Project Deliverable G
-Business Model and Economics Report-

Group B12

Bill Wu [300170086]

Gordon Akins - Barker [300177225]

Bayza Woldemariam [300131459]

Han Yan [300188341]

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GNG 2101 - Introduction to Product Development and Management for Engineers and Computer Scientists

Faculty of Engineering – University of Ottawa

Abstract

In this deliverable, as a team, we were responsible for planning our business plan for our fidget tool prototype. We assumed that we had a full functioning final prototype, started full production and were preparing to sell our product. Currently, as students at uOttawa, we have access to the 3D printer at no cost but in addition to the previous assumptions, for this deliverable, we also had to assume that we no longer had access to the schools' facilities. With this in mind when creating our economics report, every single cost from manufacturing, labour, and marketing had to be accounted for in our economics report. In our previous deliverables, the only costs associated with the development of our device were all listed in our BOM but now the running of machines, rental, and labour are all costs that have been accounted for. In addition to our economics report, a business model was chosen based on if it would ensure a positive income flow as well as if it properly aligned with our problem statement which was presented in our very first deliverable. After having chosen a business model a business model canvas was made to answer the how, what, who, and how much of our business. Once the business model canvas was composed we were able to visualize all the important factors of the business that we will need to be successful.

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Introduction

The goal of this deliverable is to present our business model and economics report. After having constructed and designed our prototype a business model was done based on it. To ensure a successful business a business model canvas was filled out as a visual of all the different/important aspects that need to be taken into consideration if we wish to put this product onto the market. Based on how we would like our product to be presented to the market a business model was chosen. All the variables, fixed, direct and indirect costs associated with our business were composed by referring back to our BOM and researching the price of running the different machines needed for manufacturing, the main one being the 3D printer. Certain costs for the economics report were assumed but all assumptions were described and explained thoroughly.

