University of Ottawa

Faculty of Engineering

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INTRODUCTION TO PRODUCT DEVELOPMENT AND MANAGEMENT

GNG 2101

Team: Z11

DELIVERABLE G.2: Economics Report

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Contents

Introduction 3
Costs 3
Three Year Income Statement 4
NPV analysis 8
Assumption Justification 10
Conclusion 13
Wrike Snapshot 14
References 14

Introduction

This economics report will highlight all the types of costs which will be associated with running the freemium business. Although the app itself is mostly free to make, there are no associated costs with making any of the essential and basic functions of the app, maintaining the app running will require having a team to debug any issues, improve its functionality based on user concerns and feedback and just ensure everything is running smoothly in general. A three-year income statement will be used to stay on top of the business expenses and predict the projected profits and expenses over that period. The three-year income statement will be made based on several assumptions that were made regarding the business and its expenses.

Costs

There were many sources of revenue discussed in the business model portion of the deliverable which outline the prices associated with the app. The costs of maintaining the app are another important aspect of the business and they are different from the prices. The costs are the money which must go into running the business. Although no costs were associated in the prototyping stages of creating the app Healthy Mind Connect, there are several costs associated with running the business which will allow patients and professionals to interact and connect and maintain that connection. There are fixed, semi-variable, and direct costs associated with running and maintaining the business. The fixed costs are costs which are unchanging. This will include the rental of the office space which will be where the employees within the business will be working on running the app. The direct costs will need to initially go into the business to the team of professionals who will be starting up the business and building the app up from scratch. These costs will go into the specific project of starting up the business. The semi-variable costs will go towards the team of professionals who will be working to maintain the app. They will oversee the app's maintenance and updating the app, improving it, and expanding its functionality. These

professionals will have fixed salaries which will vary based on their experience level and based on the position they hold within the business. The following table shows the different costs associated with the app.

Table 1: Business Costs

Cost	Cost Type	Cost Range	Description
Office Rental	Fixed Cost	$7,875/month	Cost of the office space where the business employees will work
Employee Salaries	Direct/Semi-Variable	20-30$ hour	Employee salary for starting up the business and for running it.

Three Year Income Statement

The income statement is an important part of a business because it can be used to analyze the profits made by a business over a given period. The basic form of an income statement can be represented by the following equation:

$$Revenues - Expenses = Profits/Loss$$

In this case, our group has produced a three-year income statement based on the following assumptions:

1. Ontario has approximately 9570 people who work in the therapy industry.
2. Ontario has approximately 1900 psychiatrist.
3. Ontario has approximately 60% of mental health professionals are willing to connect virtually.
4. In the first year, 20% of those willing to connect virtually use the app. This increases by 5%/year.

5. Zoom License is Free.
6. Assuming each mental health professional providing services has gains 2 patients/year.
7. Assuming office rent is 26.56 $/sq. ft.
8. The office size is about 300 sq. ft.
9. 49% of app users would use the premium version.

It's also important to note that typically interest and tax fees would be included on the income statement. However, for the purposes of this deliverable those expenses were neglected on the income statement.

Sales	448 174.00 $
Cost of Goods Sold	— 0.00 $
Gross Profit on Sales	448 174.00 $
Operating Expenses:	
Marketing Expenses	0.00 $
Office Rent	283 500.00 $
General and Admin Expenses	62 400.00 $
Depreciation	0.00 $
Previous Debt	+ 30 825.00 $
Total Operating Expenses	— 376 725.00 $
Operating Income	71 449.00 $

Figure 1: Three-year Income Statement

To further understand the three-year income statement provided above, we can classify each of the costs as shown in the following table. This supplements the income statement because it shows where the company is putting its money.

