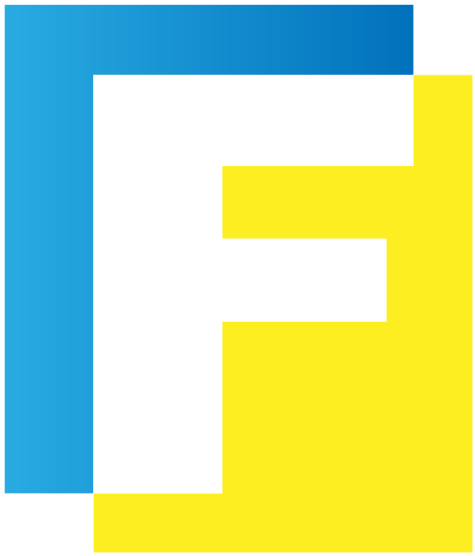


Faser

fast and effective FAcemask SanitisER.

Team members:
Winston Chen | Connor Lowe | Shayla Van | Tammy Hu | Jayson Edwards | Vivian Tran

I. Problem addressed

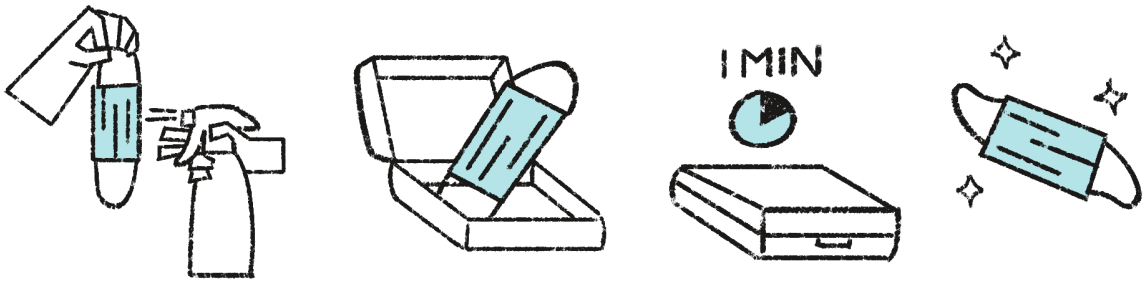
Paul is a barista who works at a local coffee shop. His job is heavily customer-oriented, on an average day he would serve hundreds of customers. Therefore, wearing a face mask is an essential part of Paul's job to keep him and his customers safe, especially during the COVID-19 pandemic. However, wearing the same mask during his 8 hours shift is a horrible experience. While he is constantly talking to the customers, his mask continues to be contaminated by his own saliva and the air that he shares with other people. At the end of his shift, his face mask always ends up smelly and gross. He really wishes that there is a quick and easy way for him to clean up the mask at work, so he doesn't have to stand the horrible smell from the mask all day long.

Paul is not alone in this. As face masks have been commonly used to fight the Coronavirus, how to maintain the cleanliness of their masks through the day has been a huge problem laid in front of the average working class with no clear solution.

Luckily Faser is here to solve this immediate problem.

II. Solutions

We present the Faser sanitization kit that allows users to sanitize their facemasks in a fast and effective manner. Each Faser kit comes with a scented hypochlorous disinfecting spray and a heating device. Upon usage, users can first thoroughly spray the hypochlorous solution over their dirty mask and then place the mask within the heating device. The face mask will then be heated up for one minute. After that, the dirty mask will be fully sanitized and ready for wearing.



Hypochlorous solution is commonly used in various clinical and sanitization applications. Due to its low cost and good safety profile, hypochlorous solution has been recommended by previous research[1] on disinfecting personal items to reduce the transmission of Covid-19. Furthermore, other research[2] have also

[1] "Hypochlorous Acid: A Review - NCBI - NIH." 25 Jun. 2020, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7315945/.
[2] "Disposable masks: Disinfection and sterilization for reuse, and non...." 13 May. 2020, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7218384/.

shown that applying heat around 60℃/140℉ can effectively inactivate common human virus and therefore sterilize wide ranges of face masks.

By applying both sanitization methods, our engineering team developed the Faser sanitization device with fully original design and implementation. We are currently working on a provisional patent application for our hardware device and planning to apply for a utility patent in the near future.

