GNG 2101 - Report
Waterproof Hearing Aid
Deliverable H - Economics Report

Written By:

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Introduction

The objective of this report is to discuss the economic aspect of our product. We will provide a classified detailed list of all the costs associated with our product, a 3 year income-statement, an NPV analysis to determine the break even point of our product, and the assumptions we established to create this report. Data from our variable, fixed, direct and indirect costs will be used to create the 3 year income statement to estimate the net income over the following years. Using the net income, and an estimated number of units sold a NPV analysis will be generated and the break even point for the company will be calculated.

Cost Classification

Below is a chart containing all of the classified costs we expect to have if we created a startup company that manufactures our waterproof hearing aid product.

Variable Cost	Direct Cost	Indirect Cost	Fixed Cost
● Direct Materials ● Packaging ● Electricity ● Interest for loan	● 3D printed ABS ● Hydrophobic Mesh (Gore-Tex Fabric Patch) ● Ninja Flex Gasket ● Publication of the application ● Rent	● Marketing ● Overhead ● Legal services(patent)	● Depreciation ● Salary ● Publication of the application

3 Year Income-Statement

The 3 year income statement is made to determine if our product development is profitable. Majority of the expenses calculated are hypothetical, because we are students and have yet to begin this startup company. The hypothetical cost includes rent, electricity costs and the wages of the workforce. The rent of the workstation is $ 1000 per month, while that of the electricity is $ 400 per month. The salary can be calculated to be about $30 per hour with a working hour of 50 hours per week. More details about how this chart was derived can be found in the product assumptions section.

		End of Year 1 ($)	End of Year 2 ($)	End of Year 3 ($)
	Sales()	90,000	125,000	200,000
	Cost Of Goods Sold	25,000	40,000	60,000
	Gross Profit	65,000	85,000	140,000
Operating Expenses				
	Electricity	4,000	4,000	5,000
	Salary	20,000	20,000	20,000
	Marketing	5,000	5,000	5,000
	Overhead	3,500	4,000	6,000
	Depreciation	4,000	4,000	4,000
	Rent	8,000	8,000	8,000
	Total Operating Expenses	44,500	45,000	48,000
	Operating Income	20,500	40,000	92,000

Net Profit

Year1: Net Profit= Operating expense - Interest Expense = 20,500 - 1,000 = $19,500

Year2: Net Profit= Operating expense - Interest Expense = 40,000 - 1,000 = $39,000

Year3: Net Profit= Operating expense - Interest Expense = 92,000 - 1,000 = $91,000

Net Income (25% Income Tax)

Year1: Net Income = Net Profit - Income Tax = 19,500 - 4,875 = $14,625

Year2: Net Income = Net Profit - Income Tax = 39,000 - 9,750= $29,250

Year3: Net Income = Net Profit - Income Tax = 92,000 - 23,000 = $69,000

Break-Even Point (NPV Analysis)

Year	Expected Income($)	Present Value ($)	Computation
1	14,625	12,717.39	14625/(1+0.15)
2	29,250	22,117.20	29250/(1+0.15)^2
3	69,000	45,368.62	69000/(1+0.15)^3

The total net present value would be $80,203.21

To break even, we would have to sell 3210 pieces of the product over the 3 year period.
80,203.21/(N*24.99)=1
N=3209.41 =3210 pieces

Product Assumptions

- The salary assigned to each engineer working on the project would be estimated to $30 per hour. Each engineer spent an estimate of 50 hours a week in the production of the design.
- We assumed the cost of goods would increase every year, since our product would be in more demand so we would need to purchase more materials each year.
- The overhead cost includes expenses that went towards the completion of the product such as the electricity, rent for space and cost of equipment, the numbers for this were derived based on research we did to find these average expenses for a similar startup company.
- Operating expenses: We expect to have roughly the same throughout our first 3 years of operation since the majority of this is fixed costs. Our goal would be to have the gross profit increase linearly every year, so once our company has been operating for a decent time our operating income will increase yearly.
- We assumed that we would sell the product for $24.99 based on production, labour and material costs.
- To conduct the NPV analysis, we assumed that the discount rate would be 15%. This is based off research to similar startup companies, The discount rate is usually a bit higher with companies that are startups based off technology due to the risk being much higher.