A PIEZO

En route to safety

Executive Summary

Golden Three is a shoe company seeking to decrease the burden of stress on parents with special needs children due to safety concerns and to create an integrated and seamless experience through effective shoes tailored to individual needs. Golden Three currently consists of six undergraduate students: Adil Ghazi, Chris Lin, and Quinn Hou in Commerce, and Henry He, Pawel Kapusta, Vivy Wang in Engineering.

À Piezo is the first product by Golden Three. À Piezo is a pair of location-tracking and self-charging shoes designed to provide a peace of mind to parents of children on the Autism Disorder Spectrum (ASD). The app indicates the live location of the child and sends out immediate alerts when the child wanders too far from safety or to high risk areas. À Piezo aims to empower parents to monitor their child's safety and to provide a seamless experience for families.

The Problem

With one out of two children on the Autism Disorder Spectrum (ASD) wandering from safe environments, families are hesitant from leaving the house due to current assistive technologies' ineffectiveness in addressing safety concerns. Current assistive technologies offer a rigid and hassle-filled user experience. There are two main factors that contribute to the hassle, inconvenience, and ineffectiveness: a) devices are extraneous items, which children with ASD dislike to have on their body and b) devices require constant recharge. Not only do parents frequently forget to put the device on the child, the device is not always guaranteed to be available, both defeating the very purpose of the device.

À Piezo is capable of completely addressing these two problems by embedding a GPS tracker into the shoe sole, where the devices are charged by each footstep with energy collecting technology. With each step, À Piezo is always ready to provide a peace of mind for parents.

Our Product

There are two notable features that make À Piezo different than other GPS tracking wearables.

1. First, it is self energy sustainable, saving parents' time and energy from manual charging and creating a seamless experience for the child wearing the shoe.
2. Second, its GPS tracking device is embedded in the sole of a shoe, hiding the hardware and reducing the discomfort that might arise. Children who are more sensitive to the materials will not notice a difference from regular sneakers (see page X for the illustration the Sectional view).

The combination of these two features in À Piezo makes it stand out from the competition.

Competitors

As one of the known GPS tracking wearable, Techsilver is perhaps the biggest competitor with its Smart Sole product. To track patients with dementia, a sole insert with GPS tracking is placed inside the shoe. Even though this is quite known in the dementia community, some complain that manual charging could be tedious at times as it requires users to monitor battery level as well as take the sole out for re-charging. Another major competitor is AngelSense with its GPS Belt, an external device half the size of a phone that has to stay on the child's waist. It locks itself onto a child's body through a strap. Not only might the child feel uncomfortable from the noticeable weight and

inconvenience, from the outer appearance, it can be immediately identifiable that there is such a tracking tool on the child. Golden Three provides the same value as both of these competitors in one, comfortable, convenient, and effective product.

Revenue Model

Our channels involve selling A piezo through our own website initially and later expand to other ecommerce websites such as Amazon and Shopify to serve a wider market. We offer an end to end service and avoid any retail mark ups. Our revenue streams consist of a monthly subscription through which we will provide route guidance for locating any missing child.

Market Size

A Piezo is focusing on parents of children with ASD from ages two to 12. Once our product has been proven in this market, we will expand to create product for dementia patients. A Piezo's broad target market is for anyone with a tendency to wander. In our market calculations, the North America market size for our shoes is **$4.05M**, the North America and Europe market size is **$571.9M**, and the Global market size is **$4.73B**.

Once the shoe has been established in the market, we will look further into developing other GPS tracking device to accommodate different groups of people, such as children of all abilities and dementia patients, who experience the same pain points. We will be conducting further research to discover other markets that could benefit from the features of our product.

Go-to-Market Plan

Our go-to-market plan involves both a top down approach and bottom up approach in the initial phases and a holistic approach in later phases of development. For top down, we will focus on gaining leadership backing, enlisting key Autism organizations and leaders to act as the forefront of support. As we gain momentum and backing from key leaders, our bottom up approach powers through by focusing on gaining community support. This is done through connecting with the people whom the customers trust the most — the child's medical and therapy team. As the support from our recommenders continue to grow, we will launch product campaigns at related conferences and events. This coupling will effectively bring a customer from the awareness through to purchasing in the purchase funnel.

What We Need

We are seeking $449,135 in financing for initial production costs, software and hardware research and development, salaries, market research, and administration fees. This will take us to end of 2020 before sales start in January 2021. Just as important as funding, continual and thorough research and development is vital to the success of our product. Therefore, we will be seeking medical experts and industry professionals to join Golden Three as advisors.

Golden Three's A Piezo aims to reduce the burden of stress and to improve the quality of everyday life for families with Autistic children by putting forward what we know best — tailoring to users' special needs and providing seamless experiences.

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The Problem

The problem that Golden Three is solving with À Piezo was inspired by the personal experience from a parent of an Autistic child. The parent is our external advisor, who is also president emeritus of Pacific Family Autism Network (PFAN), Gabe Kalmar.

While exploring challenges within the Autistic community, we connected with Gabe. As a parent and a professional in the field, he mentioned the frustration he experienced when his son with Autism regularly bolted off from safe environments. Especially when his son was young, there were countless times that his wandering caused the entire family to go into panic mode. He also mentioned that current wearables are self-defeating. Many children with Autism do not want external devices burdening them, nor do parents enjoy the process of having to constantly recharge these wearables.

Gabe and his son are not alone. One out of 59 children have ASD and nearly half of these children wander, or bolt from safe, familiar environments into dangerous situations. This constant worry puts tremendous stress on families. The anxiety stops 62% of families from leaving the house and heightens the risk of traffic accidents for 68% of the children. The Autism community calls for developing ways to protect wandering children. With this larger problem identified, our team at Golden Three sought to dig deeper.

Validation

Dislike towards Extraneous Items

Medical professionals raised the concern that children with ASD tend to dislike objects placed on them, including readily available wearables. Patients can remove them or refuse to wear it altogether. This gives only a false sense of security the child's whereabouts will be known when that is not the case upon the child's removal. They agree that À Piezo seamlessly addresses this concern through shoes that minimize the disruption to the child's daily routine while maximizing security.

Inconvenience of Recharging

With one of our team members, Quinn, being a research assistant to the Autism and Virtual Reality Lab at UBC Occupational Therapy, she has the opportunity to speak to families one on one. Parents expressed concerns over the inconvenient recharging process, the short battery life that impede the effectiveness of such a product. Notably, a parent mentioned that smart sole's unreliability of getting charged properly through its wireless charging. Other parents expressed reservations about the reliance on battery life, making the devices impractical for long distance travel without a charging port at hand.

Target Age

Research shows that wandering characteristics are especially serious in young children from ages two to five. Due to the barrier of communication at this age, parents are more cautious of safety and

are willing to spend more to ensure this. Through customer surveys and in-depth interviews, we learned that different problems arise as children grow. At the school age of two to five, the child start leaving the house more regularly for school and therapy. While parents previously only had to worry about the child in a safe, home environment, they now have to worry about more high risk areas. As with age, the child's ability and curiosity to access their surrounding grows. This means that parents are continually concerned about their safety and whereabouts from ages of five to twelve.

