Project Deliverable H - Economics Report and Video Pitch

GNG2101

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Introduction

This deliverable is a detailed report discussing the many variables required to run a successful business. Specifically, this report analyzes the possibility of producing our SensAct User Interface for the public and how realistic it would be to create a business out of our product. The report begins with analyzing the varying costs involved with running a business whether specific to our project or not. The following section includes potential income statements of our business and sample quarterly reports. The final main section of the analysis contains a Net Present Value (NPV) analysis as well as a breakeven analysis.

Cost Classifications and Descriptions

Table 1: Cost Classifications and Descriptions

Cost #	Description	Classification
1	Production Material (Desktop, Monitor, Raspberry pi)	Material, Variable Direct cost
2	Marketing (paper stocks, mailing, flyers)	Expense, Indirect cost
3	Internet	Expense, Direct cost
4	Utility (Electricity, Heating, Cooling)	Expense, Semi Variable
5	Salaries (UX/UI designer, Software Developer, Debugger)	Labour, Fixed cost
6	Income Tax	Expense, Taxation cost
7	Office Rental	Expense, Indirect cost
8	Financing Cost (debt)	Expense, Indirect cost
9	Office Equipment	Expense, Indirect cost
10	Depreciation	Expense, Indirect cost

Income Statement

Table 2: Sample Detailed Quarter 1 Year 1 Overview

Cost Name	Unit Cost	Number of Units	Quarterly cost
Direct Material Costs (Variable)			
Stock Image	$623.93/month	3	$1871.79
Direct Labour Costs (Variable)			
Manufacturing Costs	N/A	1000	N/A
Indirect Labour Costs			
Salaries			
UI Developer/Designer	$16,500	2	$33,000
Debugger	$16,636.25	1	$16,636.25
Accountants	$13,333.75	1	$13,333.75
Marketers	$13,000	1	$13,000
Graphic Designers	$11,047.25	1	$11,047.25
Total Indirect Labour Costs (Fixed)			$87,017.25
Indirect General Costs			
Building/Office Rental	$2795.00/month	3	$8385
Office Equipment			
Chairs	$50.98/unit	6	$305.084
Tables	$101.42/unit	6	$608.505
Utilities	$190	4	$570
Marketing	$0.78/flyer $0.78/brochure	500 500	$780
Internet	$94.95/month	3	$284.85
Direct Production Costs (Fixed)			
Production Equipment (i.e.computers/raspberry pi)	$501.08/month	3	$1503.25

Price	$250.00/unit	100	$25,000
Cost	$18.7/unit	100	$1871.79
Total Expenses For the Quarter			**$90,218.94**
Total Sales For The Quarter			**$25,000**

Table 3: Sample Detailed Quarter 1 Year 3 Overview

Cost Name	Unit Cost	Number of Units	Quarterly cost
Direct Material Costs (Variable)			
Stock Images	$623.93/month	3	$1871.79
Indirect Labour Costs			
Salaries			
UI Developer/Designer	$16,500	4	$66,000
Debugger	$16,636.25	4	$66,695
Accountants	$13,333.75	2	$26,667.5
Marketers	$13,000	4	$52,000
Graphic Designers	$11,047.25	3	$33,141.75
Total Indirect Labour Costs (Fixed)			$244,504.25
Indirect General Costs ()			
Building/Office Rental	$2795.00/month	3	$8385
Office Equipment			
Chairs	$203.39/unit	3	$610.17
Tables	$405.67/unit	3	$1217.01
Utility	$190	3	$570
Marketing	$0.78/flyer $0.78/brochure $1000/month of google ads	5000 5000 3	$3,900 $3,900 $3000
Internet	$94.95/month	3	$284.85

Direct Production Costs (Fixed)			
Production Equipment (i.e.computers/raspberry pi)	$276.27/month	3	$828.80
Price	$250.00/unit	3000	$750,000
Cost Per Unit	$18.7/unit	3000	$56,100
Total Expenses For the Quarter			**$325,171.87**
Total Sales For The Quarter			**$750,000**