Our product has the opportunity to revolutionize the way that people maintain the cleanliness of their face mask, and provide an unmatchable face mask wearing experience

Faser sanitization kit prototype

III. Market Analysis

We target employees of small retail businesses, such as restaurants and grocery stores, as the first set of users for Faser. According to the data from the U.S. Census Bureau[3]There are over 30 million small businesses in the US with more than 59 million people working for small businesses as of January 2021. These employees face large amounts of in-person interactions with customers on a daily basis. Compared to large corporations, small businesses also have limited resources on providing their employees with protective equipment. In addition, the lack of physical space in most of the small businesses can cause a constraint in airflow and limit employees' ability to maintain safe distance. These conditions put small retail business employees on a higher risk of contracting and spreading respiratory diseases. Furthermore, as all businesses in the U.S. started to reopen with the appropriate guidance, face masks will be even more commonly used to protect staff from customer oriented businesses, which creates a greater need for taking appropriate safety precautions on maintaining the cleanliness of their face masks.

Moreover, the Faser sanitization kit would also raise great demands from individual users. The CDC is recommending individuals to "Wash your cloth mask whenever it gets dirty or at least daily[4]." However, a

[3] "Small Business Statistics - Newly Updated for 2020." 25 Jan. 2021, https://smallbiztrends.com/small-business-statistics.
[4] "How to Wash a Cloth Face Covering | CDC." 28 Oct. 2020, https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/how-to-wash-cloth-face-coverings.html

survey by Livinguard[5] has determined that of the 49% of Americans who prefer to wear cloth masks, 79% of those people do not wash their masks after every use. Because of the inconvenience of washing their face masks after every use, people continue to put themselves at risk by wearing contaminated masks. With its fast and convenient sanitization process, the Faser sanitization kit can eliminate the obstacles that are faced by individuals in maintaining advised sanitization precautions for using masks.

Despite the fast rollout of Covid-19 vaccine in the US, the general public will likely need to continue wear masks through the year of 2021 and 2022 due to the spread of new and more transmissible variants of the virus, according to public health officials[6]. This projection strongly supports a continued demand for Faser sanitization kit in the upcoming two years.

As the pandemic continues to impact our lives, the demand for sanitization products has experienced a significant increase. During the peak of the pandemic in March 2020, sales growth of aerosol disinfectants amounted to nearly 400%[7], while other cleaning products grew at a rate of about 100-200%. Additionally, the global protective mask market size is projected to reach USD 3.59 billion by 2027[8], exhibiting a Compound Annual Growth Rate (CAGR) of 7.1%. As shown through these historic data and projections, there continues to be a growing need for products such as Faser by consumers in the long term.

IV. Competition

When analyzing the market, there are various other products that serve similar functions as Faser. However, these products show many flaws and disadvantages when used for mask sanitization.

[5] "Consumer Survey: 2020 Mask Sentiment - Livinguard - Permanent ...." 2 Oct. 2020, https://livinguard.com/2020-consumer-survey-mask-sentiment/?lang=us

[6] "How long will Americans need to wear masks? Here's Fauci's ...." 22 Feb. 2021, https://www.advisory.com/daily-briefing/2021/02/22/coronavirus

[7] "• Cleaning product sales growth from coronavirus U.S. 2020 | Statista." 6 Jan. 2021, https://www.statista.com/statistics/1104333/cleaning-product-sales-growth-from-coronavirus-us/.

[8] "Protective Face Mask Market size is projected to reach USD 3.59 ...." 7 Jan. 2021, https://www.marketwatch.com/press-release/protective-face-mask-market-size-is-projected-to-reach-usd-359-billion-by-2027-fortune-business-insightstm-2021-01-07?tesla=y

In our market survey to UW students, currently 81.6% of people use laundry machines as their primary source for sanitizing face masks. Despite its effectiveness, a laundry machine is designed to clean large quantities of items, which is excessive for sanitizing only one mask.

UV light sanitizing boxes are another currently available face mask sanitizing solution. Typically, these boxes are used to clean small everyday household items, such as phones, keys, and wallets by shining a UV light on the item. Major disadvantages[9] of such devices include the lack of ability to evenly sanitize all areas of the mask and potentially damaging the masks' filtering materials. These UV light boxes also typically range from 80$ - 200$, which is higher than the individual user's willingness to pay (WTP) of 20-40$ (based on a conducted survey by our team).

To sum up, Faser's competitive advantages include, fast, effective and low cost. We are able to allow users to sanitize their face mask in about 1 minute, which is a significant reduction from the hours of time commitment of running a laundry machine. As mentioned above, Faser sanitization kit utilizes appropriate heat and Hypochlorous solution, which can evenly and effectively sterilize the majority of the human disease while preserving the filtering materials within the mask[10]. Finally, the Faser sanitization kit will be sold at a price of 39.99$, which is cheaper than the majority of the UV light sanitizing boxes currently on the market and lands in a comfortable price range for individual customers.