Price of Safety

Parents are willing to pay a significant price to protect their child's safety. In contrast of a generic child shoe from Walmart or Costco costing around $30, parents are already paying up to $150 to $200 for shoes with unique features, such as light flashing heels. Multiple parents have mentioned that they do not consider safety a feature, but a necessity for which they are willing to pay double or more.

Our Product

See Appendix IX for High Level Hardware Arrangement

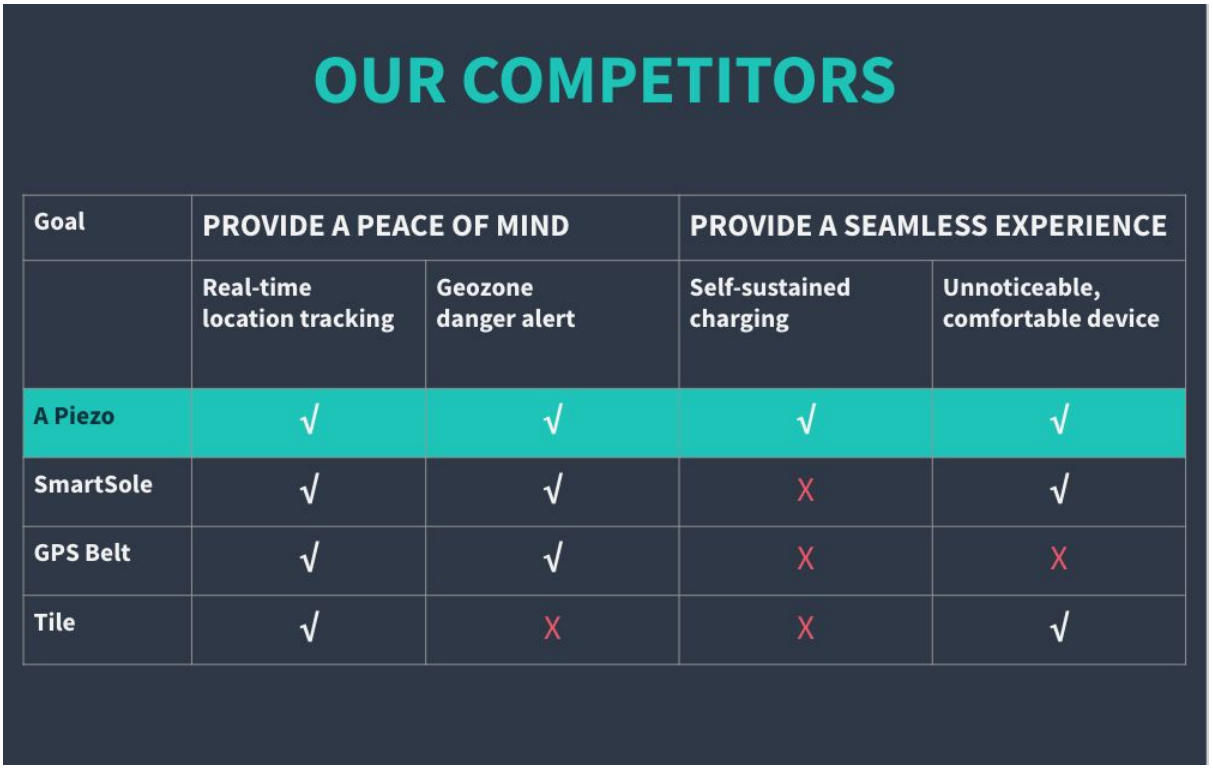
A Piezo is a shoe with built-in self energy sustaining GPS tracking device that addresses the problem identified through customer discovery, namely children within the autism spectrum tend to run off or wander away from their parents in uncomfortable or stressful situations. These components will be neatly tucked away inside the sole of a shoe so that they are essentially invisible to the user.

- The thin *piezoelectric pad* generates electricity as the shoe wearer takes a step.
- The *charging circuit* converts the ac voltage of the piezoelectric pads to a useable 5V line
- The small *battery* stores the unused energy
- The *GPS Antenna* allows to receive signals from satellites
- The *Processing Board* is the brain of our product, and handles the data collection and transmission.

Summary of IP Approach

With respect to the patent assessment, we found there to be a great number of patents which have very similar technological application to that which we expect to use. However, each of the patents found had very slight differences to what our technology is hoping to achieve, and we believe that our system is sufficiently different from the devices currently claimed.

Current Solution & Competitors

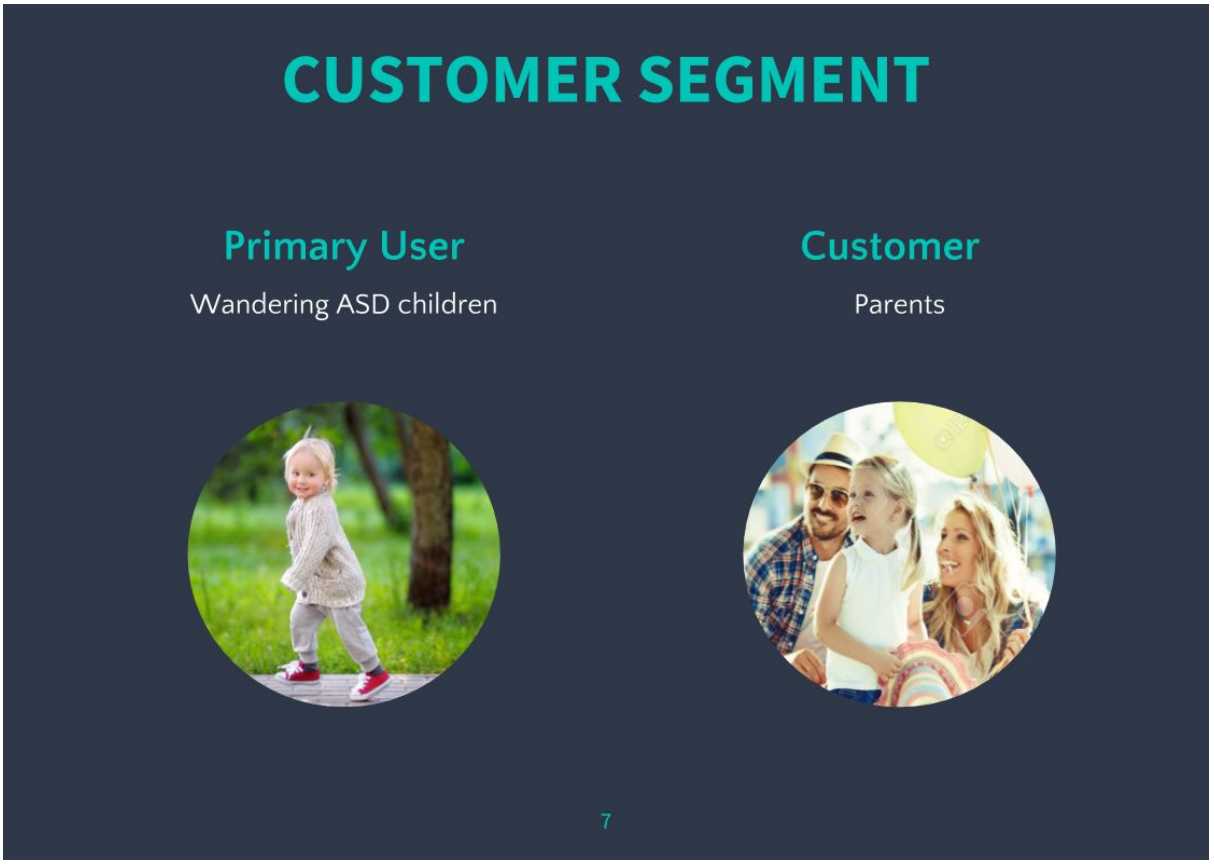


SmartSole is manufactured by Techsilver. It is priced at $299 per pair along with an app service fee of $24.98 per month that provides unlimited geozone perimeter alerts. One problem with SmartSole is that although it is hidden and convenient, many complain that the device cannot be accurately charged. As well as the worries of forgetting to monitor the battery level or place the sole back in the shoe after charging.

