GNG2101 Report: Deliverable G

Business Model and Economics Report

Submitted by

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Abstract

This report highlights the details involved in creating a business model and an economics report, in the scenario that the personal safety application has begun full production and commercialization. The team identified a suitable and profitable business model and created a business model canvas. Moreover, the team listed the different costs, created a 3-year income statement, and identified a break-even point using a NPV analysis.

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List of Acronyms

Acronym	Definition
App	Application
CAD	Canadian Dollars
FV	Future Value
iOS	iPhone Operating System
NPV	Net Present Value
US	United States

1 Introduction

The team is working on the final prototype for a personal safety application requested by the client. The use of the mobile application can satisfy not only the needs of the specific client, but can prove useful to many others. In the scenario that the team has completed the final prototype and has now begun full production, as well as beginning to have the application ready for purchase by the public, the team would need to take the necessary preliminary steps. The team has identified the business model best suited for their product and listed crucial assumptions that were made while preparing a business model canvas. Moreover, the team has identified the costs associated with the business, produced a 3-year income statement, and established a break-even point using a NPV analysis, as well as recording all the assumptions made to create the economics report.

2   Business Model

2.1 Business Model

There are multiple business models available for an app based company. There is Freemium, Paid Apps, In-App Purchases, Paywalls (Subscriptions), and Sponsorship [1]. For the type of app we are developing, we do not want to have advertisements anywhere within the app, or popping up as this can delay the time of the user checking in or using other functions. We also do not want the user clicking on the advertisement by accident and not knowing what happened, as our client base is elderly and may not be the best with technology. These decisions remove Sponsorship from the possible business models. We also decided not to have features that are only accessible if the user pays for access. We want everyone to be able to access the entire app and its features as this application's aim is to help elderly people, not make the app more difficult for them to use. From this, both the Freemium model and Paywalls business models are no longer options. This leaves our teams with two viable business model options, Paid Apps and Subscription. A paid app requires users to only pay once when they download the app and then they usually have unlimited access to all of the app's features and updates [1]. A subscription model app requires users to pay on a scheduled basis to maintain access to all of the app's features and updates [1]. Most Subscription based apps have a free version where they can access some, but not all, of the features of the app [1]. For the *Personal Safety App* we have decided to use the Subscription business model. A Subscription business model will allow our team to acquire income from the app usage which will allow us to continue to improve the app. Our version of the subscription business model will not involve a free version which will allow the user to access some features. Our app is low on features and requires most of them for the app to run properly. We also do not want to be in a situation where a user thought the app would work properly without a subscription, and finds themselves in a situation where all the app features that are necessary for the app to work properly are not present.

2.2 Business Model Canvas

Table 2.2: Business Model Canvas

Key Partners	Key Activities	Value Propositions	Relationships	Customer Segments
Google (Application can be downloaded from GooglePlay store) Apple (Application can be downloaded from Apple store) SMS Communications (Use SMS communications as a method to convey alert messages to contacts)	Automated emergency contacts (Create consistent line communication to provide assistance when necessary) User interface development (continuous application updates for bug fixes and improved features)	Communicate with vulnerable populations in the community (provide a sense of security to users and their families) Reach target audience (Use methods best suited to ensure that the application is made aware to the target audience)	Same side networking effect (Creating strong relationships with from users to ensure they have trust in the application, as well as maintaining a good reputation in order to promote the application with other companies)	Elderly populations and their family (Reduce the need to constantly check-in on elderly family remembers) Individuals with disabilities (Especially individuals with mobility disabilities that may be more prone to accidents that cause limited movement which prevents them from being able to contact assistance)
	Key Resources Personal Safety Platform (Most activities and transactions will be done using the application itself) Employees (Computer scientists to aid in the development and management of the software, as well as customer service employees to provide technological assistance to users)		**Channels** Personal Safety Website (The product can be accessible by web) Personal Safety Mobile Apps (The product can be accessible by use mobile devices)	

Cost Structure	Revenue Streams
Product development (Software requirements, production equipment, etc.) Marketing and Sales (Promotion of product using advertisements or other means) General Administrative (Customer service employees, rent, etc.)	Premium Subscriptions (Different prices for monthly, trimonthly, and yearly subscriptions) Marketing solutions

