

# Touching sound

Designing a tactile speaker that combines modern functionality with nostalgic interaction, as a timeless decorative piece.



Master thesis | Integrated Product Design

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# Abstract

This thesis explores the design of a tactile loudspeaker that combines modern functionality with nostalgic interaction. With the aim of creating a product that resonates emotionally with modern nostalgists, this project focusses on the user group that values the physical engagement of vintage audio devices alongside modern convenience. In collaboration with audio brand Devoonsounds, the project follows the Double Diamond methodology through discovery, definition, development and final product delivery.

Through market analysis, trend research and targeted user interviews, the need for a speaker that prioritises interaction, aesthetics and emotional resonance was identified. The project translates these insights into a product concept by exploring interaction mechanisms such as rotation and expansion that encourage ritualistic use. Prototypes were tested with users to validate the emotional and functional appeal of tactile engagement. User testing validated the design's ability to support intuitive interaction and emotional connection, while feedback informed final design refinements.

The final design integrates directional control, modular interaction, and visual integration into home environments. Allowing for user-driven positioning and acoustic personalisation. Material selection, manufacturability and cost estimation were considered to ensure feasibility and viability in small series production. This work contributes to the Devoonsounds portfolio by introducing a speaker concept that shifts the focus from purely technical performance to sensory and emotional experience.

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# Introduction

In an increasingly digital audio landscape, the physical and emotional dimensions of music listening are often diminished. This project explores how tactile interaction and nostalgic design can reintroduce personal engagement and emotional resonance into the listening experience. The focus is on designing a speaker that appeals to modern nostalgists, users who value sensory interaction, rich materiality, and a more intentional connection to their environment.

Working with Devoonsounds, a design-led audio company known for its sculptural, concrete-based speakers, this final project aims to expand the brand's portfolio with a product that maintains its aesthetic identity while meeting new user needs. Rather than focusing on technological innovation alone, the design aims to create a meaningful interaction that supports the speaker's role as both a functional device and a visual presence in the home.

Using a research and design iterations, the project explores how form, material and interaction can support intuitive use and create moments of ritual. The process involved contextual research, iterative prototyping, material exploration and user validation to ensure a balance between desirability, feasibility and viability. Insights from interviews and user testing revealed a desire for more sensory and emotionally engaging listening rituals, qualities often found in vintage audio equipment but rarely translated into modern audio products.

The result is a speaker concept that blends analogue featurest with modern usability, designed to be displayed, interacted with and personally adjusted. It aims to deliver not just sound, but an experience: one that reflects Devoonsounds' values while responding to wider changes in the way people want to connect with music.

# Methodology

The project follows the Double Diamond Method (see Figure 1), a design framework that provides a systematic approach to problem solving. The process is divided into four distinct phases: Discover, Define, Develop and Deliver, with each phase building on the insights and decisions of the previous one.

The Discover phase involved in-depth market and user research, including trend analysis, competitive benchmarking and user input through surveys and interviews. This phase helped identify user needs, frustrations and aspirations, as well as the gap in the market for a product that combined modern functionality with a tactile, nostalgic user experience.

The Define phase focused on framing the design problem, setting clear objectives. It also defined the market gap and target audience, while outlining the key requirements for the product. By combining insights from user research with design trends, a strong foundation was laid for the final product.

The Develop phase was a deep dive into form exploration and ideation. This phase explored different design directions, including form analysis, mood boards and prototyping of interactions such as opening mechanisms and speaker stands. The iterative nature of this phase helped to refine the product concept and ensure that the design of the speaker met the preferences of the target audience.

Finally, the Deliver phase focused on finalising the speaker design based on user input, iterative feedback and testing. The stand design, opening cap mechanism and interaction feedback were integrated to create a cohesive final product. This phase emphasises the importance of user validation to ensure the product meets both functional and emotional needs.

Using the Double Diamond method, the project's design process was structured to ensure clarity, creativity and precision to deliver a product that meets the values and expectations of the modern nostalgist. The culmination of this process is a loudspeaker that creates an emotional connection through its tactile interaction and timeless design and gives users the possibility to personalise their sound experience.

