# GNG 2101

**University of Ottawa: Faculty of Engineering**

**Project Deliverable G: Business Model and Economics Report**

**Sunday, July 3, 2022**

**Group Z-22**

**Daniel Deiros Hernandez (300166389)**

**Sean Tsang (300169861)**

**Kesi Ezirim (300194524)**

# Table of Contents

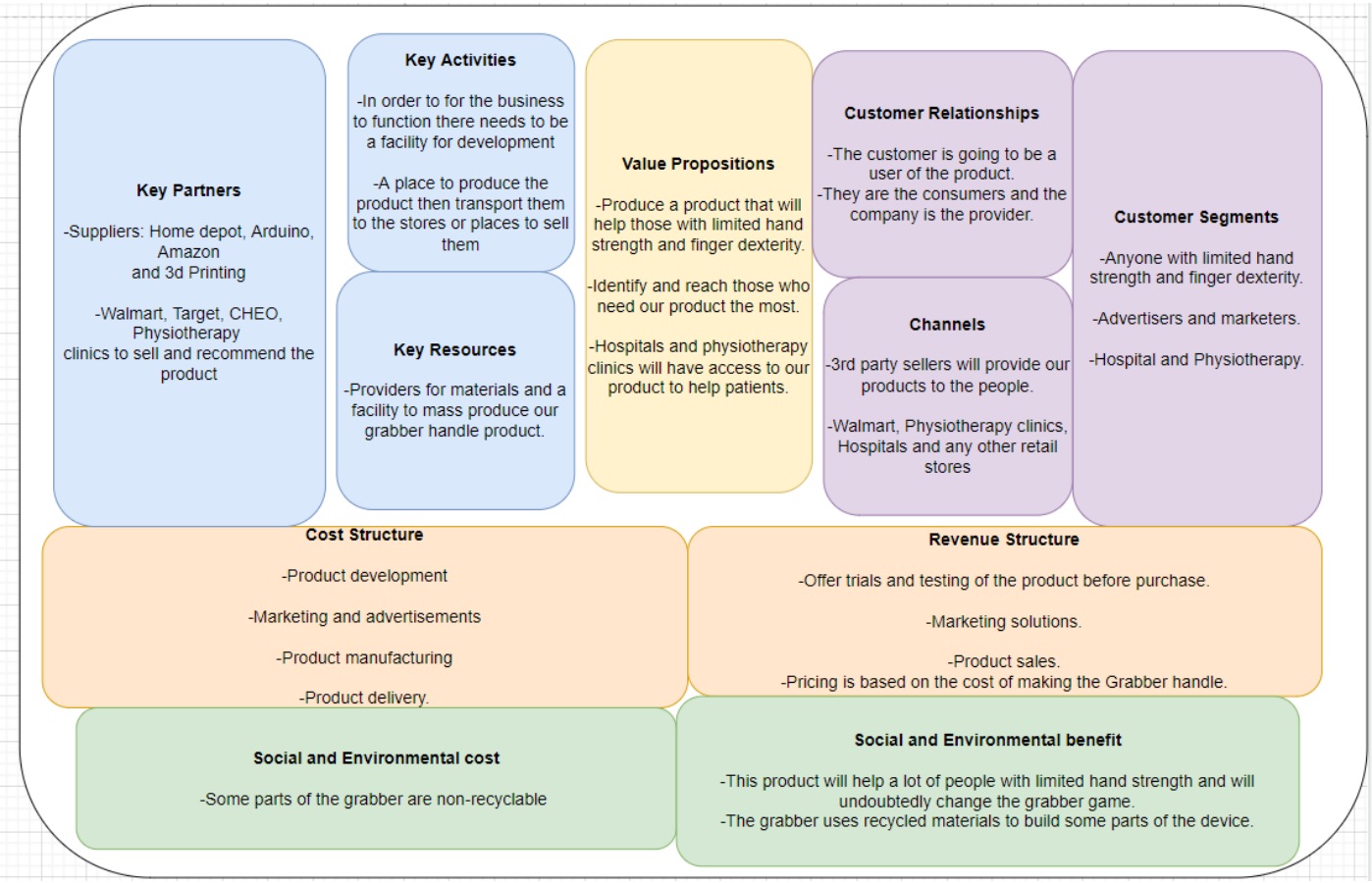
# Introduction

The objective of the deliverable is to create a business model and an economic report for our project product for the next 3 years. This deliverable will consist of the business model type that the team used to sell their product; it also includes the triple bottom line business model to explain the business philosophy behind the company. The document also includes an economic report that contains the income statement for the next three years, NPV for analysis, cash flow diagrams. Additionally, included is information of the assumptions made for the next three years of sales that will approximate many of the values displayed in the deliverable.