2.3 Core Assumptions and Feasibility

In order to develop the business model canvas, the team was required to make assumptions. The team assumed that the majority of the people who would be most attracted to the product would be elderly individuals. One of the features of the application is that it contacts the user's loved ones during an

incident, rather than emergency assistance; therefore, the team has also assumed that the families of the

elderly individuals would make up a significant portion of the customers. Thus, the application would

have an additional focus of marketing towards younger generations looking to care for senior family

members. The target audience being the elderly population is more feasible than the one focusing on

younger generations, as the value of the application would more likely be held to a higher standard to that

group. It is also important to take into consideration how many elderly individuals are in constant access

to a mobile device compatible with the application. The team assumed the data obtained from Statistics

Canada in 2018 to be applicable in 2021. According to the data, 60.4% of seniors 65 years of age and over

have a smartphone [11]. From the data, the team assumed that most of these phones are kept up to date in

order for the application to work on their phone. Making these assumptions, the feasibility of having the

product be successful with elderly individuals is of an adequate level. The team also decided to assume

that all business aspects will take place in Canada, meaning the application will only be available for

Canadians which reduces the target market to those in the area. While the team was researching

benchmarks, there was a personal safety application called SnugSafe with similar features to the one

designed by the team, but was only available in the United States. Thus, the team is making the

assumption that since SnugSafe was successful in the US, Canadians who are attracted to the features of

that application will be directed towards the team's application. SnugSafe has recorded over 1 million

check-ins and over 1000 downloads simply from the GooglePlay store. In 2021, the US currently has

approximately 54 million people aged 65 and over, compared to Canada which has approximately 7

million [1][8]. Though the difference in populations is considerable, the team believes it is still feasible to

assume that the number of Canadian seniors in need of a personal safety application is sufficient for the

product to be profitable. In addition, the team assumed a need in the market for a safety application that

relies on regular mobile use and preference of text over other forms of written communication. According

to Statistics Canada, 88.1% of Canadians aged 15 and over have a smartphone; additionally, 45.4% check

their phones at least every 30 minutes[5]. The team assumed a significant popularity of mobile devices,

and therefore would make the need for the application feasible as many other personal safety applications

only send alerts using email. The use of SMS messaging in the product would be more desirable towards this audience as with the frequent use of mobile devices, it would be easier for individuals to receive alerts using text, rather than advising them to check their emails.

3   Economics Report

3.1 Costs

The team determined various costs that the company could possess. This includes direct costs such as office equipment, server, marketplace upload fee etc. It also includes indirect costs, such as salaries of computer scientists developing the application, rent, and electricity. The costs were also classified as fixed and variable.

Table 3.1: Costs

Cost	Classification
Office Equipment ● $2500/per Desktop ● Monitors $1000/per Desktop ● Accessories $200/ per Desktop ● $500/laptop ● Office Desks $1000/Desktop	Direct, Fixed
Salaries (3) ● Computer Scientist $80 000/person/year	Indirect, Fixed
Server ● $44/Month for Website	Direct, Fixed
Marketplace Upload Fee ● Android Studio $32 ● Apple App Store $125/ year	Direct, Fixed
Rent ● $54 750/year (36.50$/sf/yr)	Indirect, Fixed
Electricity ● $ 200 /month	Indirect, Fixed
Wifi ● $ 200 /month	Indirect, Fixed
Overhead	Indirect

● 10 Customer support workers $13.50/hr 12hours/per day 5 days/week 52 weeks
  ○ $15 Headsets x 10
  ○ $70 Table x 2
  ○ $10 chair x 10	

Marketplace Income Fee ● 15% Google Play ● 15% Apple	Direct, Fixed

3.2 3-Year Income Statement

A 3-year income statement was produced based on the determined costs that the company may experience. A total revenue was developed using an estimate of the number of users subscribed to the different subscription plans. A gross profit was then produced using the deductions from Apple and Google. Operating expenses were then considered to provide a net income after the third year.