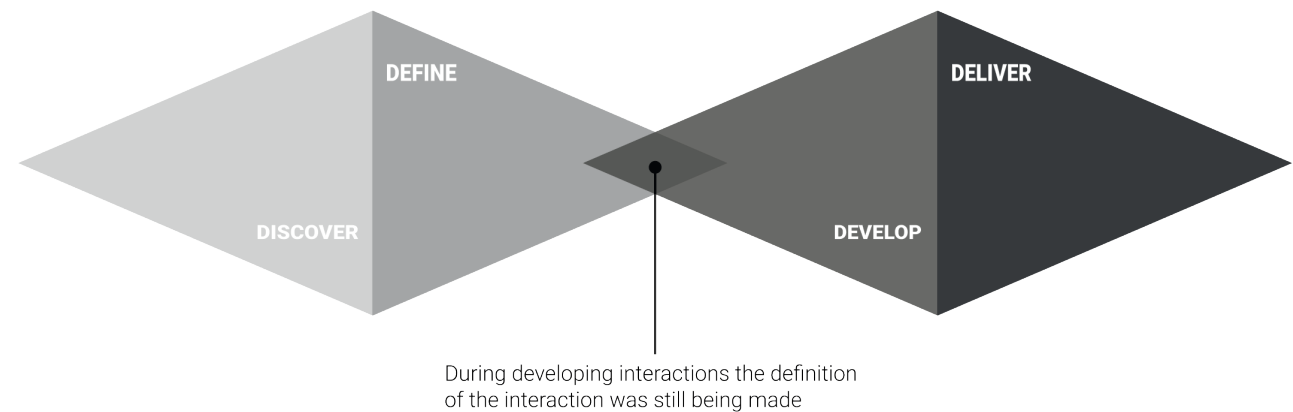


Figure 1. Double diamond method visualised

# Devoonsounds

This project is in collaboration with Devoonsounds, a high-end audio brand combining modern technology with craftsmanship to create unique and functional audio products. Positioned in the premium segment, Devoonsounds sets itself apart by blending innovation with design inspired by historical references. Their flagship product, the Devoon speaker, takes inspiration from the Devonian period, around 400 million years ago, when fossils were first discovered in Devon, England. This connection to geology informs the design philosophy, focusing on creating products that are both durable and timeless.

The Devoon speaker uses concrete as its primary material (see Figure 2). Concrete not only offers durability but also enhances the speaker's acoustic properties by absorbing unwanted frequencies, improving sound clarity. This material choice supports the brand's goal of producing long-lasting, high-performance products. Additionally, concrete's malleability enables sculptural, organic designs that maintain the speaker's functionality, combining artistic freedom with acoustic performance.

Crafted in Amsterdam, Devoonsounds combines craftsmanship and modern 3D printing techniques. This fusion allows the brand to offer products with both unique visual appeal and good sound quality. The speaker's minimalist design, with an unpolished finish, showcases the textures left by 3D printing, positioning the speaker as not only a functional device but also an unique piece that fits into modern living spaces without the need to be hidden away.

Devoonsounds operates within the premium to luxury audio market, positioning itself alongside high-end brands such as Bang & Olufsen and Devialet. The company's use of materials like concrete, its blend of craftsmanship with modern 3D printing technology, and its emphasis on distinctive, sculptural design contribute to its premium pricing. Devoonsounds' speaker falls within the €1,000 to €3,000 range, targeting consumers who prioritise aesthetics, craftsmanship, and good audio quality. This price segment reflects the brand's focus on delivering a unique combination of design and functionality, appealing to a niche market that values both luxury and high performance.

The speaker integrates modern technological features like Bluetooth and Wi-Fi connectivity and includes a mobile app for easy control. These modern features create the ease of use that modern consumers are used to and the freedom for the users to be able to listen to different music platforms they desire.

This thesis aims to contribute to Devoonsounds' product portfolio by designing a new speaker that integrates tactile interaction while being a functional aesthetic piece. The goal is to enhance the user experience by creating a product that resonates with today's consumers, while offering lasting visual appeal. The project will expand the Devoonsounds product range, combining market research, user insights, and design development through prototyping and 3D modelling. The challenge is to design a product that aligns with Devoonsounds' values while addressing emerging market opportunities.