Business Model

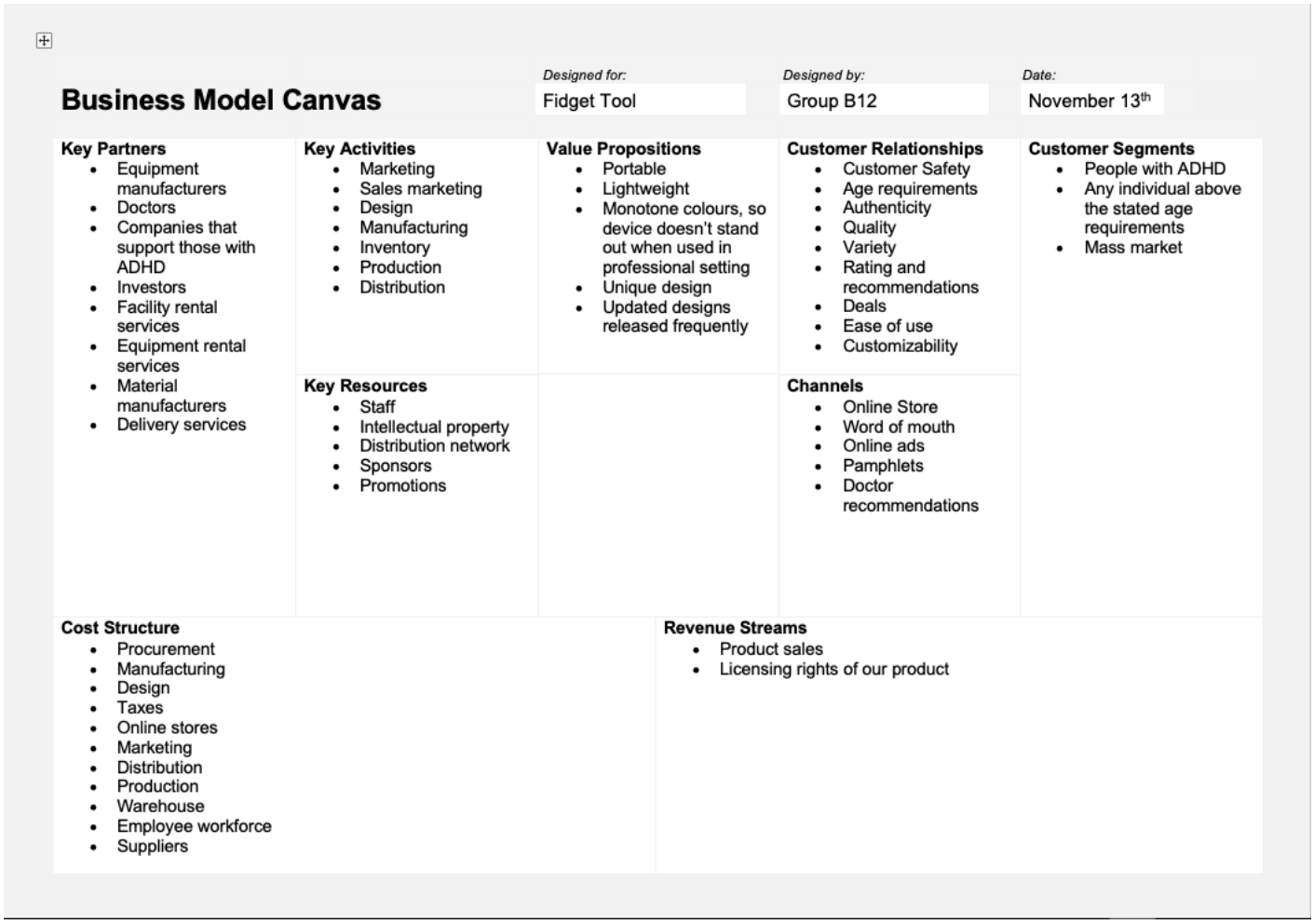
The “Razor Blade” business model is the most appropriate business model to use for the fidget tool product we are trying to produce. The resources that are required to create this product are easy to obtain and tend to be rather bountiful, meaning that they are relatively inexpensive to build. They are small and compact and a consumer can buy as many of these different boxes as they want. Meaning that whenever a new kind of fidget gadget gets produced by us the consumer can quickly purchase it separately and add it to their collection. In addition, changing the colours of one of these small boxes is also very simple, and no real difference is the cost of the material. Meaning that this can be produced with several different colours to them, allowing more appeal and variety to the consumers while doing very little and spending even less money on our end. We can sell these products at a fair price because a consumer can very easily choose to purchase multiple different parts and multiple different colours allowing us to make a lucrative profit.

Business Model Canvas

Down below is a picture of a business model canvas for a fidget tool. This diagram helps explain the how, what, who, and how much of a business. It does this by breaking down the business model canvas into 9 different elements and helps with visualizing all the building blocks you will need when you want to start a business. Creating a business model is very important and if done correctly can lead to cash generation and future expansion. All aspects of the business are identified such as the products or services that the business will be selling, the target market, and any anticipated expenses. Not only is a business canvas model helpful for a new business but it can also be very beneficial for established businesses. While creating the business model canvas some assumptions were made with the first being the customer

segment. While this product is meant for individuals with ADHD it won't help every single individual that has ADHD and in addition to that, we are assuming that customers with undiagnosed ADHD would also enjoy using this tool. We are also assuming that doctors will support our business by endorsing our product to their patients but there is a possibility that they are already endorsing another product or just don't personally believe in this type of method for coping with ADHD. But overall by being able to visualize all the aspects of our business we'll be able to see any next steps that are needed to make our business successful.

