



EVOKE Relief

A personal airflow shield designed for comfort, privacy and everyday life.Using Allergic Rhinitis as a Case Study

Industrial Design Hons | Built Environment
IDES4114 Capstone Project Process Report 2026
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Industrial Design Honours

AETHER

Evoke Relief

People living with allergic rhinitis may feel uncomfortable or self-conscious when symptoms such as sneezing and a runny nose draw attention in public. Concern about being mistaken for contagious can add to the discomfort of everyday activities.

AETHER is a wearable airflow shield designed to help limit exposure to airborne allergens while offering a degree of privacy. Two airflow units direct air along the inner surface of a curved visor, aiming to form a barrier between the wearer's face and the surrounding air.

The tinted visor provides partial visual screening and lifts above the forehead when not in use. A central support band stabilises the shield, while an adjustable headband accommodates different head sizes.



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I'm an industrial designer with a camera in one hand and a mind full of wild ideas. I love exploring the unexpected and turning even my craziest imaginations into reality

2026

Product Design Process Journal

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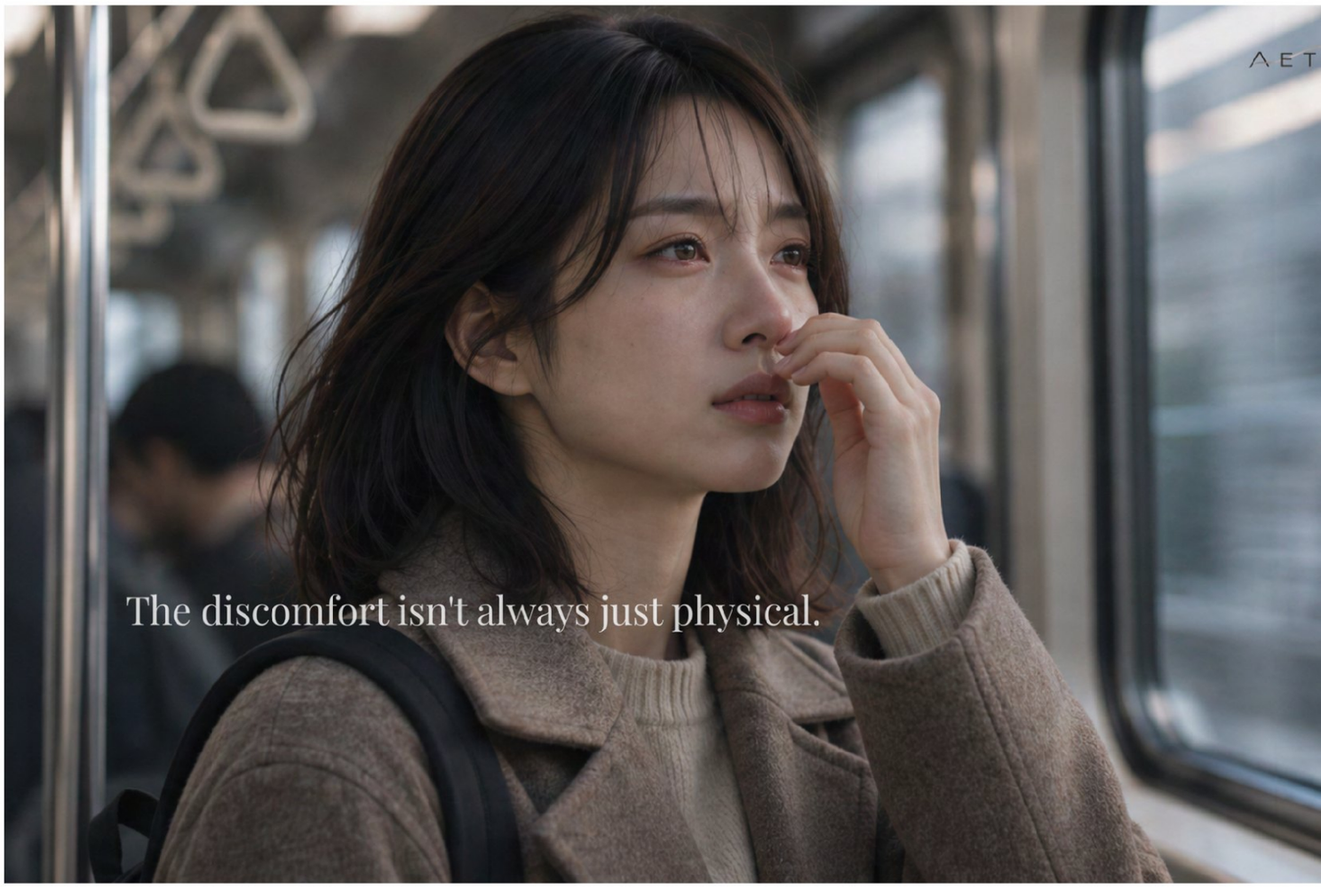
Just Another Day...
For some, stepping outside isn't so simple.


The discomfort isn't always just physical.

AETHER

Beyond Physical Discomfort

Allergic rhinitis, commonly known as hay fever, is an immune response to airborne allergens, causing symptoms such as sneezing, a runny nose and watery eyes.

When symptoms arise unexpectedly in public spaces, physical discomfort can become emotional distress. The visibility of these symptoms may create feelings of embarrassment, self-consciousness and concern about being perceived as contagious.

AETHER began with this insight: *managing allergic rhinitis is not only about physical relief, but also about feeling comfortable and confident in public.*

Research highlighted a critical period between the onset of symptoms and the relief provided by medication — **the waiting gap**.

During this time, individuals must continue their daily activities while managing both physical discomfort and emotional distress.

Symptom Begins

The Waiting Gap

Relief Arrives

THE DESIGN QUESTION

How might design provide both physical and emotional relief during everyday experiences of allergic rhinitis?

> I just want to get through the day without people staring or thinking I'm sick.

> It's not just symptoms. It's how they make me feel when others notice.

01 Research Findings

Literature review and user journey

| User Journey Mapping



| Participant 01, emotional response for sympton onset

|Allergen Exposure

|Response Time

|Medication onset

Visible symptoms can become a social experience.

User journey mapping revealed that allergic symptoms often intensify during environmental transitions. In public settings, visible symptoms can increase self-consciousness, particularly when individuals feel observed or mistaken for being unwell.

The period between symptom onset and relief emerged as a critical opportunity. Beyond managing physical discomfort, users may benefit from greater privacy and reassurance while continuing their daily activities.

> “I always need to explain, ‘it’s not COVID’...people give you weird looks otherwise.”

| Participant P20, in Opadokun et al. (2026)





| *Participant 02, emotional response for sympton onset*

Protection should address more than physical exposure.

Conventional protective solutions, such as masks, can provide physical filtration but also change the wearer's appearance.

My research highlighted a tension between seeking protection and wanting to feel comfortable in public. This shifted my design focus towards balancing intended allergen reduction, visual privacy and everyday wearability.

