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SYDNEY

**School of Mechanical and Manufacturing Engineering
DESN3000 – Strategic Design Innovation**

BUSINESS PLAN – SwetGlove

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Date of Submission: 13/08/2023

EXECUTIVE SUMMARY

Team SwetGlove business plan presents an innovative and visionary solution to address the challenges posed by palmar hyperhidrosis, a condition characterized by excessive sweating of the hands. Our proposed solution involves the development and introduction of advanced gloves that seamlessly blend functionality, style, and sustainability. SwetGlove aims to empower individuals afflicted by palmar hyperhidrosis, revolutionize the concept of hand protection, and create a positive impact on both the environment and society.

Problem Statement:

Palmar hyperhidrosis poses significant physical and emotional challenges for individuals, limiting their confidence, opportunities, and overall quality of life. Current glove solutions often fall short in effectively managing sweat, comfort, and aesthetics, leaving a void in the market for a comprehensive and innovative solution. Additionally, the environmental impact of disposable gloves exacerbates plastic waste pollution, while societal stigma further hinders acceptance and inclusivity.

Solution and Rationale:

SwetGlove presents a ground-breaking solution through its innovative gloves that combine cutting-edge technology, sustainable materials, and empathetic design. These gloves address the unique needs of individuals with palmar hyperhidrosis, offering effective sweat management, breathability, moisture-wicking, and skin-friendly properties. The integration of bamboo fabric and copper-infused antimicrobial features aligns with eco-conscious values, contributing to a lower carbon footprint and reduced plastic waste. SwetGlove's multifaceted utility transcends mere medical applications, reshaping perceptions and fostering inclusivity.

Key Advantages:

- 1. Empowerment and Comfort:** SwetGlove's ergonomic design and advanced technology provide a powerful tool for individuals to regain confidence and embrace daily life without the constraints of excessive sweating.
- 2. Environmental Responsibility:** By reducing the reliance on resource-intensive materials and promoting reusability, SwetGlove significantly decreases plastic waste, aligning with global sustainability goals.
- 3. Societal Inclusivity:** SwetGlove's multifunctional approach and integration into mainstream fashion challenge social discrimination, promoting acceptance and empathy.
- 4. Financial Viability:** The projected financial forecast showcases strong revenue growth, demonstrating the potential for profitability while addressing a pressing societal need.
- 5. Development Strategy:** SwetGlove's development strategy encompasses iterative phases, including thorough research, innovation, design, prototyping, testing, marketing, and sales. The focus on product excellence, sustainability, quality assurance, and diverse sales channels ensures a holistic approach that aligns with our core values and mission.

Financial Forecast:

The financial forecast outlines projected revenue, costs, and profitability for the first year of operation. Based on sound assumptions and calculations, the forecast projects steady revenue growth, robust gross profits, and a positive net profit. The analysis highlights efficient cost management, sustainable growth, and the potential for substantial returns on investment.

Conclusion and Call to Action:

SwetGlove stands at the cusp of transformative change, ready to revolutionize how individuals experience life despite palmar hyperhidrosis. With a proven solution that addresses environmental

concerns and societal stigma, we seek the support and backing of internal and external stakeholders. To unlock the full potential of our vision, we urge the allocation of resources and finance necessary to bring SwetGlove to fruition. By joining forces with us, stakeholders will not only contribute to a novel and innovative solution but also make a lasting impact on the lives of millions while fostering a more sustainable and inclusive future.

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1. INTRODUCTION

Palmar Hyperhidrosis, though a seemingly inconspicuous medical condition which affects 3% of the world population [1], casts far-reaching implications that infiltrate personal domains and societal structures alike. Everyday activities, often considered menial by the average individual, become arduous tasks for those afflicted. Simple gestures like handshakes, holding a pen, or interacting with touchscreens turn into daunting challenges[2]. This condition's pernicious effects contribute to social anxiety, dwindling self-esteem, and propagate unforeseen consequences across academic, athletic, social, and professional spheres. Bahar and colleagues found that dermatology patients with hyperhidrosis experienced anxiety and depression at a rate of almost 3 times more than those without the condition [3]. Correspondingly, Bragança and colleagues found that there was an increased prevalence of anxiety (49.6%) amongst individuals with hyperhidrosis compared to the general population, irrespective of gender, age, or socio-economic background [4]. Aggregating the above findings, it's evident that this condition impacts at least 1% of the working population, resulting in tangible reductions in overall productivity and economic performance on a global scale.

However, the repercussions of Palmar Hyperhidrosis go beyond the personal. Its detrimental impact on productivity amplifies societal issues. The need for frequent replacement of personal belongings marred by excessive perspiration [2] results in environmental waste. The stigma associated with sweaty palms perpetuates misconceptions, culminating in social discrimination and missed opportunities. Informed by meticulous ethical considerations and socio-economic assessments, SwetGlove, emerges as an innovative solution to this intricate predicament.

SwetGlove stands as a testament to our commitment to creating a transformative solution for Palmar Hyperhidrosis, addressing not only the profound challenges faced but also the technical intricacies that underscore its effectiveness. Whilst a comprehensive technical analysis awaits subsequent sections, SwetGlove leverages advanced materials and inventive design principles to provide optimal comfort, seamless functionality, and effective breathability. Our multi-layered fabric design, incorporating an absorbent cotton layer, an antimicrobial copper layer, and a bamboo-viscose fabric lining, signifies a leap forward in moisture management. The open-back panel further enhances its performance through evaporative design. Additionally, the incorporation of copper-infused fabric not only prevents sweat odour but also offers antimicrobial properties that can inhibit the spread of viruses, including Covid. The integration of anti-slip grip fingertips adds another layer of innovation, offering enhanced traction for carrying objects and supporting various writing grips, including for touchscreen devices.

The essence of SwetGlove transcends its technical attributes. By seamlessly integrating advanced moisture-absorbent and moisture-wicking elements, it empowers individuals to triumph over their challenges. SwetGlove not only caters to immediate needs but also fosters long-term benefits – an elevation in self-assurance, unhindered social interactions, and amplified productivity in various domains of life. The amalgamation of these remarkable attributes with the technical prowess of our multi-layered fabric design, evaporative principles, copper-infused antimicrobial features, and anti-slip grip fingertips technology exemplifies the holistic and transformative potential of SwetGlove.

As we embark on this comprehensive report journey, we will delve into meticulous market analyses, competitor evaluations, ethical frameworks, and socio-economic landscapes. This holistic approach ensures that SwetGlove's development resonates with our commitment to innovation, inclusivity, and a transformative impact on lives. Through rigorous adherence to engineering standards and the meticulous scrutiny of every facet, we stand poised to present SwetGlove as a pioneering solution worthy of investment or equivalent commitment.

2. MARKET RESEARCH

The success of SwetGlove hinges on its ability to effectively identify and cater to a specific target market while comprehensively meeting their unique needs. Through rigorous market research, competitor analysis and S.W.O.T evaluation, SwetGlove has delineated its target demographic and formulated strategies to address their requirements.

2.1 Primary Target Market Identification

SwetGlove's primary target market encompasses individuals of varying ages and professions who suffer from palmar hyperhidrosis. This medical condition is characterized by excessive sweating of the palms and significantly affects daily activities and social interactions. SwetGlove recognizes that palmar hyperhidrosis can impact individuals across different sectors, including:

Professional Settings: Individuals working in corporate environments, where handshakes and presentations are common, seek a discreet solution to manage excessive sweating and maintain a professional image. [5]. Additionally, a separate investigation revealed that individuals adhering to typical guidelines for handshakes – such as employing a firm grip and maintaining eye contact – tend to receive enhanced evaluations of their suitability for employment during job interviews [6]. Therefore handshakes, a vital form of communication and rapport-building in business, which is hindered by sweaty palms would jeopardise crucial opportunities for establishing business partnerships and career progression.

Educational Institutions: Students grappling with palmar hyperhidrosis desire a way to enhance their classroom experiences by reducing anxiety associated with gripping pens, writing on paper, and using digital devices. The use of SwetGlove extends beyond the classroom and into the domain of academic testing where palmar hyperhidrosis may otherwise inhibit the writing/typing ability of students in major standardised exams such as the HSC (Australia), UCAT (Worldwide) and university exams, all of which can directly influence academic results which are pivotal to both academic and career progression.

Sports and Physical Activities: Athletes and fitness enthusiasts require a reliable solution that offers a secure grip during physical activities, preventing equipment slippage and enhancing their performance. This need becomes even more critical in professional sports where precision in fine motor skills is crucial for achieving competitive excellence. The challenges posed by palmar hyperhidrosis can lead to minor disruptions in motor coordination during competitions, potentially compromising victory and hindering the advancement of athletic careers [7].

Everyday Activities: The general population, including house managers and individuals engaged in routine tasks, seeks an unobtrusive means to manage sweating during daily chores, using touchscreens, or handling objects.

