GNG 2101

Economic and IP Considerations

The Jabberblock B1.4

Submitted by:

Noah Stevens, 300350003

Justin Li, 300393206

Maximilien Salter, 300297218

Yasmine Kortas, 300375342

Keno Obuwoma, 300345036

Jeremy Poole, 300350006

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University of Ottawa

G1: Economics Report

1.

|  |  |  |  |
| --- | --- | --- | --- |
| Cost Item | Variable / Fixed | Direct / Indirect | Material / labour / Overhead |
| Rent for workspace | Fixed | Indirect | Overhead |
| Depreciation of tools (3D printers, soldering irons, etc.) | Fixed | indirect | Overhead |
| Software Licenses (3D modeling, etc.) | Fixed | Direct | Overhead |
| Salaries for administrative staff | Fixed | Indirect | Labour |
| Buttons (Micro push button & 3D printed cover) | Variable | Direct | Material |
| Circuit boards | Variable | Direct | Material |
| Case (plastic filament) & Battery case | Variable | Direct | Material |
| Fasteners | Variable | Direct | Material |
| AAA batteries | Variable | Direct | Material |
| Electricity | Variable | Indirect | Overhead |
| Wires | Variable | Direct | Material |
| Steel Square Bar | Variable | Direct | Material |
| Solder | Variable | Direct | Material |
| Labour | Variable | Direct | Labour |

Prototyping vs High Volume:

Material costs per part will be elevated when producing prototype compared to high volume as there are discounts on the bulk purchase of materials.

Labour costs will also cost more during the prototyping phase because of the intricate testing and constant changes in manufacturing processes. When the product is finalized, the manufacturing process will be streamlined and quicker (reducing labour per part).

Overhead as a dollar amount will likely cost more with high volume manufacturing because we will need more things (tools, labour, rent, etc.) to produce a greater quantity. However, with this increased cost comes an increased output of products, leading to a lower cost per product ratio.

2.

|  |  |  |
| --- | --- | --- |
| Material | Quantity Per Finished Product | Cost Per Finished Product |
| 0.5” x 0.5” x 12” Steel Square Bar | 2 | $7.88 |
| Thin Profile M6 Hex Nut | 6 | $0.22 |
| M6 Nylock Nut | 1 | $0.05 |
| M6 x 1.00 x 12mm Socket Head Screw | 2 | $0.21 |
| M6 x 1.00 x 16mm Socket Head Screw | 2 | $0.24 |
| M6 x 1.00 x 30mm Socket Head Screw | 2 | $0.37 |
| M6 x 1.00 x 40mm Socket Head Screw | 3 | $0.71 |
| Pet Button | 4 | $15.33 |
| Filament | 350g | $16.55 |
| Unleaded Solder | 5g | $0.13 |
| 24 AWG Solid Core Wire | 1.2m | $0.26 |
| Labour | 5hrs | $100.00 |
| Total |  | 141.95 |

Assuming a 50% gross profit, each product will be sold for $283.90

Year 1:

Products sold: 50

Gross Profit: $7097.5

Operating Expenses: (7097.5 + 705 + 50 + 18000) =$ 25853.

Operating Income: -$11,658

Sales Revenue: $14195

Year 2:

products sold: 65

Gross Profit: $9226.75

Operating Expenses: (9226.75 + 18000) = $27226.75

Operating Income: -$8772.75

Sales Revenue: $18454

Year 3:

Products sold: 85

Gross Profit: $12065.75

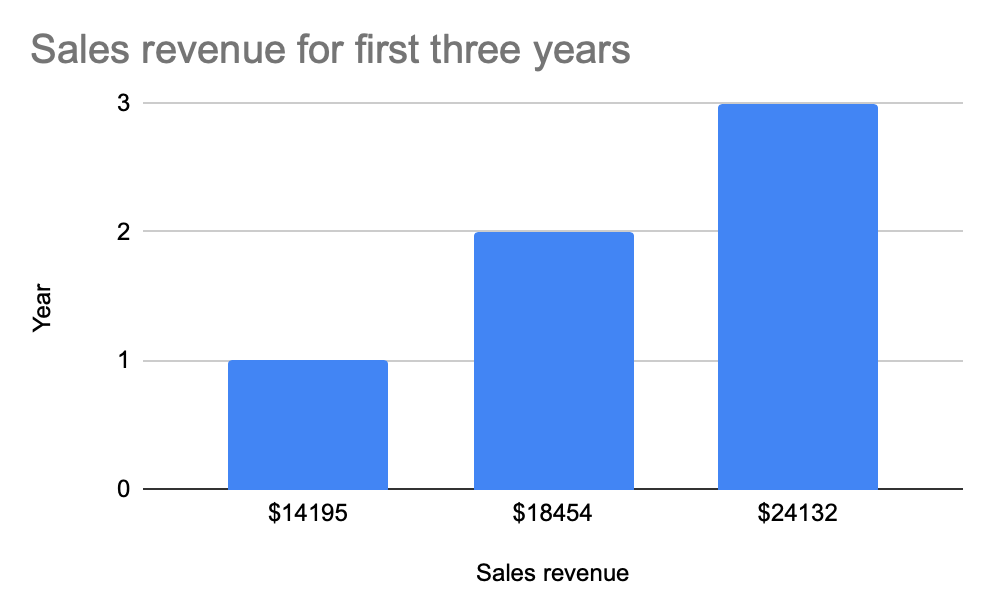
Operating Expenses: (12065.75 + 18000) = $30065.75

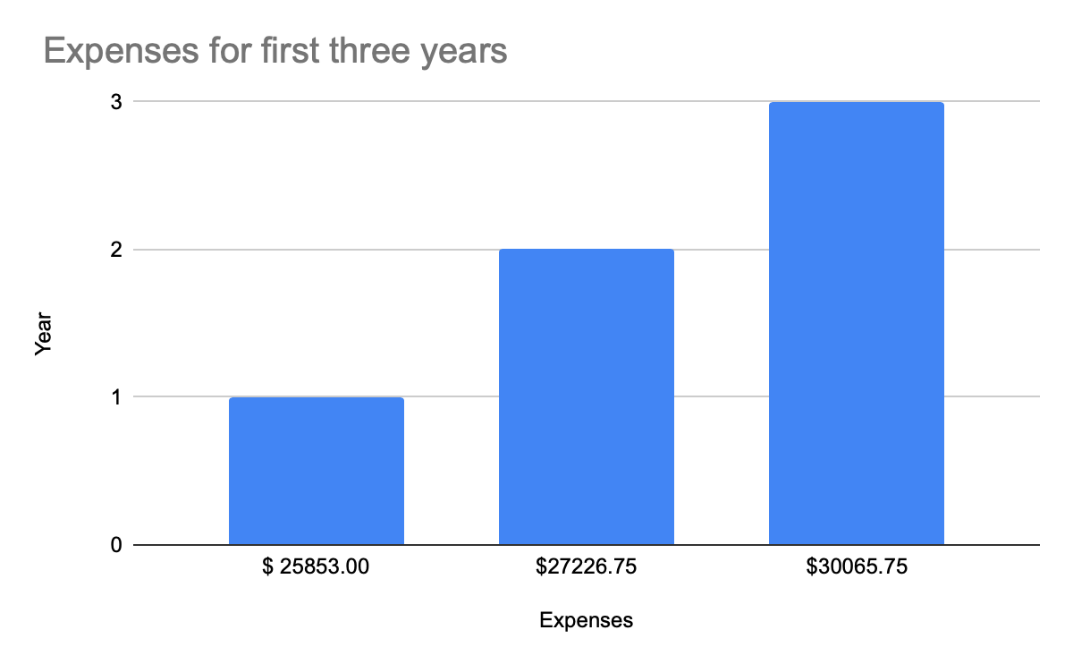
Operating Income: -$5933.75

Sales Revenue: $24132

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Cash flow diagram:





Break-even point = (Fixed costs)/(Revenue per unit – Cost per unit)

=($18000)/($283.90 - $141.95)

B.E.P. = 127 units.

Therefore, to break even (excluding random breaks of equipment etc) we need to sell 127 units.

**Assumptions:**

* Based on recent market analysis and forecast done, the market for “augmentative and alternative communication (AAC)” devices was valued at approximately “$273.6 million in 2022” and from the study, is to reach $602.19 million by 2019 (CAGR of 11.02%) based on current competitive retailing from $35 to $670 it is possible that this affordable device could capture a significant market by appealing to cost-conscious consumers while maintaining functionality and accessibility, making it a competitive option in the growing AAC market.