V. Go to Market Strategy

Stage I (3-6 month): Focus on retail business and developing a brand name

In stage I, we plan to prioritize developing a positive brand name in the market. To do so, we will focus on introducing our product to small retail businesses, such as restaurants and grocery stores, through free trials and product discount programs. This will allow us to quickly reach a large number of users and create a public interest.

During this process, we will actively collect user feedback and further improve our product. At the end of this stage, we hope to have a well engineered product and have successfully built a positive reputation around the Faser brand.

Stage II (1-2 years): Online/offline marketing

Upon completing stage 1, Faser will roll out comprehensive online and offline marketing campaigns that target populations of older ages. Data from Nelson Market[11] shows that seniors control over 70% of America's disposable income, along with their larger health concerns during the current pandemic, seniors will be the ideal consumer for the Faser sanitization kit.

Our product webpage will be tailored towards the older population by implementing larger fonts, more relatable graphics, and straightforward navigation systems. Our product description will focus on its health benefits, as most of the seniors are interested in browsing health information online. We will also promote our products through online platforms that are popular among older generations, such as Facebook and YouTube.

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[9] "Effects of Ultraviolet Germicidal Irradiation (UVGI) on N95 ... - PubMed." https://pubmed.ncbi.nlm.nih.gov/25806411/

[10] "Dry heat can effectively sanitize N95 masks - Medical News Today." 20 Aug. 2020, https://www.medicalnewstoday.com/articles/dry-heat-can-effectively-sanitize-n95-masks

[11] "Reports and Insights | Introducing Boomers: Marketing's ... - Nielsen." https://www.nielsen.com/us/en/insights/report/2012/introducing-boomers-marketing-s-most-valuable-generation/.

On the offline side, we plan to collaborate with journalists from major newspapers to deliver review articles about faser sanitization kits. Since older populations are more likely to trust information from sources that they are familiar with, promoting our products through news articles will significantly benefit the development of our brand name among seniors.

Stage III (3-4 years): Target market expansion

The last stage of our current trajectory will convert our target market towards specific industries where the use of personal protective equipment(PPE) continues due to industry standards or state regulations. As the pandemic declines and the demand for mask sanitization shrinks among average people and small retail businesses, Faser will upgrade its sanitization products to tailor toward industries such as food processing, construction, and manufacturing. These industries in general use large quantities of one-time use PPEs to protect its employees. With Faser's sanitization products, businesses can greatly reduce their expense on PPE while maintaining good safety measurements. By using the brand name we developed in the previous two stages, we hope to dominate this PPE sanitization market by providing the most competitive product at an affordable price.

VI. Financials

Our business model is to be a consumable hardware company that sells both whole sanitization kits and individually hypochlorous sprays. After purchasing the Faser kit, users can sanitize their masks for about 3 month until the hypochlorous spray runs out. By purchasing additional spray refills, they can then continue to enjoy the sanitization device. After analyzing market survey results and comparing similar products, we decided to sell our whole unit sanitization kit at $39.99 and individual spray refill at $9.99.

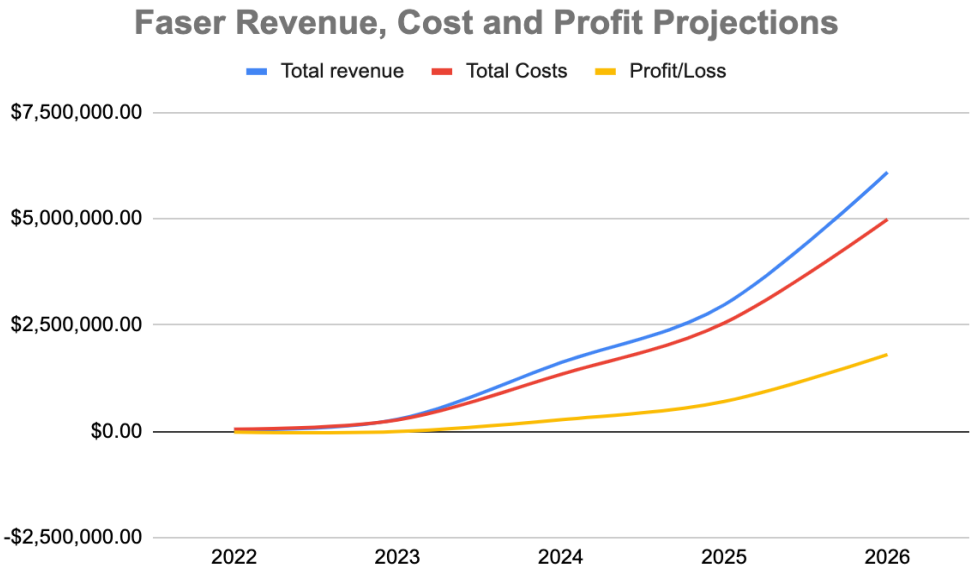
Estimated based on the market size and our market strategy, Faser is projected to sell 700 units of whole kits within the first year and reach about 90000 units of sanitization kit sales by the end of our five year cycle. As we continue to increase the number of sanitization kits we sold, the cost of each kit will drop from $60 to $30 (including the tooling cost) in the span of 5 years. We also project to earn a profit of about $3 for each individual hypochlorous spray we sell. The number of sprays sold will increase from 640 units to about 144k units by the end of the 5th year and eventually contribute to over 40% of our total revenue with a potential to grow even more.