Table 2: Cost Break Down

Cost	Break Down
Salaries	The salaries are being paid 20.00 $/h. Since our group works an average of 4h/week we took this number as a projection for 3 years of salaries. This gives the following: $$Salaries = \left(20.00\frac{\$}{h}\right) * \left(\frac{4h}{week}\right) * \left(52\frac{week}{year}\right) * (3\ years) * (5\ people)$$ $$= 62\ 400.00\ \$$$
Production materials	As seen by the bill of material in table 2, the production of this application did not require material that's costs money. 0.00 $
Rent	The research done showed that the average rent price in Ontario is 26.25 $/sq.ft. Furthermore, by consensus our current design team could work in a 300 sq.ft. This gives us the following rent price over 3 years. $$\left(26.25\frac{\$}{sq.ft.}\right)(300\ sq.ft.)\left(12\frac{month}{year}\right)(3\ years)$$ $$= 283\ 500.00\ \$$$
Depreciation	Since the product will be a free app, there should not be any depreciation associated to the product. 0.00 $
Previous Debt	Before the company brings the app to the market, there are still fees for the work done prior to its release. These accumulated fees show up on the income statement as previous debt. This includes 3 months of rent and 3 months of salary (length of the semester). This gives us the following fee. $$Rent = \left(283\ 500.00\frac{\$}{3\ years}\right)\left(\frac{\left(\frac{1}{3}\right)3\ years}{year}\right)\left(\frac{\left(\frac{1}{4}\right)year}{3\ months}\right)$$ $$= 23\ 625.00\ \$$$ $$Salaries = \left(20\frac{\$}{hour}\right)\left(6\frac{hour}{week}\right)\left(12\frac{weeks}{3\ months}\right)$$

	$= 7\ 200.00\ \$$ $Previous\ Debt = Rent + Salaries = 30\ 825.00\ \$$
Sales	Although not technically a cost of the company, there were still assumptions made to predict these sales values. We assumed there were 9570 people in Ontario working as councilors and about 1900 working as psychiatrists. This gives us the following number of mental health workers. $9\ 570 + 1\ 900 = 11\ 470\ people$ Next, we assumed that 60 % of these workers are open to virtual counseling which gives us the following. $0.6 * 11\ 470 = 6\ 882\ people$ Then, we assumed that 20 % of those people would sign up for the app in the first year and it would increase at a rate of 5 %/year which gives us the total number of professionals using the app each year. $Year\ 1 = 0.2 * 6\ 882\ people = 1\ 376\ people$ $Year\ 2 = 1.05 * 1\ 376\ people\ = 1\ 444\ people$ $Year\ 3 = 1.05 * 1\ 444\ people = 1\ 516\ people$ Since we charge professionals 100 $ to use the app per year we get the following number in sales. $Sales = 100.00\ \$\ (1\ 376 + 1\ 444 + 1\ 516) =\ 433\ 600.00\ \$$ Next, we also need to factor in the users that will want to use the premium version of the app. The premium version will not be released until the second year. The premium fee is set at 2.00 $ and unlocks additional features. We are assuming that 49 % of app users will opt for the premium version. So we get the following. $Users_2 = (1\ 444\ professionals)\left(4\frac{patient}{professional}\right)$ $= 5\ 776\ patients$ $Users_3 = (1\ 516\ professionals)\left(6\frac{patient}{professional}\right)$ $= 9\ 096\ patients$ $Premium\ Users = 0.49(5\ 776 + 9\ 096) =\ 7\ 287\ users$ $Sales_t = 433\ 600.00\ \$ + (2.00\ \$)(7\ 287\ users) = 448\ 174.00\ \$$

Table 3: Bill of Materials

Product/Material	Cost	Description	Link
React/ Javascript Library	0$	Programming language/ tool used to program and put together the app.	N/A
Android Studio	0$	Integrated Development Environment (IDE)	https://developer.android.com/studio?gclid=CjwKCAjw_ISWBhBkEiwAdqxb9jskMaY-kuN-

			JTah9sLTd7SXH8DAz07yhw92dVQsHoJEK7IqCAXY3hoC7LMQAvD_BwE&gclsrc=aw.ds
Firebase	0$	Online database	https://firebase.google.com/products/realtime-database?gclid=CjwKCAjw_ISWBhBkEiwAdqxb9mAIkT5DKJtZAsgFaGgDHDHcnIFBpAQsgMGxyL3CUBjqa9kXB6gAWBoCrzsQAvD_BwE&gclsrc=aw.ds
Github	0$	Online collaborator	https://github.com/

This report shows that the business would be making a profit (operating income show on income statement) under the list of assumptions made. However, in a more realistic situation, a larger office is likely required as well as other expenses that are not always predictable.

NPV analysis

Based on the calculated data above which is about the company's expenditure and income, we can try to calculate the company's NPV (Net Present Value). In addition, a table is made for more obvious observation, and the company's cash flow in recent years can be learned, to know the year in which the company's profits can exceed its expenses, which is the break-even point.