Figure 1: Business Model Canvas



Business Model Canvas

Designed for: Fidget Tool

Designed by: Group B12

Date: November 13th

Key Partners
- Equipment manufacturers
- Doctors
- Companies that support those with ADHD
- Investors
- Facility rental services
- Equipment rental services
- Material manufacturers
- Delivery services

Key Activities
- Marketing
- Sales marketing
- Design
- Manufacturing
- Inventory
- Production
- Distribution

Key Resources
- Staff
- Intellectual property
- Distribution network
- Sponsors
- Promotions

Value Propositions
- Portable
- Lightweight
- Monotone colours, so device doesn't stand out when used in professional setting
- Unique design
- Updated designs released frequently

Customer Relationships
- Customer Safety
- Age requirements
- Authenticity
- Quality
- Variety
- Rating and recommendations
- Deals
- Ease of use
- Customizability

Channels
- Online Store
- Word of mouth
- Online ads
- Pamphlets
- Doctor recommendations

Customer Segments
- People with ADHD
- Any individual above the stated age requirements
- Mass market

Cost Structure
- Procurement
- Manufacturing
- Design
- Taxes
- Online stores
- Marketing
- Distribution
- Production
- Warehouse
- Employee workforce
- Suppliers

Revenue Streams
- Product sales
- Licensing rights of our product

Economics report

Variables, Fixed, Direct and Indirect Costs

Table 1: Costs and Types of Costs

Cost	Type of Cost
Labour	Direct
Equipment Rental Costs(Operating Costs)	Variable
Materials	Direct
Overhead	Direct
Marketing Campaign	Indirect
Income tax	Indirect

3-Year Income Statement

Sales Revenue = *$35 x 2000 units = $70000.*

3 cubes = 1 unit

Equipment Rental Costs + Operators Pay (Operating Costs) = *$11.96/h* with taking roughly 1.5 hours to manufacture 3 cubes which are one unit. So 1 unit costs *$17.94* to make. With 2000 units each costing *$17.94* to make there's *$17.94 x 2000 = $35880* in operating and equipment rental costs [1].

When determining how many units we sold we determined how many people have ADHD in Canada (roughly 1.1 million people [4])and a rough estimate of around 0.2% of people buying our product so around 2000 units a year.

Hourly pay for a part-time employee to handle sales and assembly of the cubes is *$15/h* and works *20* hours a week = *$15600/year.*

Overhead includes *$3500* (Price of a small shared office in Ottawa *$244/month*) for rent of a small office space to handle the shipping and assembly, then another *$572* for any bills we will need to pay for the office(electricity). *$3500* in total [2].

Materials cost roughly *$5* to create *1* unit so the total cost of materials is roughly *$10000.*

For income tax since we aren't earning over *$500000* in sales revenue, we are a small business that has an income tax rate of *3.2%* [3].

One Year income statement

In the table below a one-year income statement was composed based on the variables and the associated cost. The sales revenue of this year is set to be $70000. This was calculated by assuming that 2000 units would be sold this year. Considering that this is just our first year of sales we assumed that 2000 units would be sold. Although this might seem like a large number we have quite a large target market, being those with ADHD and the general mass market, so we believe this amount of units sold is responsible for our first year.

Sales Revenue = *$35 x 2000 units = $70000.*

Table 2: One Year Income Statement

Variable	Cost
Overhead	$3500
Labour(Sales and assembly)	$15600
Equipment Rental Costs + Operators Pay (Operating Costs)	$35880
	$54980
Total After Operating Costs	$70000- $54980=$15020
Materials	$10000
Marketing Campaign	$100
	$15020 - $10100 = $4920
Income Tax	3.2% (0.032x4920) = $157.44
Net Income	$4762.56

For the three-year income statement, all the values will be multiplied by 3.

3 Year Income Statement

In the table below a three-year income statement was composed based on the variables and the associated cost. the sales revenue of this year is set to be $21000. This was calculated by assuming that 6000 units would be sold this year. This number was chosen by researching our mass market and making an approximation on how many people would purchase our product.

