

**Project Deliverable G: Business Model and Economics
Report
GNG 2101**

Submitted by Team C11

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Abstract

The following document for this deliverable is the business model and economics report of team C11's project. This document will contain a business model analysis with justification on which would be the most appropriate for the application. This report also includes an economic section which describes various costs associated with the product, a 3-year income statement as well as an NPV analysis.

Introduction

To build the business model and the economic report, the team had to analyze the product as if it was finalized. The team first searched for various business models that would correspond to the application vision and did an analysis of each of those business models. The team decided that a Freemium model mixed with an Advertising model would be best suited for the mobile application. Furthermore, a model canvas was realized based on the business model that was chosen, in order to determine the targeted client, the potential partners and the overall approach of the product. This can be used in order to better adapt the application to the targeted audience.

The second part of this deliverable is an economic report to better anticipate future years economic results. First, a list of costs was collected and the different costs were labelled as indirect, direct, variable, and fixed. Then, the team developed a 3-year income statement of the application, and included the sales revenue, a projected cost for those three years, the profit the team would make and the operating expenses and income. And finally the team completed the report by making a NPV analysis of those three years in order to find the units needed to break even.

Business Model Analysis

Table 1: Analysis of the three Business Models chosen for the Mealtime Calculator Android Application

Criteria	Subscription(free trial)	Freemium	Advertising
Accessibility for diabetics	Reduces incentive to use the application	Gives the ability to use the application but removes accessibility to all functions	Allows everyone to have access to the application
Customer application testing	The customer pays before testing, making it harder for customer to try a new product	The customer can test the free features but not the premium ones	The customer can test any app feature
User base	*1Small user base, but the customers pay for the app afterwards. However, it can't be guaranteed that they will stay.	Larger user base for the free version of the application. However, a smaller pool of customers for the premium version of the app.	The user base will be depending on how well and known the app is going to be. The larger of the three options.
Profit	The profit per user is the highest	*2The profit is based on how much the client needs the premium part of the application. High profit for the involved users but might also turn users that would pay for the subscription into free users.	The profit depends on the number/time of advertisements. This has low profit per user.
Advertisement	No advertisement	No advertisement using premium.	Advertisement can be annoying during usage

*1The subscription business model can have two options for the free trial:

1) Enter their credit card number before the free trial

- Advantage: It would guarantee that the customer is interested in the application and is willing to pay a price for the free trial.
- Disadvantage: Many customers it is guaranteed that they can be intimidated by the idea of entering their credit card number before the free trial.

2) Enter the credit card number after the free trial:

- Advantage: Free users can be your future customers. Once they pay after the free trial, it means they are pleased with the app and stay as customers.
- Disadvantage: In some cases, some customers don't want to pay the real price and will not subscribe for this reason.

*2 The Freemium business model can have a peculiar rentability

1. If there is a huge amount of clients interested in the premium option of the apps, the rentability will be elevated.
2. If in the other case, the number of clients interested in the premium option the rentability will be smaller.

Table 2: Value Analysis of the three Business Models chosen for the Mealtime Calculator Android Application

Criteria	Subscription(free trial)	Freemium	Advertising
Accessibility for diabetics	0	0.5	1
Customer application testing	0	0.5	1
User base	0	1	1
Profit	1	0.5	0.5