2.2 Meeting Customer Needs

SwetGlove is meticulously designed to fulfill the specific needs of its target market, ensuring enhanced well-being and improved quality of life. As stated in the introduction, though a more meticulous technical analysis of SwetGlove can be found in the subsequent section of the report, the product's key features directly address the challenges posed by palmar hyperhidrosis:

Effective Moisture Management: SwetGlove's multi-layered fabric design combines absorbent cotton, antimicrobial copper, and bamboo lining to manage moisture efficiently, minimizing discomfort and promoting confidence. The ventilation panel on the back of the glove works synergistically to aid moisture management via basic evaporative principles.

Enhanced Grip and Comfort: The incorporation of anti-slip grip finger and writing tips technology ensures a secure hold on objects, making daily tasks, academic writing, sports activities, and professional engagements seamless and worry-free.

Discreet Aesthetics: By positioning SwetGlove as a fashionable utility glove, the product transcends its medical utility and reduces the potential for social discrimination, appealing to individuals seeking both functionality and style.

Privacy and Confidence: SwetGlove's commitment to data privacy safeguards users' personal information, mitigating the potential social stigma and public deformation associated with the condition and/or wearing gloves nonchalantly during everyday activities.

2.3 Market Size

Given that Palmar Hyperhidrosis is prevalent in at least 3% of the general population [1] with more recent literature suggesting the condition may be even more prevalent than the 3% estimation , various market size estimates can be generated based on this statistic. Applying several other assumptions based on demographics and socio-economic background in synergy with this statistic has allowed Team SwetGlove to generate both conservative and non-conservative market size estimations:

2.3.1 Non-Conservative Market Size Estimations

Given that the world's population has exceeded 8 billion at the time of publication of this report [8] whilst also applying no additional assumptions to the base statistic,

1st Non-Conservative Iteration:

$$\begin{aligned}\text{Market Size} &= 0.03[8 \times 10^9] \\ &= 240 \times 10^6 \\ &= 240 \text{ million individuals}\end{aligned}$$

However, even this non-conservative estimate is too extreme as individuals below the age of 14 do not possess the funding or sentience required to purchase and/or utilise SwetGlove effectively. Additionally, SwetGlove has not yet developed glove sizes for children within its research and development process. Further discussion regarding glove sizing in relation to market demographics can be found within technical analysis section of the report.

Therefore, applying the assumption that 75% of the world's population is above the age of 14 justified by the *United Nations Population Division; World Population Prospects: 2022 Revision* ,Therefore, applying the assumption that 75% of the world's population is above the age of 14 justified by the *United Nations Population Division; World Population Prospects: 2022 Revision* [8],

Final Non-Conservative Iteration:

$$\begin{aligned}\text{Market Size} &= 0.03[0.75 \times (8 \times 10^9)] \\ &= 180 \times 10^6 \\ &= 180 \text{ million individuals}\end{aligned}$$

Consequently, we can generate a quantitative value for the market saturation point of SwetGlove. Assuming that roughly 50% of Palmar Hyperhidrosis cases remain undiagnosed based on Doolittle and colleagues' meta-analysis [9]:

$$\begin{aligned}\text{Saturation Point} &= \text{Market Size}[(\text{Diagnosed Cases} \times \text{SwetGlove Unit Price})] \\ &= 180 \times 10^6[0.50 \times 40] \\ &= 3.6 \times 10^9 \\ &= \$3.6 \text{ billion Australian Dollars}\end{aligned}$$

Therefore, SwetGlove's non-conservative market saturation/potential is at least \$3.6 billion AUD. This is as the estimate only factors in the sale of the base model of the glove and not its higher-tier counterparts which are still in their ideation stages.

2.3.2 Conservative Market Size Estimations

A conservative market size estimation was generated on the assumption that SwetGlove's immediate clientele resides in 1st world countries. This classification is based on a country's Human Development Index (HDI), with a threshold of 0.8 indicating a first-world classification.

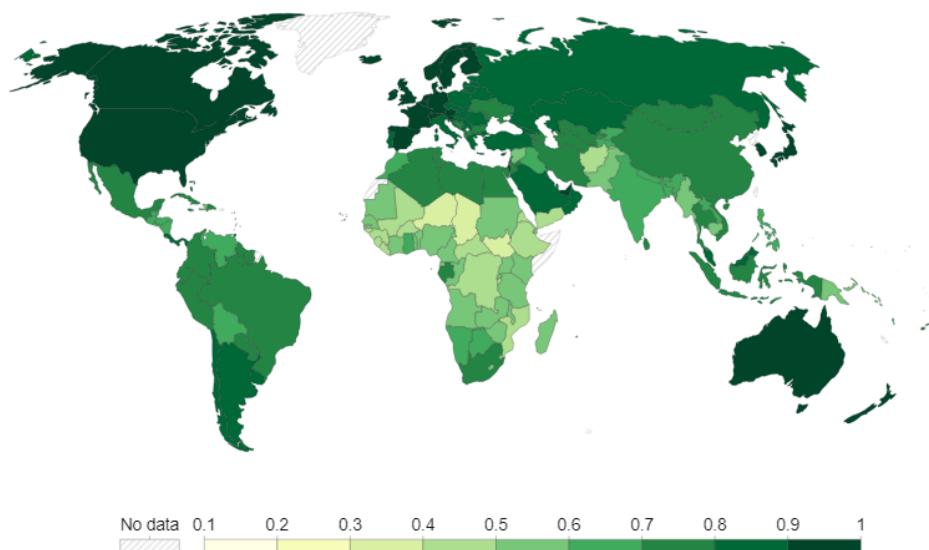


Figure 1. Graphical representation of the United Nations Population Division (UNPD) 'Human Development Index (HDI)' [10]'

According to the data presented in the graphical representation, approximately 17.2% of the global population resides in countries where the HDI exceeds 0.8. This underpins the rationale for focusing the market estimation on first-world countries, which tend to have higher economic and developmental indicators, aligning with SwetGlove's target audience. Therefore, applying this 1st world assumption in-tandem with the minimum age assumption and base palmar hyperhidrosis statistic,

Final Conservative Iteration:

$$\begin{aligned}\text{Market Size} &= 0.03[0.172 \times 0.75 \times (8 \times 10^9)] \\ &= 30.96 \times 10^6 \\ &= 30.96 \text{ million individuals}\end{aligned}$$

Applying the same process found in the non-conservative market size calculations to derive a conservative figure for market saturation point:

$$\text{Saturation Point} = 30.96 \times 10^6[0.50 \times 40]$$

$$\begin{aligned}
 &= 619.2 \times 10^6 \\
 &= \$619.2 \text{ million Australian Dollars}
 \end{aligned}$$

Therefore, SwetGlove's conservative market saturation/potential figure is at least \$619.2 million AUD.

Conclusion – Target Market & Customer Needs

SwetGlove's comprehensive market research has effectively identified its target market comprising individuals afflicted by palmar hyperhidrosis across various sectors. By addressing their specific needs through innovative design, enhanced grip, discretion, and privacy, SwetGlove aims to provide a transformative solution that empowers users to confidently navigate their daily lives and social interactions. Through strategic market penetration strategies, SwetGlove is poised to meet the demands of its 180 million potential customers and revolutionize their experience of managing palmar hyperhidrosis.

2.4 Competitor Analysis

There are no current competitors that provide a glove to specifically combat Palmar hyperhidrosis, although on the market there are products with similar designs as well as treatments to this disability.

The primary competitor to the SwetGlove is a multipurpose glove by the name of 'the writer's glove' as shown in figure 2, which is currently sold both through their own website as well as Amazon. Their mission statement is to create gloves for typing, with a thin, warm design for writing with cold hands. The main features that make this glove unique in comparison to normal or fingerless gloves is the patent pending fingertips which are designed to let you "feel" the keys as you type with no seams getting in the way, unique fitting that 'fits like a second skin' and touchscreen compatibility. The problems with this product specifically when comparing to the SwetGlove design is that the warmth provided by these gloves would increase sweat production in those suffering palmar hyperhidrosis as well as the glove being quite expensive, currently listed at \$47. On the other hand, The SwetGlove maintains nearly all the positive features of the Writers Glove whilst combating Palmar hyperhidrosis or sweaty hands and with the inexpensive price of our product, there is increased accessibility for all those who suffer from this disability.



Figure 2. The Writer's Glove

The current topical treatments for Palmer Hyperhidrosis yield superior results in treating patients suffering from Palmer Hyperhidrosis but are not a long-term solution with many problems stemming from their use. One current topical treatment Glycopyrronium cloth has been shown to provide benefits in reducing sweat severity in those suffering from Palmar Hyperhidrosis. According to a study

completed at the department of dermatology in the eastern Virginia medical school, when comparing the use of the glycopyrronium cloth to cotton gloves, the overall mean change in hand sweat severity was 4.2 in the topical treatment and 2.6 in the use of cotton gloves ¹showing how affective this treatment is in reducing sweat severity in comparison to what our design could achieve. Despite yielding superior results, topical treatments are not cost effective due to the non-reusability of the creams and clothes on top of this, there have been found long term negative effects on the skin due to repeated use of these topical treatments.

