

Project Deliverable G.2 - Economics Report

Group 8: BRAKEthrough Solutions
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November 4th, 2021
GNG2101 : Introduction to Product Development and Management for Engineers
and Computer Scientists
The Centre of Entrepreneurship and Design
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Introduction

The purpose of this document is to outline an economics report on the profitability of BRAKEthrough solutions based on its associated costs, a projected 3-year income statement, an NPV analysis and identifying the critical assumptions associated with these tasks.

Problem Statement

The client needs a safe and reliable remote braking system for his son's pediatric gait trainer, the R82 Crocodile. It can be activated from a distance to let him practice walking independently—most existing brakes are manual and require the guardian to be within arms reach. This will be achieved by having a Bluetooth remote activation of a linear actuator and stopper.

Cost Classification

Table 1 - Associated Costs and their Type for Startups

Cost	Variable/Fixed	Direct/Indirect
Manufacturing and Selling		
Labour (manufacturing)	Variable	Direct
Raw materials	Variable	Direct
Packaging materials	Variable	Direct
Transportation and shipping fees (of material)	Variable	Direct
Marketing Campaigns	Fixed	Direct
Administration		
Loans	Semi-Variable	Indirect
Legal fees	Variable	Indirect

Market research fees	Fixed	Indirect
Technological fees	Fixed	Indirect
Payroll	Fixed	Indirect
Overhead		
Equipment	Fixed	Indirect
Depreciation	Fixed	Indirect

The table above highlights costs associated with startups. The table contains the standard costs associated with manufacturing and selling the product. The product must be manufactured, packaged and transported to the customer. To get our startup started, the team will need to acquire loans. Furthermore, there are legal fees for legal advice and licensing and costs for market research and a thorough market evaluation. There are also technological fees such as building a website, any software services such as Microsoft Word, Excel etc.

Table 2 - Associated Costs and their Type for Higher Volume Manufacturing

Cost	Variable/Fixed	Direct/Indirect
Manufacturing and Selling		
Labour (manufacturing)	Variable	Direct
Raw materials	Variable	Direct
Packaging materials	Variable	Direct
Transportation (of material)	Variable	Direct
Marketing campaigns	Fixed	Direct
Administration		
Payroll	Fixed	Indirect
Legal fees	Variable	Indirect
Overhead		
Office supplies and furniture	Fixed	Indirect
Equipment	Fixed	Indirect

Depreciation	Fixed	Indirect
Electricity	Fixed	Indirect
Building rent	Fixed	Indirect
Inventory	Fixed	Indirect

The table above highlights some of the associated costs of high-level manufacturing. In higher-level manufacturing, there would be a lot more overhead costs associated with the manufacturing and sale of the team’s product. As the business would progress, buildings for manufacturing and an office would be needed as a base for operations. With these buildings come costs such as office supplies and furniture, electricity and rent. Additionally, the company would need to patent, trademark or copyright the name of the company, product, etc. which would include legal fees. The fixed salaries of employees would be needed as well. Finally, there are many costs associated with the manufacturing and selling of the product which include labour, raw and packaging materials and marketing campaigns to name a few.

Assumptions, Research & Income Statement

The gait trainer market for both pediatric and elderly populations is expected to grow at an extremely fast rate from \$217M in 2017 to a size of \$456 million by 2028⁽²⁾ due to the increasing prevalence of strokes and spinal cord injuries⁽¹⁾. The current major players in this industry include Rifton Equipment, Ottobock Inc, Ekso Bionics etc. who are seeking to expand their market share globally into untapped markets and adding new types of technologies to their gait trainers. Along with this, sources expect government assistance to raise the gait trainer market value, as many developed nations seek to include greater coverage of pediatric and assistive technology to healthcare plans, assisted living homes, and hospitals⁽³⁾. This in theory should give individuals who need assistive technology more access to it, and drive the demand upwards. In our early research into remote controlled brakes for a pediatric gait trainer or walker, we found that the existing market for specifically remote controlled brakes was slim to none. Finding exact details for much of the industry and market is very hard to do, as most market reports found online are pay-walled, or require special permission to view. This hinders our ability to research current statistics quite a bit, limiting our sources to a few free-to-view websites. In terms of actual tech, many pre-existing companies either offered mechanically functioning brakes or “reverse” brakes which engage with the change in direction of the walker/gait trainer. The market for remote brakes is in its infancy, however will grow rapidly within a short time.