GPS Belt by Angel Sense is designed to stay in the user's waist at all time unless it is unlocked by the key. It serves the similar purpose of location tracking. However, it is not very comfortable to active kids, especially for children who are sensitive to physical touch. Not only might the child feel uncomfortable from the noticeable weight and inconvenience, from the outer appearance, it can be immediately identifiable that there is such a tracking device on the child. This can raise more concern.

Tile is a small key-chain like bluetooth GPS location tracker. It is mainly designed to fit into wallets, phone cases, and cars, and some users leave them in children's pocket to track their location. However, since Tile is using bluetooth connection, if the child goes out of range it is impossible to location him/her.

Customer Segment



Our business is such that our end user and purchaser are different.

User profile

Our users are children between the ages of two to twelve who are on the Autism Spectrum. These children wander and can put themselves in dangerous situations. Parents and/or guardians of these children constantly worry about their safety.

Purchaser profile

Our lead customers are parents of children with ASD from ages two to twelve. The parents will be the ones who will decide to purchase the product for their child. We will test À Piezo through various Autism organizations and they will become our channel to sell to our lead customer. These organizations will act as a recommender in us being able to sell to the parents. Below, we will highlight our customer acquisition plan for our lead customer.
Our primary customers are heavily invested in their child's growth, safety, and health, and rely on their network of medical professionals, teachers, and friends in a similar situation for guidance on supporting their child. As such, utilizing this network will be the most effective in acquiring customers' trust and purchasing power. To foster this sense of trust, we will focus on earned demand creation activities, as opposed to paid demand creation.

Market Opportunity

Through our customer discovery and market research, we valued the Canadian and American market at $41.05 million for 2021.

The population that make up this market can be classified as children age two to 12 who are within the autism spectrum. (Refer to appendix II for the breakdown of market sizing)

Revenue Model

Revenue Streams

Our main revenue stream is an app subscription. The cost of our subscription is $25/month. The service we provide from the subscription will be a google map display and route guidance for locating any missing child. Our justification for pricing our subscription at $25/month is based off of our competitors as well. Angle sense charges its customers $39.99 per month and smartsole charges $24.99/month. We feel that we should keep our price within this range in order to remain competitive.

Revenue Channels

Partner Channels — Our partner channels include the various Autism organizations through which we can reach our primary market of parents of children with Autism.

Golden Three Website — Our main channel will be selling À Piezo directly through our own website for our initial market of children with ASD.

E-commerce Platforms — As mentioned in our pro-forma, we will later expand by selling our product through other e-commerce platforms such as Amazon and Shopify. Our competitors currently sell online through their own website, so we decided to incorporate the same approach.

Brick and Mortar Stores — Far down the road and not mentioned in our pro-formas, we are considering to expand to brick and mortar stores to cater to a more general market through

partnering channels, such as authorized shoe retailers or wholesalers. This will allow us to test wider customer segments as we grow.

Currently, parents of children with Autism buy products for their children through medical professionals but their purchasing decisions are also influenced by organizations such as Autism BC. In terms of our channel economics, we avoid any retail markups because we ourselves sell to the end consumer. Due to this, we realize 100% of the retail value. The customer is responsible for paying half of the cost of the product. Once a customer purchases the product from our website, we will have it delivered to their door. The customer is responsible for paying for the shipping as this cost will vary according to where they are located. Once our revenue channels increase, we will only be responsible for certain expenses related to selling from those channels and will again not experience any retail markup.

Pricing

Our pricing method was built from a cost based pricing model, where we valued the price of each of the individual components and added them together to determine the cost of the product. We further conducted industry analysis to understand the normal price markup of retail products and marked up our price accordingly. Although there is no exact rule for pricing, average retail products are marked up by 50%, or doubling costs. We believe this is an appropriate markup for our product as well. (Refer to Appendix III for COGS breakdown and Appendix IV for price analysis)

In terms of production, we have evaluated that outsourcing is most cost efficient. Using Nike as industry reference and taking into account that Nike has achieved economies of scale, we estimate our shoe production to be $35, slightly higher than Nike's production costs of $28.50 for a shoe that retails at $100. Our justification for using Nike as an example is because Nike is a very popular shoe brand and we were unable to find local shoe manufacturers that could cater to our specific needs. (Refer to Appendix III for COGS breakdown) Although we plan to outsource production, we wanted to ask local manufactures their costs for building a shoe just to gain some more knowledge on the matter.