Advertisement	1	1	0
Total	2	3.5	3.5

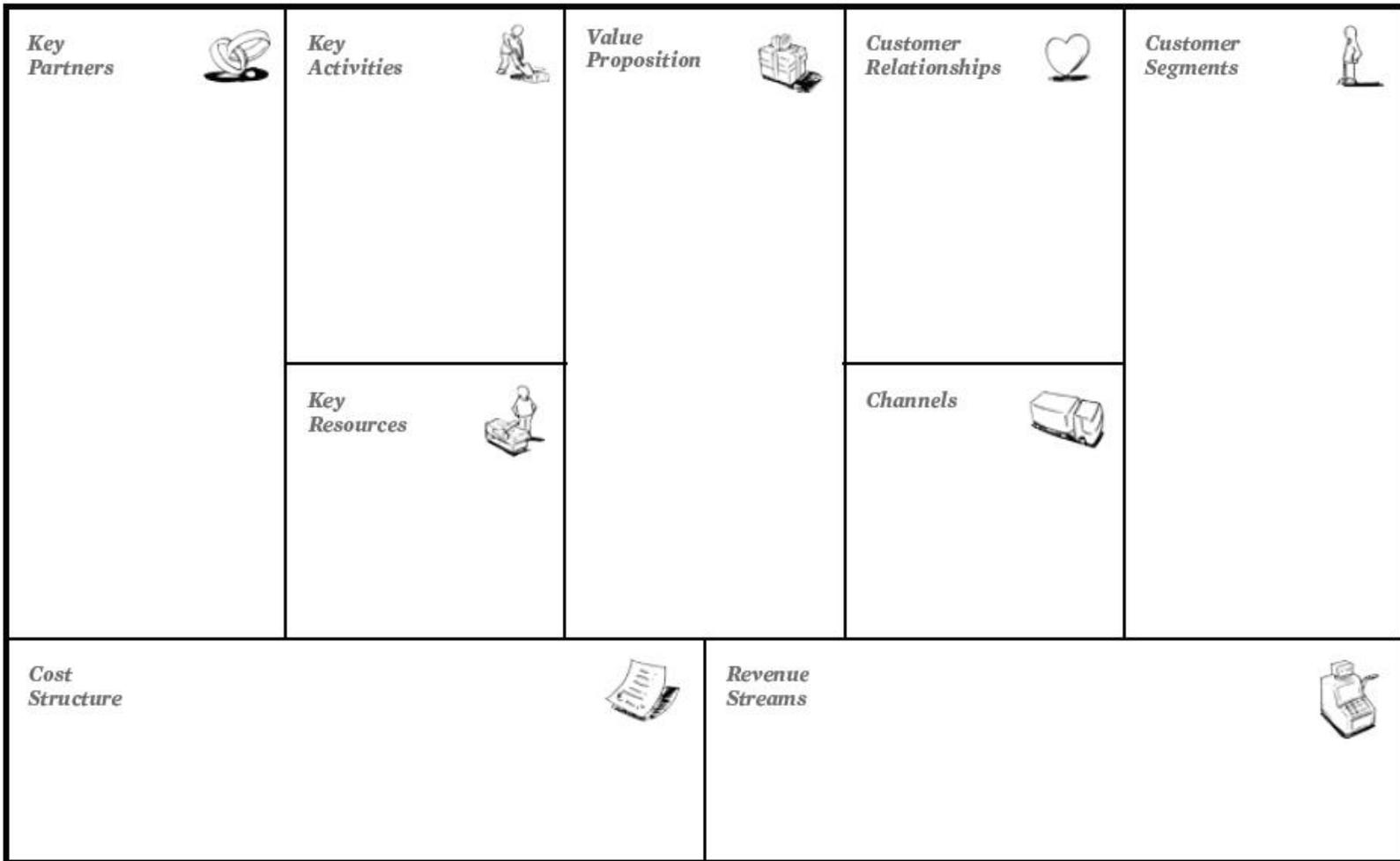
The three business models were chosen because they were better aligned with the objective of the application: Giving open access to a resource for diabetes management through a mobile application. The Landlord business model would not make sense in an application setting. The Razor-Blade business model does not apply either, as it does not directly help diabetics accessibility to the resource for diabetics. Buying the product will not make the person want to buy the same access again. The subscription, freemium and advertising models allow for diabetes to use the application as a resource to better manage diabetes.

Looking at the table's advantages and disadvantages, the team decided to go with a mix of freemium and advertisement. Both scored a total of 3.5 points. By taking both, the application can take the advantages and disadvantages of both Freenium and Advertising business models. This can be seen in the Accessibility for diabetics, customer applications testing and advertisement. By having both, diabetics can have access to almost the whole app by simply having advertisements. If the user wants to use the full extent of the application, they simply have to pay a subscription fee. For the customer application testing, because most of the application is free with advertisements, the user gets a strong idea of the functionality of the application to make a better choice if they want to pay a subscription. The last one, advertisement, can be bothersome for some users; the freemium option will allow the user to get rid of the advertisements.