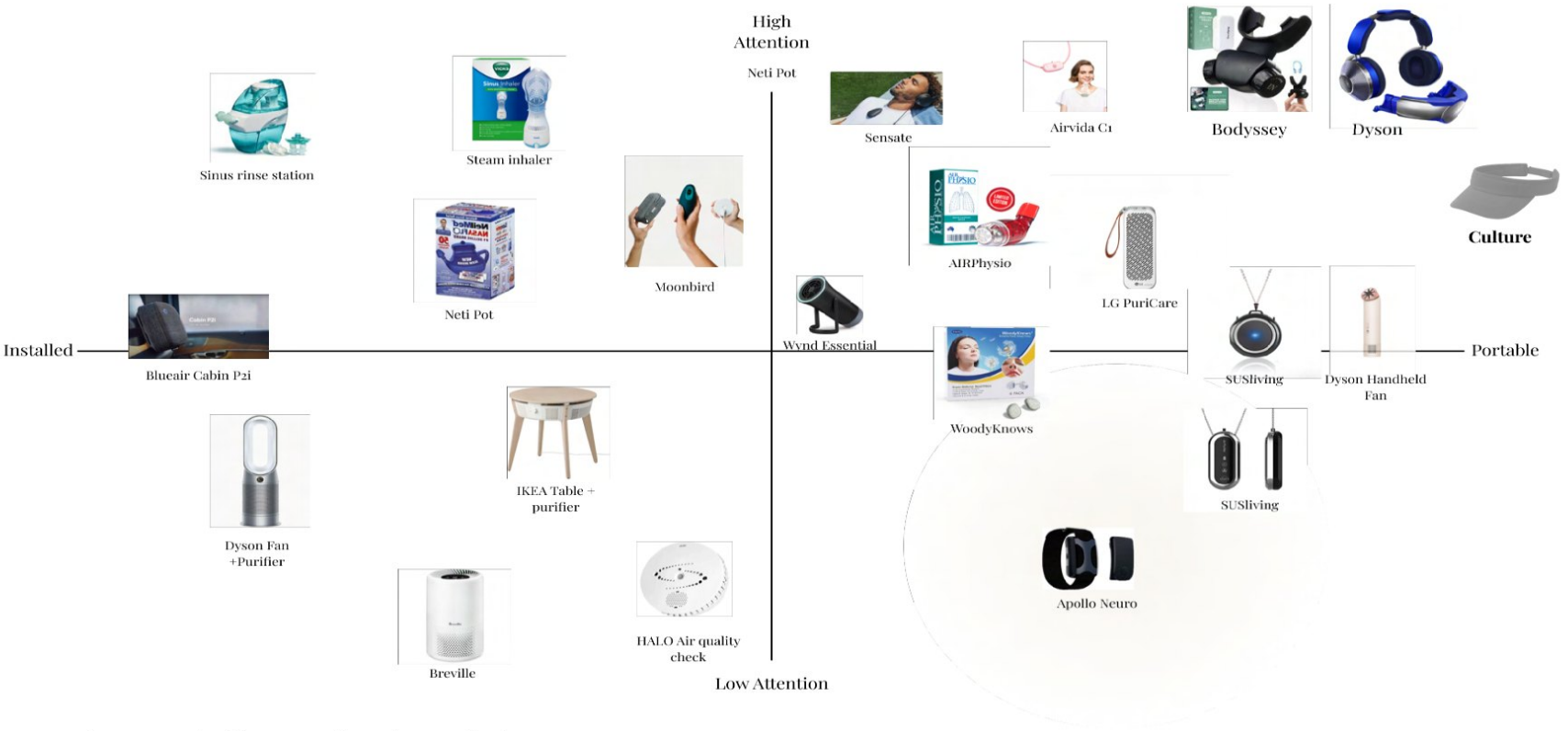
Design Opportunity
How might protective wearables reduce allergen exposure without increasing feelings of social exposure?



| *Participant 03, emotional response for sympton onset*

> Allergic rhinitis affects physical and mental aspects of quality of life, including sleep and daily functioning.

| *Wise et al. (2023)*



| 2x2 matrix diagram of market analysis

Market Analysis

01 —Initial Market Analysis

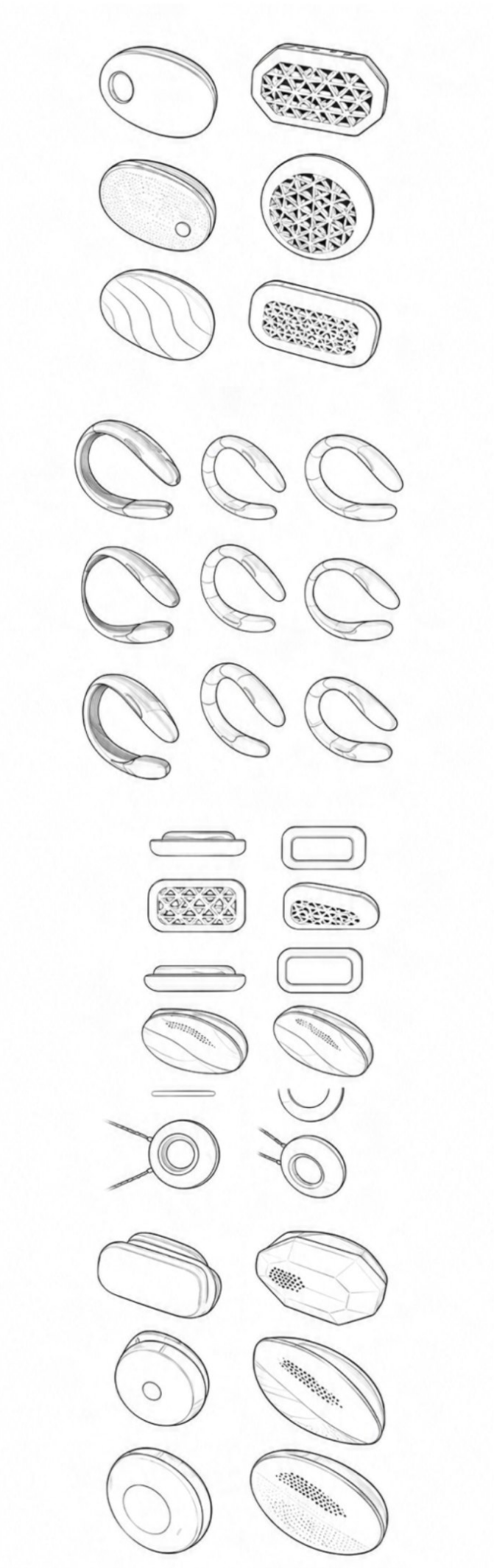
Exploring Existing Solutions

An initial market analysis examined existing medical treatments, air-purification devices and personal protective products, comparing their portability, visibility and modes of interaction.

The exploration highlighted opportunities for more accessible, portable solutions that could support users during everyday activities.

Initial Design Opportunity

To explore personal air-purification solutions that **provide immediate, accessible support** while minimising disruption to daily routines.



