

ENBUS 203 | Group 11

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Introduction: The Problem

Problem Definition & Background

Microplastics are a particular contaminant of petroleum-based plastics (Wu, Yang, & Criddle, 2017), of which there are two types: primary and secondary. Primary microplastics are intentionally manufactured to be of "millimetric or submilletric size" while secondary microplastics are formed as plastic debris breaks down (Dris et al., 2015). Microplastics pose an environmental risk because they contain many diverse toxic and persistent organic contaminants, which affect water quality and ecosystem health as the oceans and other biomes fill with miniscule plastic debris and toxic contaminants (Wu, Yang, & Criddle, 2017). Due to their persistence, microplastics easily cycle through food systems because they resist digestion and organic breakdown (Wu, Yang, & Criddle, 2017).

While ocean plastic pollution is the most prevalent of consequences, with an estimated 0.48 to 1.27 million tons of plastic waste was entering the ocean annually and a predicted 10-year doubling time, microplastics pollution also affects biomes beyond the ocean. Research has shown that microplastics are occurring in atmospheric fallout, particularly coming down through rainfall. Of the sample, 29% of the fibers examined contained petrochemicals used in plastics production, indicating that manufactured microplastics have cycled into the natural rainwater system, spreading contamination (Dris et al., 2015).

Primary microplastics are released as pollution through numerous sources including hygiene products such as toothpaste, as well as from microplastic fibres from synthetic textiles containing polyesters which are largely released into wastewater from the laundry machine (Wu, Yang, & Criddle, 2017). According to a 2018 report by Common Objective, 65% of the fibres used in the fashion industry are made from synthetic material, the majority of which is polyester (Common Objective, 2018). Therefore, most of the clothes on the market are a risk for microplastics contamination as there are no measures to prevent its release into wastewater when they are washed.

Sustainable Development Goals

The microplastics problem is connected to three major Sustainable Development Goals. First, is Goal 6: Ensuring availability and sustainable management of water and sanitation for all (United Nations, 2019). Specifically, if we are to prevent the release of

microplastics into wastewater, effectively reducing the pollution and eliminating the materials that can cause detrimental impacts, the sustainability of our wastewater management would be improved. The second goal is Goal 12: Ensuring sustainable consumption and production patterns (United Nations, 2019). Microplastics are released through manufactured products, therefore this pollution problem is human-driven, and a result of the over-consumption of plastics. However, since humans are unlikely to change their behaviour for a problem which does not visibly affect them, thoughtful end-of-life and waste management solutions must be implemented in order to prevent irreversible and reckless release of particulate contaminants such as microplastics. Lastly, Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development (United Nations, 2019). Our solution to microplastics pollution focuses on filtering which will prevent the release of microplastics into nature and the subsequent consequences. By focusing on a specific material that is commonly released from washing machines, the problem can be targeted and a solution can be tangibly implemented.

In addition, our solution will support Canada's Pan-Canadian framework on Clean Growth and Climate Change. By 2030, Canada aims to protect the planet by minimizing and addressing the current problems from ocean pollution (Global Affairs Canada, 2018). It is important for everyone to understand the impacts microplastics are causing from a simple task such as washing our clothes. Our solution, if it becomes a standardized component of washing machines, will bring about awareness and education on the consequences of microplastics pollution and instill a culture of preventative action. Furthermore, our solution can inspire major companies to create similar products to help reduce pollution in order to standardize the practice of pollution prevention.

Importance of Problem

Many people are not aware about the problems that arise from microplastics pollution and do not think that it affects them personally. However, microplastics do affect everyone. Microplastics are incredibly persistent and almost impossible to remove from afflicted systems as they are non-biodegradable, allowing them to stay in land, water, and food systems forever, absorbing and outputting harmful chemicals and pollutants indefinitely (Yang, et al., 2015). Despite seeming to have little direct impact on humans, microplastics are easily passed into our bodies through the ingestion of food and drinks. In particular, when a fish or a sea-animal directly or indirectly ingest microplastics, the microplastics are not processed out of their body. Therefore, when humans eat this seafood, the microplastics pass into us as well. One study indicated that even products such as sea salt are contaminated by microplastics (Yang, et al., 2015).