# Business Model

The type of business model that would best used to best commercialize the team's product is the "Razor-Blade" business model. This model would best suit our style as there are few competitors for the product the team is attempting to sell. This would mean selling our product initially at a lower price than the team's competitors to get the initial customers, these early predecessors of the company will begin the company's initial revenue and investment into the company. Additionally, once the business begins acquiring more customers, the team will release an updated version of the product in order to obtain more profit from customers. As the updated version will cost more and have updated specifications. This business model type would be best for our team due to the limited products that are similar on the market, thus, the team will use this to their advantage by selling their product at a lower cost to gain more customers. Then increase the price of an updated version of the product to gain a higher profit margin per product sold.

## Triple Bottom Line Business Model




## Core assumption

Our product's target market is likely to be disabled people, including those with arthrogryposis, who are aged 6 and up and have difficulties using commercially available grabbers on the market. Arthrogryposis is a rare disease and only less than 200,000 people in the United States and approximately 1 out of 3000 live births have the condition. It is feasible because the commercial grabber doesn't consider people with difficulty considering people with difficulty in moving joints on their fingers, making the product quite useful. It is also possible that our business model will focus only on product manufacturing and sales, with assistance from the North American Tetra Society. Tetra would also be our primary source of revenue, allowing us to reach out to and identify potential customers/clients across the continent. This is doable since Tetra has prior experience dealing with disabled persons and has completed numerous initiatives comparable to ours. Aside from tetra we are to have partners in supplies and delivery.

# Economic report

| Expenses | Variable/Fixed | Indirect/direct | Reason | Cost Year 1 | Cost Year 2 | Cost Year 3 |
|---|---|---|---|---|---|---|
| Material | Variable | Direct | In BOM it's total is $150 With 2750 units made and 250 more made for year 2 and year 3 | $412,500 | $450,000 | $487,500 |
| Rent | Fixed | Indirect | Space use- 2000 ft² Total rent- $1,123/mo. | $13,476 | $13,476 | $13,476 |
| Salaries | Fixed | Indirect | 5 employees with a yearly salary of $32,000 | $160,000 | $160,000 | $160,000 |
| Electricity | Fixed | Direct | 2000 kwh- $250/mo. | $3,000 | $3,000 | $3,000 |
| Equipment | Variable | Indirect | Laser cutter - $1500*5 3d Printer - $1000*10 Paint- $500 Repairs will be considered for overhead | $18,000 | $0 | $0 |
| overhead | Fixed | Direct | $15,000 | $15,000 | $15,000 | $15,000 |
| Marketing | Variable | Indirect | Promoting the product | $2,000 | $2,500 | $1,500 |
| Total | | | | $623,976 | $643,976 | $680,476 |

## 3-year income statement

| | 1st Year | 2nd Year | 3rd Year |
|---|---|---|---|
| Sales (Revenue) | $225*2500 = $562,500 | $225*3000 = $675,000 | $225*3,150 = $708,750 |
| Cost of Goods sold | $150*2750+$160000 = $572,500 | $150*3000+$160000 = $610,000 | $150*3,000+$160000 = $610,000 |
| Gross profit | -$10,000 | $65,000 | $98,750 |
| Operating expense: | $3000 + $13,476 + $18,000+$15000 = $49,476 | $3000 + $13,476 + +$15000= $31,476 | $3000 + $13,476 + +$15000 = $31,476 |
| Marketing | $2000 | $2500 | $1500 |
| Total operating expenses | $51,476 | $33,976 | $32,976 |
| Operating income | -$61,476 | $31,024 | $65,774 |

3. Assuming a yearly interest rate of 2.5%.
   Creating an NPV for analysis for the expenses:

| Year 1 | | Year 2 | | Year 3 | |
|---|---|---|---|---|---|
| **Expense** | **Cost** | **Expense** | **Cost** | **Expense** | **Cost** |
| Material | $412,500 | Material | $450,000 | Material | $487,500 |
| Rent | $13,476 | Rent | $13,476 | Rent | $13,476 |
| Salaries | $160,000 | Salaries | $160,000 | Salaries | $160,000 |
| Electricity | $3,000 | Electricity | $3,000 | Electricity | $3,000 |
| Equipment | $18,000 | Equipment | $0 | Equipment | $0 |
| Overhead | $15,000 | Overhead | $15,000 | Overhead | $15,000 |
| Marketing | $2,000 | Marketing | $2,500 | Marketing | $1,500 |
| **Total** | $623,976 | **Total** | $643,976 | **Total** | $680,476 |
| **NPV** | $608,757.07 | **NPV** | $612,945.63 | **NPV** | $631,889.61 |