02

Process Sketches

Design Exploration

01 — Portable Air Purifier

Explore user interaction

The initial concept explored a portable handheld air purifier designed to provide quick relief when allergic rhinitis symptoms began in public. The idea focused on accessibility and immediacy, allowing users to direct cleaner air towards their breathing zone when discomfort occurred.

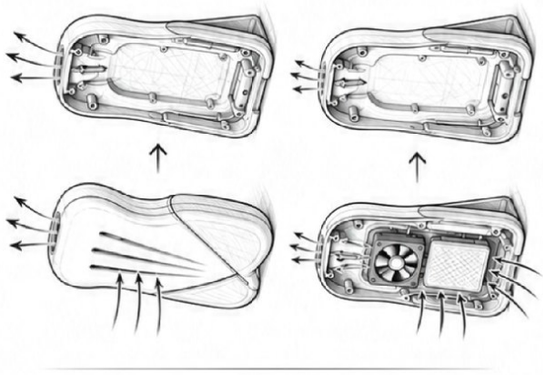
While the handheld format offered flexibility and easy access, it required continuous manual use and occupied the user's hand. This limited convenience during everyday activities such as commuting, walking or carrying belongings.

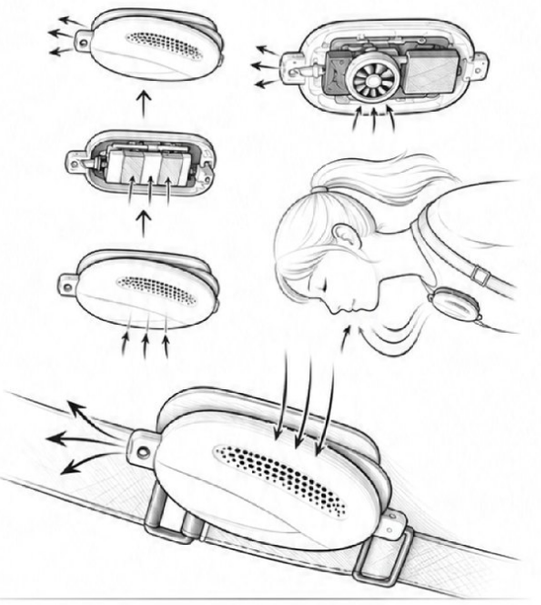
Key learning:
Relief needed to be more seamlessly integrated into daily movement, rather than functioning as a separate object that had to be held and activated. Also should consider medical grade devices.

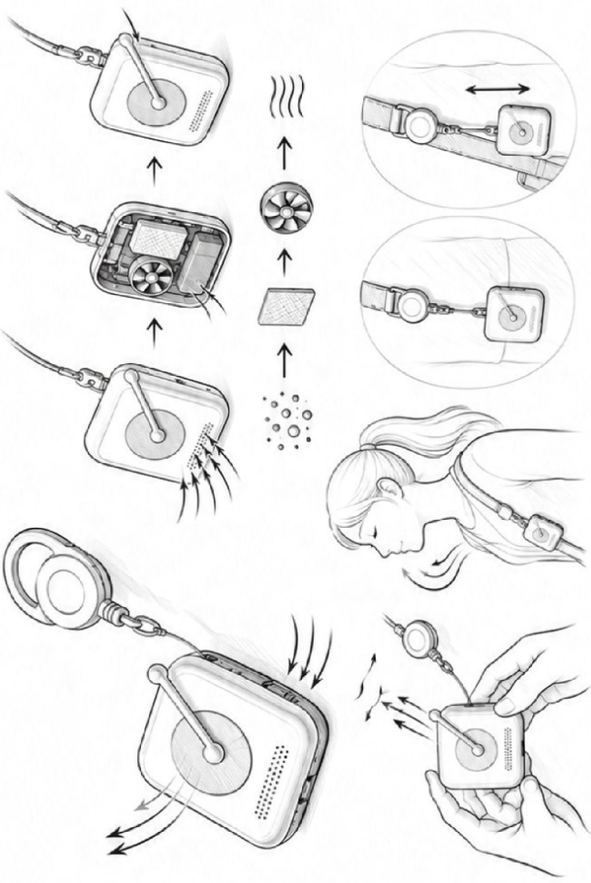


| Prototype 1.0

02 / Form development









| Prototype 2.0

02 — Fashion Clip-On Purifier

Explore device position and airflow direction

The second concept evolved into a **fashion clip-on purifier no longer working on any medical treatment devices**, exploring how allergen protection might become more wearable and discreet. By attaching the device to clothing, the concept aimed to free the user's hands while introducing a form that felt closer to an everyday fashion accessory.

This stage began to address not only physical relief, but also the importance of **low visual intrusion** in public.

Although the clip-on format improved portability and discretion, its distance from the face reduced the potential to create a more direct protective effect around the breathing zone. It also remained visually separate from the face, limiting opportunities to address privacy and the emotional discomfort associated with visible symptoms.

Key learning:
The design needed to move closer to the face to better support both functional protection and the user's public experience.



| Prototype 3.0 Aeris



Concept 1

Inlet from below, airflow 5/5



Concept 2

Inlet from front, airflow 3/5

Concept 3

Inlet from below, airflow 2/5. inlet too small, outlet is big but the entire device is too big.



Concept 4

Inlet from front, airflow 1/5. inlet too small and it blow straight to forehead instead of nose



02 — Reassessing Functional Limitations

Reflecting on Concept 01 & 02

Following the exploration of airflow direction and strength, I revisited the market to critically evaluate the limitations of the two initial concepts.

The handheld purifier required active positioning, making continuous use inconvenient during everyday activities. Although the clip-on concept offered hands-free operation, its distance from the breathing zone raised concerns about airflow effectiveness and consistency.

More importantly, both concepts remained primarily focused on functional air purification, with limited consideration of the emotional discomfort and social self-consciousness associated with allergic rhinitis in public.

Design Reflection

These limitations highlighted the need to reconsider not only how protection is delivered, but also how it is experienced by the user. Future exploration would need to balance functional performance, everyday usability and emotional wellbeing.



Market Reassessment

From Function to Human Experience

Following the development of the handheld and clip-on concepts, I revisited the market to critically evaluate their relevance to the original design challenge.

Although both concepts explored portable air purification, they remained primarily focused on functional performance. Neither fully addressed the emotional discomfort and social self-consciousness experienced during allergic rhinitis symptoms in public.

This prompted a shift beyond conventional air-purification products towards exploring how wearable protection could intersect with fashion, culture and personal identity.

Critical Reflection

> The opportunity was not simply to develop another purification device, but to reconsider how protection could be experienced and perceived in everyday life.



| Casual korean aunty wearing sun protection on street.



| Japan new visor trend



| K-Pop BTS boys group Jung Kook



| Chinese sun protection trend

East Asian Cultural Exploration

The Influence of Beauty, Fashion & Social Behaviour

01 — Beauty Standards & Protective Behaviour

In East Asian contexts, beauty standards have influenced everyday protective behaviours. In South Korea, the cultural preference for clear, fair-looking skin has encouraged sun-protection practices, while K-pop idols and celebrity culture have contributed to the importance of personal appearance and self-presentation (Seo, Cruz and Fifita, 2020).