Table 3.2: 3-Year income Statement

Revenue After 3 Years	
Monthly Subscription	$ 208 125
Tri-Monthly Subscription	$ 787 500
Yearly Subscription	$ 702 000
Total Revenue	$ 1 697 625
Apple App Store Deduction	$ 140 054
Google Play Store Deduction	$ 114 589
Gross Profit	$ 1 442 981
Operating Expenses	
Computer Scientist Salary	$ 720 000
Customer Support Salaries	$ 126 360
Launching	$ 407
Rent	$ 164 250
Electricity	$ 7 200
Wifi	$ 7 200

Furniture	$ 1 580
Desktop Computers	$ 7500
Desktop Accessories	$ 600
Monitors	$ 3 000
Laptops	$ 5 000
Furniture	$ 3 380
Website Domain	$ 1 584
Total Operating Expenses	$ 1 048 061
Operating Income	$ 394 920
Net Income (26.50%)	**$ 290 267**

3.3 NPV Analysis

Assuming 30 000 users by the end of the first year (50% use the tri-monthly plan, 37% use the monthly plan, and 13% use the yearly plan) and 4% interest rate.

Yearly revenue can then be estimated using the assumed number of users per subscription plan.

Table 3.3.1: Yearly Profit After 1 Year

Yearly Revenue After 1 Year	
Monthly Subscription	$ 27 750
Tri-Monthly Subscription	$ 105 000
Yearly Subscription	$ 93 600
Total Profit	$ 226 350

Yearly revenue for 3 years can be estimated using a NPV analysis.

$$FV \ = \ \Sigma PV(1 \ + \ i)^{n}$$

Table 3.3.2: Yearly Profit

Yearly Revenue	
Year 1	$226 350/year

Year 2	$244 820.16/year
Year 3	$254 612.97/year
Total Profit Over 3 years	**$725 783.13**

Using the same assumptions made to determine the yearly profit, yearly costs after 1 year can be estimated.

Table 3.3.4: Yearly Costs After 1 Year

Yearly Costs After 1 Year	
Website	$528/year
Apple App Store	$125/year
Rent	$54 750/year
Electricity	$2 400/year
WiFi	$2 400/year
10 Customer Service Support Workers Salaries	$ 42 120/year
3 Computer Scientist Salaries	$ 240 000/year
Apple App Store Deduction	$ 18 674/year
Google Play Store Deduction	$ 15 279/year
Total Costs	**$ 373 876/year**

Moreover, yearly costs for 3 years can be calculated using an NPV analysis.

$$FV \; = \; \Sigma PV(1 \; + \; i)^{n}$$

Table 3.3.5: Yearly Costs

Yearly Costs	
Year 1	$373 876/year
Year 2	$404 384.28/year
Year 3	$420 559.65/year
Total Costs Over 3 Years	**$1 198 819.93**

Using the calculated yearly revenue and yearly costs, a diagram can be displayed in order to determine when the company can break even in units of years. This is shown in figure 3.2.
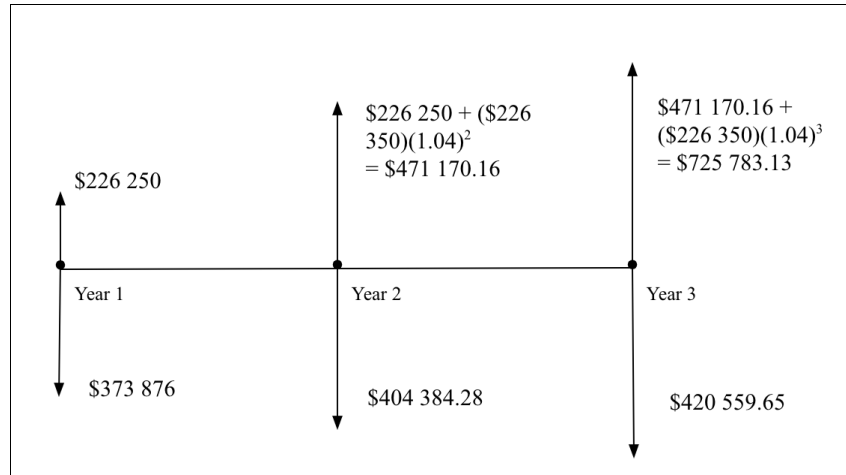
Figure 3.2: NPV Analysis visualization

