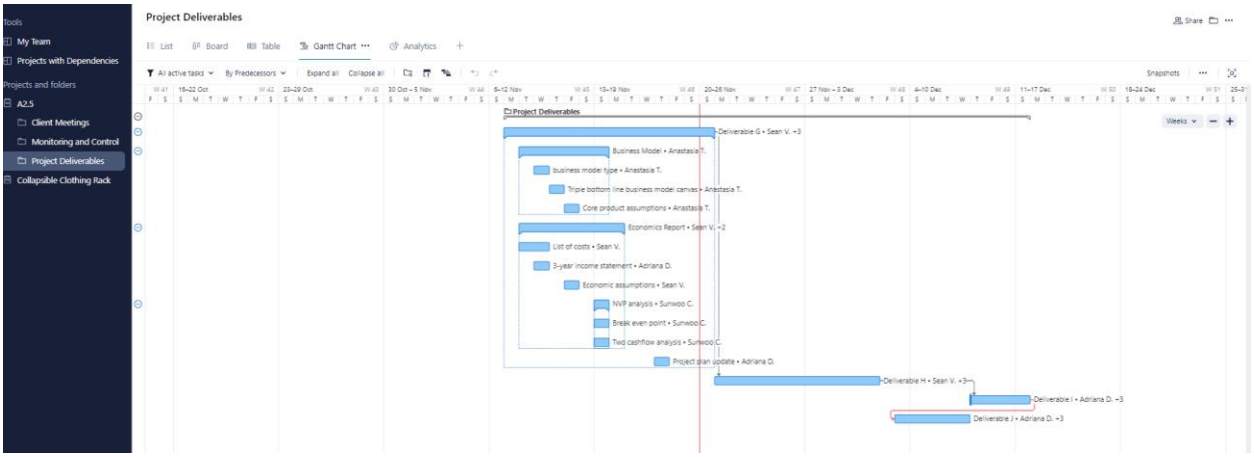

Figure 2 Wrike

5 Conclusions and Recommendations for Future Work

In this report, we have outlined both our business model and our economics report in regard to potentially selling our product in a marketplace and how we may handle our finances. In our next deliverable, we will be presenting our product to our clients, peers, and judges on design day. In the coming week we plan to research and practice a design day script so that we can

portray the meaning behind our project and its creating, as well as functionality and features of our design that makes it unique and practical.

6 Bibliography

Smith, E. M., Giesbrecht, E. M., Mortenson, W. B., & Miller, W. C. (2016, August). *Prevalence of wheelchair and scooter use among community-dwelling Canadians*. Physical therapy. Retrieved November 20, 2022, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4992144/#:~:text=Results,1.0%25%20of%20the%20Canadian%20population.

APPENDICES

No further information to be added to this report.