The most effective treatment currently on the market for those suffering palmar hyperhidrosis is iontophoresis which sends gentle electrical currents through water to shut down the sweat glands temporarily. Those suffering must undergo this treatment several times per week with 20–40-minute sessions in order to decrease sweating to a desirable level which for many people, is hard to find time to complete the sessions. Not only is this process time consuming, but the current cost for one of these machines is over \$500 which shows that it is not very accessible for all people suffering. The negative side effects that can result from the use of this machine include skin irritation, pain or discomfort, blistering and skin dryness which in the long-term will negatively impact these users.

As shown in table 1, the comparison between these competitors and SwetGlove prove how our design is the superior option when it comes to assisting those suffering Palmar Hyperhidrosis on a daily basis.

Table 1. A comparison between SwetGlove and its competitors

Competitors	Pros/Cons	How SwetGlove is Superior
'The Writer's Glove'	<ul style="list-style-type: none"> - Warm and productive - Fits like a second skin - Touchscreen and computer typing capability - Expensive (\$47) - Unfashionable - Will Increase sweat production 	<ul style="list-style-type: none"> - Breathable fabrics with open back design to allow for cool hands - Touchscreen, computer typing and pen/pencil writing capabilities - Perfectly fitted sizes - Sleek design - Affordable
Topical Treatments	<ul style="list-style-type: none"> - Yields superior results in treating sweat severity - Found in any chemist - Long-term negative affects - Expensive over time - Non-reusable 	<ul style="list-style-type: none"> - Reusable - No long-term side affects - Can be used in daily situations - High Quality gloves will last a long time and require no extra purchases
Iontophoresis	<ul style="list-style-type: none"> - Most effective solution to combat Palmar Hyperhidrosis - Time consuming - Extremely expensive (\$500+) - Negative side-effects 	<ul style="list-style-type: none"> - Does not require long sessions - All people can use the SwetGlove - Inexpensive - No side effects

2.6 SWOT Analysis

To evaluate market position, Team SwetGlove implemented a S.W.O.T analysis and generated a unique value proposition accordingly.

Table 2. SwetGlove S.W.O.T Analysis

INTERNAL FACTORS	
STRENGTHS +	WEAKNESSES -
<ol style="list-style-type: none"> 1. Innovative Design: SwetGlove boasts a unique multi-layered fabric design that effectively manages moisture, offers anti-slip grip technology, and addresses the specific needs of individuals with palmar hyperhidrosis. 2. Fashionable Utility: The rebranding of SwetGlove as a fashionable utility glove sets it apart from conventional medical solutions, reducing the potential for social discrimination and appealing to a broader audience. 3. Diverse Technical Expertise: The SwetGlove team comprises members from various technical backgrounds, enabling a holistic approach to design, functionality, and market understanding. 4. Data Privacy Focus: Team SwetGlove's commitment to data privacy and protection enhances user confidence, mitigating potential stigma associated with the condition. 	<ol style="list-style-type: none"> 1. Price Point: The initial cost of \$40-50+ for SwetGlove may be a barrier for individuals with lower economic status, potentially limiting its accessibility. 2. Awareness and Education: Despite its potential, SwetGlove's success relies on raising awareness about palmar hyperhidrosis and educating the target market about its benefits. Additionally, SwetGlove's market size exponentiation requires solely on the success of its marketing campaigns to the general public.
EXTERNAL FACTORS	
OPPORTUNITIES +	THREATS -
<ol style="list-style-type: none"> 1. Expanding Healthcare Partnerships: Collaborating with medical professionals can lead to increased recommendations and prescriptions, expanding SwetGlove's customer base. 2. Growing Health and Wellness Trend: The increasing focus on health and wellness presents an opportunity for SwetGlove to position itself as an essential tool for enhancing daily comfort and performance. 3. Fashion Collaboration: Partnering with renowned designers and influencers can elevate SwetGlove's image, making it a trendy and stylish accessory. 	<ol style="list-style-type: none"> 1. Competition: The market may see the emergence of competing products targeting palmar hyperhidrosis, potentially diluting SwetGlove's market share. 2. Intellectual Property Infringement: Cheaper alternatives or clones of SwetGlove could pose a threat to its brand image and patent protection. 3. Economic Factors: Economic downturns or shifts in consumer spending habits could impact SwetGlove's sales and growth potential.

2.6 Unique Value Proposition (UVP)

Team SwetGlove's unique value proposition lies in its combination of innovative design, fashionable utility, and data privacy focus. Unlike traditional medical solutions, SwetGlove provides covert yet effective management of palmar hyperhidrosis whilst enhancing daily activities. By offering a stylish accessory that caters to various sectors and demographics, SwetGlove addresses the specific needs of its multifaceted target market, in both primary and secondary domains, whilst promoting inclusivity and confidence for Palmar Hyperhidrosis in its entirety. Additionally, our commitment to data privacy further distinguishes SwetGlove as a reliable and ethical choice for managing Palmar Hyperhidrosis.

Incorporating the insights gained from this SWOT analysis, SwetGlove can refine its strategies, mitigate weaknesses, capitalize on opportunities, and navigate potential threats, ensuring a strong market position and successful implementation of its business plan.

3. TECHNICAL DESIGN

3.1 Overview of Glove Systems and Materials

SwetGlove utilises highly absorbent materials over several layers to draw excess moisture away from the hands so that it can be evaporated out to the surrounding environment, leaving the user with sweat-free hands and reassuring their tactile functionality. These layers are strategically designed to motivate evaporation of sweat away from the palms of users' hands, through the use of ventilation panels. Additionally, layers of antimicrobial fabric are used to ensure odour-causing bacteria from sweat is killed immediately, preventing pungent odours before they can start. These antimicrobial layers also provide sanitary benefits including protection against bacterial and viral infections. Finally, to improve the gripping ability of our users, SwetGlove incorporates grip panels on the outer layer of the gloves to improve our users' performance in everyday tasks such as writing and using touchscreen devices.



Figure 2. SwetGlove's glove model

Figure 2 shows the layers of features and materials used in SwetGlove's glove model. The inner cotton layer carries out the bulk of sweat absorption, while a copper-infused fabric mesh eliminates bacteria from the absorbed sweat to prevent odours. The outer bamboo viscose layer is highly evaporative, and also possesses some antimicrobial properties.

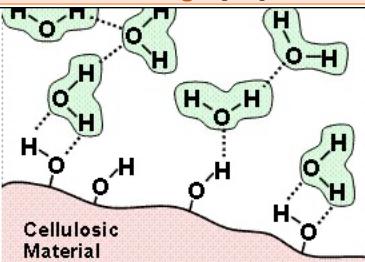
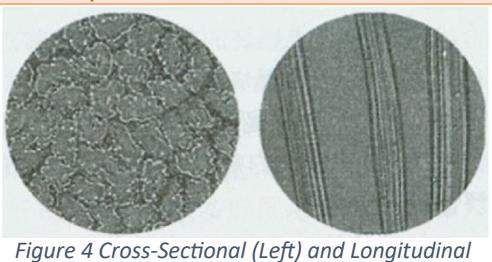
3.2 Absorption and Evaporation of Sweat

3.2.1 Justification of Bamboo and Cotton Material Linings

Bamboo and cotton are natural fibres that are known for their ability to absorb moisture, and are heavily used in the clothing industry. They can absorb sweat through a combination of porosity, and the chemical properties of cellulose, the main component of their fibres. While cotton is generally cheaper and more readily available than bamboo fabrics, it is also less sustainable and requires more water and pesticides to grow. Cotton's ability to absorb moisture is limited by its inability to evaporate this moisture away effectively, as sweat gets trapped in the micropores of cellulose fibres. Furthermore, cotton fabrics have a tendency to retain odours under sweat-prone environments, including users with hyperhidrosis. In comparison, bamboo is a renewable and fast-growing resource that possesses natural antibacterial properties, which help to reduce odour-causing bacteria. Unlike cotton, bamboo viscose fabrics are able to effectively distribute moisture throughout the material, allowing it to be evaporated away more effectively from a larger surface area. Hence to ensure moisture from sweat is efficiently drawn away from the users hands, SwetGloves utilise:

- cotton for the inner lining of the glove to absorb large amounts of sweat
- bamboo viscose fabric on the outer lining to effectively evaporate excess moisture

Table 3. Material comparison between cotton and Bamboo Viscose.