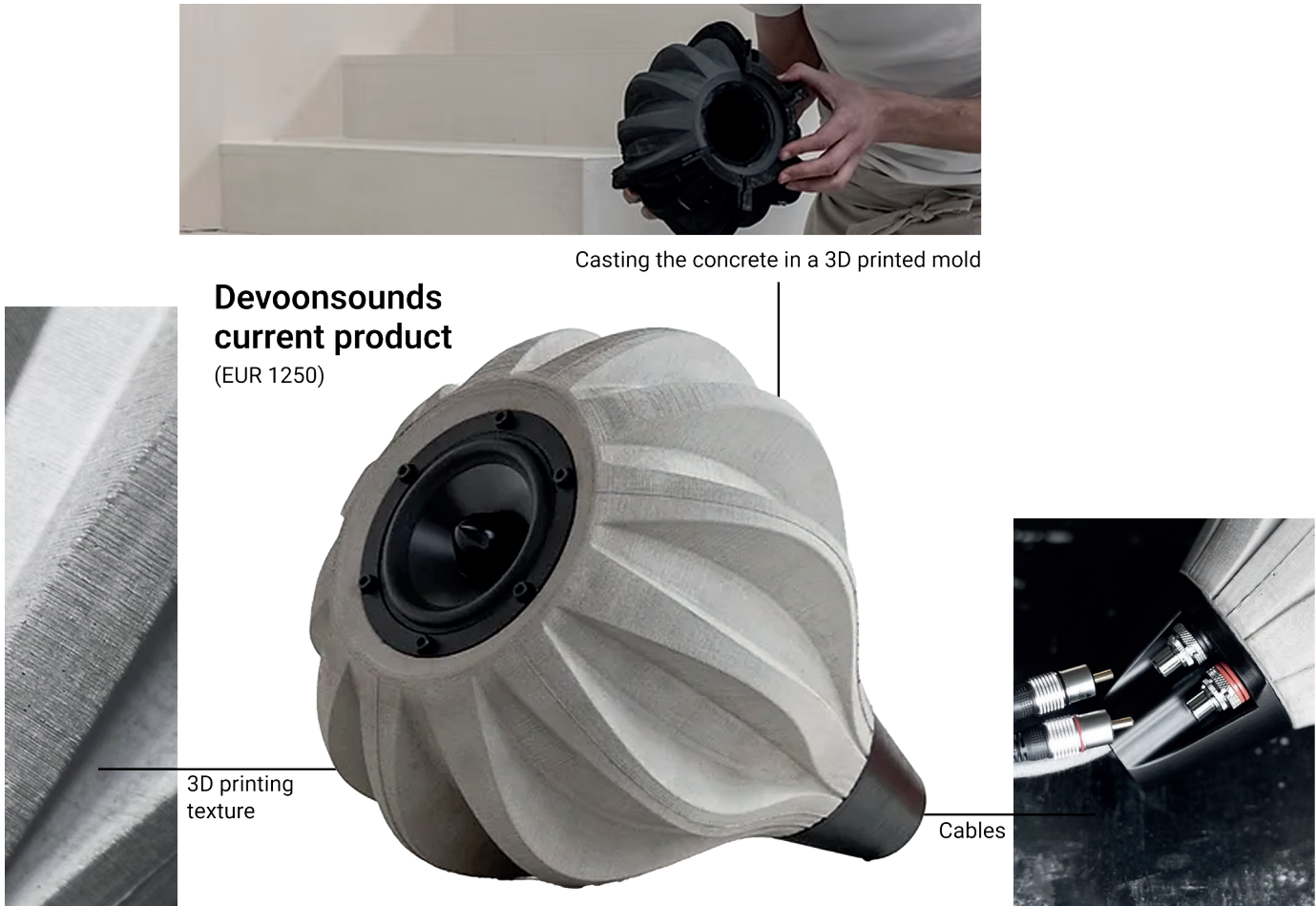
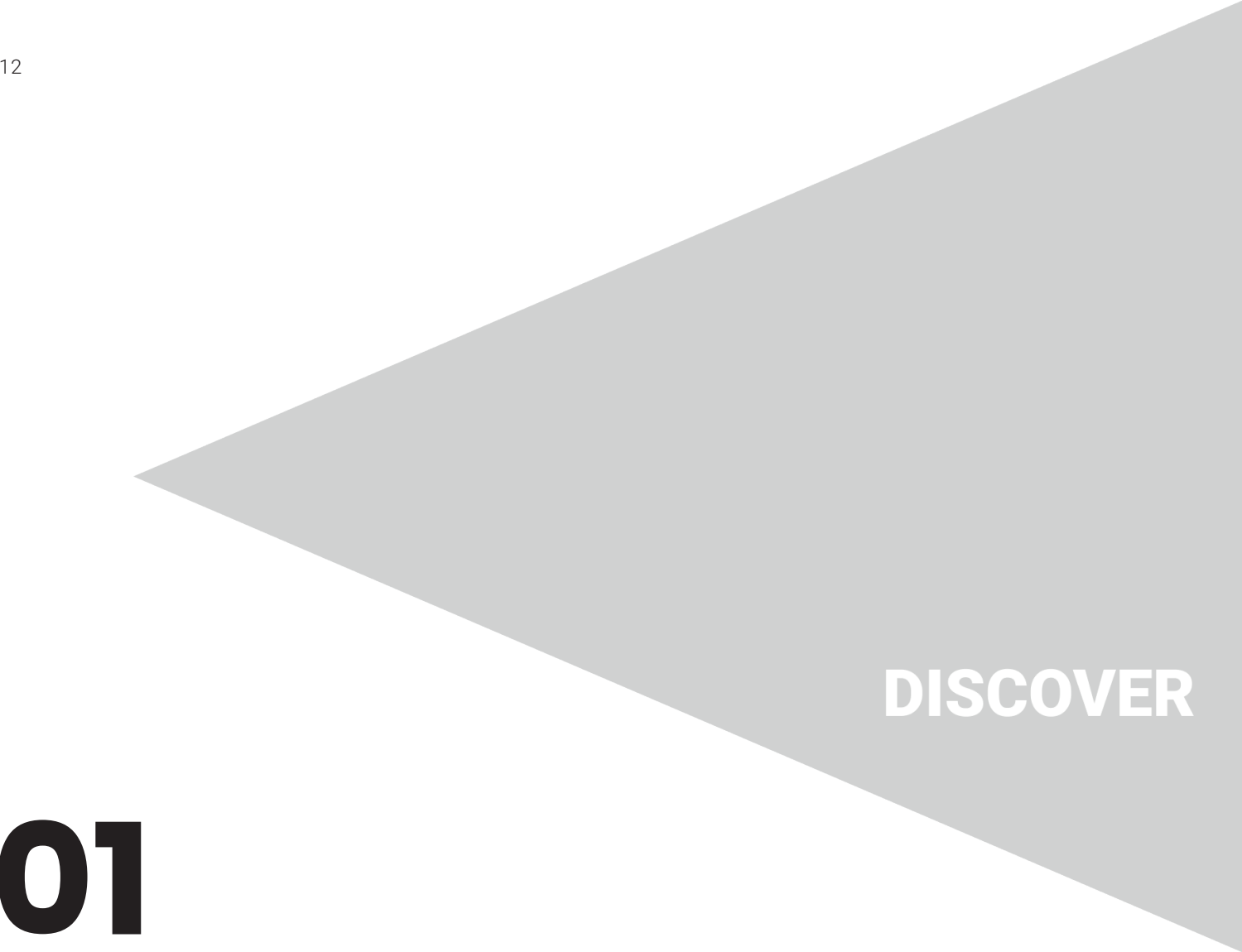