Creating an NPV for analysis for the incomes:

| Year 1 | | Year 2 | | Year 3 | |
|---|---|---|---|---|---|
| **Income** | **Amount** | **Income** | **Amount** | **Income** | **Amount** |
| Sales | $562,500 | Sales | $675,000 | Sales | $708,750 |
| **Total** | $562,500 | **Total** | $675,000 | **Total** | $708,750 |
| **NPV** | $548,780.49 | **NPV** | $642,474.72 | **NPV** | $658,144.83 |

Calculating the differences

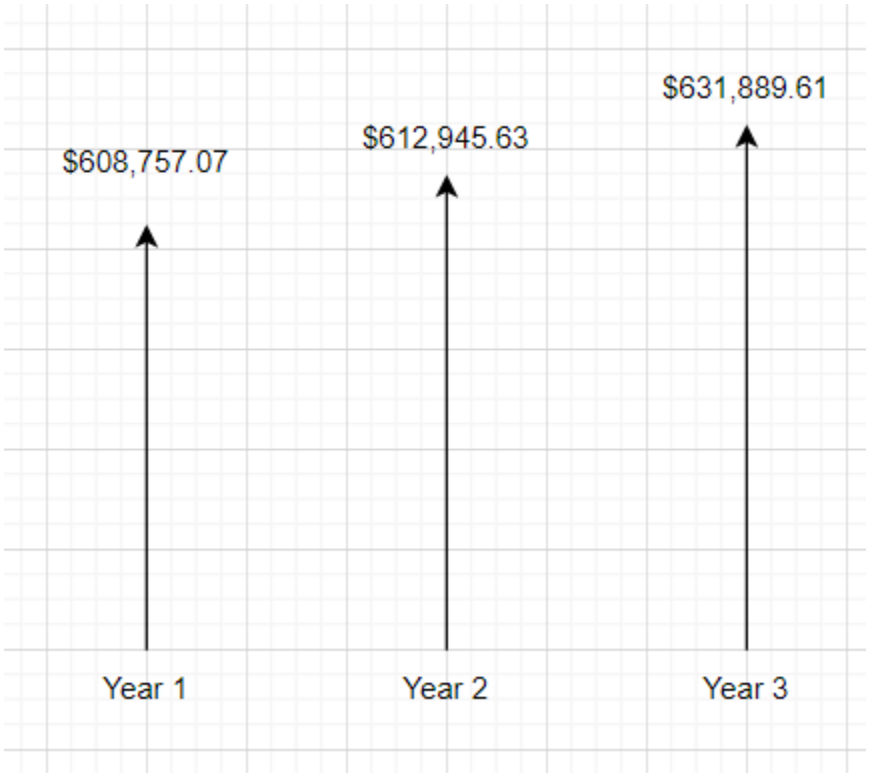
| Year 1 | Year 2 | Year 3 |
|---|---|---|
| $\$548780.49 - \$608757.07 = -\$59976.58$ | $\$642474.72 - \$612945.63 = \$29529.09$ | $\$658144.83 - \$631889.61 = \$26255.22$ |