Sun visors, face coverings and UV-protective accessories demonstrate how functional protection can become integrated into daily routines and personal appearance.

02 — Face Covering as Social Comfort

In Japan, facial appearance is also shaped by social expectations. Research suggests that makeup can carry social significance, while some women use face masks when not wearing makeup, allowing them to feel less exposed in public (Kido, 2011; Miyazaki and Kawahara, 2016).

Beyond hygiene, face coverings can provide psychological reassurance by partially concealing facial expressions and reducing concerns about being observed or judged.

03 — Cultural Insight & Design Opportunity

These observations revealed that the acceptance of protective products is influenced not only by functionality, but also by cultural familiarity, social expectations and personal identity.

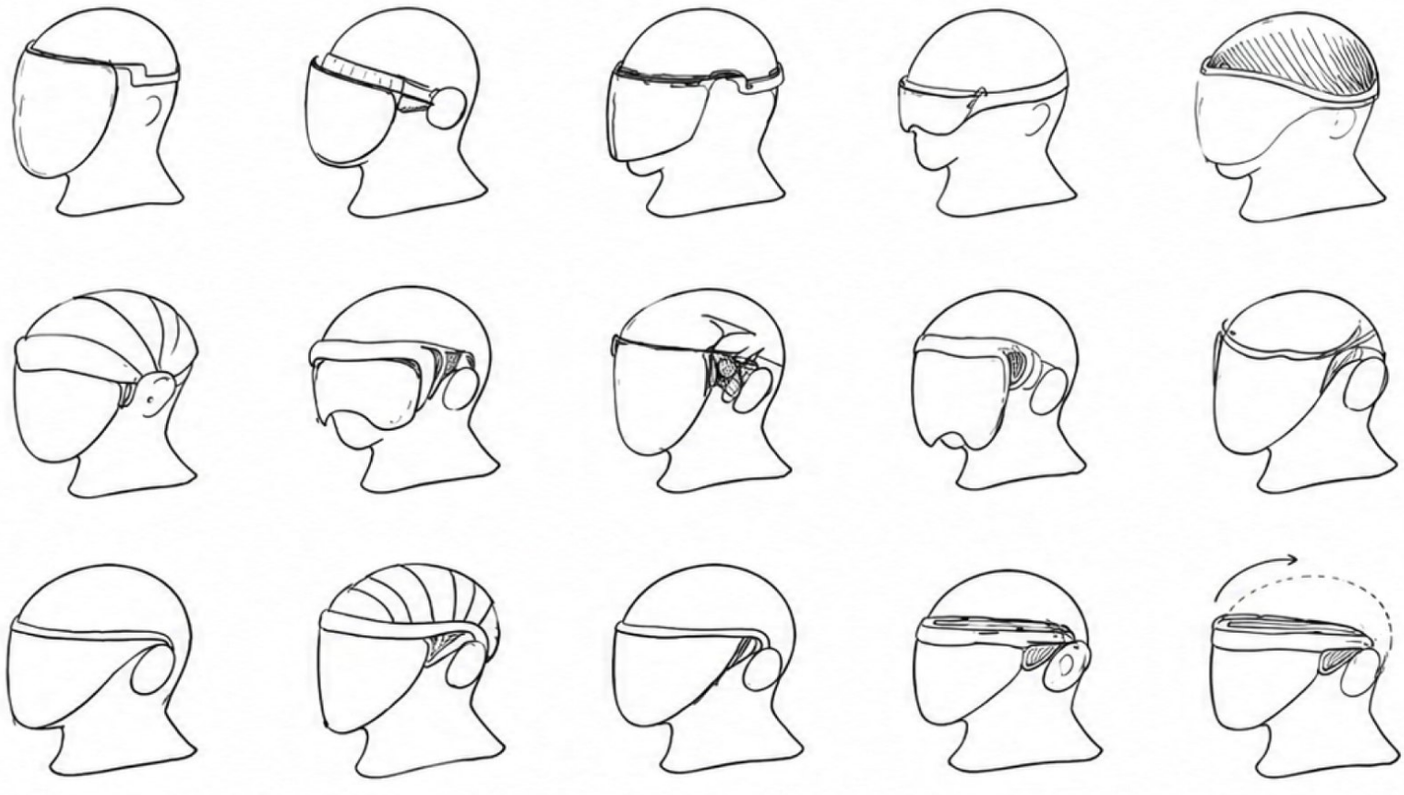
The everyday use of sun visors and face coverings suggested an alternative direction for product exploration: **transforming protective equipment into a wearable accessory that feels intentional rather than exclusively medical.**

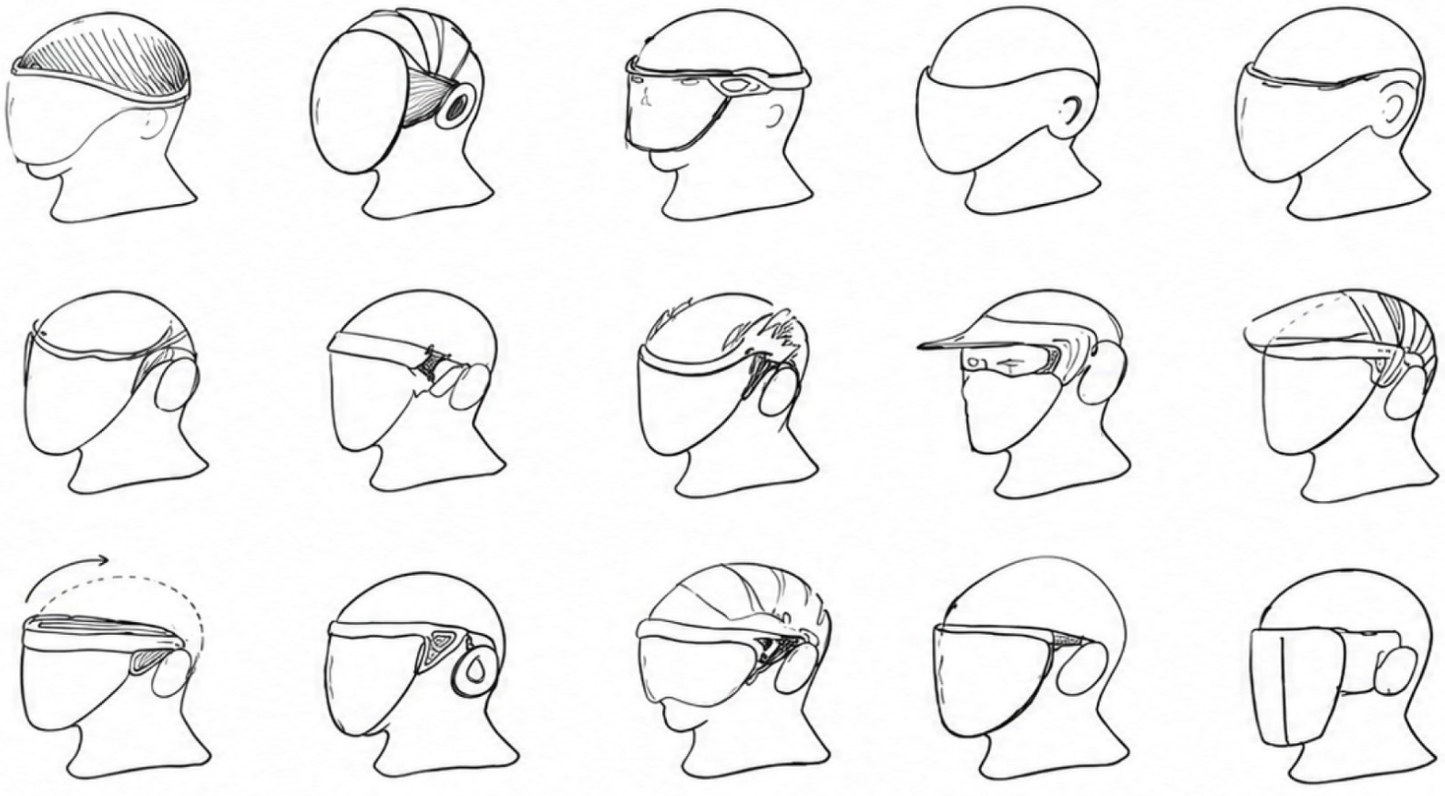
This became an important starting point for investigating a fashion-oriented visor that could combine physical protection, visual privacy and emotional comfort.