The combination of both models allows for a more adapted model for the application. The model allows the user to have more options to choose how to support the team.

Business Model Canvas. What's Your Business: Freemium/Advertising

This model was chosen since it is the most advantageous.



Business Model Canvas

Key Partners:

- Hospitals
- Companies associated with diabetic persons (e.g Diabetes Canada, SickKids, Heart and Stroke Foundation)
- Clients directly

Key Activities:

- Carbohydrate calculations
- Data storage of meals/foods to facilitate carbohydrate counting

Key Resources:

- Developers, Customer Service
- Technology (Smartphones, laptops/PC's)
- Database

Value Proposition:

- Carbohydrates Calculator
- Simplify diabetic tasks during meals
- Store information about meals and keeping reminders/notifications for customer

Channels:

- Google Play Store - Mobile App
- Partnerships, Advertising
- Word of mouth

Customer Segments:

- Diabetic Users
- Hospital Doctors
- Nutritionists

Customer Relationships:

- Mobile Users
- Doctors
- Nutritionists
- Diabetics

Cost Structure:

- Employee salary
- General and Administrative
- Office space/building

Revenue Streams:

- Premium subscriptions
- Advertisement in application
- Sponsorships, partnerships

While making the business canvas, multiple assumptions were made. The following paragraphs will each give detail of specific assumptions that are being made from the team and their feasibility.

Getting hospitals interest is the first assumption that will be explored. In this assumption, the team is assuming that doctors, nutritionists would use the application as a tool to help diabetics. This assumption is feasible, as hospitals often use applications and resources to help deal with diabetic patients and introduce the applications/resources to patients with diabetes to help their lifestyles.

Word to mouth is another assumption that will be explored. For this assumption, the team assumes that people using the application will share the application with other

people which would increase the user base of the application. This assumption is not the most feasible, because it assumes that clients with diabetes are close to other potential clients with diabetes. The part of the assumption that is the most feasible would-be doctors telling their patients about the application.

The size of the company is also another assumption. The assumption implies the necessity for office space and employees to get the application running. This assumption is not very feasible in the current situation. The current situation includes the production of the application being a product of students working on a project. For this assumption to become feasible, the team would have to invest time and decide that it is worth investing money to start a business, which is realistic but most likely will not happen.

From this, it can be concluded that there are many assumptions being made when it comes to creating a business model and business canvas. Assumptions are being made based on expected success and potential for the ideas of the company. If the product idea were to fail, the business canvas would be obligated to change/adapt to failures to better portray the current situation.

Economics Report

Fixed-Direct:	Google play fee
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Fixed-Indirect	rent for work space, office supplies, insurances + benefits, hardware (laptops, computers), mobile phones for testing
Variable-Direct	Adding new features/updates
Variable-Indirect	marketing/advertising, Marketing campaigns

These are all costs. Costs is the amount of money needed for the company to manufacture, maintain and deliver their products. The price is the money that the client is willing to pay for the product/service. As seen above, all of the costs represent the money that the company would have to pay to maintain the business.

Table 3: Three Year Income-Statement

Year	1	2	3
Item	Amount		
Revenue	\$4040.25	\$14140.88	\$40402.51
Advertisement Revenue	\$1040.25	\$2600.625	\$6761.625
Subscription Revenue	\$3000	\$10500	\$43500
Raw Material	\$0.00	\$0.00	\$0.00
Gross Profit	\$4040.25	\$14140.88	\$40402.51
Operating Expense	\$13 272.57	\$13 272.57	\$13 272.57
Marketing	\$121.075	\$121.075	\$121.075
Electricity	\$1131.36	\$1131.36	\$1131.36

General & admin	\$0.00	\$0.00	\$0.00
Direct salaries	\$0.00	\$0.00	\$0.00
Other overhead	\$0.00	\$0.00	\$0.00
Depreciation	\$20	\$20	\$20
Rent	\$12000.00	\$12000.00	\$12000.00
Operating Income	\$-9232.32	\$868.31	\$27129.94

Explanation of these assumptions:

For the direct salaries, the software application will be produced by in-house software developers. In other words, it is going to be the team that would do the application and there will be no outsourcing software development. Therefore, the direct salaries are \$0. The project would be seen as being made from students developing a side-project.