Furthermore, microplastics are small enough to pass through the pipes and filters of sewage systems as well as into agricultural lands through runoff, rivers and oceans (Boddy, 2017). Agricultural exposure to microplastics pollution can impact crop quality, resulting in potential economic losses or health implications if the affected harvests are

ingested. Overall, the microplastics problem is all-encompassing as it can have severe and persistent implications on natural ecosystems, certain fishing- or agriculture-dependent economies, and human health. If not prevented at the source, this problem could be permanently irreversible.

Our Solution: uFilter

Given the domination of synthetic fabrics in the fashion industry, due to their various quality and accessibility benefits, it would be unsustainable and unreasonable to completely stop using fabrics made of petroleum-based plastics. Therefore, a solution would be to use these filtering components in our washing machines to ensure plastics do not get released into wastewater and subsequent systems. Thus, the impacts resulting from microplastics pollution can be prevented at a very early stage.

Our solution is to create straight to consumer microplastics and chemical filter which would attach to the backend of a washing machine; i.e. its drain. This filter features several components including a physical filter, using 635 grade stainless steel mesh (used commonly in the fishing industry), with openings 0.02mm (or 20 microns) wide, which will catch the majority of all microplastics which pass through the laundering system. This filter is made to be durable and easily removed to dispose of microplastics (or to be collected and sent to TerraCycle), but can be purchased separately and easily replaced if necessary.

Secondly, a charcoal filter, will absorb and nullify any chemical or dirt impurities. This charcoal filter is a charcoal rod which will disperse charcoal to purify the water as it passes through as well as absorb impurities. This rod can be replaced easily as well, purchased separately. The water will then pass through a water tester which determines if the water is pure enough to be sent directly back into the wash for the ongoing load or the next load. Depending on the score, the water will be either diverted this way or drained into the wastewater system, where it will have a much reduced risk of contaminating water streams. Users have the option of switching this option on and off depending if the water will need to be used immediately. Water storage for future use will potentially be explored later on in development for future iterations.



- scan me!



These QR codes will be displayed on our products so that users can easily access information and instructions on changing out filters, sending their collected plastics to TerraCycle, and a quick link to our online store.



These filters can be purchased individually by the average consumer but our target market for the moment are owners or managers of student housing, including university residences, in Waterloo, who own multiple or many washing machine units. We are also looking into the potential for hospitals, retirement homes, and laundromats. The incentive for these companies to purchase our product include the water- (and therefore money-) saving component, as well as improving their corporate social responsibility, which will attract eco-conscious millennial students that they house. Furthermore, if we pursue a partnership with Polygone's labelling system, this can further incentivise customers, if their ecological efforts are recognized at an official capacity.

Comparison to Existing Solutions

A subcategory of microplastics are microfibers, which establish 35% of all microplastic contamination. These microfibers are generally originating from our garments. Of all the fiber creation in the world, 65% of it is engineered, which means produced using plastic material (Pedrotti, 2019). Each time you wash your garments or sheets, the textures discharge microfibers that are too little to even consider being caught by the machine's channel. Luckily, our approach to filter the water from your laundry prevents microfibers from entering the water supply that winds up in our seas and our food.

Some solutions to this problem include Extended Producer Responsibility (EPR). There is a wide understanding that waste administration must be improved, including reusing, taking care of the waste of offices and composting. Similarly, there is a need to improve the design of items and bundling to encourage recuperation in the first place. Further efforts, such as zero waste systems, improving waste recovery, and less microplastic creation have also been considered (McIlwraitha, 2019). Another approach is ocean cleanup. However, the seas are huge, and the measure of debris is developing constantly, the rise of microplastics makes it increasingly hard to gather. Ocean cleanup isn't financially or strategically attainable. Rather than cleaning oceans or banning synthetic clothes we are pursuing on the idea through which we minimize the microplastics going into the ocean from tackling the source.

Others have had similar ideas to use a filter on laundry machines, and can be considered our competitors. Firstly, Cora Ball is a ball that is thrown into the washing machine with clothes to collect microfibers. The benefits of this solution is that it is relatively inexpensive and very easy for users, who just have to throw it in the wash and forget about it. The downside to this solution is that it is very ineffective at removing microplastics compared to back-end filtrage solutions, preventing only 26% of microfibers from entering water systems (Cora Ball, 2019).