CULTURAL DESIGN INSIGHT

"Cultural familiarity can reshape how protection is perceived — from a sign of vulnerability to an intentional part of personal appearance."

03 / Refined concept





03 — Final Direction: Fashion Visor

Refine proportions, interaction and component placement

The final concept developed into a **fashion visor based wearable**, combining a head-worn airflow system with a smoke-tinted facial shield. This direction responded more directly to the insights gathered through research: users may need support not only with allergen exposure, but also with the emotional discomfort of managing symptoms in public.

By integrating airflow and a visor into one wearable system, the design began to address multiple needs at once

This final direction represents a shift from designing a device that simply delivers cleaner air, to designing a wearable experience that considers both **physical and emotional relief**.

Key learning:
The concept evolved from solving a functional problem in isolation to addressing the broader experience of allergic rhinitis in public.





Articulated Pivot Mechanism



Contoured Visor Profile



Sculptural Metallic Finish

Tinted Visual Privacy





Textured Grip Surface



Design inspiration

The moodboard explores a balance between futuristic aesthetics, functional detailing and everyday wearability.

Sculptural metallic finishes and a contoured, tinted visor establish a refined, fashion-oriented identity while offering visual privacy.

Articulated mechanisms, tactile surfaces and breathable textiles inform the design's interaction, comfort and adjustability.

Together, these elements guide AETHER towards a cohesive wearable form that integrates protective functionality with personal expression.



| Prototype 4.0

Prototype









| Prototype 5.0

Prototype Evaluation and Design Refinement

User feedback on the first two prototypes revealed several limitations in ergonomics, comfort and usability. Both designs felt bulky and heavy, with unnecessary decorative elements that attracted attention rather than providing privacy. The visor curvature also restricted access to the face during allergic reactions and raised concerns about ventilation.

Users expressed a preference for a more discreet, technologically refined appearance with intuitive operation.

These findings led me to discontinue both prototypes and further develop the final concept, drawing inspiration from over-ear headphones to create a more streamlined, adjustable and user-friendly wearable design.

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| Internal airflow diagram

03

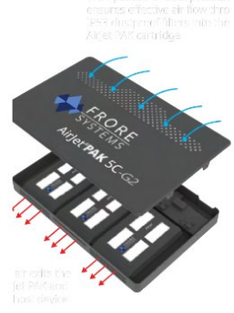
Technology and renders

Concept Details

Technical Feasibility

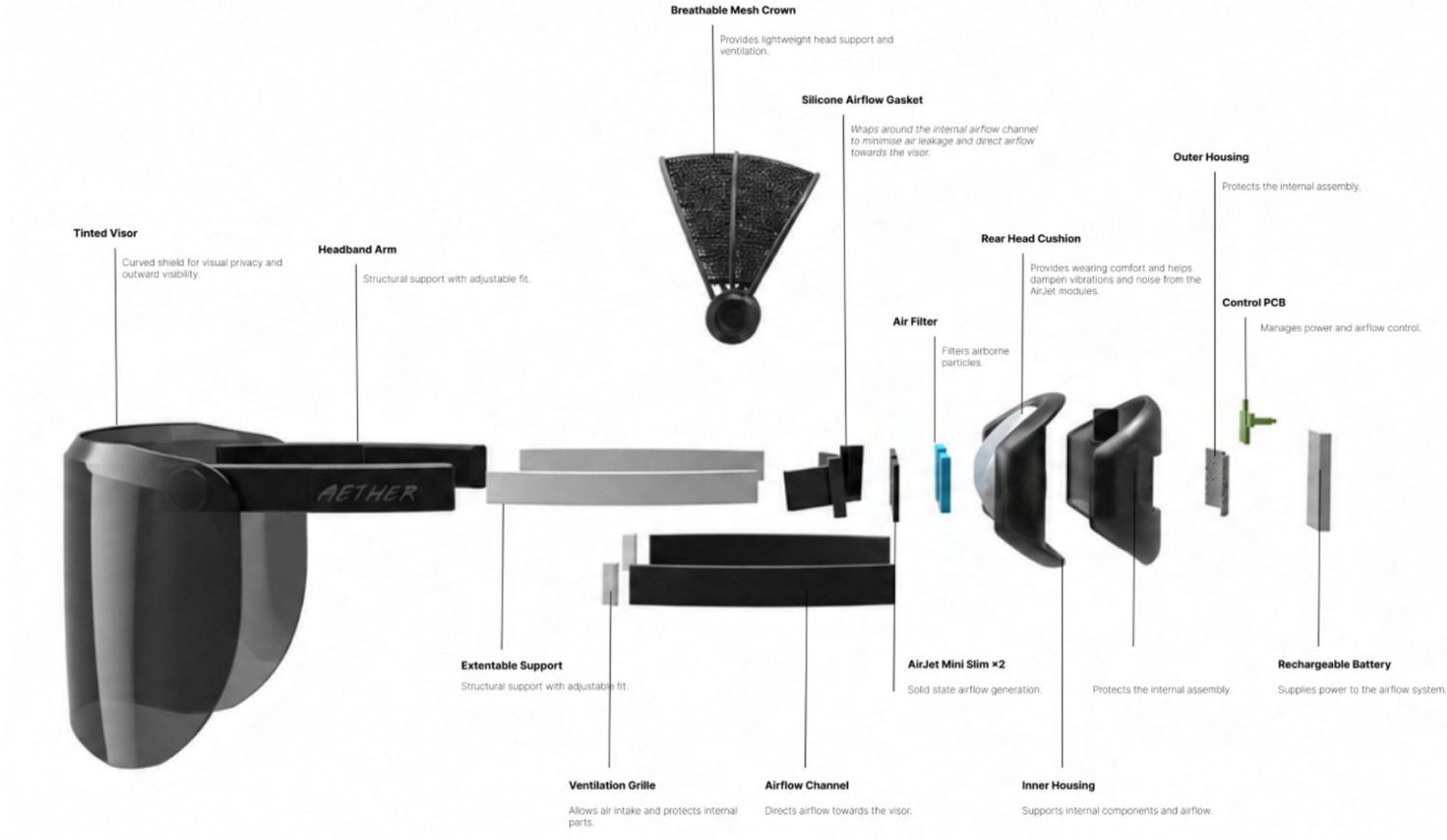
Solid-State Airflow & Aerodynamic Protection