The team assumed that the rent of a small office is \$1000/month. Therefore a total of \$12 000 per year and, also the team assumed that the price would not change over the years or the company will not change the size of the office. The team already assumed that there would be no other employees, therefore, making the assumption that the office space will not need to grow, would be a fair assumption.

The team assumed that the depreciation would be of 20\$ for computer equipment. In the case of a computer costing \$100, the depreciation would be 20% each year, which coincides with the average depreciation life of computer equipment.

*The price is added low, as everyone in the team already has computers/laptops they can use, and the price would be business expense if a new monitor or item is necessary for the business.

The general/admin and other overheads were decided to be \$0.00 because it is a new company and it is primordial to minimize any unnecessary spendings if need be.

The team assumed to take a 3% of the total avenue and invest it in the marketing aspect of the company. It would be beneficiaries to have publicity outside of the application (e.g. on television, bus posters, etc.). This tactic would attract even more customers and would, therefore, increase the revenue.

It is important to note that the team assumes that there is no reason to need any copyright or patent to the application, as the company would not make enough money to bring to court any company stealing intellectual property.

Operating expenses (for the three years) = marketing + electricity + General & admin + Direct salaries + other overheads + Depreciation + Rent = \$121.075 + \$1131.36 + \$0.00 + \$0.00 + \$0.00 + \$20 + \$12000.00 = \$13272.57

Operating income for the first year:

Operating Income = Gross Profit - Operating Expense = \$4040.25 - \$13272.57 = \$-9232.32

Operating income for the second year:

Operating Income = Gross Profit - Operating Expense = \$14140.88 - \$13272.57 = \$868.31

Operating income for the third year:

Operating Income = Gross Profit - Operating Expense = \$40402.51 - \$13272.57 = \$27129.94

Assumed electricity expense will be \$1131.36 each year. According to a report done by Hydro Ottawa, the monthly residential electricity costs for Ottawa is \$94.28 (750 kWh monthly usage). Per year, the total becomes \$1131.36 per year.

Assumptions for Sales Revenue:

Sales revenue - Freemium + Ad revenue

“On average, 5 to 10% of users are willing to pay for an application, but only one with high quality and performance, and specific functionality. Thus, the majority of downloads and profits (98%) come from the free app segment.

Additionally, Gartner Research Group states that 24% of users would interact more via in-app purchases rather than paid apps.” - (Lastovetska, 2021)

Using this information, the team will assume that 5% of users will pay for the app's subscription-based service.

The team will also take the average number application downloads from a market application to replicate the total revenue the app will make over 3 years.

[Diabetes Carb Counter for Type 1 Diabetics - Apps on Google Play](#) 10k downloads over 3 years.

Indeed, after analyzing the amount of download after 3 years, an assumption can be made; indeed, the first year there would be 1000 downloads, the second year an addition of 2500 downloads and the third year an addition of 6500. That assumption was made using a certain logic. Indeed, If there are 100 people downloading the app per month. Since the app would take some time to be noticed by the public there is an assumption that in the two first months no one would download the app. As a result, after one year, 1000 people would have downloaded the app. For the second year, an approximation would be made by assuming that the app would gain in popularity due to the different ads the client is doing word-of-mouth. Indeed, this gain would be 2500 in the year which is 2.5 times more than the first year. Indeed, the total number of subscribers would be 3500 people. In the third year, the assumption can be drawn with the same logic, since the app has been there for 2 years there would be a lot of reviews, ads and mouth-to-mouth that have been done and that help to make the app to be more popular. For the third year, the team assumes that there would be 6500 new downloads which is 2.6 more than the previous year.