Another solution which has preceded ours is the Filtrol, which similarly attaches to the backend of a laundry machine to filter out microplastics before drainage. Filtrol has been tested to be 240 times more effective than the Cora Ball with its 100 micron (0.1 mm) filter bag, but has not been able to tap into a large market or incentivise consumers beyond those who care about the issue (Filtrol, 2019). On the other hand,

the uFilter uses a 20 micron (0.02 mm) stainless steel cup filter which is much more long lasting and easier to clean. Furthermore, due to the openings which are five times smaller, uFilter is much more effective at catching microfibres than Filtrol. Furthermore, our water saving component and our partnership with TerraCycle economically incentivises purchases, and therefore, has a higher potential for mass implementation and scalability than Filtrol. See further details in our business model below.

Lastly, PolyGone Technologies is a startup from Waterloo which aims to solve microplastic pollution. They also started with the concept to create a washing machine filter but have since pivoted to measuring microplastic in consumables, and issuing labels for companies who make an effort to reduce their microplastic pollution. Rather than a competitor, PolyGone Technologies could potentially be a partner, providing labels/certification to building owners/developers who implement uFilter into all or some of their washing machines.

Business Model

Value Proposition

The uFilter is bringing forward a solution to a problem which affects marine life, wildlife, human health, and the wellbeing of our planet. Microplastics are released from our clothing when washed, which pollute our oceans and eventually make it up into the food chain after being consumed by marine life. uFilter is a unique way to give consumers an opportunity to their part. uFilter filters out the microplastics which are released into oceans from simply washing clothes. Many people are unaware of the effects washing clothing has on the environment and marine life. These microplastics are too small for the human eye to detect but are small enough to be consumed and fill the stomachs of marine life. Due to containing no nutritional value the fish either die or are eaten by a bigger fish and eventually make their way up the food chain when the fish is eaten by humans. This is also the reason for the increasing amounts of plastics being found in the human body, which is extremely dangerous.

By simply adding a filter to the washing machine consumers can help prevent and decrease the amount of illnesses and deaths which are caused by microplastics. Although the issue of microplastics may not be something that we can solve in a small period of time and visually see the effects of this issue needs to be given more attention to. With the help of uFilter endorsed and in the market it will spark interest in consumers for why the product is being made and the importance of it will be realised by those who may have not known. We are in a day and age where we strive to make healthy lifestyle choices and this product will be an addition to that. In addition to that consumers will also notice less damage in the pipelines of their machines as the microplastics will be filtered out and lengthening the use and lifespan of their washing machines.

Compared to our main competitor in the market, Filtrol, users of our product can save money and time by purchasing uFilter rather than Filtrol. The installation of our filter can

be done in 20 minutes compared to 30 minutes. The price of uFilter is less than half the price of Filtrol at about \$44.99 to \$64.99 dollars each compared to \$140. uFilter also offers installation for residents and student housing in waterloo as many filters would need to be installed for a few machines. uFilter believes in being as convenient as possible for their consumers which is why a free installation for consumers who buy 12 or more filters is offered. Easily removable components which can be changed every 3 months makes the filter easy to use and maintain. After the assembly users will only be required to change out the filter once a month rather than the whole filter itself.

Target Market

The target market for uFilter are building owners or managers who operate multiple washing machines, such as owners of student housing, university residences, senior homes, etc. The product is also accessible to the average homeowner with personal washing machines. uFilter targets these groups of consumers as these consumers will have a washing machine that the filter can be installed to. Homeowners will be able to afford to purchase the filter and see the value it holds in preventing human health concerns, the health of marine life, and will be saving the amount of water being used from each wash which would also save our consumers money. Student housing and residents will usually contain many washing machines. The amount of machines in a building will be great for the business as uFilter will be installed to many washing machines in one location. The water saving component of the filter incentivises these managers since it implies money saving. This may also draw more environmentally conscious students/residents to buildings with these filters, and they may potentially pay more rent for a place that puts in environmentally conscious efforts.

uFilter is a simple way to do your part for the environment. It allows environmentally aware consumers to do their part for the environment even if they have a busy schedule. uFilter is also directed to consumers who may have not been aware of the issue of microplastics but are willing to do their part, uFilter also helps consumers save 25% water for every wash which conserves energy overtime and also saves users money. The product consists of the uFilter itself and filters that must be changed out every 4 month. uFilter is a one time installation and is easy to use and requires minimal change to your washing routine.