Go-to-Market Plan

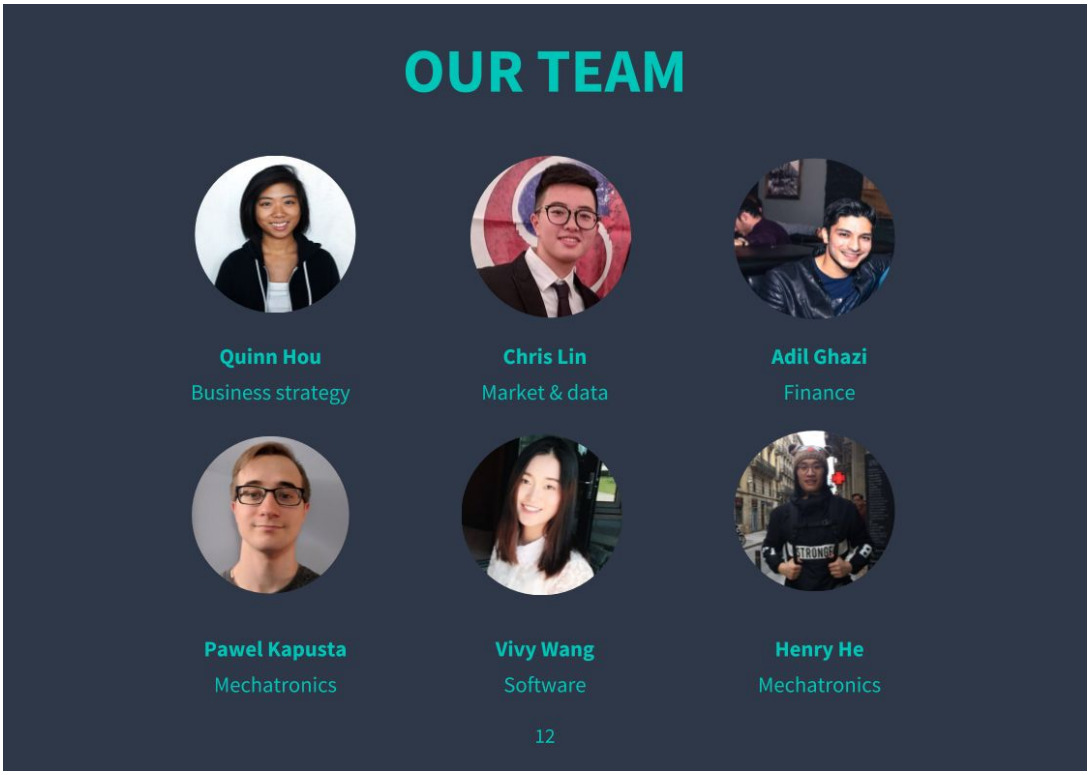
Customer Acquisition

Leadership Backing — This is our top down approach. Golden Three will be enlisting the backing of Autism organizations and key opinion leaders to act as the forefront of support. For instance, Gabe Kalmar, president emeritus from Pacific Autism Family Network (PAFM), whom we met throughout the school year, would be able to provide support and help spread the word. Partnering with these organizations will allow us to get the word out faster, while guaranteeing that we are receiving the support to further product adoption. These recommenders include Autism BC, Autism Support Network, Pacific Autism Family Network (PAFM), Canucks Autism Network, Autism Community Training, Provincial Outreach, Autism Speaks, Victoria Society for Children with Autism (VSCA), PALS Autism, and Occupational Therapy at UBC. This group will help us engage the community.

Community Support — Following the backing of key leaders in the field, we plan to continue this momentum of trust by connecting with the people who wield the most reliance and knowledge from the customer's perspective-- a child's medical and therapy team. Due to parents' trust on their child's therapy team, receiving a strong backing from the team will solidify customers' consideration of our product. This can convert consideration into a purchase. This will be the most effective in bringing a customer from the awareness through to purchasing in the purchase funnel.

Product Campaigns — Both the leadership and community will be helpful in providing exposure for À Piezo at related industry conferences, speeches, and events. Further building on existing rapport with industry, these physical platforms present opportunities to engage customers in live demos and in-person testimonies. We will complement in person events with online presence by encouraging or paying recommenders and influencers to post on relevant help forums and support groups. As our product matures, we will create online advertisement campaigns to fine tune our targeting of our primary customer based on demographics.

Our Team



Quinn Hou — Quinn is a 4th year Commerce and student pursuing a double specialization in Business and Computer Science. She has experience working in Vancouver's tech start-up scene in software development.

Chris Lin — Chris is a 4th year Statistics student who is currently working in data science project at Distill Analytics and has experience in data analytics.

Adil Ghaz — Adil is a 4th year Commerce student specializing in Finance and Real Estate. His is interested in pursuing real estate development in the future.

Pawel Kapusta — Pawel is a 4th year Mechatronics Engineering student specializing in mechanical systems.

Vivy Wang — Vivy is graduating from Computer Engineering and has had experience in software development through internships at SAP and Microsoft.

Henry He — Henry is a 4th year Mechatronics Engineering with practical project management experience and specializing in mechatronics design.

Gabe Kalmar — Gabe Kalmar is president Emeritus of the Pacific Autism Family Network. He helped up identify this problem and challenged our team to come up with a solution. Throughout the term, he connected us with multiple organizations and key leaders in the industry. Gabe will act as one of our first members of leadership backing.

We also contacted and interviewed several other registered counsellors, venture capitalists, and researchers in the field.

Execution Plan

$449,135 needed in financing

Timeline of major Value achieving Milestones

Prototype 1 — By september 1st of 2019, we hope to complete our first prototype. We would then test this prototype with various Autism organizations to get their feedback on how to improve.

Prototype 2 — By December 20th of 2019, we hope have the second prototype completed and tested.

Final Prototype — Finally, by November 1st 2020, we will test and complete the final prototype.

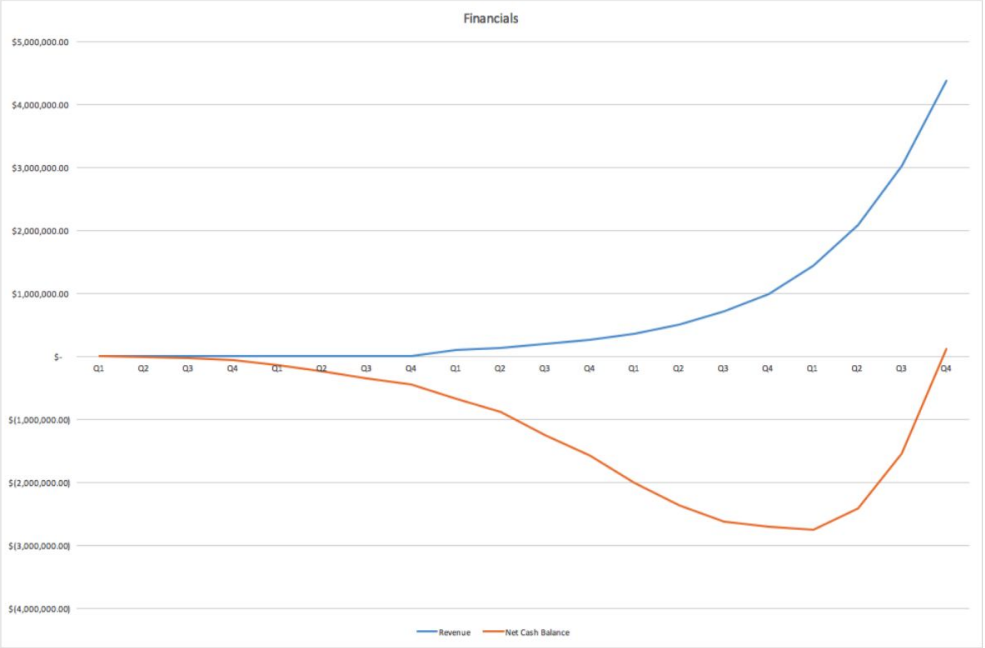
Sales Start — January 1st of 2021 will be when our sales start. Our initial customers will be parents who we will reach by the help of the various Autism organizations we work with to test our product.

Advertising — From the start of September 2020 up to when sales start in January 2021, the business team and all the external hires will travel to start advertising the product and reach out to other Autism organizations around British Columbia and eventually all of North America.

Before achieving any of the milestones, we would need cash infusions to fund the projects.
Financing needed before sales start: $449,135
Refer to Appendix V for technical timeline.

Financials

FINANCIAL PROJECTIONS



$2, 747, 783 needed in cash

Model Explanation

As seen from our graph, we have a negative cash balance through the majority of our projections. This was expected because our product requires a lot of capital infusion to get it started. This involves investing money in prototype development and skilled employees. (Refer to Appendix VI for assumptions and excel sheet for additional projections) Our revenues start at the beginning of our third fiscal year because during the first 2 years, we will be doing a lot of R&D to get the product ready. We continue to experience a negative profit up until the net cash balance curve starts to slope up, which is during the first quarter of our fifth fiscal year. Total capital infusion required is expected to be $2,747,783.00.