Cash flow calculation: cash out+ cash in

Table 4. Cash flow diagram (Cash in)

	Cash In (CAD$)	
Year 0	N/A	0
Total		**0**
Year 1	Charge (Therapist)	137600
Total		**137600**
Year 2	Charge (Therapist)	144400
	Charge (Premium)	5660
Total		**150060**
Year 3	Charge (Therapist)	151600
	Charge (Premium)	8914
Total		**160514**
Total cash in		**448174**

Table 5. Cash flow diagram (Cash out)

	Cash Out (CAD$)	
Year 0	Rent	23625
	Salaries	7200
Total		**30825**
Year 1	Rent	94500
	Salaries	20800
Total		**115300**
Year 2	Rent	94500
	Salaries	20800
Total		**115300**
Year 3	Rent	94500
	Salaries	20800
Total		**115300**
Total cash out		**376725**

Net Cash Flow (total cash in – total cash out)=448174-376725=71449

NPV calculation: NPV=FV/(1+i)^n

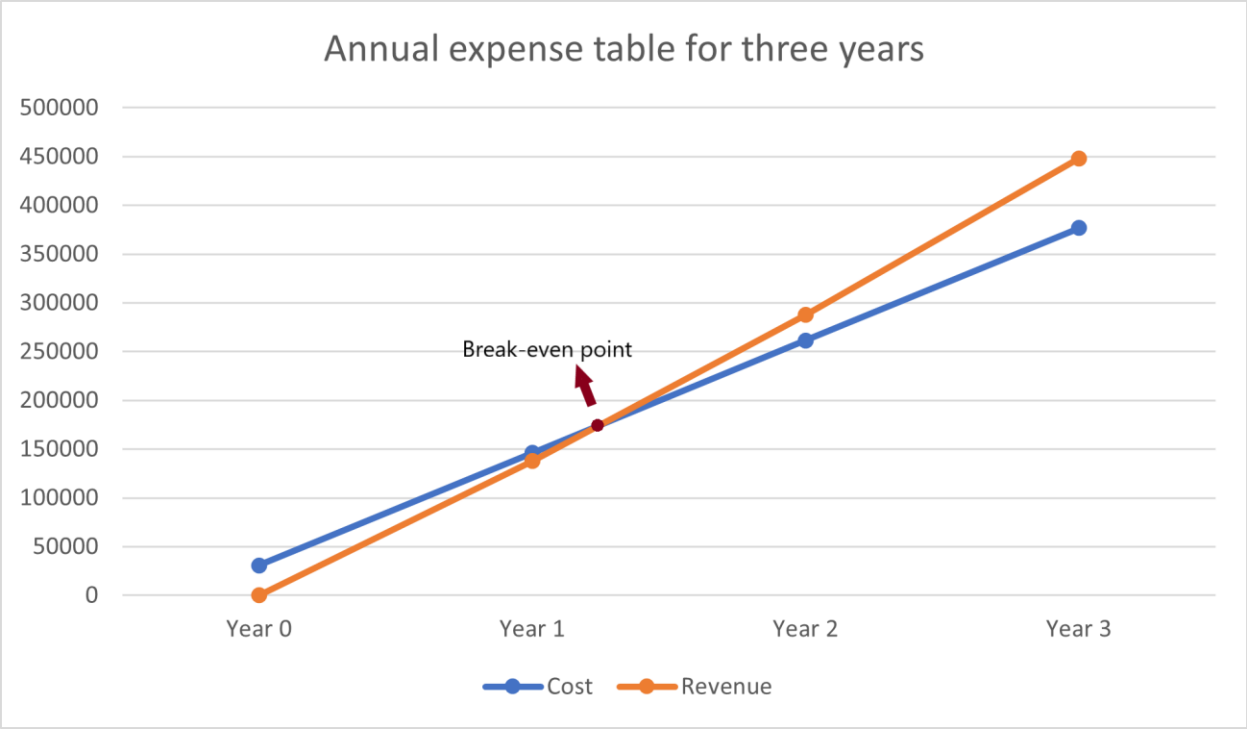
(i=0.25% according to the interest of Bank of Canada)

(FV: Future Value)

Table 6. Net present value

	Net Present Value($CAD)
Debt	**-30825**
The first year	22,300/(1+0.0025)^1=**22,244.39**
The second year	34,760/(1+0.0025)^2=**34,586.85**
The third year	45,214/(1+0.0025)^3=**44,876.58**

Figure 2. Annual expense table



According to the chart, the break-even point of our company was after the first year. Since the annual expenditure is a fixed value, a certain amount of profit can be achieved only if the income is greater than the fixed value in the following years. If we want to improve profitability, consider cutting costs, which means looking at lower rent or smaller offices. Or, on the other hand, try raising the price of an premium membership.