Table 4: Year 1 Income Statement

	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4
Unit sold	100	150	200	250
Material cost	$1871.79	$1871.79	$1871.79	$1871.79
Revenue	$25,000	$37,500	$50,000	$62,500
Gross profit	$23,128.21	$35,628.21	$48,128.21	$60,628.21
Utilities	$570	$570	$570	$570
Salaries	$87,017.25	$87,017.25	$87,017.25	$87,017.25
Marketing	$780	$780	$780	$780
Location rent	$8385	$8385	$8385	$8385
Office Equipment Cost	$913.50	$913.50	$913.50	$913.50
Equipment Cost	$1503.25	$1503.25	$1503.25	$1503.25
Equipment depreciation	$402.4	$402.4	$402.4	$402.4
Operating income	$-76,443.19	$-63,943.19	$-51,443.19	$-38,943.19
Loan payment	$62,500	$62,500	$62,500	$62,500
Net earnings	$-138,943.19	$-123,443.19	$-113,943.19	$-101,443.19

Table 5: Year 2 Income Statement

	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4
Unit sold	500	1000	1500	2000
Material cost	$1712.96	$1712.96	$1712.96	$1712.96
Revenue	$125,000	$250,000	$375,000	$500,000
Gross profit	$123,287.04	$248,287.04	$373,287.04	$498,287.04
Utilities	$570	$570	$570	$570
Salaries	$144,200.75	$144,200.75	$144,200.75	$144,200.75
Marketing	$4560	$4560	$4560	$4560
Location rent	$8385	$8385	$8385	$8385
Office Equipment Cost	$609.06	$609.06	$609.06	$609.06
Equipment Cost	$1,103.83	$1,103.83	$1,103.83	$1,103.83
Equipment depreciation	$171.29	$171.29	$171.29	$171.29
Operating income	$-36,312.89	$88,687.11	$213,687.11	$338,687.11
Loan payment	$0	$0	$0	$0
Net earnings	$-36,312.89	$88,687.11	$213,687.11	$338,687.11

Table 6: Year 3 Income Statement

	QUARTER 1	QUARTER 2	QUARTER 3	QUARTER 4
Unit sold	3000	4000	5000	6000
Material cost	$1288.1	$1288.1	$1288.1	$1288.1
Revenue	$750,000	$1,000,000	$1,250,000	$1,500,000
Gross profit	$748,711.9	$998,711.9	1,247,711.9	$1,498,711.9
Utilities	$570	$570	$570	$570
Salaries	$183,534.50	$183,534.50	$183,534.50	$183,534.50
Marketing	$10,800	$10,800	$10,800	$10,800
Location rent	$8385	$8385	$8385	$8385
Office Equipment Cost	$456.80	$456.80	$456.80	$456.80
Equipment Cost	$828.80	$828.80	$828.80	$828.80
Equipment depreciation	$128.56	$128.56	$128.56	$128.56
Operating income	$544,008.24	$794,008.24	$1,043,008.24	$1,294,008.24
Loan payment	$0	$0	$0	$0
Net earnings	$544,008.24	$794,008.24	$1,043,008.24	$1,294,008.24

NPV Analysis

Table 7: Year 1 NPV Analysis

	Y1Q1	Y1Q2	Y1Q3	Y1Q4
Net earning	$-138,943.19	$-123,443.19	$-113,943.19	$-101,443.19
PV time frame (Months)	3	6	9	12
PV estimation	$-136,879.71124	$-4,0943.01493	$-37,792.10282	$-33,646.16584
Net PV estimation	$-136,879.71124	$-254,650.7252	$-359,810.46325	$-450,016.71379

Table 8: Year 2 NPV Analysis

	Y2Q1	Y2Q2	Y2Q3	Y2Q4
Net earning	$-36,312.89	$88,687.11	$213,687.11	$338,687.11
PV time frame (Months)	15	18	21	24
PV estimation	$-12,044.07629	$29,415.29353	$70,874.66335	$112,334.0332
Net PV estimation	$-34,101.86733	$-23,515.67385	$-10,031.33997	$5,264.331675