Based on our financial projections, we plan to raise 2 rounds of seed investments for approximately 30% equity of the company in preferred stocks. Each round we will raise $40,000 to cover the start-up cost and loss we will face in the first 2 years. At the end of year two, Faser will reach its break-even point. By year five, we will reach a total profit of around $1.8 million.

See detailed financial table on the next page.

Faser 5 Year Financial Table (Projected)

	2022	2023	2024	2025	2026
Revenue					
Sanitization kit sold	700	5400	30000	55000	90000
Revenue per sale	$39.99	$39.99	$39.99	$39.99	$39.99
Hypochlorous spray sold	640	6560	41760	77760	249760
Revenue per sale	$9.99	$9.99	$9.99	$9.99	$9.99
Total revenue	$34,386.60	$281,480.40	$1,616,882.40	$2,976,272.40	$6,094,202.40
Expenditures					
COGS per kit sold	$31.45	$31.45	$31.00	$30.50	$30.00
COGS per spray sold	$6.20	$6.00	$5.80	$5.60	$5.50
COGS for kit	$22,015.00	$169,830.00	$930,000.00	$1,677,500.00	$2,700,000.00
COGS for spray	$3,968.00	$39,360.00	$242,208.00	$435,456.00	$1,373,680.00
Total COGS	$25,983.00	$209,190.00	$1,172,208.00	$2,112,956.00	$4,073,680.00
Manufacture tooling cost	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00
Selling costs	$1,719.33	$14,074.02	$80,844.12	$148,813.62	$304,710.12
Labor costs	$0	$10,000	$50,000	$200,000	$500,000
Advertisement costs	$5,000.00	$15,000.00	$16,888.82	$64,675.30	$89,288.17
Website costs	$100.00	$100.00	$100.00	$100.00	$100.00
Total Costs	$52,802.33	$268,364.02	$1,340,040.94	$2,546,544.92	$4,987,778.29
Profit/Loss	($18,415.73)	($5,299.35)	$271,542.11	$701,269.59	$1,807,693.70



VII. Management Team

Our team consists of 6 UW students coming from diverse major backgrounds including engineering, business, design, and informatics. We are equipped with essential skills needed to develop and implement this project.

Here is a brief bio for each team member:

Winston Chen	Junior at UW ECE equipped with software & hardware development skills. Developed and demonstrated strong project management & leadership skills through UW Entrepreneurship program and multiple start-up projects.
Shayla Van	Junior studying business with a focus in information systems and supply chain management. Currently working in human resources and has obtained many roles in mentorship/leadership. Background of experience in various case competitions.
Connor Lowe	Junior focusing on ECE Embedded Systems with an interest in communications. Extensive manufacturing experience shown in the workplace where designs are developed into prototypes and products.
Jayson Edwards	Senior majoring in Informatics focused on Human Computer Interaction. Ideating and creating solutions aimed at meeting the needs of the users. Creating clean and intuitive designs to help communicate businesses' brand and values.
Tammy Hu	Junior studying Biology and HCDE with visual and UX design skills and background in research. Focuses on designing to meet user needs and prototyping intuitive products.
Vivian Tran	Junior at the University of Washington School of Design focused on Interaction Design with UX and web development skills. Created and managed digital assets and experiences to support various organizations.

We've received mentorship from multiple technical staffs at UW's maker space(the MILL): Dei Caudle(Instructional Technicians), Derrick Kirk(Instructional Technicians), and Kristin Mauke(Residence Education Specialist) on the manufacture of the sanitization device's external case. We are also actively seeking advice on our device's circuit board development from a UW ECE faculty, Professor Blake Hannaford, who specializes in embedded hardware and software design and had decades of product development experience at NASA Jet Propulsion Lab, Google X, and UW Global Innovation Exchange .

We are excited to invite VC firms, who can be advisors, mentors, or partners in our journey to bring the best face mask sanitization solution to the post-pandemic world.