For example, here:

Assuming that there are N people who become premium users, our total revenue is N times the price of the upgrade. Set the target revenue is $1,000.

$1000=N*$2/people

$1000=N*$2.5/people

At the upgrade price of $2, N=500 meets the target. At $3, N=400 meets the target.

Assumption Justification

In the production of the three-year income statement, nine assumptions were made based on the business model and cost predictions for things the company has not yet acquired. This section will provide a justification for each assumption made and provide references to any sourced data.

1. **Ontario has approximately 9570 people who work in the therapy industry:** According to the government of Canada Job Bank, this is the approximate number of people in the profession in Ontario.

   Retrieved from: https://www.jobbank.gc.ca/marketreport/outlook-occupation/2218/ON

2. **Ontario has approximately 1900 psychiatrist:** According to the Canadian Mental Health Association, this is the approximate number of people in the profession in Ontario.

   Retrieved from: https://ontario.cmha.ca/news/how-should-ontario-tackle-the-psychiatrist-shortage/#:~:text=Released%20by%20the%20Ontario%20Psychiatric,over%20half%20are%20approaching%20retirement.

3. **Ontario has approximately 60% of mental health professionals are willing to connect virtually:** This number was found in a study conducted by a group at the Royal College.

   Retrieved from: https://www.cma.ca/sites/default/files/2022-02/Virtual-Care-in-Canada-Progress-and-Potential-EN.pdf

4. **In the first year, 20% of those willing to connect virtually use the app. This increases by 5%/year:** These numbers were a group consensus based on the following points.

   - Most mental health professionals lost hours due to the covid 19 pandemic.
   - Zoom has already gotten the appropriate certifications for the privacy of the meetings because there would be handling of medical information.
   - Most people in the industry have already been exposed to zoom (they don't need to learn something new).

- The small fee paid by the professionals allows them to run their services at their usual fee (creates more job opportunities for the industry).
- The app will gain popularity every year due to natural product growth (it gets more well-known).

5. **Zoom License is Free:** This income statement assumes the business will be using the basic zoom package which is free. This report could also be analyzed with other zoom packages to find the optimal package.

   Retrieved from: https://zoom.us/pricing

6. **Assuming each mental health professional providing services has gains 2 patients/year:** These numbers were a group consensus based on the following points.
   - Given the number of professionals that are predicted to use the app, patients will have many options which means its less likely for one councilor to acquire multiple patients.
   - With this assumption its important to note that its possible that some councilors will have more than 2 patients a year but at the same time, some will have less which should lead to a balance.
   - We assume that the idea of virtual mental health appeals to the people in remote communities of Ontario and they will want to participate (provides the client base).
7. **Assuming office rent is 26.56 $/sq. ft.:** This was found to be the average office rent prices in Ontario.

Retrieved from:

https://www.propertyshark.com/cre/office/us/ca/ontario/#:~:text=The%20average%20rental%20rate%20for,a%20similar%20average%20rental%20rate.

8. **The office size is about 300 sq. ft.:** This was found to be in the range of average office sizes in Ontario. As a group we stuck close to the lower end (rough minimum being at 165 sq. ft.) because the office would theoretically be just for a design team of 5 which could easily run out of an office space that size.

   Retrieved from:

   https://www.propertyshark.com/cre/office/us/ca/ontario/#:~:text=The%20average%20rental%20rate%20for,a%20similar%20average%20rental%20rate.

   49% of app users would use the premium version: This is a statistic pulled from a survey done on android users.

   Retrieved from:

   https://www.androidauthority.com/49-percent-app-users-willing-pay-monthly-subscription-534602/

Conclusion

To conclude, there are many costs associated with any business and this one is no different. This economics report outlines all the costs associated with starting up, running, and maintaining the business. This deliverable differentiates between the prices and costs of running the business and it also puts into perspective all the money coming and going from the business through a three-year income statement which allows for the profits and/or losses as well as the progress of the business to be clear to the business owners. The cash flow diagrams also helped with seeing the

progress of the business. Finally, the break-even point was used to determine at which point the business would start profiting.

Wrike Snapshot

https://www.wrike.com/frontend/ganttchart/index.html?snapshotId=udbrLP19dLOtoKVuN7XH4Ot4GtWtIC1F%7CIE2DSNZVHA2DELSTGIYA

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