Competitive product example:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | Inserting image... |  |  |
| Cheap Talk 4 in-line Direct retails from $170-360 | iTalk 4 retails for $275 | Totally Tactile Communicator retails for $670 | Dog Recordable Training Buttons retails to $50 | Communication Device for Non-Verbal Kids & Adults retails for $35 |

However, it is important to notice that they are not made from the most durable material thus they can easily break and won’t necessarily withstand a hit while strapped to a wheelchair. Furthermore, our product has sturdier care, but it includes a hook that can be mounted to the wheelchair

* However, it is important to realize that even with an increasing market size we might not sell as many products in the first few years. Thus, to be safe and not go in surplus (making too many products than we sell) we will assume that not a lot of people will buy our products in the first year until we see demand for them.
* We found out the product has a large group of target audience from the information we got from researching the communication device. We assume 50 units sold in the first year, increasing by 30% each year (65 in year 2, and 85 in year 3).
* We assume we are going to buy the 3D printers used to facilitate the production of our device. We assume that the cost to buy a used 3D printer is $705 CAD: [https://www.ebay.com/itm/196576167176chn=ps&google\_free\_listing\_action=view\_item](https://www.ebay.com/itm/196576167176?chn=ps&google_free_listing_action=view_item).
* We assume that we are able to make everything in time with only 1 soldering iron and 1 3D printer. In a more realistic scenario, we would have to purchase multiple (which would lead to more sales as well).
* We assume we will sell the product at a 50% profit margin, since it costs us $141.95 to make, we will sell each unit at $283.90
  + Which for its quality, durability and practicality is affordable compared to similar competitive products (table above)

Reference: Global augmentative & alternative communication (AAC) devices market analysis 2024-2029 by device type, application, end-user, region, and country. (2024, Jan 16). *Financial Services Monitor Worldwide* Retrieved from https://login.proxy.bib.uottawa.ca/login?url=https://www.proquest.com/wire-feeds/global-augmentative-amp-alternative-communication/docview/2914947829/se-2

## G2: Intellectual Property Report

**Patent 1:**

<https://www.freepatentsonline.com/20120202177.pdf>

**Description:** A TV-remote that communicates using an app on a TV screen. The user can select displayed texts with the remote, which is then transformed to an audio sound so that the intended listener can understand what the user is saying. It is intended to be used by dentist patients, while they are reclined in a chair and they cannot speak while a dentist operates, so phrases like “That hurt!”, “Yes/No”, and other urgent messages can be forwarded with ease. Extra features are added onto the screen software, such as entertainment (games, movies, music), education (about dental procedures), and many peripherals for this concept are listed (remotes, keyboards, mouses, touchscreen).

**Patent 2:**

<https://www.ablenetinc.com/italk4/>

<https://ablenetinc.zendesk.com/hc/en-us/articles/360060499951-Getting-Started-With-iTalk4-Speech-Device>

<https://files.ablenetinc.com/KnowledgeBase/QuickStartGuides/10000028-iTalk4-QSG-06-18-21.pdf>

* **The iTalk4:** Not officially patented in a database, but copyrighted trademark by Ablenet (the company that makes these devices). This means that the brand name is the only copyright held.
* **Similarities to our product:** Consists of 4 large buttons aligned on a case that can record and play a sound for each button. A microphone speaker is placed on the back of the device. Runs on batteries.
* **Has more features:** A volume dial, a level-feature switch (to toggle between sets of soundboards for more sounds), several MIDI/Headphone jacks, an app to set custom icons/displays for the buttons.
* **Differences from our product:**
  + The “mounting arm” to fit on a wheelchair is sold separately: a special separate arm-mounting device for wheelchairs from the company must be bought.
  + Pricing. Our product is intended to be more affordable to our client, while this product is “high-tech” with many features.

This product is very similar to our device in functionality, but this product is not a patent owned by Able talk we are not infringing copyright. In fact, many sound button products exist, although they aren’t particularly marketed toward the speech impaired.



The importance of exploring existing patents and intellectual properties is important for product developers to understand and be aware of what features on existing products already exist. This helps design teams to not only avoid getting sued, but also to encourage engineers to come up with newer, more innovative ideas that work around these boundaries. Our product is built off technology that already exists (buttons that make sound, and a mounting arm for a wheelchair), but that patent is evidently expired and as we have explored many companies and inventors registering and selling their own variations on the market.

**Project Plan Update**