Key Assumptions

- We can penetrate at least 0.5% of our serviceable obtainable market because we will test our prototypes beforehand with them
- We expect a quarterly growth rate of 35% in FY3, and then 40% and 45% in FY4 and FY5 respectively due to the additions of more revenue channels and reaching more customers in our serviceable obtainable market. (Refer to Appendix VI for more detailed assumptions)

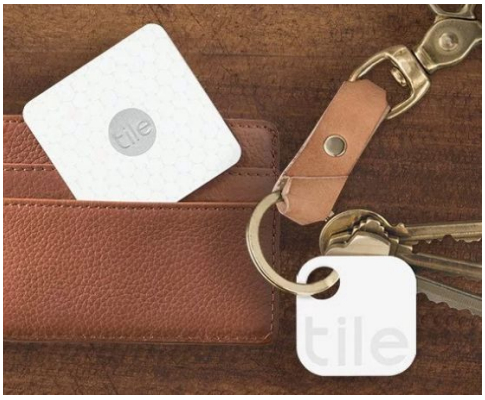
Major Costs

- Our major costs involve the various prototype costs, as well as costs related to external hires. (Refer to Appendix VI for more detailed cost assumptions)
- COGS are $65 per unit

Appendix I - Competitors

AngelSense

SmartSole



Tile

Appendix II - Market Sizing

Global					
Condition	Percentage	Age two to 12	Number of Users	Shoe changes/year	Market Size
ASD	0.63%	0.11%	11,000,000	1	$4,990,000,000
Canada & US & Europe					
Condition	Percentage	Age two to 12	Number of Users	Shoe changes/year	Market Size
ASD	1.69%	0.11%	1,330,000	1	$206,150,000
Canada & US					
Condition	Percentage	Age two to 12	Number of Users	Shoe changes/year	Market Size
ASD	1.69%	0.11%	135,000	1	$20,960,000

Appendix III - COGS Breakdown

COGS Component	Manufacturing Costs	Reasoning
Shoe Production Cost	$35	Nike Example
Energy Generation/Management Unit	$5	See Appendix IV
Power Storage Unit	$3	See Appendix IV
Motherboard	$22	See Appendix IV
Total COGS (1 unit)	$65	
Total Price (Double COGS)	$130	Average Retail Product Markup

Looking at our competitors, we are priced far below them. Smartsole prices its products at $299 per device and charges an additional fee for their services, which begins at $24.98 per month. Angelsense products cost $229 per device.

The production costs take into account the direct labour, transportation, and materials involved in making the shoe itself. Operating costs are mentioned in assumptions.

Appendix IV - Price Analysis

Energy Generation/Management

Table 18. Energy generation/management cost summary

Component Name	Quantity Per Device	Material Price (CDN)	Unit Price Per Device (CDN)	Link	Note
Piezoelectric Pad	1	$48.12	$12.03	https://www.digikey.ca/product-detail/en/tdk-corporation/AG-SHEETSAMPLE-4/445-180939-ND/9634768	Price of one sheet is $48.12, and one sheet can make 4 devices
Diode Bridge	1	$0.37290	$0.37290	https://www.digikey.ca/product-detail/en/comchip-technology/B10S-G/641-1336-1-ND/2074797	High voltage diode bridge to convert the piezoelectric AC voltage to DC
Filtering Capacitor	1	$0.27170	$0.27170	https://www.digikey.com/product-detail/en/kemet/C961U222MWWDBA7317/399-9520-3-ND/3645123	High voltage filtering capacitor.
Manufacturing	1	$1.00	$1.00	N/A	The board itself is very small.

Power Storage

Table 19. Power storage cost summary

Component Name	Number Of Units	Unit Price	Total Price	Link	Note
Supercapacitor	1	$2.01	$2.01	https://www.digikey.com/product-detail/en/avx-corporation/SCCR12E105PRB/478-11281-ND/7595397	For temporary store generated electricity
Button Cell	1	$0.56	$0.56	https://www.digikey.ca/product-detail/en/energizer-battery-company/A76/N402-N	Battery to keep the GPS module

				D/704827	on to speed up initializing
Li-Po Battery	1	$1.6	$1.6	https://item.taobao.com/item.htm?spm=a230r.1.14.54.506659971iz1RD&id=44237667273&ns=1&abbucket=13#detail	Battery to keep energy in the long run

Motherboard

Table 20. Motherboard cost summary

Component Name	Number Of Units	Unit Price	Total Price	Link	Note
BG96	1	$19.5	$19.5	https://www.top-electronicsusa.com/quectel-bg96-gg-lte-catm1nb1-and-egprs-module-with-embedded-gnss-p-17723.html	This chip is a multi-purpose module, which is the one we used on our development board. We assume that we can loser the cost if we find a more dedicated module.
STM32L496ZG	1	$10	$10	https://www.digikey.ca/product-detail/en/stmicroelectronics/STM32L496ZGT6P/497-17999-ND/7313372	This chip is also a multi-purpose module. We can replace this chip with a more proper chip to reduce cost and power consumption. We assume the new chip price can be $3. (STM32L0 series)
Cloud FXP611 GPS/GLONASS/ GALILEO/BeiDou Flexible PCB 38*37*0.15mm , 92mm Ø1.37	1	$13.5	$13.5	https://www.taoglas.com/product/cloud-fxp611-gps-glonass-compass-flexible-pcb-2/	This antenna is a retail product. The BG96 user manual described how to design our own antenna. We assume that we can make our own antenna for $3.
FXUB63 Wide Band Flex Antenna, 150mm Ø1.37	1	$9.63	$9.63	https://www.taoglas.com/product/fxub63-ultra-wide-band-flex-antenna/	This antenna is a retail product. The BG96 user manual described how to design our own antenna. We assume that we can make our own antenna