Freemium Revenue:

Subscription-based app - \$5 a month for additional features. 10000 downloads for 3 years

let's assume on average 5% of users each year pay for freemium features, freemium users pay for full 3 years (April 1st 2021 - April 1st 2024)

1000 downloads first year x 0.05 = 50 freemium users x \$5 = \$250 a month x 12 = \$3000 a year

2500 downloads second year x 0.05 = 125 freemium users x \$5 = \$625 a month x 12 = \$7500/y + 3000 (including users from 1st year paying for all 3 years) = 10500/y

6500 downloads third year x 0.05 = 325 freemium users x \$5 = \$1625 a month x 12 = \$19500/y + 10500 (including users from 1st year paying full 3 years and 2nd year users paying for 2 years) = 30000

= \$43500 for 3 years

Ad revenue:

According to MLSDev, the general revenue per impression from:

- banner ad is the lowest, \$0.10
- interstitial ad is moderate, \$1-3
- video ad is the highest, \$5-10

The application will use banner ads. Banner ads are less invasive and won't annoy users as much when compared to video ads and interstitial ads. Invasive ads will cause users to input calculations at a much slower rate and could cause users to avoid using the application out of frustration. Using invasive ads could also cause a lawsuit to be filed if a user ends up getting hurt or hospitalized because they weren't able to put in their calculations fast enough due to the ads.

“Most app advertisements use the CPC model where optimal RPM (revenue per mile) is 1.5%-2%

For example, if you have 50,000 banner ads displayed per day, your average number of clicks is 750, while the revenue comes out to \$75 (750 x \$0.10).

AN of clicks= ad number x (1.5/100)” - (Lastovetska, 2021)

Assuming that 95% of users don't have the freemium option;

950 non-freemium first year users (1000 x 0.95) x 2 ads per min (average of 1 min time user is on app)

= 1900 ads x 0.015 (AN of clicks)

= 28.5 CPM (Clicks per minute) x \$0.1 (Banner ad revenue per impression)

= \$2.85 a day x 365

= \$1040.25 year 1 revenue

2375 non-freemium second year users x 2 = 4750 ads x 0.015

= 71.25 CPM x \$0.1

= \$7.125 a day x 365

= \$2600.625 year 2 revenue

6175 non-freemium third year users x 2 = 12350 ads x 0.015

= 185.25 CPM x \$0.1

= \$18.525 a day x 365

= \$6761.625 year 3 revenue

Total ad revenue for three years= \$10402.5

For the Net Present Value Analysis to find the break-even point, the team decided to use excel in order to calculate the break-even point. The values made from the excel are shown below.

	A	B	C	D	E
1	Breakever analysis				
2					
3	Price	5.106			
4	Demand	7798.219741			
5	Unit Cost	0			
6	Fixed Cost	\$39,817.71			
7	Revenue	39817.71	Price*Demand		
8	Variable Cost	0	Demand*UnitCost		
9	Total Cost	39817.71	FixedCost+VariableCost		
10	Profit	0	Revenue-TotalCost		
11					

The table above calculates the demand needed to break even. Using this, the team is able to determine how many users need to be using the application in order to break-even. Each of the sections will be described below.

The price used is the average price per user. The team assumes that 5% will get a premium version for a cost of \$7. The calculation for the other 95% (through advertisements), gives \$0.09 per month.

Equation: # of users x # of ads = Total ads for the day

Total ads x 0.015 (Average Number of clicks) = Clicks per minute

CPM X \$0.1 (Banner ad revenue per impression) = Revenue/day

(Revenue/day) x 30 = Revenue/month

1 user x 2 ads a min (for 1 min of user active time) = 2 total ads

2 total ads x \$0.015 = 0.03 clicks per minute

0.03CPM x \$0.1 = \$0.003 a day

\$0.003 x 30 = \$0.09 a month

Using both values, the average price per unit (user) of the app will be:

Average price = %subscribed * subscriptionFee + %non-subscribed * advertisementRevenue

NOTE: advertisementRevenue = the average price per unit with advertisements.