Sales Revenue = *6000 units x $35 = $210000*

Table 3: Three Year Income Statement

Variable	Cost
Overhead	$10500
Labour(Sales and assembly)	$46800
Equipment Rental Costs + Operators Pay (Operating Costs)	$107640
	$164940
Total After Operating Costs	$210000- $164940=$45060
Materials	$30000
Marketing Campaign	$300
	$45060 - $30300 = $14760
Income Tax	3.2% (0.032x14760) = $472.32
Net Income	$14287.68

NPV Analysis

Below is a figure of our income cash flow statement for the next 5 years, it includes our initial investments along with all the cash in and cashes out for the year. The break-even point is reached in the year 2022 when we reach 1860 units of product sold. In our first year, it is expected that our operating income will be negative which is evident in the figure below since we have many fixed costs. Once the break-even point has been reached our company will finally being to earn money.

Figure 2: Income Cash Flow Statement for Five-Years

Operations		2022	2023	2024	2025	2026
Cash Recepits From...						
	Unit price	$ 35	$ 35	$ 35	$ 35	$ 35
	unit sold	2000	2000	2000	2000	2000
	Total income	$ 70,000	$ 70,000	$ 70,000	$ 70,000	$ 70,000
Cash paid for...						
	Overhead	-$ 3,500	-$ 3,500	-$ 3,500	-$ 3,500	-$ 3,500
	Labour	-$ 15,600	-$ 15,600	-$ 15,600	-$ 15,600	-$ 15,600
	Equipemtn rental + operating	-$ 35,880	-$ 35,880	-$ 35,880	-$ 35,880	-$ 35,880
	Total paid	-$ 54,980	-$ 54,980	-$ 54,980	-$ 54,980	-$ 54,980
Others						
	Materials	-$ 10,000	-$ 10,000	-$ 10,000	-$ 10,000	-$ 10,000
	Marketing Campaign	-$ 100	-$ 100	-$ 100	-$ 100	-$ 100
	Others Total	-$ 10,100	-$ 10,100	-$ 10,100	-$ 10,100	-$ 10,100
Tax						
	Income	$ 4,920	$ 4,920	$ 4,920	$ 4,920	$ 4,920
	Tax	3.20%	3.20%	3.20%	3.20%	3.20%
	Net Income	$ 4,763	$ 4,763	$ 4,763	$ 4,763	$ 4,763
Cash at Beginning of year		$ 50	$ 4,813	$ 9,575	$ 14,338	$ 19,100
Cash at End of year		$ 4,813	$ 9,575	$ 14,338	$ 19,100	$ 23,863

↑*Break-even Point

*Break-even point: Breakeven point is in 2022 when we sell 1860 units of products

Project plan

The following diagram below shows an updated version of our Gantt chart on Wrike, which includes an expanded view of our upcoming deliverables that we have. At the moment we are getting ready to submit our deliverable G but all main components of the deliverable were done a day in advance at minimum to ensure an adequate amount of time was given so a quality check could be done a day in advance of the due date. With only 3 deliverables remaining and exams coming up, it is important that all tasks are divided reasonably and every team member is given enough time to complete each task. We currently have roles picked out for design day divided and since not all members will be presenting on design day certain team members will start working on the final presentation along with certain parts of the user manual and video. Tasked are prioritized based on when they are due. Currently, some team members have more than one task assigned to them but not all tasks are expected to take the amount of time that they are given so for that reason once they have finished a task they can start working on their next tasks but we will continue to have weekly check-ins to ensure that everyone is on the right track. Keeping in mind that the coming weeks will be fairly busy for all of us, the project plan will be updated accordingly and tasks will be assigned in a manner that if extra time is needed each task will have some buffer space.