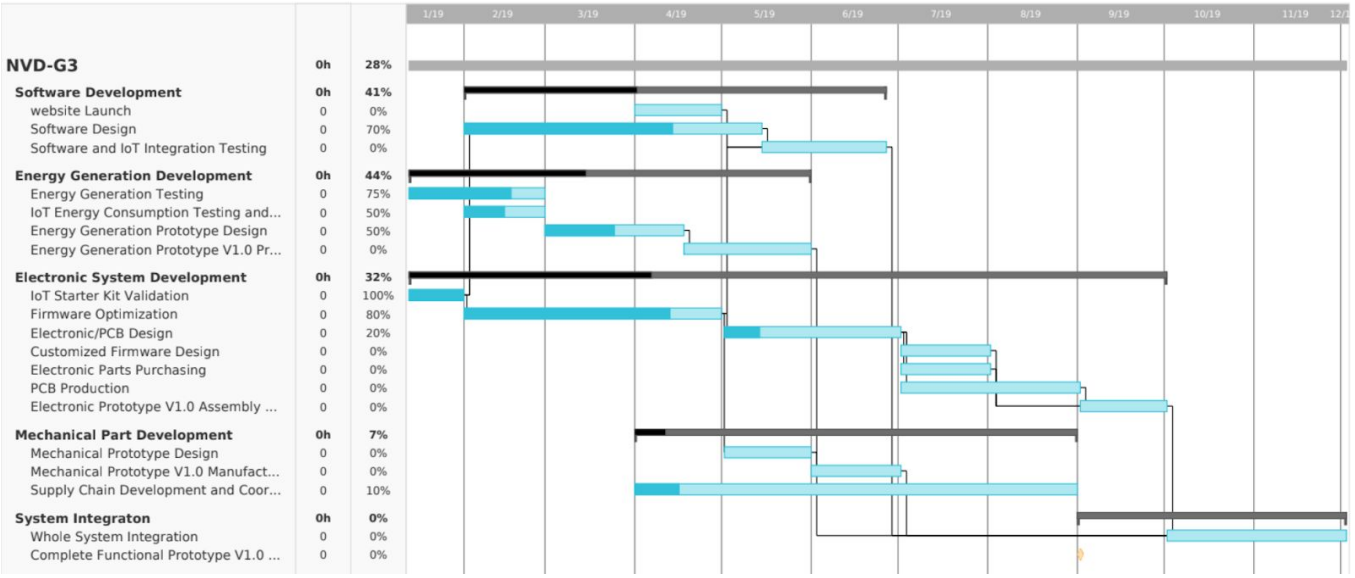
					for $2.
Other Components, including resistors, capacitors, connectors.	-	$6	$6	TBD	Resistor, capacitors and connectors are inexpensive comparing to the major components. To be designed and selected at a later date
Manufacturing	1	$2	$2		Manufacturing will be done automatically by machines in large scale.

Shoe Cost

Table 21. Shoe cost summary

Component Name	Number Of Units	Unit Price	Total Price	Link	Note
Shoe	1	$35	$35	TBD	The business team found that the average cost for a pair of Nike shoes cost about $35. So we assume that we are going to produce proper shoes but not as fancy as Nike's. Our small manufacturing scale will balance out our cost advantages. As a result, our shoe cost will stay at $35. (which is still pretty high) To be designed at a later date
Mechanical Support Structure	1	TBD	TBD	TBD	To be designed at a later date

Appendix V - Timeline



Technical milestone timeline

Appendix VI - Financial Pro Forma Assumptions

(Refer to excel sheet for detailed financial projections, advertising costs, and employee costs. All assumptions for projections are mentioned here)

Sales and growth rate assumption

Based on our market research, we believe that our serviceable obtainable market consists of 135,000 individuals in North America. (See Appendix II) From this market, we believe that initially, we will only be able to achieve 0.5% of the customers. Our rationale behind keeping this assumption pessimistic is because our company or brand name has no current market presence and therefore customers will be hesitant in buying our product. However, we strongly believe that if we can gain some traction at the start, our company will be able to grow significantly. Our product is such that if it is successful with our first customers, others will also want to purchase it.

Additionally, we are confident that we can at least penetrate 0.5% of our serviceable obtainable market because we plan on developing prototypes, which we will test with a few organizations such as Autism BC and the Pacific Autism Family Network. Our timeline shows our key value creating milestones. In each of these milestones, we plan to have a better prototype ready, which we will then again test with these organizations. When our final product is ready, we would already have a customer to serve. This is our assumption for penetrating at least 0.5% of our serviceable obtainable market.

However, since our product caters to a very niche market, our growth is also not set very high. We anticipate a quarterly growth rate of 35%. Our rationale behind this assumption is that there is a cloud of organizations that surround organizations such as Autism BC and the Pacific Autism Family Network. These organizations are all in communication with one another, so if we were to gain traction with the initial two, we are confident we can sell through these other organizations. Keep in mind, that through these organizations, we can reach our primary customer, which are parents of children with Autism. We must work to build trust initially, and if we are successful with this entry point (Autism BC and PAFC), it will help lead to future revenue growth.

Our quarterly sales growth rate takes into account selling to parents through various Autism organizations and to individuals through our website, and advertising through PR events. We will also be contacting a child's medical and therapy team as mentioned in our bottom up approach, though this is a slower process. If our product is successful with these organizations, individuals will be more comfortable in buying our product themselves.

Our justification for choosing Autism BC and the PACF is because they are located close to us and are easy to reach. Our timeline shows when we plan on testing our prototypes with these organizations. Furthermore, as we increase our revenue channels, we expect our quarterly growth rate to increase as well. When we start selling on Shopify, we expect our quarterly growth rate to be 40% and 45% when we include Amazon. (Refer to excel sheet for revenue and profit growth)

Travel Assumptions

Our travel assumptions are based on our timeline on when we expect to get our product completely functional and ready to sell. This involves a lot travelling initially required by our engineering teams and then later by the business team in order to advertise our product.

Since we plan on outsourcing production, two engineers will travel in our FY1 to meet with our manufacturers. The purpose of this trip will consist of making sure our engineers are able to communicate effectively with the manufacturers to make sure our product is made in the way we want it to be made. The first travel period will be in July, and the purpose of this trip will be to ensure that our initial prototype will be ready by September of this year. The second travel period will be in November, and the purpose of this trip will be to ensure that our prototype 2 will be ready before Christmas of 2019.

In our fiscal year 2, the engineers will also make 2 more trips to ensure our final prototype is ready, and our business team will start travelling to start advertising our product.

In our third fiscal year, our product would start experiencing some traction so our advertising trips will increase even more. We understand that the travel costs for our engineers will be more than for our business team so we have taken the average of both in our costs assumptions for this. Our travel involves travelling to all parts of Canada so we can gain more traction. Our travelling consists of going to various organizations around Canada to make them aware of our product. Again, we can reach our primary customer through these organizations.

Employee and Salary Assumptions

The founding team is expected to stay until the end of fiscal year 3, which is one year after we start experiencing sales. During our first fiscal year, which is 2019, the founding members will not collect any salary. We must try to keep our costs low so we can invest more in the venture. Starting fiscal year 2, the engineers will be paid an annual salary of $40,000 each and the business team members will be paid $32,000 each. These are a reasonable starting salaries for our founding members. In fiscal year 3, the engineers will be paid $48,000 each and the business members will be paid $40,000 each. Our justification for increasing the salary amount is due to the fact that in fiscal year 3, we would start making some sales. However, we still would not collect a large salary because our company would not have generated any profits as of yet. We feel it is necessary to pay ourselves something so we can continue working on the prototypes.

Starting in the third quarter of this year, we will hire a shoe designer to help make our first prototype. We will experiment with 2 different shoe designers to ultimately see which one is the most effective in building our product. From online research, we found that qualified shoe designers that would serve our purpose charge around $70/hour. We estimate that every quarter, we would need at least 13 hours of the designers service. This totals $1,000 per quarter per designer. Towards the beginning of the 4th quarter in fiscal year 2, we will hire 1 advertising employee and 1 PR employee to help us advertise the product. These hires are made beforehand so the employees have time to learn about the business. We do not need a lot of new sales and marketing employees at the start because all the business team members will contribute in marketing the product. As time goes on, we will continue hiring more marketing employees. This will help our company grow and gain more traction.

Towards the end of the second quarter of fiscal year 3, we will need to hire external production and electrical engineers. These engineers will help us innovate and will help keep us up with the increasing demand that we expect from our product. As we continue to grow, we will increase the number of engineers as well.

