Deliverable G

G.1 Economics report:

A list of variable/fixed, direct/indirect, and material/labour/overhead costs associated with your business, based on the manufacturing and sale of your product.

	Variable	Fixed	Direct	Indirect	Price ($)
Material Costs					750,000
Overhead costs					30,000
Electricity					100,000
Salaries					200,000
Rent					40,000

The green portion in this chart is the ones that apply to those certain expenses. The ones that are not coloured in are the ones that are not applicable. Then the last section of the chart is the overall prices for each as a rough estimate based on previous examples in lecture and group consensus.

3-year income statement

For the list of assumption is based off a 1-year term, we sold 10,000 units in at $150 each, it costs $40,000 for rent material cost was $750,000, overhead costs were $30,000, electricity costs $100,000 and salaries were $200,000 for the employes making $20/hour to build our product. We also assume that our revenue would be constant over the first three years. Therefore, we can multiply the costs and incomes by three to show consistency.

Sales Revenue:

= 10,000 units * $150/unit

= $1,500,000

Over three years would be: $4,500,000

Gross Profit:

= $1,500,000 - ($750,000 + $100,000 + $200,000 + $40,000)

= $410,000

Over three years would be: $1,230,000

Operating Expenses:

= $40,000+$750,000+$30,000+$100,000+$200,000

= $1,120,000

Over three years would be: $3,360,000

Operating Income:

= $1,500,000 - $1,120,000

= $380,000

Over three years would be: $1,140,000

Determining the NPV and breakeven point

	Year 1	Year 2	Year 3
Cash flow	Income – Expenses $1,500,00-$1,120,000 = $380,000	Income – Expenses $1,500,00-$1,120,000 = $380,000	Income - Expenses $1,500,00-$1,120,000 = $380,000

Breakeven:

Operating expenses / Cost of Unit

$1,120,000/ $150 = 7466.67 which means we need to sell 7467 units to break even

Justification of Assumptions

Assumptions are we sold 10,000 units at $150 each. It cost $40,000 for rent, Material cost was $750,000, overhead costs were $30,000, electricity costs $100,000 and salaries were $200,000.

The cost values are based on the BOM we submitted where if we purchased the material from amazon, it would be roughly $170 however if we bought in bulk to prepare 10,000 units we would get a significant reduction on price. Thats where we assumed the $150 would be a proper cost per unit.

Since the cost of a window opener from online source costs about $350[1]. It is safe to assume we would have a large share of the market since our price is a lot less. That is why assuming 10,000 units being sold each year would make sense.

The operating costs the rent being $40,000 the cost of materials being $750,000 the overhead cost of $30,000 and electricity costs of $100,000 also makes sense. When there is 10,000 units being made the space needed would be large so bigger place higher rent, bigger place would mean higher electricity cost

[1] https://www.olidesmart.com/products/automatic-sliding-window-opener (for cost of window opener)

as well as more overhead. The cost of materials is on the conservative side but since we mentioned we are getting them in bulk the price would be less and that's how we came to this conclusion.

The salaries would be 1 hour to create one unit and we pay $20 an hour in wage this is how we got to $200,000 for salaries.

G.2 Intellectual property report:

Identifying of relevant intellectual Properties

1. Patent 3168351[1]
2. Patent 2356814[2]
3. Patent 2022623[3]

Importance and legal constraints

Patent 3168351:

Patent 3168351 describes a device that automatically opens and closes windows and doors through a system that aims to control the indoor air parameters which are measured by sensors. The method of manipulating devices is consisting of a stepper motor which moves a flexible connection to the window.

With respect to the impact on our project, this patent may limit our ability to use the automatic control of the window through sensors. The method of opening and closing windows however is very different as ours uses a belt and chain and there's uses a flexible connection controlled by a stepper motor. Furthermore, our method of interaction with the device is different as ours uses Bluetooth while theirs uses the internet.

Patent 2356814:

Patent 2356814 describes a window opening and closing device that is mounted to a window frame. The device is to comprise two flexible coil arms extending from within the housing that is to be connected to the window sash. Inside the housing is to be a worm gear that can open or close the device, depending on the direction of the rotation.

While the patent describes a product with a similar goal to our project, the method of opening and closing is very different. Additionally, the patent does not relate to how the device is to be controlled, therefore that aspect of our design is not at risk either.

Patent 2022623:

Patent 2022623 describes a window being opened through a motorized operator of windows, skylines, and other devices which can also be opened manually through cranks or handles. Also, the devices will be connected to a gear train to help with the torque needed to open or close the window, with this you are able to read how open or closed the window is by following the gear rotation.

This patent would have no effect whatsoever on our design as since it was filed in 1990, it is well out of date. This is due to patents expiring in 20 years.[5]

Project Plan Update

The link below is for the updates Gnatt chart with a complete plan to complete all deliverables excluding deliverable K because there is no additional information on Brightspace.

https://uottawa-my.sharepoint.com/:x:/r/personal/etrai055_uottawa_ca/_layouts/15/Doc.aspx?sourcedoc=%7B974619AB-8140-4899-8CAE-2716124A267D%7D&file=Breezy%20Window%20Opener%20Gnatt%20Chart.xlsx&action=default&mobileredirect=true&DefaultItemOpen=1&login_hint=etrai055%40uottawa.ca&ct=1711144786543&wdOrigin=OFFICECOM-WEB.START.REC&cid=7ee6450f-a1b3-4a33-b81a-e0becb63724d&wdPreviousSessionSrc=HarmonyWeb&wdPreviousSession=9200f8db-a415-419d-a663-fe47dc65cb3e

References:

[1] Government of Canada, I. (2015, January 30). *Canadian patent database / base de données sur les Brevets Canadiens*. Canadian Patents Database. https://www.ic.gc.ca/opic-cipo/cpd/eng/patent/3168351/summary.html?query=Automatic%2BWindow%2Bopening%2Bsystem%2Bfor%2Ba%2Bhouse&type=basic_search

[2] Government of Canada, I. (2015a, January 30). *Canadian patent database / base de données sur les Brevets Canadiens*. Canadian Patents Database. https://www.ic.gc.ca/opic-cipo/cpd/eng/patent/2356814/summary.html?query=Automatic%2BWindow%2Bopening%2Bsystem%2Bfor%2Ba%2Bhouse&type=basic_search

[3] Government of Canada, I. (2015a, January 30). *Canadian patent database / base de données sur les Brevets Canadiens*. Canadian Patents Database. https://www.ic.gc.ca/opic-cipo/cpd/eng/patent/2022623/summary.html?query=Automatic%2BWindow%2Bopening%2Bsystem%2Bfor%2Ba%2Bhouse&type=basic_search

[4] olidesmart. (n.d.). *Automatic sliding window opener length customizable*. olidesmart. https://www.olidesmart.com/products/automatic-sliding-window-opener

[5] Government of Canada, I. (2015a, January 30). *Canadian patent database / base de données sur les Brevets Canadiens*. Canadian Patents Database. https://www.ic.gc.ca/opic-cipo/cpd/eng/patent/2022623/summary.html?query=Automatic%2BWindow%2Bopening%2Bsystem%2Bfor%2Ba%2Bhouse&type=basic_search