The price of uFilter is \$44.99-\$64.99 dollars Canadian. The charcoal filters come in packs of 4 making them a yearly supply, priced at \$3.00 per pack. The stainless steel 635 mesh filters can be replaced on a 3 month basis, at \$15.00 each. The price of the uFilter is much less than Filtrol, our major competitor, and is more desirable due to the water saving component. Due to the filter being manufactured in Canada and by the filter being designed by the University of Waterloo students it is easily accessible nationally around canada, uFilter also offers free installation to ensure their customers can save time when 12 or more filters are bought at once.

uFilter will be installed in residences, buildings, and in homes. Since uFilter is going to be installed where many students will be using the washing machines or multiple

residents in a building, the product will be promoted and the word of the product will get around. The uFilter also has a website where consumers can get an in depth description of the product, the benefits, and the cost. A lot of the promotion is done through social media to get the younger and future generations informed about the benefits of uFilter and the dangers of microplastics being released from just washing clothes. A lot of people are unaware about the risks of microplastics and by the promotion of uFilter we can successfully get the consumers informed about the issue and how uFilter can help.

Revenue Streams and Cost Structure

After researching, our company has decided to outsource by minimizing the cost as much as possible. After outsourcing our parts for the filter we will have our manufacturing team to put all the parts together along with packaging and have it ready to be shipped to its new owner. The total cost of one filter is represented in the chart below.

| Component | Bulk Order from Manufacturer | Per Unit | Starting inventory (1000 units) | Reference |
|---|---|-------------|---------------------------------------|---------------------------|
| | CO | ST | | |
| Plastic Jars, Natural HDPE Straight Sided Jars with White Lined Screw Caps | \$17.40 case of 12 | \$1.45 | 84 orders = \$1,461.60 | Sks Bottle & Packaging |
| Charcoal Rod/ Stick | \$3.05 case of 500 | \$0.0061 | 2 orders = \$6.10 | <u>Alibaba</u> |
| 635 Mesh Woven | 1 square metre roll (1.5 rolls needed per filter) | \$10.92 | 1,500 orders = \$16,380.00 | Alibaba |
| Drip Irrigation Male Elbow | \$650 for 5000 pcs | \$0.13 | 1 order = \$650.00 | <u>Alibaba</u> |

| Table | 1. | Filter | Cost | 3 | Potential | Revenue |
|-------|----|--------|------|---|------------------|-----------|
| | | | 0000 | | | 110101100 |

| 2- Threaded Male Pipe Straight | \$330 for 500 pcs | \$1.32 | 2 orders = \$660.00 | <u>Alibaba</u> | |
|--------------------------------------|------------------------------------|---------|------------------------------|------------------------|--|
| Double Stainless Steel Wall Mount | \$50 for 100 pcs | \$0.50 | 10 orders = \$500.00 | <u>Alibaba</u> | |
| 2- 5 ft Machine Draining Hose | \$350 for 500 pcs | \$0.94 | 2 orders = \$700.00 | <u>Alibaba</u> | |
| 3- Hose Clamp | \$250 for 5000 pcs (3 per unit) | \$0.15 | 1 order = \$250.00 | <u>Alibaba</u> | |
| Washing Machine Water Diverter | \$10 per unit | \$10.00 | 1000 orders = \$10,000.00 | | |
| Packaging (5x5x5" box) | \$400 for 1000 pcs | \$0.40 | 1 order = \$1,000.00 | ULINE | |
| Total Cost | | \$31.61 | \$31,607.70 | | |
| RETAIL PRICE | | | | | |
| 1-11 units (~50% markup) | | \$64.99 | \$49,990.00 - \$64,990.00 | Source for calculation | |
| >11 units (~40% markup) | | \$49.99 | | | |

Table 2. Cost & Price for Pack of Charcoal Filter Replacements

Charcoal rods should be replaced every three months. They are sold separately in packs of four, making a year's supply.

| Component | Cost | |
|-----------------------|----------------------|--|
| Charcoal Rod | \$0.0061 x4 = \$0.02 | |
| Packaging | \$0.06 | |
| Total Cost per unit | = \$0.08 | |
| Retail Price per unit | = \$3.00 | |