Material	Cotton	Bamboo Viscose
Absorbency / Evaporative Action	<ul style="list-style-type: none"> • Cotton fibres primarily comprise of 80%-94% cellulose, which contain hydroxyl groups that are polar and have an affinity to water molecules[11]. • This hydrophilic action causes cotton fibres to attract and bind to water molecules, causing it to absorb up to 24-27 times its own weight[11]. 	<ul style="list-style-type: none"> • Bamboo viscose fibres have a fine microstructure with small gaps and pores between fibres that provide a pathway for moisture, including sweat, to be drawn away from the skin and transported along the fibres. • This capillary action allows sweat to be evaporated away from the gloves quickly, as the moisture gets spread across a larger surface area for evaporation.
Diagram	 <p>Figure 3 Representation of Hydrogen Bonding Between Water Molecules and Hydroxyl Groups Bound To Cellulose[12]</p>	 <p>Figure 4 Cross-Sectional (Left) and Longitudinal (Right) Views of Bamboo Viscose Fibres Demonstrating Capillary Channels[13]</p>

3.2.2 Ventilation Panels

SwetGlove makes use of thin hatch panels to provide extra ventilation for moisture in the gloves. Ventilation in clothing has been proven to increase fabric air permeability, inducing dry and evaporative heat loss for keeping the user comfortable [14].

In the context of users with palmar hyperhidrosis, sweat is usually concentrated at the palms and fingers of the hands, where it is most important for users to maintain a sense of touch and grip. Hence when remediating the issue of excess sweat, SwetGloves cannot use ventilation panels on the front side of the gloves as the palms and fingers will likely be covered when the users is holding onto objects or resting their hands on surfaces. This not only inhibits the ventilation capacity of the panels, but also can adversely affect a user's grip strength since the permeable hatch design means there is minimal layering between the palm's sweat and the environment, effectively negating the purpose of the gloves.



Figure 5 Ventilation Panel on Back of SwetGlove Model

Instead, the ventilation panels are positioned on the backside of the gloves, shown in Figure 5, where grip and sense of touch are less crucial to a user's tactile experience with their surroundings. In this position, the thin hatch construction is less likely to interfere with the wearer's grip and possibly be damaged. Sweat from the user's palms is able to reach this panel through the capillary action of bamboo viscose, as explained in Section 3.2.1 Justification of Bamboo and Cotton Material Linings. As moisture evaporates away from this panel, the capillary action of bamboo viscose motivates moisture from other parts of the glove to move towards the dried ventilation panel, creating a positive feedback loop of evaporation.

3.3 Odour Prevention and Antimicrobial Layer

While the layers of cotton and bamboo viscose fabric are able to absorb and evaporate moisture relatively quickly, retention of sweat in the fabric can create an environment conducive to the growth of bacteria. The dampness of the inner cotton lining, coupled with body heat from the wearer allows bacteria to thrive. Bacteria that naturally resides on human skin can feed on nutrients present in sweat, producing volatile organic compounds (VOCs) as by-products when metabolizing. VOCs are responsible for body-odours, which can be detrimental to user experience.

3.3.1 Anti-microbial Properties of Bamboo Viscose

Bamboo has naturally excellent anti-microbial properties but the process to transform it into a fabric called the '*viscose process*' is chemically and physically intensive. Whether this process nullifies these properties is currently unknown but the viscose process itself provides anti-microbial properties to the fabric. In a study conducted to determine the anti-microbial properties of certain fabrics [15], the bacteria harboured on fabrics undergone viscose processing were significantly less seen in Table 4.

Table 4. Bacteria concentrations on a range of fabric materials introduced with various bacterium. [15]

Bacterium	Bacterial concentration							
	Initial	Cotton	Acrylic	Wool	Viscose	Nylon	Fleece	Polyester
<i>Staphylococcus epidermidis</i>	(6.94 ± 0.53) × 10 ⁶	(1.04 ± 0.67) × 10 ⁷	(3.00 ± 0.86) × 10 ⁶	(9.76 ± 9.70) × 10 ⁷	(9.09 ± 7.00) × 10 ⁴	(8.96 ± 13.74) × 10 ⁷	(8.05 ± 2.70) × 10 ⁵	(5.19 ± 4.43) × 10 ⁶
<i>Propionibacterium acnes</i>	(8.69 ± 0.29) × 10 ⁵	(2.34 ± 4.04) × 10 ⁷	(2.79 ± 1.95) × 10 ⁵	(3.58 ± 3.16) × 10 ⁷	(7.68 ± 3.11) × 10 ⁵	(2.25 ± 1.76) × 10 ⁸	(8.72 ± 10.16) × 10 ⁵	(2.65 ± 0.52) × 10 ⁷
<i>Corynebacterium jeikeium</i>	(3.88 ± 1.16) × 10 ⁶	(6.70 ± 3.17) × 10 ⁶	(1.34 ± 0.86) × 10 ⁶	(1.08 ± 1.34) × 10 ⁶	(5.05 ± 1.75) × 10 ⁴	(4.04 ± 2.02) × 10 ⁵	(1.34 ± 1.23) × 10 ⁶	(5.39 ± 4.20) × 10 ⁵
<i>Micrococcus luteus</i>	(8.45 ± 0.05) × 10 ⁶	(7.81 ± 7.56) × 10 ⁶	(1.40 ± 0.40) × 10 ⁶	(1.21 ± 1.44) × 10 ⁷	(8.42 ± 3.25) × 10 ⁴	(2.90 ± 1.37) × 10 ⁶	(2.53 ± 1.69) × 10 ⁵	(1.42 ± 0.57) × 10 ⁷
<i>Enhydrobacter aerosaccus</i>	(9.66 ± 0.42) × 10 ⁵	(4.53 ± 0.78) × 10 ⁶	(1.93 ± 1.04) × 10 ⁶	(2.30 ± 2.33) × 10 ⁷	(6.26 ± 0.35) × 10 ⁵	(2.44 ± 1.23) × 10 ⁷	(1.44 ± 0.76) × 10 ⁶	(2.30 ± 0.21) × 10 ⁷

Legend	-2 log	-1 log	0 log	+1 log	+2 log	+3 log
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The bacteria concentrations on the viscose fabric decreased by an average factor of 60 compared to the bacteria introduced to the material. The viscose fabric performed significantly better than that of its counterparts where the bacteria concentrations on fabrics such as Cotton and Polyester increased by an average factor of 32.

3.3.2 Anti-microbial Properties of Copper-Ion infused Fabric

While bamboo viscose demonstrates some antimicrobial properties, its effect on bacterium cells pales in comparison to copper's antimicrobial action. Copper-ion infused fabric takes advantage of the oligodynamic effect, a phenomenon in which certain metals, such as copper and silver, exhibit toxic effects on microorganisms. When bacteria come into contact with copper, reactive copper ions are released from the fabric and puncture the exterior of bacteria cells. These ions can interact with various components of microbial cells, disrupting their cellular processes and leading to cell death. This includes damaging cell membranes, interfering with DNA replication, and generating reactive oxygen species that cause oxidative stress [16].

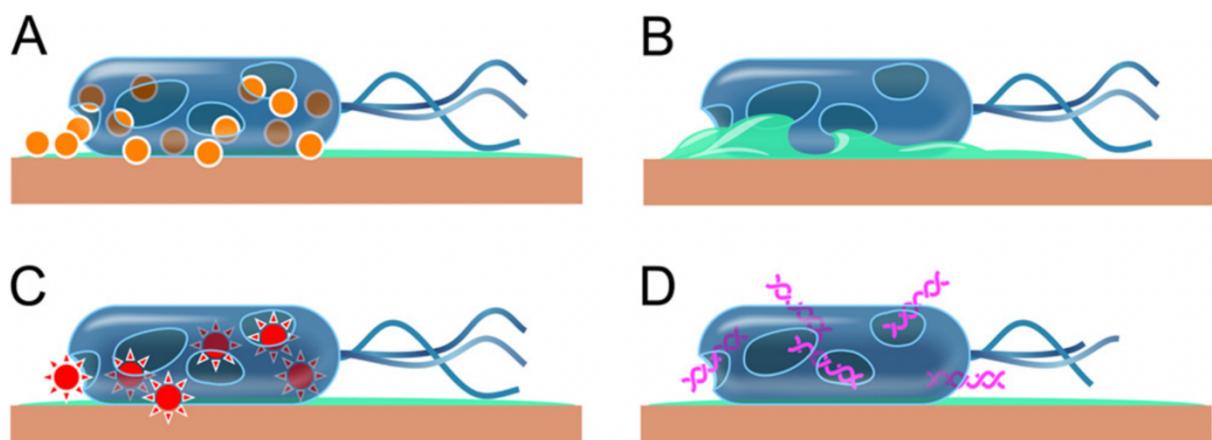


Figure 6 Antimicrobial Action of Copper. (A) Copper ions penetrate bacterium cell membrane upon contact (B) Cell membrane ruptures leading to loss of membrane potential and cytoplasmic content. (C) Generation of reactive oxygen species causing further damage. (D) Genomic and Plasmid DNA becomes degraded.[16]

Fabrics functionalised with copper ions exhibit these anti-microbial properties thus such fabrics are resilient to odour causing microbes as well as resilient to various virus's such as rhinovirus 2, yellow fever, influenza A, measles, parainfluenza 3, Punta Toro, human immunodeficiency, adenovirus type 1, cytomegalovirus, vaccinia, human influenza A, hepatitis C, and herpes simplex type 1 [17]. Copper-

infused fabrics are proven to permanently maintain their biocidal effects against microbes even after extreme washing conditions and colour dying [18], and are hence suitable for long-term use.