AETHER explores a personal airflow barrier powered by two solid-state AirJet modules. Filtered air is intended to travel from the rear housing through concealed channels within the headband, before being directed along the inner surface of the curved visor.





| User Interaction



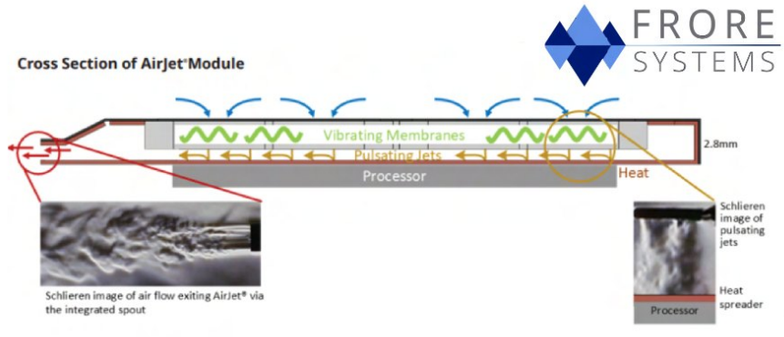
| Exploded view

The proposed system draws on research into aerodynamic air curtains, where controlled airflow can help reduce the movement of airborne particles into the breathing zone. Previous studies have demonstrated the potential of combining directed airflow with facial shields to reduce exposure to airborne contaminants (Rosa et al., 2022; Keisar et al., 2023).

Compact solid-state airflow technology provides a potential alternative to conventional rotary fans, supporting a streamlined wearable form.

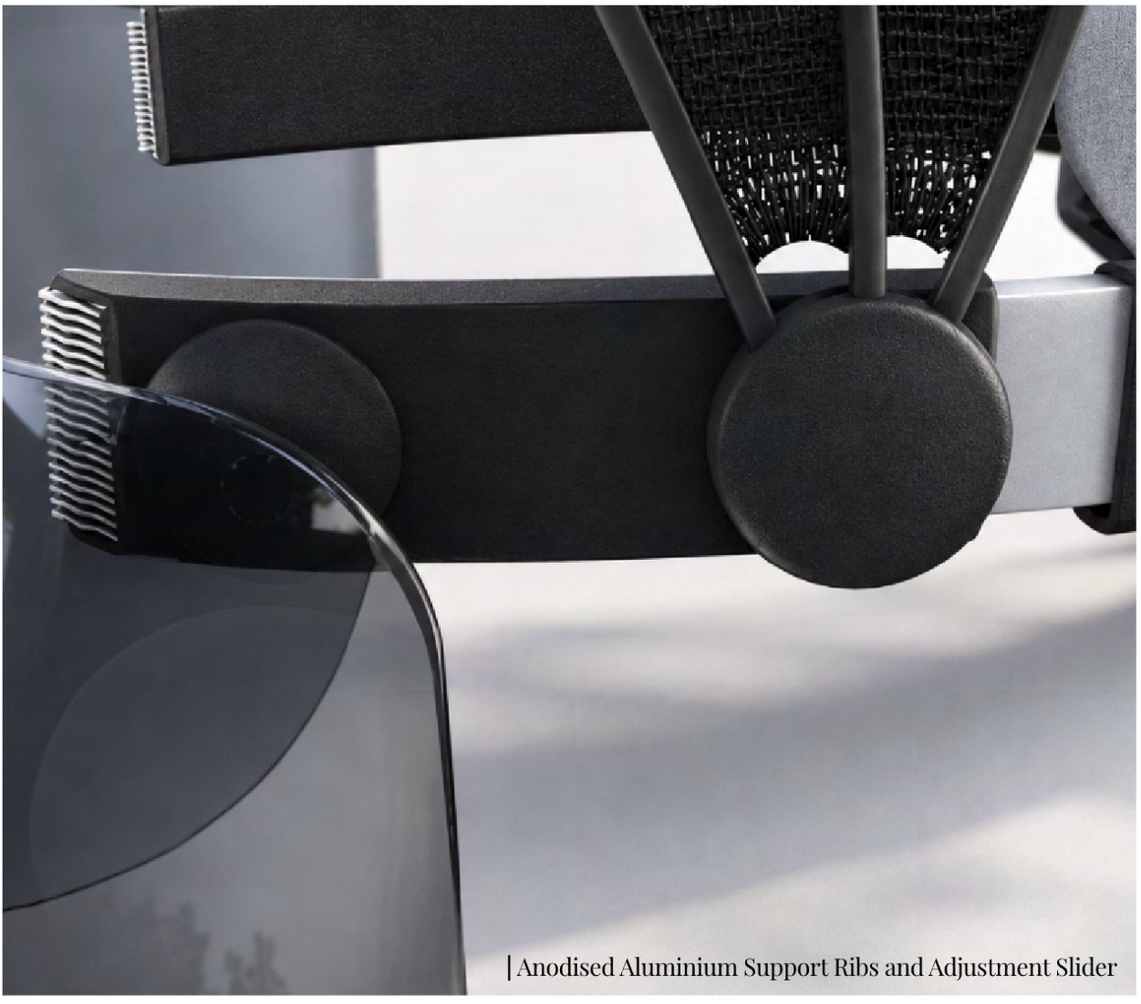
Design Reflection

These findings establish a scientific basis for further development of AETHER's proposed airflow system. However, its effectiveness against airborne allergens requires validation through airflow measurement, filtration testing and particle-exposure experiments.



Metric	AirJet® Mini
Total heat dissipation (@ 85C die temperature, 25C ambient)	5.25 W (Net 4.25W)
Maximum noise (inside device at 50cm)	21 dBA
Maximum power consumption	1 W
Back pressure	1750 Pa
Dimensions (width x length x thickness)	27.5 x 41.5 x 2.8mm
Weight	9g

| Technical information from Frore System



| Anodised Aluminium Support Ribs and Adjustment Slider

Textured ABS housing provides a lightweight, tactile finish, while anodised aluminium support components offer structural stability and adjustment. Breathable mesh enhances ventilation and wearing comfort.

Proposed manufacturing processes include injection moulding for the ABS housing, thermoforming for the curved PC visor, and metal forming, machining and anodising for the aluminium components.