Table 3. Cost & Price for Stainless Steel Filter Replacements

The physical filter can last for very long spans of time if properly taken care of. However, the estimated average lifespan is also three months since the miniscule openings can get clogged. The filters are also sold separately at \$20 or if the customer signs up for our quarterly subscription service, the cost is \$60 per year (for four filters).

| Component | Cost | |
|-----------------------------------|------------------------|--|
| Filter (635 stainless steel mesh) | \$10.92 | |
| Packaging | \$0.2 | |
| Total Cost per unit | = \$11.12 | |
| Retail Price per unit | = \$20.00 | |
| Subscription price (x4 per year) | = \$15.00 x4 = \$60.00 | |

Revenue Strategy

Our company will be generating revenue from product sales. Our products can be purchased individually, on the household level, or through our target market, bulk purchases. As mentioned above, we will also be selling replacement filters which can be bought as needed or through a subscription which will reduce overall cost. Another way our customers can get a discounted price on our product is through our partnership with TerraCycle. Since TerraCycle is already established, they will advertise for us. In return, a system will be established so that if our customers collect the plastic waste collected from their laundry and sends it to TerraCycle, they will receive vouchers for even further discounts on replacement parts and potentially maintenance in the future.

Our prices were decided on standard cross-industry markup. Since ours is a rather niche industry, we have chosen a middle ground standard markup of 50% for unit purchases. This is perfect as it fall just below the \$65-\$85 range that 20% of our surveyors said they would feel comfortable paying for our product. For bulk purchases of 12 or more units, the markup is reduced to 40%, priced at \$49.99 per unit. From our first inventory purchase of 1000 units, we are set to generate anywhere between \$50k to \$65k in revenue. In addition to this, our subscription service or replacement parts will generate further revenue, especially since those margins are higher.

Expenses & Resources

In order to launch our business, we have minimized costs substantially by handling daily operations, marketing and advertising, manufacturing, and shipping and handling independently, and running our business out of one of our owner's properties. Our expenses during the first year and before launching, include research and development, materials & manufacturing (inventory), marketing and advertising, our website, and patents, licenses, and other legal requirements. These expenses are demonstrated below in Table 4, and our total projected initial costs come out to \$50k.

Our financing plan for this is to tap into each of our founders' savings, with each person contributing \$7k. We will also seek other funding opportunities from startup pitches and government small business opportunities to generate \$20k. As mentioned above in Table 1, our projected revenue is between \$45k to \$65k, meaning profits up to \$13k. As our economies of scale grow, and the cost to produce each unit lessens, these profit margins will increase without heightening the price for our customers. Furthermore, many of the set up fees such as the patent will be one time fees, and so our expenses will change over time.

| Financing | | Expenses | |
|------------------------------|---------------------|------------------------------|---------------------|
| Cash | <u>\$ 55,000.00</u> | Research & Development | <u>\$ 10,000.00</u> |
| Bootstrapping | \$ 35,000.00 | Materials & Manufacturing | <u>\$ 31,750.00</u> |
| Government | \$ 10,000.00 | Marketing & Advertising | <u>\$ 5,000.00</u> |
| Other Funds | \$ 10,000.00 | Other operational expenses | <u>\$ 1,000.00</u> |
| | | Website | \$ 1,000.00 |
| | | Patents/licenses/etc. | <u>\$ 5,000.00</u> |
| Total Projected Financing | \$ 55,000.00 | Total Projected Expenses | \$ 52,750.00 |

 Table 4. Income Statement projection before sales

Key Resources

Physical Resources

The major physical resources required by our company include a space for operations and the materials required for our products and packaging. As mentioned previously, we will be using the property of one of our founders for the beginning stages of our operations, which would be saving us rent expenses for a facility. The facility is in Toronto and the facility will also act as a hybrid headquarter for our company. From this property, we will assemble, package, and send out all orders. As for materials, we will be outsourcing from online distributors such as AliBaba. For our technological component which will divert water depending on setting and cleanliness, we will be working with a technological company who we will pay to develop this product for us, which we will then outsource to be manufactured as well. Packing will likely be sourced from ULINE, which is also an online provider.