Figure 2. The current product of Devoonsounds. Images were sourced from Devoonsounds (2025).





# 01 Context research

Building on Devoonsounds' aim to expand its product range, the Discover phase focuses on gaining a deeper understanding of the market and target group. This phase discovers emerging opportunities, identifies gaps, and explores user needs to guide the development of the new speaker.

Market research, including trend analysis, benchmarking, and SWOT analysis, evaluates the current landscape and highlights market opportunities. Meanwhile, user research (using tools like customer journey mapping, surveys, and interviews) provides insights into consumer behavior and expectations.

These combined insights will help define the design challenge, align objectives, and shape the initial product concept, ensuring it meets both market demands and user desires. This phase lays the groundwork for the following stages of the design process.

## Market research

A thorough market analysis was conducted to position the new speaker within a competitive landscape. The objective was to identify emerging trends, assess competitors, and uncover opportunities for differentiation. This research aimed to understand consumer preferences, the competitive landscape, and market trends, which will guide the design direction.

Given the saturated nature of the speaker market, a competitive analysis consisting of market insight, benchmarking and SWOT analysis was conducted using premium, design-led brands: Sonos, Devialet, Bang & Olufsen and Concrete Audio. These companies were selected based on their relevance to the target price range (€250-€6000), target demographic, and aesthetic appeal. Additional trend insights were gathered from Bowers & Wilkins and industry articles from Fast Company and Wired.

A SWOT analysis of the current product, including a SWOT matrix, was conducted to evaluate Devoonsounds’ strengths, weaknesses, opportunities, and threats relative to competitors. This analysis provided key insights for differentiation and helped refine the design direction.