Replaceable Filtration System

The removable rear cover provides convenient access to the filter cartridge, allowing replacement without disassembling the wearable structure.



| Textured ABS Housing, Replaceable Filtration System



| Breathable Mesh Fabric

CMF and Manufacturing Considerations

Material Selection, Production and Maintenance

AETHER's CMF strategy combines a refined, technology-inspired aesthetic with comfort and functionality. The smoke-tinted, optical-grade polycarbonate (PC) visor is designed to provide visual privacy by reducing facial visibility from the outside while maintaining outward visibility for the wearer. Its intended use extends to both daytime and illuminated nighttime environments, subject to sufficient optical transparency and visibility testing.



| Optical-Grade Polycarbonate (PC)



Visors Lifted





Visors Down





Airflow Testing and Prototype Evaluation

Airflow testing on the refined prototype confirmed that air could be directed towards the front of the visor, supporting the intended airflow pathway.

Rather than prioritising high airflow strength, AETHER focuses on delivering a gentle stream of filtered air to create a personal zone of cleaner air during everyday outdoor activities.

The testing also highlighted potential noise and vibration generated by the rear-mounted power pack and airflow system. Cushioning was incorporated to reduce the transmission of vibration and improve wearing comfort.

However, some operational noise and vibration may remain, requiring further evaluation and refinement.



| Prototype airflow testing

Design Reflection

The refined concept prioritises controlled airflow and personal comfort over maximum air velocity, exploring how a wearable system might provide users with a more comfortable personal breathing environment in public.


AETHER

Project Reflection

From Functional Protection to Human-Centred Design

Throughout the development of AETHER, my understanding of the design challenge evolved significantly. What initially began as an exploration of portable air purification gradually became an investigation into the relationship between physical protection, emotional wellbeing and personal identity.

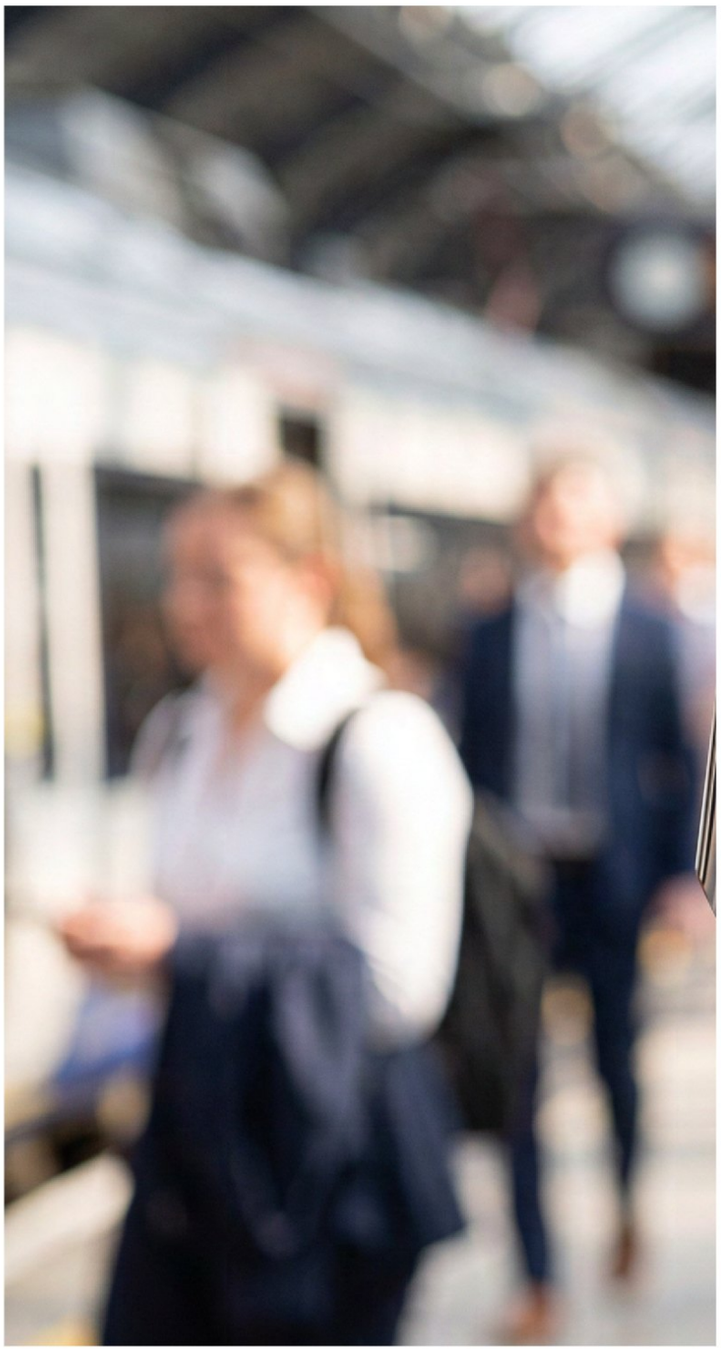
The early handheld and clip-on concepts focused primarily on delivering cleaner air. However, airflow exploration, prototype evaluation and user feedback revealed limitations in ergonomics, usability and comfort. More importantly, these iterations highlighted that addressing physical symptoms alone did not fully respond to the emotional discomfort experienced by individuals with allergic rhinitis in public.

Revisiting the market became a turning point in my design process. Exploring East Asian protective accessories and fashion culture challenged my perception of what protective equipment could look like. I began to recognise that cultural familiarity, appearance and social expectations can influence how people interact with wearable products.

This shifted my approach from designing a purely functional device towards creating a wearable experience that considers privacy, confidence and everyday self-expression.

The final AETHER concept reflects this transition. Inspired by contemporary headwear and over-ear headphones, it integrates a smoke-tinted retractable visor, directed airflow and adjustable support into a cohesive wearable form.

Prototype testing demonstrated that airflow could be directed towards the front of the visor, while also identifying remaining challenges involving noise, vibration, ventilation and wearing comfort. Although the intended allergen-reduction performance requires further validation, these findings established a foundation for continued technical development.



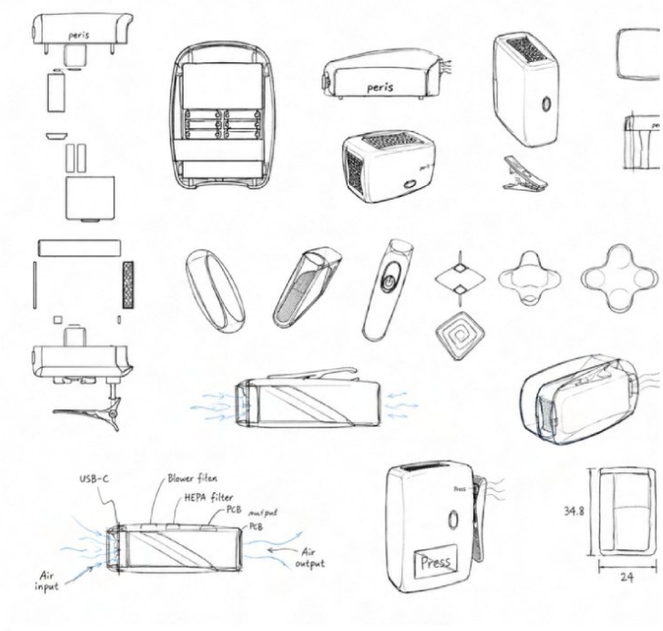
My most significant learning was that successful industrial design is not simply about solving a functional problem, but about understanding how a solution fits into people's lives. The iterative process taught me to question my initial assumptions, critically evaluate design decisions and remain open to changing direction when research revealed new opportunities