On the basis of the Gait trainer industry being a fragmented market, the barrier to entry for the market is relatively small, but the competition is very fierce. We assumed with our unique

product that we'll be able to enter and seize a small market share of the gait trainer industry by offering remote braking systems directly to a wide variety of gait trainer manufacturers. There are no public numbers on the actual market share of the current major players in the industry (currently beyond our budget), so we assume we're maintaining 2.5% market share of the global market in the next 3 years. We're assuming that 10 workers can reasonably make 20 braking systems per day. Multiply this by 5 days per week and 48 weeks per year, our company can make 4,800 units per year. We are quite limited by the budget for this course, so we assumed it costs \$200 for each unit made and we sold each one for \$400. Keep in mind that market share is defined by total sales made by a company over total sales made in the industry. Since we don't have any number on the number of gait trainer sales made in any year, we used a proportion of the market value as the sales revenue. We know this is a faulty assumption, but is the best we can do given the information we have. The following table shows our income statement for the next three years.

Table 3 - Income Statement Over Past Three Years

	Income (\$)	Cost (\$)	Details
Sales Revenue (3 years)	5,760,000		(\$400/unit*4800 units)*3 years
Materials		2,880,000	(\$200/unit*4800 units)*3 years
Cost of Goods Sold		2,880,000	
Gross Profit	2,880,000		
Operating Expenses			
	Shipping Costs	300,000	(\$21*4800 units/year)*3 years
	Electricity	300,000	
	Salaries	1.5 million	(10 Workers *\$50,000 annual)*3 years
	Equipment Rental and Rent	112,500	(40ft by 40ft Space at \$1.50/ft ² , Also 3 mills at \$2900 each)*3 years
	Depreciation Costs	30,000	(3 Years)
	Loans	100,000	(Over all 3 years) (Paid back in first year)

Operating Income	537,500		(No income Tax)
Net Income	537,500		

NPV Analysis and Break-Even Point

We will do two 12-quarter analyses, assuming expenses and profits can be distributed equally throughout the fiscal year.

Income:

4800 units per year is projected to sell $4800 / 4 = 1200$ units per quarter. Sales revenue is the only source of income for the company, and sales revenue per quarter is $\$400 * 1200 = \$480,000$ / quarter.

Present Value (assuming a consistent 1200 sales per quarter)

Q1: \$480,000	Q2: \$960,000	Q3: \$1,440,000	Q4: \$1,920,000
Q5: \$2,400,000	Q6: \$2,880,000	Q7: \$3,360,000	Q8: \$3,840,000
Q9: \$4,320,000	Q10: \$4,800,000	Q11: \$5,280,000	Q12: \$5,760,000

Expenses:

Before starting the first quarter, fixed initial expenses must be paid to get the company started. This includes funding office supplies, initiating marketing campaigns, and opening legal fees. Take this “quarter zero” cost to be \$200,000. The loan gets paid in the first four quarters in even amounts of \$25,000. Besides that, every expense is assumed to be even and constant with the steady production of braking systems. That is, \$240,000 in COGS, plus \$50,000 in shipping costs and electricity, plus \$125,000 in employee salaries, plus \$9,375 in rent, plus \$2500 in depreciation costs: totalling a consistent \$426,875.

Present Value (with the above assumptions):

Q1: \$651,875	Q2: \$1,103,750	Q3: \$1,555,625	Q4: \$2,007,500
Q5: \$2,434,375	Q6: \$2,861,250	Q7: \$3,288,125	Q8: \$3,715,000
Q9: \$4,141,875	Q10: \$4,568,750	Q11: \$4,995,625	Q12: \$5,422,500

For break-even analysis, we calculate the difference between the present values of the income and expenses at each quarter.

Table 4 - Break-Even Point Analysis

Quarter	PV Income	PV Expenses	PV Profit (I - E)
1	\$480,000	\$651,875	-\$171,875
2	\$960,000	\$1,103,750	-\$143,750
3	\$1,440,000	\$1,555,625	-\$115,625
4	\$1,920,000	\$2,007,500	-\$87,500
5	\$2,400,000	\$2,434,375	-\$37,375
6	\$2,880,000	\$2,861,250	\$18,750
7	\$3,360,000	\$3,288,125	\$71,875
8	\$3,840,000	\$3,715,000	\$125,000
9	\$4,320,000	\$4,141,875	\$178,125
10	\$4,800,000	\$4,568,750	\$231,250
11	\$5,280,000	\$4,995,625	\$284,375
12	\$5,760,000	\$5,422,500	\$337,500

Accounting for the fixed initial expenses of \$200,000, the net profit from the above break-even analysis and the income statement from the previous section are identical. Therefore, it can be reasoned that the break-even point of the company would be somewhere in the 5th quarter, just over a year after getting started.

Conclusion

In conclusion, the group has outlined associated costs, drafted a 3-year income statement and done an NPV analysis in this deliverable. It was shown that given the assumptions, costs and profits, the company would break even in the 5th quarter.

Through this deliverable we have learned how to do market research, analyze revenue streams, create an income statement and conduct an NPV analysis and calculate the break-even point. These are valuable lessons the group will apply in the future to our own companies.

References

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Project Plan Update