Table 9: Year 3 NPV Analysis

	Y3Q1	Y3Q2	Y3Q3	Y3Q4
Net earning	$544,008.24	$794,008.24	$1,043,008.24	$1,294,008.24
PV time frame (Months)	27	30	33	36
PV estimation	$180,433.9104	$263,352.6501	$345,939.7148	$429,190.1294
Net PV estimation	$24,727.61821	$40,298.24743	$68,083.83537	$98,176.02653

Table 10: NPV Analysis of 3 Year Time Frame

Quarterly time frame	Y1Q1	Y1Q2	Y1Q3	Y1Q4	Y2Q1	Y2Q2	Y2Q3	Y2Q4	Y3Q1	Y3Q2	Y3Q3	Y3Q4
Net PV performance to date	$-136,879.71124	$-254,650.7252	$-359,810.46325	$-450,016.71379	$-34,101.86733	$-23,515.67385	$-10,031.33997	$5,264.331675	$24,727.61821	$40,298.24743	$68,083.83537	$98,176.02653
Quarterly PV performance	$-136,879.71124	$-4,093.014093	$-37,792.10282	$-33,646.16584	$-12,044.07629	$29,415.29353	$70,874.66335	$112,334.0332	$180,433.9104	$263,352.6501	$345,939.7148	$429,190.1294