Technological & Human Resources

Our company will flourish from its technological ability, which is a consequence of our focus on R&D and from our commitment to spare the oceans from getting more polluted by microplastics. We have a focused strategy and the design of uFilter enables us to adjust easily to various market conditions for the future. Human capital is a key resource for the organization, as the five founders Jenny, Aarti, Carissa, Matthew and Jasdeep will be manufacturing the products themselves to guarantee that the item is working according to the desires and that the quality is not sacrificed at all.

Intellectual Resources

Patents give the exclusive rights which enables us to utilize the technology for a long time from the date of recording of the patent application. Through these rights, we can keep others from commercially utilizing our patented creation, in this way we reduce challenges and set up ourselves in the market (World Intellectual Property Organisation, 2019). With contribution of a lot of cash and time in creating our product, we would also be filing for a utility patent in the future as well. We would be saving money as one of our founders' family members is a lawyer and they will help us to apply for a patent. For the patent itself, we would be paying around \$4,500 including all applicable fees. This number can vary greatly, but this is our estimation based on the information we have assessed. The annual fee to maintain our patent will be determined based on our actual patent cost.

Financial Resources

The financial resources incorporate money, credit extensions etc. Funding a business from savings is the most well-known kind of financing for start-ups (BDC, 2019). Our main source of funding would be savings and other bootstrapping initiatives. We have consented to depend on our savings for starting the business and for this each of the founder will contribute \$7,000 which would be used in the initial stages of the business. We will also be actively seeking government funding opportunities and participating in pitch competitions for further funding which will be necessary to acquire our first inventory order. Ontario's SmartStart grant provides tech companies up to \$70,000 provided they are based in Ontario. According to our projected financial plan, we would only need an additional \$20,000 in grant money to meet our needs (Balmforth, 2019). Another potential government grant is the Strategic Innovation Fund (SIF) which will also support us in non-monetary ways, such as through training (Balmforth, 2019).

Key Partnerships

Strategic Alliances

TerraCycle, in partnership with UpGyres, promotes and gives an outlet to the assemblage of dryer and washer effluents through TerraCycle's Zero Waste Box

Program and this program consummately aligns us to them (UpGyres, 2019). So TerraCycle along with UpGyres are going to be our key partners as all the microplastic that is filtered by uFilter can be collected by TerraCycle and then UpGyres' consortium accomplices will at that point procedure the recovered waste strands and upcycle them into yarn. This upcycled item can be utilized to make textiles and make a diverse range of items including pieces of clothing, embellishments, stuffing, carpets, soundproofing and insulation (UpGyres, 2019). The program successfully permits TerraCycle to gather anything for which there is a market by enabling people or independent ventures to support their preferred reusing of the waste surges. So basically in this partnership all of us are benefitting as we would have a place to send the microplastics that our customers collect collect and in return they would advertise and promote our product through their websites and also whoever by informing every new person whoever sends anything to recycle to them about our product and everyone who's already in their database.

Buyer-supplier relationships

As mentioned above, our materials will be sourced from various online suppliers, such as AliBaba, SKS Bottle & Packaging, and ULINE. These may change over time as our capacity for selectiveness based on strategic and moral motivations grows alongside higher financial capital. Our hope is to work with more environmentally aligned and humane suppliers in the future.

Key Activities

As per our business model, our key activities would be procurement, assembly, marketing, and shipping. All the work would be done by the founders and at a private facility owned by one of the founders. Some of our major key activities in bringing uFilter to the market are giving orders of different components and receiving the shipments then arranging and packaging them this part would be headed by Jenny and Matthew. Design and day to day operations would be headed by Carissa. Jasdeep would be responsible for inventory and shipping. To attract customers in a jam-packed marketplace, the intended target market must know why they ought to pick our product over somebody else's. This is where marketing comes in to inform present and potential clients about the business and how it serves a need that this world has. All of the marketing and sales department will be led and looked over by Aarti.