3.4 Enhanced Grip Panels

As outlined in Section 2.2 Meeting Customer Needs, a key problem to be addressed by SwetGloves is the enhancement of grip for ensuring a secure hold on objects, to improve the performance for users with severely affected grip due to palmar hyperhidrosis. Activities such as academic writing, sports, and professional engagements require adequate grip strength, that usual fabric linings can't provide in gloves. SwetGloves overcome this issue with the use of anti-slip grip panels adhered to the outer layer of the glove, strategically placed on areas of the fingers that are pertinent to holding objects.

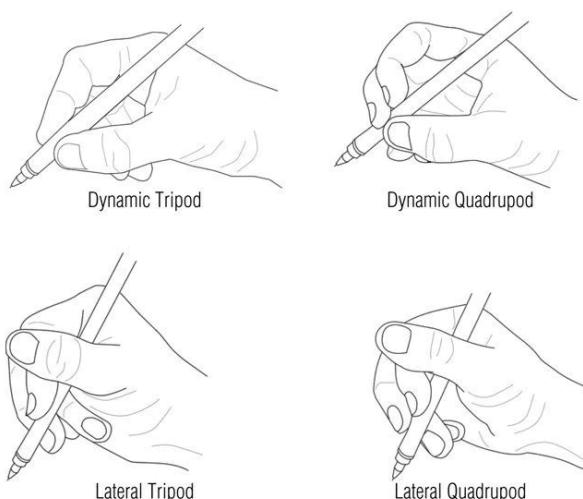


Figure 7 Most Common Mature Pencil Grasp Patterns[19]

3.5 Sizing and Aesthetic

3.5.1 Sizing Range

As the SwetGlove is not considered protective equipment, there is no Australian standard for sizing but to accommodate for the majority of the individual hand sizes, the EN 420:2003 standard will be used. This standard is based on palm circumference and the sizing range is detailed in Table 5.

Table. 5 Glove sizes of the EN 420:2003 glove standards. [20]

Size	Size #	Hand Circumference (mm)	Minimum Glove Length (mm)
XS	6	152/160	220
S	7	178/171	230
M	8	203/182	240
L	9	229/192	250
XL	10	254/204	260
XXL	11	279/215	270

3.5.2 Aesthetic Considerations

Medical devices often face challenges related to visibility, illness association, and social perception. Visible devices can cause self-consciousness, connecting individuals' appearance to their medical

needs. Devices linked to illness might remind users of their health challenges, affecting their psychological well-being. Moreover, societal attitudes and stereotypes can shape how people are perceived and treated when using medical equipment, potentially leading to exclusion and discrimination. A study conducted at UNSW [21] explores the role of aesthetic design in medical devices and concludes that there are three aspects, Desirability, how attractive the device is, Feasibility, if the device can function and Viability if the introduction of aesthetic aspects of the device changes its business viability.

The purpose of the SwetGlove is to provide medical assistance but not to be perceived as a medical device. By designing an aesthetic glove first, then using materials and technologies like the Bamboo Viscose and copper-ion impregnation to reduce the effects of sweating, the desirability, feasibility, and viability of the device are all high as it is aesthetic, functional and at low cost to the business.

3.6 Adherence to Professional Standards and Regulations

The professional standards and regulations that were adhered to during the design process of the SwetGlove are:

- ISO 20743:2021 – Textiles – Determination of antibacterial activity of textile products. [22]
- IEC 63203-201-3:2021 – Electronic textile — Determination of electrical resistance of conductive textiles under simulated microclimate. [23]
- ISO 21232:2018 – Textiles — Determination of moisturizing effect of textile materials by measurement of microclimate between textiles and simulated human skin using sweating guarded hotplate. [24]

As there is yet to be a physical product to test these regulations, they are theoretical regulations our product must follow. During our design stage, we have adhered to these standards as closely as possible.

4. BUSINESS ORGANISATION

4.1 Vision Statement

Empowering Lives, Transforming Comfort: Our vision is to create a world where individuals afflicted by palmar hyperhidrosis find solace and confidence in their daily lives. We envision a future where our innovative gloves become synonymous with comfort and liberation, enabling people to embrace every moment without the constraints of excessive sweating. Through continuous research, technological advancements, and empathetic design, we strive to redefine the standards of quality of life for those who seek respite from the challenges of palmar hyperhidrosis.

4.2 Mission Statement

At SwetGlove, our mission is to revolutionize the way people experience life despite palmar hyperhidrosis. We are committed to engineering cutting-edge gloves that seamlessly merge function and fashion, providing effective solutions that restore confidence, promote well-being, and enhance overall quality of life. Through unwavering dedication to research, innovation, and compassionate customer care, we aim to be the global leader in delivering advanced, reliable, and aesthetically pleasing products that empower individuals to regain control over their lives and confidently grasp the opportunities before them.

4.3 Our Goals

Sustainability:

Our commitment to sustainability drives us to explore and adopt eco-friendly materials and manufacturing methods. We align with environmental standards to contribute to a more sustainable future. By utilizing materials like bamboo and implementing recyclable processing chemicals such as N-Methyl morpholine N-oxide with up to 99% solvent recovery rate, we maintain a neutral impact on the environment.

Product Excellence:

We strive for product excellence, crafting gloves that surpass managing palmar hyperhidrosis. Our designs ensure effectiveness, comfort, durability, aesthetics, and athletic capability. Through advanced tech and ergonomic style, we exceed expectations, delivering standout gloves that showcase our dedication to exceptional solutions for customers.

Quality Assurance:

To establish unwavering customer trust, we enforce rigorous quality control measures across our production process. Our chosen production partners hold BSCI or SA8000 certifications, ensuring not only high-quality outcomes through regular quality checks but also ethical practices. These certifications underscore our commitment to fair wages, ethical labour, and optimal working conditions, eliminating any room for forced or child labour.



Figure 5. The global goals SwetGlove strives to adhere to. [25]

4.4 Business Development Milestones

4.4.1 Development

This is the initial phase where the SwetGlove product is conceived and created. During development, you'll be focusing on designing gloves that effectively address the needs of individuals with palmar hyperhidrosis while embodying the principles of comfort, functionality, and aesthetics mentioned in the vision and mission statements. This phase involves:

- **Research:** Conduct thorough research on the challenges faced by people with palmar hyperhidrosis, available treatment options, and current glove solutions. Gather insights from medical professionals, potential customers, and existing market trends.
- **Innovation:** Develop innovative technologies and materials that offer effective sweat management, breathability, moisture-wicking, and skin-friendly properties. Integrate technology, such as moisture-absorbing fabrics, cooling elements, or antimicrobial treatments, into the gloves to enhance their performance.
- **Design:** Create glove designs that cater to different preferences and styles, ensuring that the gloves are not only functional but also fashionable. Incorporate features like adjustable straps, ergonomic fit, and various sizes to accommodate a wide range of users.
- **Prototyping:** Build prototypes of the gloves to test their fit, comfort, and performance. Iterate on these prototypes based on feedback from potential users and experts in the field.

4.4.2 Testing

Once the initial prototypes are ready, it's crucial to rigorously test them to ensure they meet the high standards set by the vision and mission. This phase involves:

- **Functionality Testing:** Evaluate the gloves' ability to effectively manage sweat, provide comfort, and maintain their performance over time. Test them in various real-world scenarios to simulate daily usage.
- **Durability Testing:** Assess the durability of the gloves by subjecting them to wear and tear conditions. This could involve repeated stretching, washing, and exposure to different environmental factors.
- **User Feedback:** Collaborate with individuals who have palmar hyperhidrosis to gather their insights on the comfort, fit, and overall effectiveness of the gloves. Use their feedback to make any necessary improvements.
- **Medical Endorsement:** Seek endorsements from medical professionals or dermatologists who can verify the efficacy of your gloves in managing palmar hyperhidrosis. This endorsement can enhance the credibility of your product.

4.4.3 Marketing

Marketing is essential to create awareness about SwetGlove and establish its unique value proposition in the market. This phase involves:

- **Branding:** Develop a strong brand identity that resonates with your vision and mission. Craft a logo, brand colours, and messaging that reflect empowerment, comfort, and innovation.
- **Content Creation:** Create compelling content that educates potential customers about palmar hyperhidrosis, its impact on daily life, and how SwetGlove can be a solution. Use blog posts, videos, and social media to share informative content.
- **Influencer Partnerships:** Collaborate with influencers who have a strong presence in the healthcare, wellness, or fashion sectors. Their endorsement can help you reach a wider audience and build credibility.
- **Digital Marketing:** Utilize online advertising, social media marketing, and search engine optimization (SEO) to reach individuals actively searching for solutions to palmar hyperhidrosis.