Figure 3: Project Plan

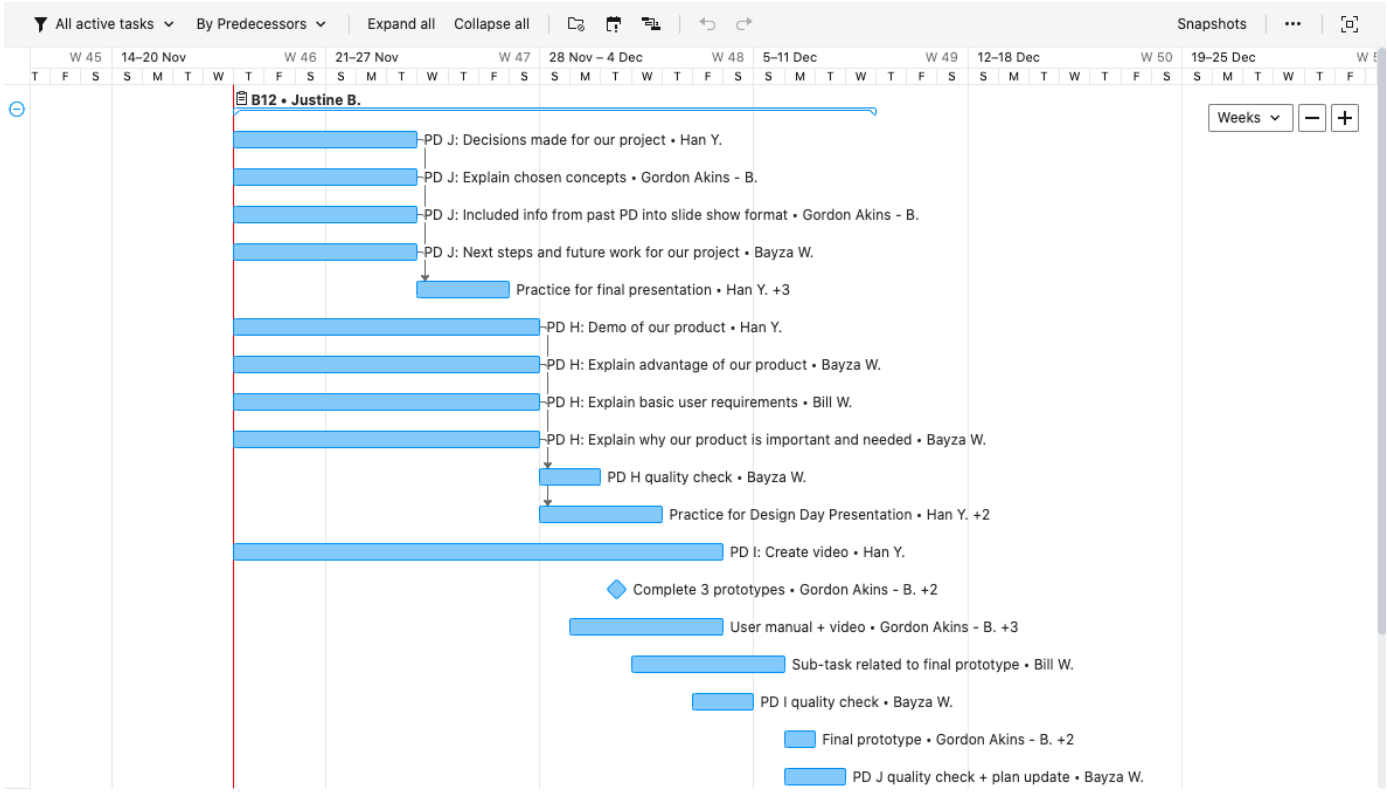
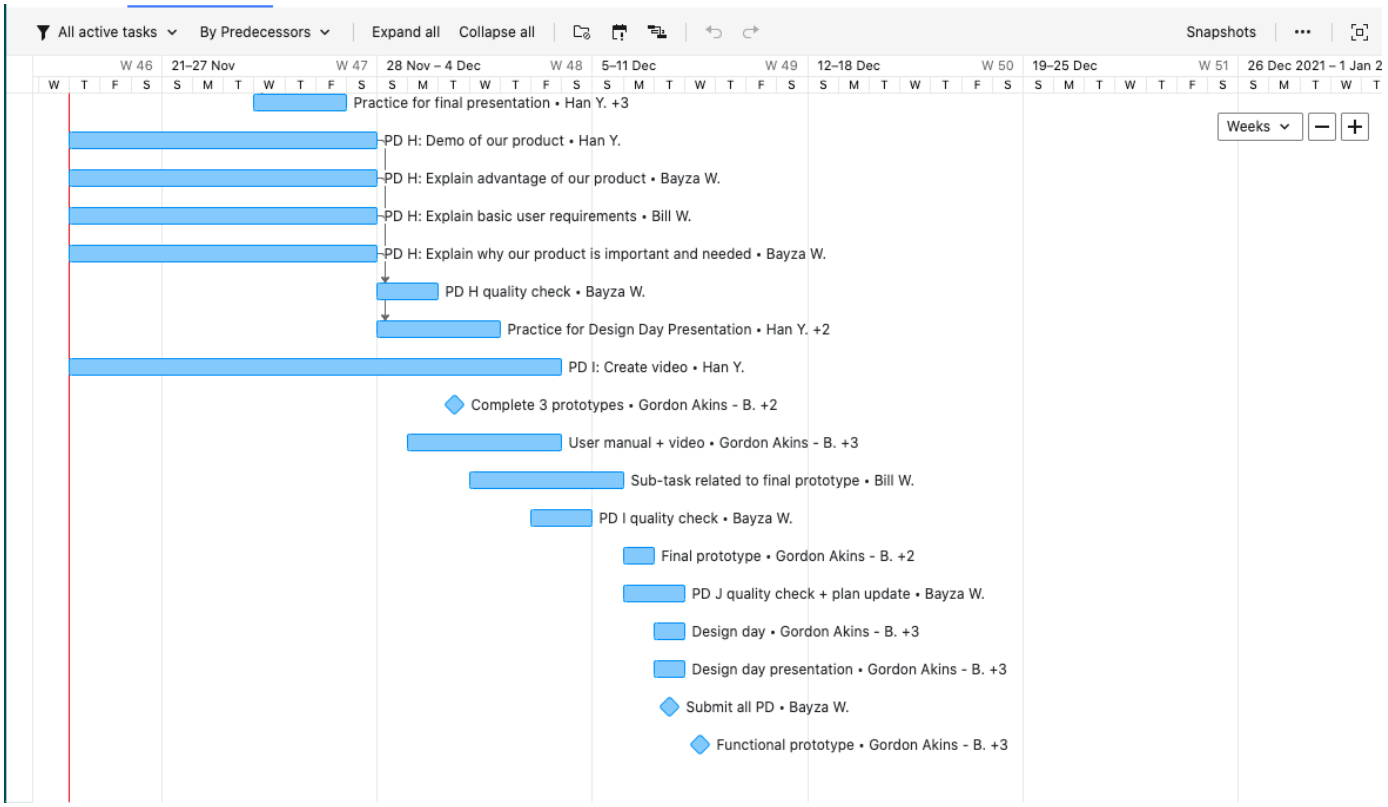


Figure 4: Continued Project Plan



Conclusion

In conclusion, our team spent a lot of time discussing with one another core assumptions that we believe were fair to make for the construction of both our business model and economics report. The main thing we decided as a team was the best-suited business model for our product and based on the current market, how much we would sell our product for. In the long term, it is important that we are able to reach the breakeven point and eventually make a profit and the price per unit plays a big role in when we would attain that goal. Many factors had to be taken into consideration when creating the NPV analysis such as the current market and the depreciation value since money now doesn't equal the same amount it will in a couple of years. All in all, to start up a business takes a big investment of time and money which is why you must have a good team and stay as organized as possible by having a plan.

References

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