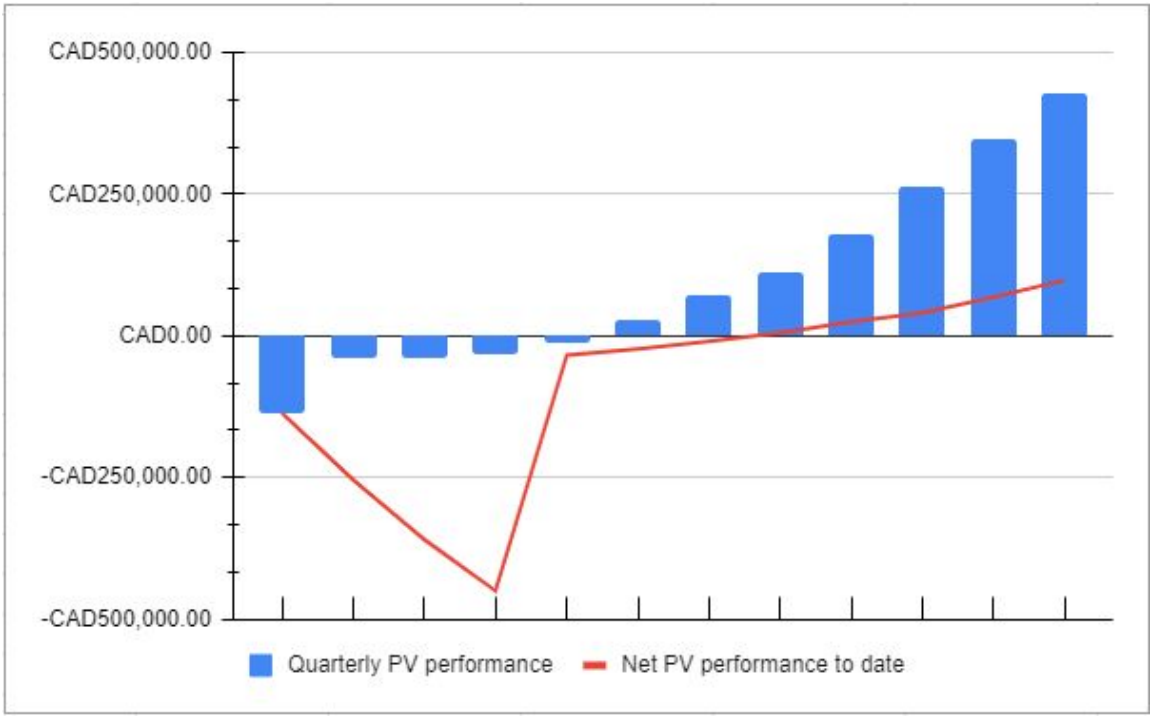


Figure 1: NPV Analysis Represented in Graph

Break-Even Analysis

As seen in figure 1 (NPV Analysis graph) our company starts to make profit roughly ¾ths of our third quarter in our second year in business. The break even point can be calculated using the graph and our number of goods sold in each quarter (found in our net income statement tables). This is seen on the red curve in figure 1, along the point which the curve crosses the x-axis and touches 0 Dollars meaning our company isn't at loss anymore and begins to make some profit. At this point we can add the products sold from year 1 Q1 all the way to 3/4ths of the 3Q in year 2 and this results in break even number =100+150+200+250+500+1000+(0.75*1500) = 3325 products sold to break even. The number for products in each quarter was obtained from our net income statement tables above (Tables 4 and 5). In other words our company would not be profiting from sales until towards the end of our 2nd year of business, where we would have sold a total of 3325 of our products.

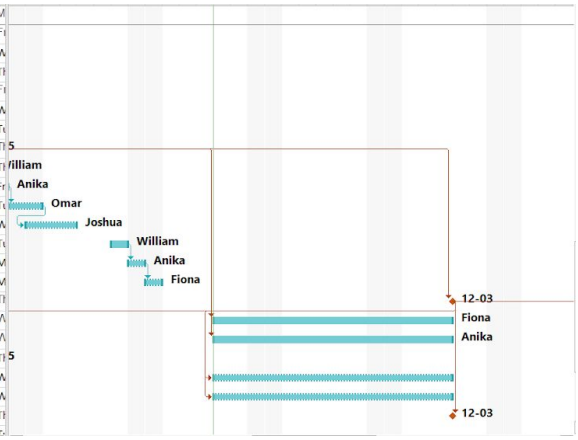
Core Assumptions

- It is assumed that the product will be programed entirely on Node Red- a free online based dashboard program
- It is assumed that the graphic designers hired by the company will be responsible for the graphics of the interface, and also for all forms of company advertisements created
- It is assumed that the company is located in an office to be rented in Ottawa, Ontario
- The product is a functional user interface (not a hardware device) but the company requires a Sensact Device, Raspberry pi for the testing of the User Interface functionality before the product can be sold
- It is assumed that we have a good business relationship with different hospitals, clinics and Care homes in Ontario that allow us to drop off our brochures and flyers (our 2 methods of advertisement) without expenses. This enables us to market more efficiently only having to pay the salary of the marketers and the cost of making/distributing the brochures and flyers. Another marketing method we assume to have is direct meetings with hospital executives to promote our product.

- It is assumed that our company is able to run with only 6 hired employees in our first year. Specifically; 2 Developers/UI Designers, 1 Debugger, 1 Accountant, 1 Marketer, and 1 Graphic Designer and with each year we will employ more workers as the company grows to meet production demands.
- It is assumed that we will have one table and one chair and one computer for each employee in our company then there will come 6 pairs of tables and chairs and computers for the first year. It is also assumed that we will require 2 raspberry pi first year for the employees to use.
- It is assumed that we are going to make a one time payment to our client to purchase 3 sensact devices for testing (at $55 each) which would be shared between all employees to carry out testing of the user interface on the device.

Project Plan:

3.9.1.1	Sens-Act JavaCode configure functior	Fiona	3 days	Thu 20-10-22	Sat 20-10-24	Thu 20-10-22	M
3.9.1.2	Node-Red and SensAct working togeth	Fiona	7 days	Thu 20-10-22	Fri 20-10-30	Thu 20-10-22	Fr
3.9.1.2.1	Update UI button functionality	Omar	7 days	Thu 20-10-22	Fri 20-10-30	Tue 20-09-15	W
3.9.1.3	Prototype Specifications	Joshua	3 days	Sat 20-10-24	Tue 20-10-27	Tue 20-09-15	Th
3.9.2	Testing	Fiona	2 days	Sat 20-10-31	Mon 20-11-02	Thu 20-10-22	Fr
3.9.2.1	Prototype Analysis and fucntionality	Omar	1 day	Mon 20-10-26	Mon 20-10-26	Wed 20-10-28	W
3.9.2.2	Prototype Testing Table	Anika	1 day	Tue 20-10-27	Tue 20-10-27	Tue 20-11-03	Tu
3.10	PD-H Economics Report + Video Pitcl	Anika	0 days	Thu 20-11-05	Thu 20-11-05	Thu 20-10-22	Th
3.10.1	Classified Cost list	William	1 day	Thu 20-11-05	Thu 20-11-05	Thu 20-10-22	Th
3.10.1.2	3 year income statement	Anika	1 day	Fri 20-11-06	Fri 20-11-06	Fri 20-11-06	Fr
3.10.1.3	NVP analysis	Omar	2 days	Sat 20-11-07	Sun 20-11-08	Mon 20-11-09	Tu
3.10.1.4	Assumptions	Joshua	3 days	Sun 20-11-08	Tue 20-11-10	Mon 20-11-09	W
3.10.2	Video Pitch intro	William	1 day	Fri 20-11-13	Fri 20-11-13	Tue 20-09-15	Tu
3.10.2.1	Problem + importance	Joshua	1 day	Sat 20-11-14	Sat 20-11-14	Mon 20-11-16	M
3.10.2.2	Proposed soln + advantages	Anika	1 day	Sun 20-11-15	Sun 20-11-15	Mon 20-11-16	M
3.10.1	Final prototype	Fiona	0 days	Thu 20-12-03	Thu 20-12-03	Thu 20-11-05	Th
3.10.1.1	Work on Java Script functionality	Fiona	10 days	Thu 20-11-19	Wed 20-12-02	Thu 20-11-05	W
3.10.1.2	Polish final deisgn of User Interface	Omar	10 days	Thu 20-11-19	Wed 20-12-02	Thu 20-11-05	W
3	Design Day	Omar	0 days	Thu 20-11-05	Thu 20-11-05	Thu 20-12-03	Th
30.10.1.3	Design Day presentation slides	Anika	10 days	Thu 20-11-19	Wed 20-12-02	Thu 20-12-03	W
30.10.1.4	Design Day Pitch	Joshua	10 days	Thu 20-11-19	Wed 20-12-02	Thu 20-12-03	W
3.10.2	Design Day	Omar	0 days	Thu 20-12-03	Thu 20-12-03	Thu 20-12-03	Th
4.1	Project objectives	William				Tue 20-09-15	Tu



Conclusion:

In conclusion, this deliverable gave us more context on whether our product is a viable business opportunity. Upon analysis, the idea seems promising, however there were many assumptions used in order to come to this conclusion and we are unable to definitively say if this product would result in a profitable company.

Appendix:

Table 11: Cost Classifications Research

	Item	Specific Cost	Source
Direct Costs			
Materials:			
	Raspberry pi (2G)	$47.75/unit	https://www.buyapi.ca/product/raspberry-pi-4-model-b-2gb/?src=raspberrypi
	Desktop	$799.99/unit	https://www.canadacomputers.com/product_info.php?cPath=1517_1518&item_id=111921
	Monitor	$139.99/unit	https://www.dell.com/en-ca/shop/dell-19-monitor-e1920h/apd/210-aund/monitors-monitor-accessories
	Keyboard/Mouse	$24.99/unit	https://www.bestbuy.ca/en-ca/product/logitech-keyboard-mouse-combo-mk120/10207205
Production Materials:			
	Stock Images	$623.93/ month	https://www.shutterstock.com/pricing
Marketing [Advertisements]			
	5000 flyers on 100lb gloss text paper stock	$641.48	https://www.psprint.com/resources/brochure-flyer-marketing-budget/
	5000 brochures on 100 lb gloss text paper stock	$464.84	https://www.psprint.com/resources/brochure-flyer-marketing-budget/
	Flyer distributions cost for 5000	$3256.9	https://www.psprint.com/resources/brochure-flyer-marketing-budget/
	Brochure distribution cost(	$3451.77	https://www.psprint.com/resources/brochure-flyer-marketing-budget/