Environmental Scan - SWOT Analysis

In this section, the key strengths, weaknesses, threats or opportunities will be discussed from each major area. Below is a table overviewing these factors with further detailed explanation below.

| | Strength | Weaknesses | Opportunities | Threats |
|-----------------|--|--|--|---|
| Political | New Minority government which can mean a change in policy which could benefit the company's goals. | Policies implemented could be changed which may go against the company's goals. | Possible government regulations at the municipal level to incorporate filters in laundry machines. | New government may have different values and make decisions that are against green initiative. |
| Economic | Improve quality of life by having the filter to reduce ocean pollution. | Consumers may not be highly interested in the product // Do they really need the product? | Venture Capitalists could invest into the product/ company because we are doing it for a good cause. | Competitors include Flitrol and Cora Ball. |
| Social/Cultural | Climate Change has been a popular topic to discuss recently which could influence consumers to buy the product. | Is the society willing to help/ support solving and reducing climate change? | Potential to be consumer driven or government driven. Celebrities can create trends and influence buyers. | Change in income/wealth distribution could alter a buyer's decision. |
| Technological | Not user intensive because the technology does it. | Idea is hard to manufacture (Filtering microplastics) It may not work efficiently. | New form of technology that could help green initiatives. | Similar forms of technology could currently be in development |
| Environmental | Contributes to achieving SDGs. | May not provide the necessary results we need. | Opportunity to reduce pollution in our weekly activity. | Due to climate change, unforeseen circumstances can occur which may alter our product. |

Political

Within the political area, a major strength would be an increased chance of change because of a new minority government. By having this change, new priorities can be implemented and values can be different from before. For instance, climate change is a global issue that is growing and will not stop unless action is made. Having a new minority government can help influence businesses and citizens to support green initiatives like our product. Apart from strength, a weakness would be a potential change in policies and regulations. More specifically, this does not have to come from a new government but a pre-existing one like Doug Ford's. In an article written by Mike Crawley from CBC, he explains how "Doug Ford's government spent \$231M to scrap green energy projects" (Crawley, 2019). Having this form of action made by the government can create a backlash and lack of support for current and future green initiatives, which can affect our business model. Government forces can implement policies, regulations, or bylaws which can enforce our product as a requirement in building code. Given this regulation, every building with a washing machine will be required to have a uFilter attachment to meet building code.

Economic

On an economic level, a major opportunity would be the potential possibility of investment from venture capitalists or celebrities because the company is built on positive values and a mission to solve a global problem. As an example, Leonardo Dicaprio is an actor, producer but most importantly an environmentalist. The Leonardo Dicaprio Foundation focuses on tackling many global environmental issues by creating or supporting climate change initiatives. Foundations like this can create opportunities for many small companies like uFilter to be invested in to help solve a global cause. Apart from opportunities, there are competitors that are similar to uFilter which may be a potential threat. These competitors are PolyGone Technologies and Cora Ball, who makes similar products as uFilter. This is a threat because consumers would have to choose which product they would purchase from different companies.

Social/Cultural

In a social/cultural standpoint, a very common and popular opportunity would be partnering with celebrities or social media influencers that can create trends that may alter a buyer's decision. In relation to uFilter's mission and product, microplastics are posing a threat to the coral reef, destroying the ecosystem. For example, Coral Gardener is currently partnering up with Alexis Ren to bring awareness about the current problem with coral reefs. By partnering with social media influencers like Alexis Ren, uFilter can grow as a company by receiving support and potential growth in sales.

Technological

In the technological area, there are key strengths and opportunities that should be highlighted. Starting in technological, a strength for uFilter is having a product that is not user-intensive because the technology does the work. In addition to this strength, it

also creates an opportunity for future products and green initiatives to receive new or better forms of technology.

Environmental

An important strength in the environmental area is that uFilter supports and contributes to achieving three major Sustainable Development Goals (SDGs). These SDGs are: Goal 6: Ensuring availability and sustainable management of water and sanitation for all, Goal 12: Ensuring sustainable consumption and production patterns, and Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development (United Nations, 2019).

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Appendix A

Surveying potential target markets

At an early stage of development, our team surveyed 35 people from differing demographics, all above 18 years of age. Our results were as follows:

How often do you do laundry?





Washing my clothes has a severe impact on the ocean, aquatic life and environment



When I wash my clothing nothing goes into the ocean apart from detergents and dirt.

35 responses



Washing your clothes and its effect on the ocean, aquatic life and environment affect you



Did you know every time you wash acrylic, nylon and polyester synthetic fabrics, millions of microfibers are released into the water

35 responses



Have you heard of the term "Microplastics" or "Microfibres"

35 responses



On the scale of 1-10, how severe do you perceive the microplastics problem to be?



Would you buy a product to prevent microplastics when doing laundry?