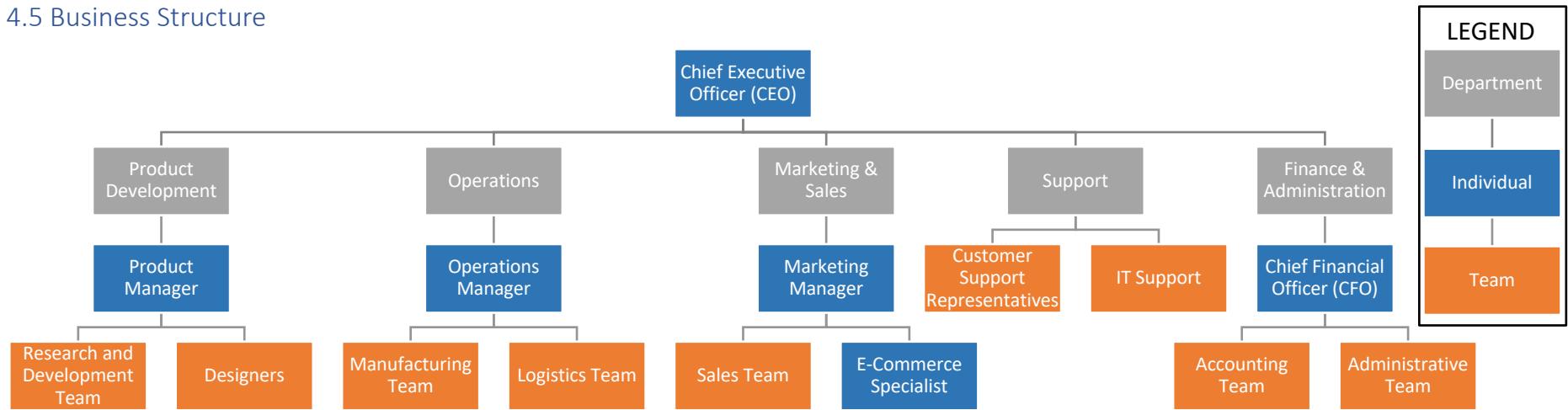
4.4.4 Sales

The sales phase involves making your SwetGlove product accessible to your target audience and ensuring a seamless buying experience. This phase involves:

- **E-Commerce Platform:** Set up an easy-to-navigate and secure e-commerce website where customers can browse, select, and purchase your gloves. Include detailed product descriptions, sizing guides, and customer reviews.
- **Distribution Channels:** Explore partnerships with medical supply stores, dermatology clinics, and wellness centres to expand your product's reach. Attend relevant trade shows and conferences to showcase your gloves to potential buyers.
- **Customer Support:** Offer exceptional customer support to address inquiries, aid with sizing and product selection, and handle returns or exchanges promptly and courteously.
- **Packaging and Presentation:** Design packaging that aligns with your brand's aesthetics and reinforces the message of comfort and confidence. Include clear instructions for using and caring for the gloves.

these milestones are interconnected and often require iterative processes. The vision and mission statements provide a strong foundation for guiding each milestone and ensuring that your product aligns with your core values and goal.

4.5 Business Structure



The SwetGlove company has a business model that aims to empower individuals with palmar hyperhidrosis regardless of the scale of operation. We have an approach that aligns with their vision and mission. Throughout the process from development to sales SwetGlove conducts thorough research, innovation, and design to create gloves that combine both functionality and style. These gloves provide solutions to improve the quality of life for people with palmar hyperhidrosis. This approach ensures that every step, including prototype creation, testing, marketing, and eventual sales is focused on comfort, confidence, and customer satisfaction. Whether it's a start-up or a larger enterprise SwetGlove's integrated strategy enables us to consistently deliver advanced products that are empathetic to customer needs while also maintaining a strong brand presence and fostering innovation, in sweat management technology.

4.6 Sales and Distribution

4.6.1 Product Description

We've created product tiers to meet our aim of aiding a wide Palmar Hyperhidrosis audience. The SwetGlove entry level lowers financial constraints, while the SwetGlove Pro provides the greatest sweat management. See Table 5 for detailed product descriptions.

Table 6. Descriptions of the offered SwetGlove products.

Product	Description	Unit Price
SwetGlove	A sweat management glove utilising Bamboo viscose's anti-microbial property to minimise bacteria growth and prevent odour. Permeable back design to allow increased moisture evaporation. Device friendly fingertip grips positioned to accommodate multiple writing styles.	\$40
SwetGlove Pro	The SwetGlove with the addition of fabrics functionalised with copper-ions to provide a superior anti-microbial product.	\$65

4.6.2 Sales and Distribution Channels

Our sales channels embody product objectives. Medical institutions will convey medical utility, while athletic and fashion stores, alongside influencers, highlight style and athleticism. Direct-to-consumer online sales personalise products and amplify our brand. Refer to Table 6 for an overview of sales channels and their roles.

Table 7. Description of the sales and distribution channels for the SwetGlove products.

Sales Channel	Description	Utilisation
Medical Institutions	Partnering with medical experts and institutions, presenting our sweat-managing gloves as a solution for Palmar hyperhidrosis.	Medical endorsement enhances credibility, offering comfort and wellness to individuals.
Retail Partnerships	Collaborating with retailers in healthcare, sports, and fashion, we showcase our gloves as functional and stylish accessories.	In-store displays capture diverse markets and provide wide advertising streams.
Direct-to-Consumer (DTC) Online Sales	Provide a DTC e-commerce platform which connects directly with consumers.	Allows personalisation of our products and the motivations behind them.
Sporting Goods and Fashion Avenues	Aligning with sports and fashion retailers and influencers so the gloves capture athletic and fashion-oriented customers. <i>A possible athletic avenue would be a partnership with the Australian Football player Mary Fowler who is known for wearing gloves during her games.</i>	Widening the products appeal from a medical device to a fashion and athletic product.

4.7 Risks and Mitigation Strategies

Table 8. Identification and description of the business' main risks and subsequent mitigation strategies.

Risk	Description	Mitigation Strategy
Regulatory Compliance	Non-compliance with medical regulations and standards can lead to legal and reputation issues.	Consult regulatory experts to ensure adherence to relevant standards. Obtain necessary certifications and approvals before launching. Implement robust quality control measures throughout the manufacturing process.
Intellectual Property Protection	Unauthorized use or replication of the products design or contained technologies by others can hinder competitive advantage.	File for appropriate patents, trademarks, and copyrights. Regularly monitor the market for infringements and take legal action if necessary. Keep sensitive information and designs confidential within the business.
Finances, Pricing and Profit Margins	Insufficient start-up funding or cash flow can hinder operations, growth, and future propositions. Increasing interest rates decrease loan benefits.	Develop a detailed financial plan with realistic projections. Secure adequate funding through investments, loans, or grants. Implement efficient cash flow management practices to monitor and control expenses.
Market Acceptance	The market might take longer to adopt or understand the product's unique value.	Invest in targeted distribution channels and marketing efforts. Demonstrate clear product benefits and offer trial periods for the entry level product.
Product Liability	Product defects or safety issues could lead to legal liabilities and reputation damage especially within the medical field.	Implement stringent quality controls, conduct product testing, and ensure comprehensive product liability insurance.

5. IMPACT ASSESSMENT

5.1 Environmental Impact

SwetGlove's innovative design incorporates sustainable materials, including bamboo fabric and copper-infused antimicrobial features. These choices align with eco-conscious values by reducing reliance on resource-intensive materials and curbing environmental degradation. The integration of an evaporative design promotes water conservation, as the open-back panel facilitates moisture evaporation, reducing the need for frequent washing. These sustainable practices contribute to a lower carbon footprint, minimizing the product's impact on the environment.

Furthermore, SwetGlove's potential to reduce waste is notable. By preventing the need for frequent replacement of personal items due to perspiration damage, the product can contribute to decreasing consumer waste and the associated environmental strain. As stated by the International Data Corporation (IDC) in 2016, water exposure emerged as the second leading factor contributing to smartphone damage on a global scale, ranking just below screen breakage resulting from physical impacts [26]. By extension, as perspiration is equivocal to water, smartphones ruined by those experiencing palmar hyperhidrosis undoubtedly contribute to this statistic. Therefore, through the widespread adoption of SwetGlove and its touchscreen compatible grips, electronic waste originating from water damage will be minimised.

SwetGlove's status as a reusable glove brings a significant positive environmental impact by directly addressing the issue of disposable plastic gloves. The widespread use of disposable plastic gloves, often single-use and non-biodegradable, has contributed to the mounting global plastic waste crisis. This was especially paramount during the SARS-CoV-2 pandemic in which 65 billion gloves were estimated to have been used every month [27]. Prior historical trends implicate that 75% of coronavirus plastic will end up in oceans [28] which equates to roughly 200 million kilograms of plastic [29] from disposable gloves alone.