3.3.1 Break-Even Point

of Monthly Subscriptions = $373876/$2.50
                          = 149 550
# of Tri-monthly Subscriptions = $373876/$7
                          = 534 111
# of Yearly Subscriptions = $373876/$24
                          = 15 578

In order to break even, the company would need 149 550 monthly subscriptions. In the case that tri-monthly subscriptions dominate, the company would need 534 111 subscriptions using the tri-monthly plan. Moreover, if the company wants to break even with the use of yearly subscriptions, the company would need to record 15 578 yearly plans. If the company considers users that subscribe to different plans, the company can expect to break even in about 2 years of production (based on figure 3.2).

3.4 Assumptions

In order to create the economics report, the team researched aspects about the target demographic and made the corresponding assumptions. It was found that 18.5% of Canadians were aged 65 and older in 2021 [5]. According to a 2016 study, 24.6% of Canadians 65 and older live alone [11]. The team assumed the percentage of Canadian seniors living alone in 2021 to be close to the value from the 2016 study. This makes approximately 7 million seniors in Canada and almost 2 million of them living alone. The team also decided that the product could be profitable towards people with disabilities, which made up 22% of

the population in 2017, for individuals aged 15 and over [10]. However, it is better to assume that within the population of people with disabilities, people with mobility issues are more likely to find use of the product; in 2017, 2.7 million people aged 15 identified as having mobility issues [9].

Moreover, in 2019, 10.1% of Canadians and 5.4% of Canadians 65 years and over were considered persons of low income [10]. The team assumed that the product could also be targeted towards these individuals, as it could be used for people who can not afford a home health care worker for their senior family members. Since the team would be considering people with low income, the subscription fees for the application would have to accommodate the target market.

With the increase in target audience, the business production requires a larger staff. Thus, the team estimated that 3 computer scientists would be able to handle the main development of the application. As the application is already being prepared for launch, the company would only need a few computer scientists to continue on with software updates and other future requirements necessary. In the income statement, the average computer scientist salary was assumed to be $80 000/year. The company would also require minimum wage workers that would provide customer assistance. Thus, the team used average values in Canada for minimum wage, rent, electricity, wifi, and other equipment to complete the income statement. Moreover, the team estimated approximately 10 workers to complete the jobs required for customer assistance; the application itself has rudimentary features, but some users may struggle with come across technological issues, or simply navigation issues. In this case, the company would not need a small help centre due to the fact that the target audience is not as big as other applications, but the application would need more than simply an email for users to message as the main priority of the application is to ensure user safety; thus, a call centre would be more logical.

Next, it was found that the iOS products dominated 55% of the market share while Android mobile products possessed 45% in 2021 [9]. As the product is compatible with iOS and Android, the

application will be able to be purchased by both Apple and Android users, meaning that the target

audience will be able to be reached based on the market shares that iOS and Android products own.

Assuming SnugSafe is a competitor due to the similarities that the two products possess, the

different fees were made in comparison to SnugSafe. SnugSafe offers a basic version for free and a

premium version for $12.59CAD/month or $125.98CAD/year. Since the team assumed the company

would have just begun production, the costs would be much lower. Many companies with subscription

business models offer a free trial; thus, the team decided that a 1 month free trial would be included. The

team then decided for a $2.50CAD/month plan in order to accomodate the average incomes of the target

market. Using the specified monthly rate, the team calculated corresponding values for a tri-monthly and

an annual plan, which resulted in unit prices of $7CAD/3months and $24CAD/year.

Furthermore, in order to estimate how many users the product would have on average, the team

researched average downloads of similar applications. The team reviewed the amount of downloads of

applications that are popular within the elderly community, such as applications focusing on reminding

the user to take medication, as well as more obscure products such as those involving an application that

reminds the user where they parked their car. The downloads ranged on average from 10 000 to 500 000.

As the product can be applicable in many scenarios, the team assumed a higher download number than 10

000, but since the application is only beginning to launch on the market, it must be significantly lower

than 500 000. The team estimated an average number of 75 000 concurrent users each year based on the

number of downloads of similar apps, as well as the target market previously mentioned.