	direct mailing) for 5000		
	Youtube Ad	$2080/year	https://www.webfx.com/internet-marketing/how-much-does-youtube-advertising-cost.html#youtube-ad-cost
Utility/Bills:			
	Internet	$94.95/ month	https://business.bell.ca/Shop/small-business/internet/packages/business-fibe-25-FTTN
	Electricity	$0.125/kWh.	https://www.energyhub.org/electricity-prices/
	Heat/AC/ Garbage	$190	
Salaries			
	UI designer/ developer	$66,000 annually	https://www.payscale.com/research/CA/Job=UI_Developer/Salary
	Debugger	$66,545 annually	https://www.payscale.com/research/CA/Job=Software_Developer/Salary
	Accountants	$53,335 annually	https://www.payscale.com/research/CA/Job=Accountant/Salary
	Marketers	$52,000 annually	https://neuvoo.ca/salary/?job=Marketing
	Graphic Designer	$44,189 annually	https://www.payscale.com/research/CA/Job=Graphic_Designer/Salary
Indirect Costs			
	Income Tax	15% General 10% private business	
	Office Rental	$2,795/ month	https://www.kijiji.ca/v-commercial-office-space/ottawa/new-commercial-office-space-for-lease-reduced-by-500-a-month/1497388811
Materials			

	Chairs	$179.99/unit	https://www.staples.ca/products/394403-en-staples-mesh-task-chair-black
	Tables	$359/unit	https://www.officefurniture.com/Modular-72W-Desk-BUS-10103.aspx

Income Statements Research

400 establishments (hospitals), as of 2019 in Ontario

Our members provide care and accommodation services to more than 70,000 residents annually.

630 long term care homes (https://www.oltca.com/OLTCA/)

(https://www.oltca.com/OLTCA/)

https://www150.statcan.gc.ca/n1/pub/89-654-x/89-654-x2018002-eng.htm

- 2,676,370 with mobility disability
- 1,275,610 with dexterity disability

Our product can serve people with Seeing (5%), hearing (5%), dexterity (5%) and mobility (10%) disabilities.

Out of the roughly 1.85 million Ontarians affected by disabilities, our target audience would be 462,500. In our conducted survey, we determined that 64.8% of surveyors would be willing to purchase our product to help out someone in their lives, who has a disability.

https://accessibilityconsultants.ca/resources/legislation#:~:text=Today%2C%20over%2015%25%20of%20Ontario's,to%20one%20in%20five%20Ontarians.

Loan: https://www.bdc.ca/en/financing/starting-business-loan

Table 12: Rough Calculations for Yearly Expenses

Salaries			
Year 1:			
	UI Developer/Designer	2	132,000
	Debugger	1	66,545
	Accountants	1	53,335
	Marketers	1	52,000
	Graphic Designer	1	44,189
Total Cost			348,069
Year 2:			
	UI Developer/Designer	3	198,000

	Debugger	2	133,090
	Accountants	1	53,335
	Marketers	2	104,000
	Graphic Designer	2	88,378
Total Cost			576,803
	UI Developer/Designer	3	198,000
	Debugger	2	133,090
	Accountants	2	106,670
	Marketers	4	208,000
	Graphic Designer	2	88,378
Total Cost			734,138
Materials			
Year 1			
	Chairs	6	1,220.334 including tax
	Tables	6	2,434.02 including tax
	Raspberry Pi	2	107.8 including tax
	Desktop	6	4881.54 including tax
	Monitor	6	854.22 including tax
	Keyboard/Mouse	6	169.434 including tax
Total			9,667.35
Year 2			
	Chairs	4	813.55 including tax
	Tables	4	1622.68 including tax
	Raspberry Pi	1	53.96 including tax
	Desktop	4	3615.95 including tax

	Monitor	4	632.75 including tax
	Keyboard/Mouse	4	112.95 including tax
Total			6851.84
Year 3			
	Chairs	3	610.17 including tax
	Tables	3	1217.01 including tax
	Raspberry Pi	1	53.96 including tax
	Desktop	3	2711.97 including tax
	Monitor	3	474.57 including tax
	Keyboard/Mouse	3	84.72 including tax
Total			5152.40