For operations, we will not need external hires until the start of fiscal year 3, which again, is when sales start. For all the accounting and financial work that needs to be done before, our business team members are capable of handling the work themselves. We would need external hires in the future to keep our business operational. These include accounting and finance employees,

administrative employees, and customer support employees. Due to the fact that we offer a service as well through our app subscription, we need a lot of customer support employees to deal with any concern our customers may have with our product. Finance and accounting employees will help in making future projections and dealing with any tax payments we would incur. Administrative employees will help with the day to day operations of the business.

Finally, as we increase our revenue channels by selling our product through Shopify and later Amazon, we need supply chain management employees to help streamline sales through these channels. As our sales continue to increase, our external hires will continue to increase. We will hire all the employees at strategic points so that once the founding members leave, the transition to take over the business will be smooth. To be more specific, we will hire these employees way before the founding members leave so everyone is comfortable with the business. We as the founding members will remain as shareholders of the company but will not be involved in the day to day operations of the company. Our payoff will be based upon an exit strategy.

All external hires are included in the excel sheet.

All salaries are from google searches and are based off of what an average person would earn in that specific field on an entry level position. For example, we learned that an entry level accounting employee is usually paid $60,000 per year and an entry level production engineer is paid $80,000 per year. Refer to excel sheet for specific details.

Marketing Programs Cost Assumptions

Our advertising budget continues to increase as our sales grow. We do not need a large advertising budget because our advertising method involves travelling and meeting with members of various Autism organizations. The travelling costs related to these advertising trips have already been taken into consideration (see above). In order to market out product, we would need a simple presentation and demonstration of our product, as well as validation from our previous customers that the product actually works. The budget that is allocated to this expense is enough to cater to our specific needs. This budget also incorates the advertising costs related to meeting a child's medical and therapy team.

Again, we do not need a large budget to advertise this way either. We also have a public relations budget that is dedicated to advertising our product through that channel. By marketing through these organizations, our product will grow more in popularity amongst parents with children that are Autistic. Finally, we will conduct e-marketing once we start selling on Shopify and Amazon. Due to Amazon being such an enormous e-commerce website, we have allocated a lot of money in fiscal year 5 for marketing our product online then. Fiscal year 5 is when we start selling on Amazon. By allocating some money to e-marketing, we can acquire a larger customer base. Furthermore, Amazon and Shopify are trustworthy revenue channels that can attract more customers and in turn, increase sales. (Refer to excel sheet for budgets)

All remaining Costs and Assumptions

Our miscellaneous expenses include website development and maintenance as well as prototype expenses. These must be incurred to help make our final product, as well as keep our own website up and running. Furthermore, selling on Shopify and Amazon requires a specific fee (see excel sheet). These numbers were found on Amazon and Shopify. Our engineering team has predicted the costs for the prototypes and website maintenance (see excel sheet).

Finally, we also have cost relating to the software. For every time an individual uses the GPS function to find a route to locate their missing child, it will cost them $0.005. We have made an assumption that every user will do this at least twice a day. Our rationale behind this assumption is that we would expect a child to wander at least once a day from a specific geo-zone, such as their school. Another reason could be that a parent would track their child just to be extra careful, even if the child wouldn't wander. These costs are highlighted in the excel document.

Financing Assumption

Our timeline shows our main value created milestones. These milestones include the testing and development of our prototypes. This is initially when we need the money. In order to finance the development of our prototypes and pay our initial external hires, we will resort to IRWAP competitions and seed funding from Venture Capital companies. The beginning of fiscal year 3 is our next major milestone as this is when sales start. In order to streamline sales, we would need a series A round of funding from venture capital companies to grow our business.

Every pro-forma number, from external hires to advertising and sales, is highlighted in the excel document.

Appendix VII - Income Statement

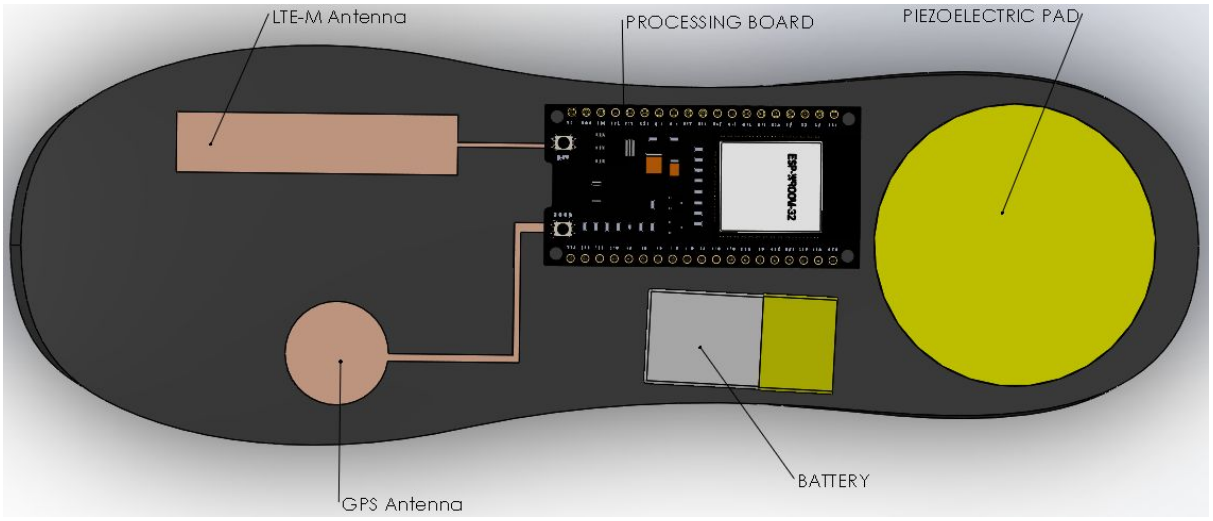
		FY1				FY1	FY2				FY2
		Q1	Q2	Q3	Q4	Total	Q1	Q2	Q3	Q4	Total
REVENUES											
Revenues		-	-	-	-	-	-	-	-	-	-
less Cost of goods sold		-	-	-	-	-	-	-	-	-	-
Gross Margin		-	-	-	-	-	-	-	-	-	-
EXPENSES						-					-
Sales and marketing		-	-	1,100	1,100	***2,200***	6,900	8,000	8,000	30,275	***53,175***
Research & Development		-	-	-	-	-	-	-	-	-	-
General & administrative		2,025	2,025	22,105	24,605	***50,760***	73,388	95,968	98,513	75,133	***343,000***
Less Govt' Receipts (eg. SRED/IRAP)		-	-	-	-	-	-	-	-	-	-
Total Expenses		**2,025**	**2,025**	**23,205**	**25,705**	***52,960***	**80,288**	**103,968**	**106,513**	**105,408**	***396,175***
Net earnings (loss)		***(2,025)***	***(2,025)***	***(23,205)***	***(25,705)***	***(52,960)***	***(80,288)***	***(103,968)***	***(106,513)***	***(105,408)***	***(396,175)***
Gain (Deficit), beginning of period		-	(2,025)	(4,050)	(27,255)	-	(52,960)	(133,248)	(237,215)	(343,728)	*(52,960)*
Gain (Deficit), end of period		(2,025)	(4,050)	(27,255)	(52,960)	*(52,960)*	(133,248)	(237,215)	(343,728)	(449,135)	*(449,135)*