Finally, the team estimated that by the first year, the number of users would begin with 10 000

and increase in future years. In addition, the team assumed that 50% of the users would use the

tri-monthly plan as it offers a short period with little commitment, which is likely to be the most popular

plan. It was then assumed that 37% of users would opt for the monthly plan as there is almost no

commitment and the users can opt-out more easily than the yearly plan, making it the second most popular. Lastly, 13% would make up the yearly users as this would mainly be customers who have tested the application out and have familiarized themselves with the product.

4   Conclusions and Recommendations for Future Work

In the scenario that the team has begun production after finalizing the personal safety application, as well as beginning to sell the product, the team identified the best business model suited to commercialize the application. Using the determined business model, the team created a business model canvas using appropriate assumptions as well as identifying the feasibility of the statements. The team then created a list of different costs associated with the development of the product and the business. The costs were then used to create an income statement as well as an NPV-analysis to determine the break-even point. Furthermore, the assumptions made to produce the economics report were listed and justified. After identifying significant aspects of the business model and the economics report, the team will use the information in order to aid in the development of the final prototype.

References

[1] *America's Health Rankings | Ahr*. (n.d.). Retrieved November 19, 2021, from https://www.americashealthrankings.org/learn/reports/2021-senior-report/introductio.

[2] Canada, E. and S. D. (2021, June 4). *Government of Canada*. Making an accessible Canada for people with disabilities - Canada.ca. Retrieved November 19, 2021, from https://www.canada.ca/en/employment-social-development/programs/accessible-canad a.html.

[3] Government of Canada, S. C. (2020, December 3). *A profile of Canadians with a mobility disability and groups designated as visible minorities with a disability*. The Daily - . Retrieved November 19, 2021, from https://www150.statcan.gc.ca/n1/daily-quotidien/201203/dq201203a-eng.htm.

[4] Government of Canada, S. C. (2021, September 29). *Canada's population estimates: Age and sex, July 1, 2021*. The Daily - . Retrieved November 19, 2021, from https://www150.statcan.gc.ca/n1/daily-quotidien/210929/dq210929d-eng.htm.

[5] Government of Canada, Statistics Canada. (2021, June 22). Smartphone use and smartphone habits by gender and age group, inactive. Retrieved November 19, 2021, from https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=2210011501&pickMembers%5 B0%5D=3.1&pickMembers%5B1%5D=4.1.

[6] Government of Canada, Statistics Canada. (2021, June 22). Smartphone use and smartphone habits by gender and age group, inactive. Retrieved November 19, 2021, from https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=2210011501&pickMembers%5 B0%5D=3.1&pickMembers%5B1%5D=4.5.

[7] Government of Canada, Statistics Canada. (2021, March 23). *Low income statistics by age, sex and Economic Family Type*. Low income statistics by age, sex and economic family type. Retrieved November 19, 2021, from https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1110013501.

[8] Government of Canada, Statistics Canada. (2021, September 29). Population estimates on July 1st, by age and sex. Retrieved November 19, 2021, from https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710000501&pickMembers%5 B0%5D=1.1&pickMembers%5B1%5D=2.1&cubeTimeFrame.startYear=2021&cubeTi meFrame.endYear=2021&referencePeriods=20210101%2C20210101.

[9] ontario.ca. (n.d.). Retrieved November 19, 2021, from
    https://www.ontario.ca/document/your-guide-employment-standards-act-0/minimum-
    wage.

[10] *Mobile Operating System Market Share Canada*. StatCounter Global Stats. (n.d.).
    Retrieved November 19, 2021, from
    https://gs.statcounter.com/os-market-share/mobile/canada.

[11] *Our aging population: Statistics*. Retirement Homes, Communities and Care. (n.d.).
    Retrieved November 19, 2021, from
    https://www.comfortlife.ca/retirement-communities/our-aging-population-statistics.

$226\ 250$

$226\ 250 + (\$226\ 350)(1.04)^2$
$= \$471\ 170.16$

$226\ 250 + (\$226\ 350)(1.04)^3$
$= \$725\ 783.13$

Year 1

Year 2

Year 3

$373\ 876

$404\ 384.28

$420\ 559.65