Calculating break even points

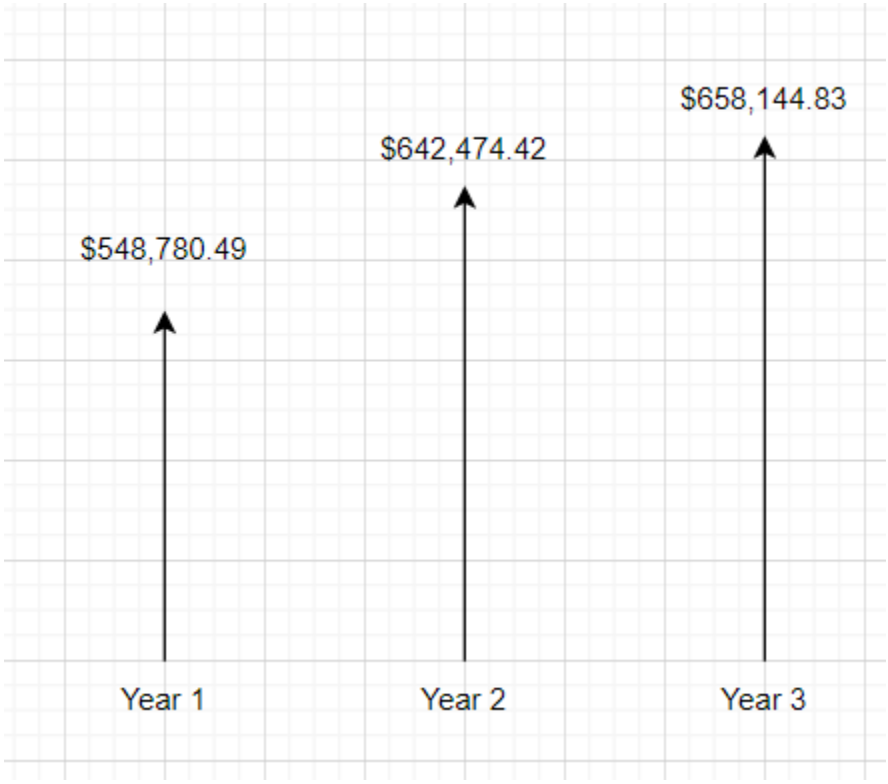
| Year 1 | Year 2 | Year 3 |
|---|---|---|
| $= \frac{\$608,757.07}{\$225} \approx 2706$ | $= \frac{\$612,945.63}{\$225} \approx 2725$ | $= \frac{\$631,889.61}{\$225} \approx 2809$ |

## Cash Flow Diagrams

Cash Flow Diagram for Expenses




Cash Flow Diagram for Income



## Assumptions

To determine how many people would be interested in this product, first we need to know how many people could use our product. This is very hard to determine as there is no data for weakened grip strength of limited finger dexterity. However, predicting the number of people with arthrogryposis in Canada is done by taking the population of Canada and dividing by the number of live births per case of arthrogryposis. So this gives us about $\frac{38000000}{3000} \approx 12667$ [1][2]. Now for those with arthritis in their hands, up to 4 in 10 people develop arthritis in their hands [3]. To be conservative, we will say 2 in 10 people will develop an arthritis that affects their grip strength. According to a report in 2017, 6.2 million people in Canada were seniors [4]. So, taking 20% of these, we get 1240000. Assuming that 15% of these have a grabber already (so that all they need is our product to attach on), then there are 186000 arthritis patients that could use our product. Further, for arthrogryposis patients, we will say 50% have a grabber already. Then about 192334 people could buy our product. Accounting for those willing to buy a grabber to use our product or those with other diseases limiting their grip strength and/or finger dexterity, we assume about 8000 more potential customers arise. Therefore, we have about 200000 potential customers in Canada. We have the privilege that two of our members work at a retirement home, so we went and asked those that we know have grip issues if they would be interested in a product like this and about 82% (9 of 11) said yes. Taking 82% of 200000 then we have 164000 prospects in Canada alone. We also assume that our product sales will increase throughout the years. This is because not only will more people find out about the product, but also because arthritis is tending to become more common [5].

# Wrike

https://www.wrike.com/frontend/ganttchart/index.html?snapshotId=r82CcKvsuhyfWitJH6oztQWtaU2AxVAA%7CIE2DSNZVHA2DELSTGIYA

# Conclusion

To conclude, the business model chosen “Razor-Blade” business model would best suit the team's product due to the type of products low market presence. Additionally, the core assumptions and triple bottom line business model displayed the team’s strategy and philosophy to approximate how the business will run over the three-year timeframe. The team proceeded to draft an economic report using the assumptions discussed in the business model. The constructed an associated business cost, income statement, NPV analysis, and cash flow diagrams was made using the approximation of the company’s success in the next three years.

# References


https://www.nationwidechildrens.org/conditions/arthrogryposis#:~:text=This%20is%20a%20rare%20disorder,of%20every%2010%2C000%20live%20births. [1]

https://datacommons.org/place/country/CAN?utm_medium=explore&mprop=count&popt=Person&hl=en [2]

https://www.reuters.com/article/us-health-arthritis-hands-idUSKBN18828Q [3]

https://www.cihi.ca/en/infographic-canadas-seniors-population-outlook-uncharted-territory#:~:text=Over%20the%20next%2020%20years,sits%20at%20about%206.2%20million. [4]

https://www.healthline.com/health-news/why-have-arthritis-rates-doubled-since-world-war-2#:~:text=Since%20World%20War%20II%2C%20arthritis,examined%20more%20than%202%2C000%20skeletons. [5]