SwetGlove's innovative design and reusability present a sustainable alternative that significantly reduces the demand for disposable gloves whilst maintaining the anti-bacterial properties sought after in disposable gloves due to its anti-microbial copper-infused fabric composition. By offering a durable and washable solution, SwetGlove minimizes the consumption of plastic materials, subsequently decreasing the production and disposal of single-use items. This reduction in plastic waste generation aligns with United Nation's Sustainability Development goals and initiatives aimed at curbing plastic pollution and promoting environmentally conscious practices. SwetGlove's role in mitigating plastic waste and its associated environmental hazards reinforces its commitment to not only addressing palmar hyperhidrosis but also fostering a more ecologically responsible approach to hand protection.

5.2 Societal Impact

SwetGlove's societal impact transcends the realm of medical innovation, addressing broader issues of social perception, discrimination, and awareness. A noteworthy concern revolves around the potential for social discrimination arising from the mislabelling of SwetGlove as a "disability implement." Analogous to eyeglasses, which correct vision impairments, SwetGlove users could face discrimination akin to that experienced by those with glasses as evidenced by UCL-led study which found that of "7677 older adults (≥ 50 years of age), 52.1% of those with poor eyesight reported discrimination vs 43.8% of those with good eyesight" [30]. This raises the importance of the proactive measures Team SwetGlove intends on using to mitigate the risk of discrimination and their subsequent societal impacts.

To combat discrimination, SwetGlove's rebranding as a fashionable utility glove becomes pivotal. Rather than being exclusively positioned as a solution for palmar hyperhidrosis, the team's strategy is to reshape SwetGlove's image. By highlighting its multifaceted utility, including moisture protection and enhanced grip, SwetGlove can shed the stigma of being perceived solely as a medical device. This strategic shift diminishes the potential for social discrimination and paves the way for broader acceptance across various social contexts.

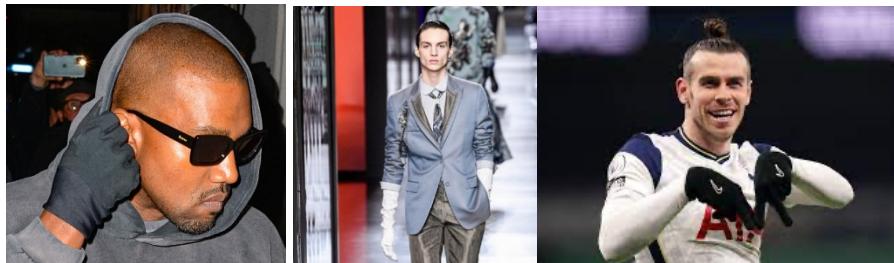


Figure 8. Examples of glove integration in the mainstream (left), high-fashion (middle) and sporting (right) spheres as means of the destigmatisation of SwetGlove and Palmar Hyperhidrosis

A visual depiction of SwetGlove integrated into public scenarios, as shown in the figures above, serves as a compelling tool to destigmatise its use. By portraying the glove as a natural and unremarkable accessory in daily life, these images challenge preconceived notions and normalize its presence. This visual approach complements the broader efforts to change public perception.

Furthermore, reinvesting future profits into targeted awareness campaigns holds significant potential for reducing stigma. By educating the public about palmar hyperhidrosis, its impact on individuals' lives, and the role SwetGlove plays in managing the condition, these campaigns contribute to destigmatisation of not only the wear of the glove but palmar hyperhidrosis in its entirety. Public understanding and empathy can flourish, breaking down barriers and promoting inclusivity.

SwetGlove's planned integration into the realm of high fashion emerges as an ingenious strategy for destigmatisation. Collaboration with influential designers and personalities would elevate SwetGlove's image, positioning it as a stylish and trendy accessory. This approach not only enhances the product's allure but also fosters a normalization of its use. By associating SwetGlove with fashion, the product will transcend its functional role and become a symbol of both sophistication and practicality.

In conclusion, SwetGlove's societal impact resonates in its ability to reshape public perceptions, combat social discrimination, and promote inclusivity. Through rebranding, awareness campaigns, and integration into the world of fashion, SwetGlove will foster a more empathetic and accepting society, where medical innovation seamlessly intertwines with everyday life.

5.3 Legal & Insurance Considerations

5.3.1 Intellectual Property Protection

The legal landscape also encompasses intellectual property protection, particularly regarding the threat of cheaper alternatives infringing upon SwetGlove's unique design and functionality. Ensuring the safeguarding of intellectual property rights is crucial to maintaining the product's integrity, market position, and ethical principles.

In response, SwetGlove should engage in thorough patenting and trademark strategies to shield key aspects of its design from replication. This legal measure not only protects the company's innovations but also upholds its commitment to ethical practices. Collaboration with legal experts can assist in

navigating the complexities of patent law, ensuring the comprehensive protection of SwetGlove's innovative features.

5.3.2 Insurance Coverage and Liability

In the realm of insurance, considerations related to liability and coverage are of utmost importance. The usage of SwetGlove, especially in situations where enhanced grip is critical, raises potential concerns about liability in case of accidents or unintended outcomes. Ensuring appropriate insurance coverage is essential to mitigate these risks and provide a safety net for both users and the company.

SwetGlove should engage with insurance professionals to assess the most suitable coverage options. This includes product liability insurance to safeguard against potential claims stemming from product use. Collaborating with insurance experts ensures that SwetGlove is equipped to address any unforeseen challenges while maintaining transparency and ethical responsibility.

6. FINANCIAL FORECAST

The following financial forecast outlines the projected revenue, costs, and profitability for the SwetGlove business during its first year of operation. The forecast is based on a set of assumptions and calculations that have been carefully crafted to provide insights into the potential financial performance of the business. While this simplified, it highlights the methodologies used to arrive at the projected figures.

6.1 Financial Assumptions

- **Product Pricing:** Each unit of SwetGlove is priced at \$40 and the SwetGlove Pro is at \$65. This pricing strategy considers the perceived value of the product, market trends, and potential customer demand.
- **Initial Sales:** In the first month, the start-up expects to sell 1,000 units of gloves. Sales are projected to increase by 10% each subsequent month, reflecting the anticipated growth in customer adoption.
- **Cost of Goods Sold (COGS) per Unit:** The cost of producing each pair of gloves, including material costs and labour, is estimated at \$13.85. This calculation considers various factors, such as the cost of raw materials and the associated manufacturing expenses.
- **Fixed Operating Expenses:** Monthly fixed operating expenses, including rent, utilities, salaries, and other administrative costs, amount to \$12,750. These fixed expenses are essential for the business's day-to-day operations and infrastructure.
- **Initial Investment:** The business received an initial investment of \$50,000 at the beginning of January. This investment serves as working capital to cover start-up costs and initial operational expenses.

6.2 Start Up Cost

At the onset of the business, an initial investment of \$50,000 was secured. This capital infusion provided the necessary financial foundation to cover various start-up costs. These costs encompassed elements such as market research, product development, legal fees, and initial inventory purchases. The initial investment played a pivotal role in allowing the business to commence its operations and establish its presence in the market.

6.3 Manufacturing Cost

A crucial aspect of the manufacturing process involves assessing the labour costs associated with producing each pair of SwetGlove. Assuming a workforce of 10 skilled workers, with an average hourly wage of \$15, the total labour cost per hour amounts to \$150. Each worker is anticipated to produce 5 pairs of gloves per hour, resulting in a labour cost of \$3 per pair of gloves. To craft each pair of "Sweat Gloves," a combination of materials is utilized. These materials include bamboo fabric [31], cotton spandex fabric [32], copper infused fabric [33], anti-Slip Grip material [34], and thread [35]. Based on table number, the total material cost per unit is calculated to be \$10.85. This calculation considers the specific dimensions and costs of each material component.

Table 9. Material Cost Summary

Material	Cost (\$AUD)
Bamboo Fabric	2.55
Cotton Spandex Fabric	5.00
Copper Infused Fabric	2.30

Anti-Slip Grip	1.00
Total	10.85

In addition to direct manufacturing costs, overhead expenses play a significant role in the overall financial structure of the business. These expenses encompass a range of categories, including rent and utilities, employee salaries and benefits, office supplies, marketing and advertising, insurance, accounting and legal fees, maintenance, and various other administrative costs. The total estimated monthly overhead expenses amount to \$12,750.

Table 10. Overhead Expenses.

Overhead Expenses	Cost (\$AUD)
Rent and Utilities	2500.00
Salaries and Benefits	5000.00
Office Supplies	200.00
Marketing and Advertising	1500.00
Insurance	700.00
Accounting and Legal	700.00
Maintenance and Repairs	300.00
Administrative Costs	350.00
Transportation and Shipping	750.00
Research and Development	750.00
Total	12750.00

By dividing the total overhead expenses by the projected number of gloves produced per month, an overhead cost per pair of gloves is derived. This overhead cost is \$1.60 per pair of gloves. When combined with the manufacturing cost of \$13.85, the total manufacturing cost per pair of gloves, including overhead, is \$15.45.