Ultimately, AETHER represents more than the development of a wearable airflow system. It reflects my growth as a designer in recognising that functionality, emotional experience and cultural context are interconnected. Moving forward,

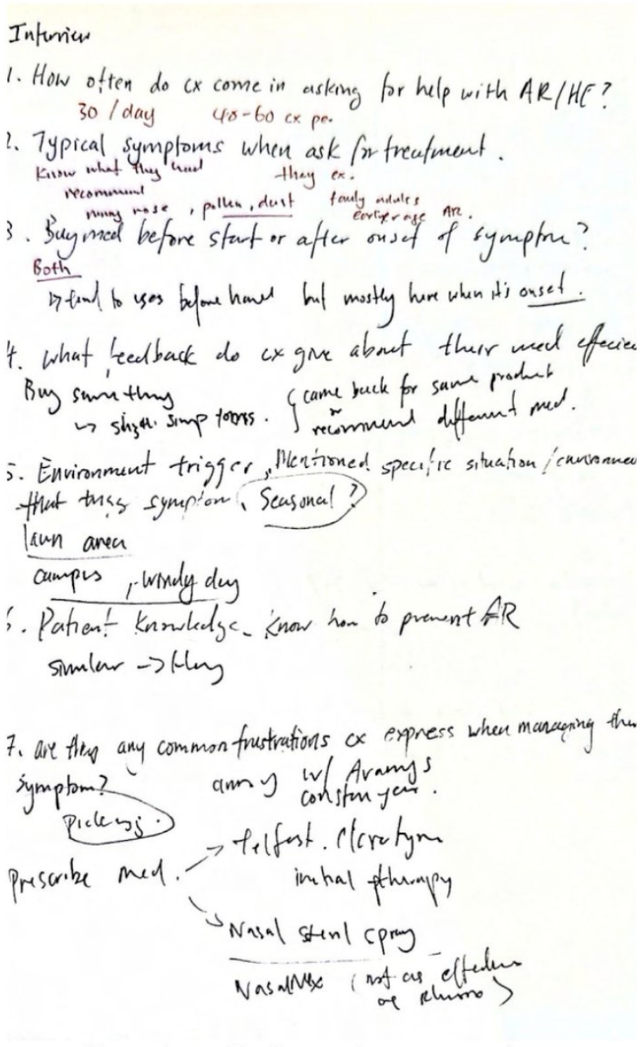
I aim to strengthen this approach through further user testing, technical validation and ergonomic refinement, ensuring that future design decisions remain grounded in both human needs and practical feasibility.



Other Support Materials



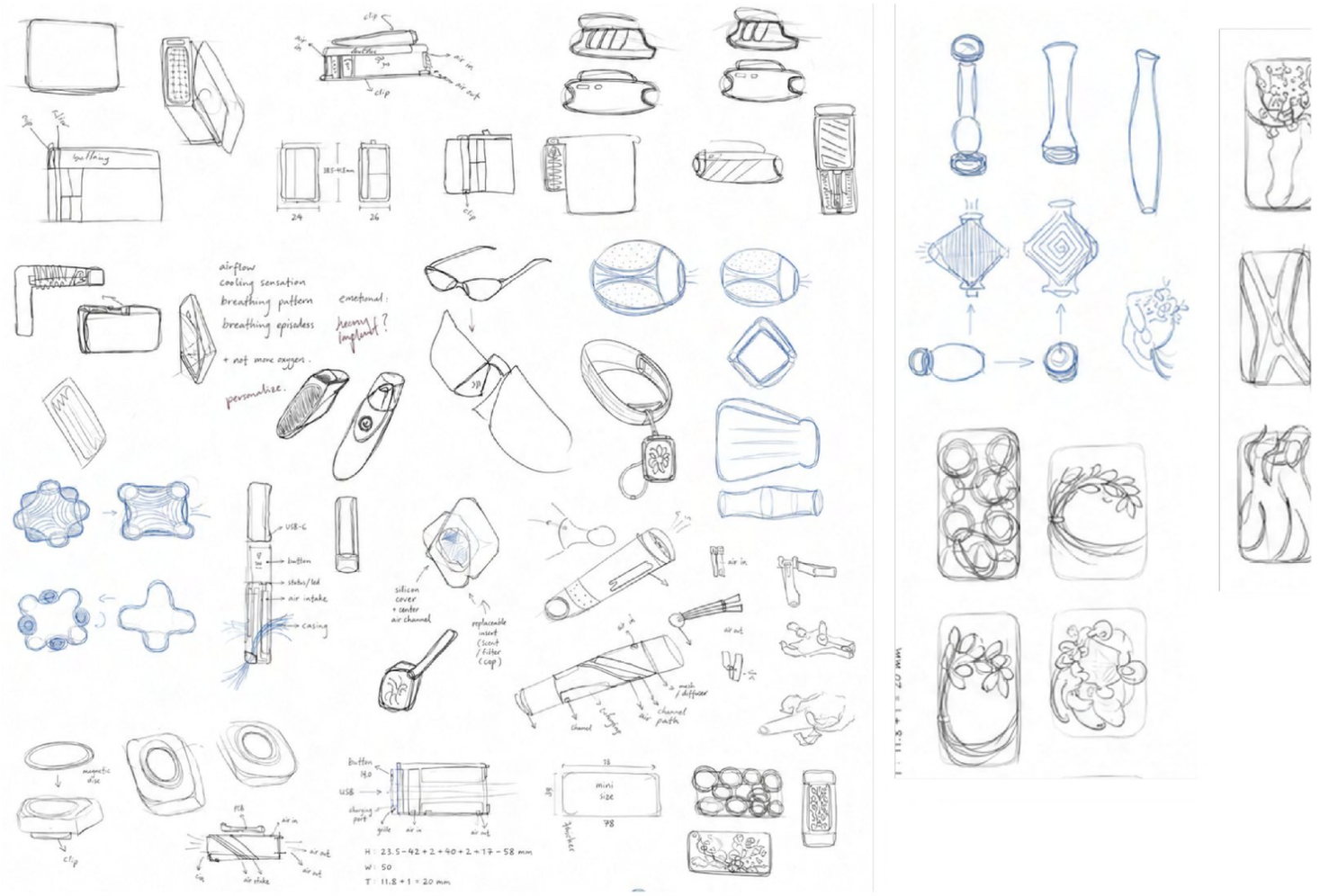
| *Concept 2 sketches*



| Notes of interview with Pharmacist at UNSW Pharmacy



| Form exploration for concept 2



| Initial Concept sketches



| AETHER Presentation