Average price = 0.05 * \$7 + 0.95 * \$0.09

Average price = \$0.4255

NOTE: Although usually only 2 decimal places are used, in this case, they should be kept, because it is an average of the prices.

From the price, the yearly user price would be $\$0.4255 * 12 = \underline{5.106}$.

The unit cost is 0, where there is no cost for each unit being produced. If anyone downloads the application, there will be no cost to provide the application to the user outside the cost of having the application hosted on the app store.

The Fixed Cost is the last number determined before calculating the break-even point. This number is determined from all the costs necessary to run the application.

This table represents the case where the interest is 0 or if the sales happen in the first year. In the case where there is a %4 interest rate, the calculation will have to be slightly different.

The fixed cost is set at \$39817.71 for the maintenance price of three years. As it can be seen, for three years periods, there would need to be 93,579 MonthUsers. This does not mean that there needs to be 93,579 users active, but if those users use the app over months, it will add up to 93,579 units.

Below the team will calculate how many years it would take to break even.

NPV analysis:

Year	PV
0	= Fixed cost = 0
1	= $PV_0 + \text{FixedCost} + 5.106 \cdot \text{Users} / 1.04$ = $0 - 13272.57 + 5.106 \cdot 1000 / 1.04$ = -8362.95
2	= $PV_1 + 5.106 \cdot \text{Users} / 1.04$ = $-8362.95 - 13272.57 + 5.106 \cdot 3500 / 1.04$ = -4451.87
3	= $PV_2 + 5.106 \cdot \text{Users} / 1.04$ = $-4451.87 - 11236.64 + 5.106 \cdot 10000 / 1.04$ = 31371.71

*5.106 represents the units per year, where per month is \$0.4255, therefore $\$0.4255 \cdot 12 = \5.106 .

By looking at this table, it can be noted, that profit will be broken even after year 2.

Looking at this, using a 4% interest, it would take less than 3 years to break even. It is important to consider that the users that already had the application and continue using will compound over time. In order to calculate the number of units necessary to break even, it can be assumed that all the units are necessary for the three years, minus the extra for the third year. The total units for the three years is $1000 + 3500 + 10000 = 14,500$ (keeping in mind that subscription is kept each year). There is an extra \$31371.71 extra profit.

$$\$31371.71 = 5.106 * \text{Users} / 1.04$$

$$\text{Users} = \$31371.71 * 1.04 / 5.106$$

$$\text{Users} = 6,389.85$$

After getting the user worth of \$31,371 (14,500-6,390 = 8110), the team can compare the results from breaking even if there is no interest rate, or if there is an interest rate of 4%. If there is no interest rate, it will take 7799 units (whether through advertising or subscription) while it would take 8110 units if there is a 4% interest rate.

Assumptions for NPV

The biggest assumption is that there would be a 4% interest rate. This rate was used as an example in the class and thus used here in order to have an approximation. The other assumptions for the NPV stem from the assumptions mentioned earlier in the economics section.

Conclusion

Through this deliverable we first compared which business model would correspond the most to the application we are making, we settled on a mix of freemium and advertising. We then made a business model canvas with the model we chose to get detailed information of our business plan. After that we established the direct and indirect costs of our product and made a 3-year income statement of our product. In that 3-year projection we calculated the income we would make in that period of time. This report gave us a good outlook of a realistic business model that our application would

take if we had to commercialize our mobile application and what the first three years would look like from a financial perspective.

Wrike

<https://www.wrike.com/frontend/ganttchart/index.html?snapshotId=XyPP8wwkfITfZzvReYMOHJ6q0OuGsLpt%7CIE2DGNBSHA2TCLSTGE3A>

Division of the work :

- Khalil advanced in mobile application development and helped a bit those who worked mainly on the report.
- Spencer mostly worked on the deliverable and fully did the project plan updated on wrike.
- Mounira, Regina and James worked on the deliverable.

Works Cited

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