6.4 Projected Profit and loss

The data in table 5 provided offers insights into the company's financial performance, operational efficiency, and net profitability over the course of a year. The business demonstrated a consistent growth in sales volume over the year, starting with 1,000 units in January and culminating in 2,853 units in December. This upward trend highlights increasing customer demand and market penetration. Efficient cost management is evident, as the cost of goods sold (COGS) amounted to \$449,070, leaving a robust gross profit of \$406,301. Operating expenses remained steady at \$153,000, reflecting the company's commitment to financial stability. The total revenue generated throughout the year amounted to \$855,371. The revenue growth aligned with the escalating sales figures, indicating that the business effectively translated sales into tangible financial gains. After accounting for both gross profit and operating expenses, the net profit or loss was calculated. The net profit reflects the business's overall financial health. In this case, the year ended with a net profit of \$406,199, showcasing a commendable positive financial outcome.

Table 11. Summary: projected profit & loss for SwetGlove monthly.

Month	Sales (Units)	Revenue	COGS	Gross Profit	Operating Expenses	Net Profit/Loss
Jan	1000	40000	13850	26150	12750	13400
Feb	1100	44000	15235	28765	12750	16015
Mar	1210	48400	16759	31642	12750	18892
Apr	1331	53240	18434	34806	12750	22056
May	1464	58564	20278	38286	12750	25536
Jun	1611	64420	22306	42115	12750	29365
Jul	1772	70862	24536	46326	12750	33576
Aug	1949	77949	26990	50959	12750	38209
Sep	2144	85744	29689	56055	12750	43305
Oct	2358	94318	32658	61660	12750	48910
Nov	2594	103750	35923	67826	12750	55076
Dec	2853	114125	39516	74609	12750	61859
TOTAL	21384	855371	449070	406301	153000	406199

6.5 Break Even Analysis

The break-even analysis provides key insights into the financial dynamics of the company. With fixed costs totalling \$12,750 and variable costs averaging \$16 per unit, the company's \$40 unit sell price yields a contribution margin of \$24. This represents the amount of revenue available to cover fixed expenses and contribute to profit. The volume of sales at which total revenue equals total expenses is determined to be 519 units. Accordingly, the projected break-even revenue is \$20,774. This analysis enables decision-makers to establish sales goals, formulate pricing strategies, and navigate the delicate balance between revenue and costs. Each unit sold contributes positively to the financial bottom line, so exceeding the break-even point guarantees profitability.

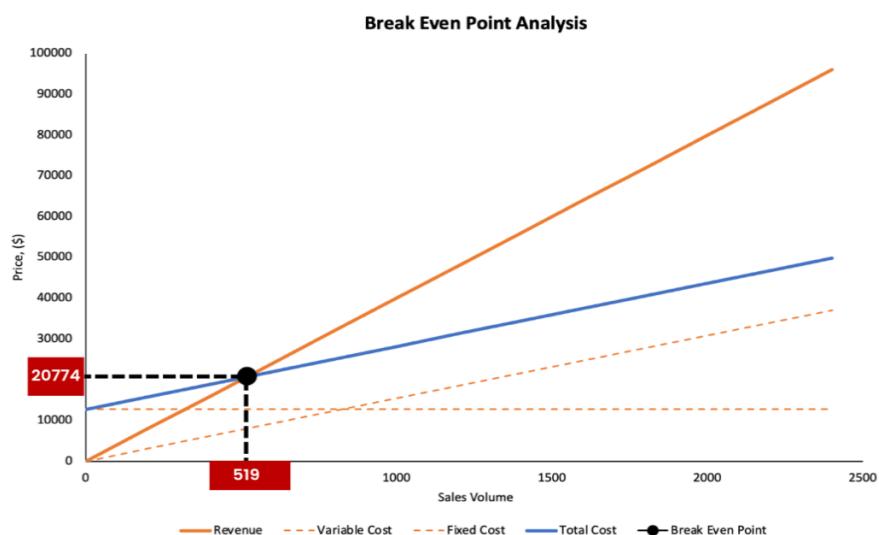


Figure 9. graphical depiction of the 'break-even point'

6.6 Projected Income Statement

The projected income statement for our company reveals a promising financial outlook over a span of three years. With consistent revenue growth from \$855,371 in Year 1 to \$2,423,579 in Year 3, the business demonstrates strong market demand. Effective cost management is evident through declining costs of goods sold (COGS), resulting in escalating gross profit figures of \$406,301, \$556,440, and \$1,150,235 for Years 1, 2, and 3, respectively. Operating expenses remain steady at (\$186,000), reflecting prudent financial planning. This leads to substantial net operating income growth from \$220,301 in Year 1 to an impressive \$964,235 in Year 3. The business maintains consistent interest income and expenses, while net income before taxes grows from \$219,801 in Year 1 to \$963,735 in Year 3. Accounting for income tax, net income follows a remarkable trajectory, reaching \$722,801 in Year 3. This comprehensive analysis showcases the business's potential for profitable growth and prudent financial management, underpinning a foundation for sustained success.

SwetGlove Projected Income Statement			
	Year 1	Year 2	Year 3
Revenue			
Sales Revenue	\$855,371	\$1,174,896	\$2,423,579
Cost of Goods Sold (COGS)			
Cost of Goods Sold	(\$449,070)	(\$618,456)	(\$1,273,344)
Gross Profit	\$406,301	\$556,440	\$1,150,235
Operating Expenses			
Rent and Utilities	(\$30,000)	(\$30,000)	(\$30,000)
Salaries and Wages	(\$120,000)	(\$120,000)	(\$120,000)
Marketing and Advertising	(\$15,000)	(\$15,000)	(\$15,000)
Insurance	(\$14,400)	(\$14,400)	(\$14,400)
Office Supplies	(\$3,600)	(\$3,600)	(\$3,600)
Research and Development	(\$3,000)	(\$3,000)	(\$3,000)
Total Operating Expenses	(\$186,000)	(\$186,000)	(\$186,000)
Net Operating Income	\$220,301	\$370,440	\$964,235
Other Income and Expenses			
Interest Income	\$500	\$500	\$500
Interest Expense	(\$1,000)	(\$1,000)	(\$1,000)
Net Income Before Taxes	\$219,801	\$369,940	\$963,735
Income Tax Expense	(\$54,950)	(\$92,486)	(\$240,934)
Net Income	<u>\$164,851</u>	<u>\$277,454</u>	<u>\$722,801</u>

7. CONCLUSION

In conclusion, the SwetGlove Business Plan Report outlines a comprehensive and visionary roadmap for addressing the challenges posed by palmar hyperhidrosis through innovative gloves that empower individuals and promote positive change on both environmental and societal fronts. Guided by a steadfast commitment to excellence, compassion, and sustainability, Team SwetGlove has meticulously crafted a business strategy that encompasses every facet of product development, marketing, sales, and impact assessment.

At its current stage of development, Team SwetGlove is poised at the height of transformative change. Armed with a groundbreaking product that seamlessly integrates functionality and style, SwetGlove is primed to redefine the standards of quality of life for those who endure the challenges of palmar hyperhidrosis. The innovative vision of empowering lives and transforming comfort resonates throughout every phase of the business plan, from research and development to sales and societal impact. This vision has evolved beyond a mere concept; it has materialized into a tangible solution that is set to make a profound impact on the lives of individuals worldwide.

Looking ahead, Team SwetGlove envisions a future that extends far beyond product innovation. The mission to revolutionize how people experience life in the face of palmar hyperhidrosis is but the beginning. SwetGlove aspires to become a global leader, fostering a new standard of empathy-driven, technologically advanced solutions that inspire confidence, well-being, and societal inclusivity. The journey to create a world where individuals afflicted by palmar hyperhidrosis find solace and confidence in their daily lives continues, fuelling the team's determination to push the boundaries of possibility and create lasting change.

However, to bring this transformative vision to fruition and embark on a journey of expansive growth, Team SwetGlove recognizes the need to raise capital. The journey from concept to reality demands strategic investments to facilitate product development, manufacturing, marketing, and distribution. By securing the necessary funding, SwetGlove can unlock its potential to impact the lives of millions while simultaneously addressing environmental concerns and societal stigma.

In essence, the SwetGlove Business Plan Report outlines not only a business strategy but a movement that champions innovation, compassion, and positive change. Team SwetGlove's unwavering dedication to realizing their vision is a testament to their commitment to making a tangible difference in the lives of individuals grappling with palmar hyperhidrosis. Driven by a resolute sense of purpose, Team SwetGlove is well poised to transform its visionary aspirations into a reality that will transcend boundaries, redefine norms, and empower countless lives.

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