FY3				FY3	FY4				FY4
Q1	Q2	Q3	Q4	Total	Q1	Q2	Q3	Q4	Total
104,625	141,244	190,679	257,417	***693,965***	360,383	504,537	706,352	988,892	***2,560,164***
43,875	59,231	79,962	107,949	***291,017***	151,129	211,580	296,212	414,697	***1,073,617***
60,750	**82,013**	**110,717**	**149,468**	***402,947***	**209,255**	**292,957**	**410,140**	**574,195**	***1,486,547***
				-					-
58,181	58,181	107,681	107,681	***331,725***	180,213	180,213	191,213	191,213	***742,850***
-	-	88,000	88,000	***176,000***	132,000	132,000	132,000	132,000	***528,000***
229,637	229,639	283,892	283,897	***1,027,065***	333,869	333,879	334,692	334,710	***1,337,149***
-	-	-	-	-	-	-	-	-	-
287,818	**287,820**	**479,574**	**479,578**	***1,534,790***	**646,082**	**646,091**	**657,904**	**657,922**	***2,607,999***
(227,068)	***(205,808)***	***(368,857)***	***(330,110)***	***(1,131,843)***	***(436,827)***	***(353,134)***	***(247,764)***	***(83,727)***	***(1,121,452)***
(449,135)	**(676,203)**	**(882,011)**	**(1,250,868)**	*(449,135)*	**(1,580,978)**	**(2,017,804)**	**(2,370,939)**	**(2,618,703)**	*(1,580,978)*
(676,203)	**(882,011)**	**(1,250,868)**	**(1,580,978)**	*(1,580,978)*	**(2,017,804)**	**(2,370,939)**	**(2,618,703)**	**(2,702,430)**	*(2,702,430)*

FY5				FY5
Q1	Q2	Q3	Q4	Total
1,433,894	2,079,146	3,014,761	4,371,404	***10,899,204***
601,310	871,900	1,264,255	1,833,169	***4,570,634***
832,583	**1,207,246**	**1,750,507**	**2,538,234**	***6,328,570***
				-
234,988	234,988	234,988	234,988	***939,950***
132,000	132,000	132,000	132,000	***528,000***
510,949	511,403	512,061	513,015	***2,047,428***
-	-	-	-	-
877,937	**878,391**	**879,049**	**880,003**	***3,515,378***
(45,353)	***328,855***	***871,458***	***1,658,232***	***2,813,192***
(2,702,430)	**(2,747,783)**	**(2,418,928)**	**(1,547,470)**	*(2,702,430)*
(2,747,783)	**(2,418,928)**	**(1,547,470)**	**110,762**	***110,762***

See attached excel sheet for all pro-formas.

Appendix VIII - Sketch of prototype and Summary of IP Approach



Below is a mock layout of the hardware component used for our shoe

The product we have chosen to pursue contains 2 main parts as follows:

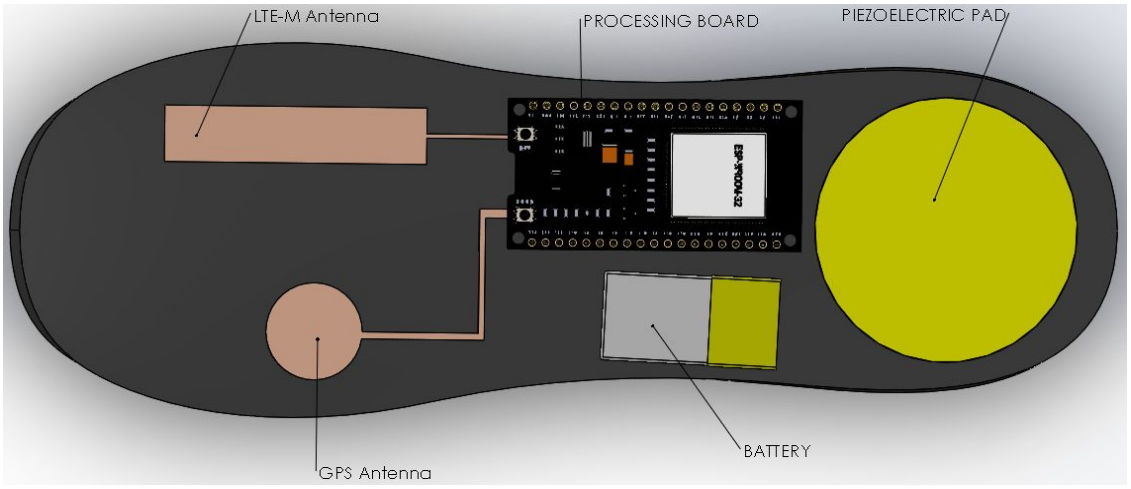
1. An in-shoe piezoelectric (tentative) energy collection mechanism
2. An in-shoe embedded / wearable GPS tracker

For a longer IP assessment analysis which shows multiple patent examples please refer to the appendices.

With respect to the patent assessment, we found there to be a great number of patents which have very similar technological application to that which we expect to use. However, each of the patents found had very slight differences to what our technology is hoping to achieve, and we believe that our system is sufficiently different from the devices currently claimed.

With this said, after discussing with our founder's agreement attorney, we believe that it would be very wise to consult with a patent lawyer and explain our current product and patent research. By consulting with a professional we could ensure that our freedom to operate assumption is correct. Should we find this to not be the case, we will also be able to consult with our patent attorney for the next best steps.

Appendix IX Hardware Arrangement



Appendix X - Business Model Canvas

Right hand side

<table>
<tr>
<td rowspan="3">Value Proposition

Addressing the problem where parents lack of sense of security of their ASD child's whereabouts.
Child's intolerance of having extraneous items
Inconvenience when repeatedly recharging device
With build-in location tracking and self-rechargeable childrens shoes. We decided to stick with shoes because the charging hardware is quite large and bulky, and would not fit well in an insole.</td>
<td>Customer Relationships

GET
Through connecting with recommenders: therapy team, ASD associations, teachers, other ASD families
Through presenting and partnering with influencers: conferences, community events, online forums, advertising. (ASD organizations)
KEEP
Product updates and newsletters
GROW
Referral program to spread the word</td>
<td rowspan="2">Customer Segment

PRIMARY
Parents of children with ASD between ages two to 12. We chose this segment because children in this age group are the most susceptible to danger while wandering.
SECONDARY
Parents of children of all abilities between ages two to 12
REACH
Family members of patients with dementia and other memory concerns</td>
</tr>
<tr>
<td>Channels

Sell our product through our website
Gain traction by partnering up with ASD organizations
Later expand to other E-commerce channels (Amazon, Shopify)
Physical retailers (Foot Locker - far in the future)</td>
</tr>
<tr>
<td colspan="2">Revenue Streams: Monthly app subscription revenue :$25/month
Pricing: Total COGS: $65
Price: $130 (double COGS)</td>
</tr>
</table>