### Competitor insights

From the analysis of the selected brands, the following brand strategies emerged:  
Devialet Phantom (Price range: €1.100-€3.600): Positioned as a luxury lifestyle product, Devialet Phantom combines cutting-edge technology with a futuristic design (see Figure 3). Its focus on engineering excellence appeals to high-end consumers seeking exceptional performance and a status symbol. The brand’s high-performance reputation serves to solidify its position in the luxury speaker market.

Sonos (Price range: €229,00-€649,00): Sonos focuses on user-centric design and seamless multi-room integration, appealing to tech-savvy and lifestyle-oriented consumers (see Figure 4). Notable features like Sound Swap, which allows users to easily switch audio between Sonos products, enhance its value proposition. The brand also emphasizes sustainability, attracting environmentally conscious users, while its community involvement and commitment to sound-related research reinforce customer loyalty and relevance.

Bang & Olufsen (Price range: €1.400-€160.000): Bang & Olufsen merges design-led innovation with premium craftsmanship, positioning its speakers as functional art (see Figure 5). The brand’s recent shift toward modular, sustainable designs demonstrates its commitment to long-lasting products. Its speakers are not only technological devices but also design statements, appealing to consumers who value premium craftsmanship and aesthetic value.

Concrete Audio (Price range: €5.950-€17.440): Concrete Audio differentiates itself by using concrete as a primary material, emphasizing both acoustic benefits and industrial aesthetics (see Figure 6). This appeals to audiophiles and design enthusiasts who value unique materials and craftsmanship. The brand highlights the importance of distinctive design alongside high-quality sound.

This competitor analysis provided a clearer understanding of the current premium speaker market and the positioning strategies used by leading brands. It highlights the importance of combining high-quality sound performance with strong design identity, emotional appeal, and material storytelling.



Figure 3. Sourced from Devialet (2025).



Figure 4. Sourced from Sonos (2025).



Figure 5. Sourced from Bang en Olufsen (2025).



Figure 6. Sourced from Concrete Audio (2025).

Benchmarking sale price

The benchmarking was done to compare the current Devoonsounds speaker with other speakers on the market. The speakers were ranked by price to see who the direct competitors are and how the different price points compare (see Figure 7). Bang & Olufsen are known for their speakers being design statement pieces, they are in the top range of speakers, reflecting that consumers are willing to pay more for more aesthetic design. In the higher segment, the speakers have more unique, rounded shapes, while in the lower segment the design is more cubic. Looking at the shapes and prices of the speakers, Devoon is positioned within the designs and prices of its competitors, although its competitors have the advantage that people know and trust their brand more.

The price range for the new Devoonsounds product was chosen based on an analysis of competitors offering a similar focus on aesthetics and design. Brands like Devialet, Ruark, and KEF show that customers are willing to pay between €1000 and €1300 for speakers that combine strong sound performance with distinctive, sculptural design. Positioning Devoonsounds in this segment allows it to compete directly, offering a more tactile and design-driven alternative to more conventional options.

By targeting this range, Devoonsounds can strengthen its brand image as a maker of high-quality, visually striking products, while staying accessible to consumers who value both sound quality and design. It also creates a clear position between the mass market segment (below €800) and the ultra-premium market (above €4000), offering a balanced mix of exclusivity and accessibility.



Figure 7. Different speakers ranked from high to low priced. Sourced from: BO, Devoon, ruark, devialet, BW, sonos, harman kardon, (Acoustic Sculpture, 2025), (Cabasse, 2025), jbl, (LSX II, 2025), q acoustic, (Klipsch, 2024), (Polk Audio Global, 2025)



Competitor market trends

To identify key market trends for this speaker design project, an analysis of competitor brands was conducted, examining their websites, brand identities and social media channels. A combination of content analysis was used to gain insight into how companies present themselves, the values they promote and the key selling points they emphasise to their audiences. This process helped me identify the key trends currently being used by companies that are shaping the speaker market.

The analysis of the brands used in the competitor analysis also revealed the following market trends:

Sustainability

A growing demand for eco-friendly products is evident, with consumers increasingly prioritizing speakers that are modular, repairable, and recyclable. Brands like Sonos and Bang & Olufsen are incorporating durable, sustainable materials and focusing on long-term usability, aligning with the shift toward environmentally conscious products.

Aesthetic Innovation

Speakers are increasingly being viewed as home decor, with a growing trend for speakers made from unique materials (such as concrete and fabric) and sculptural designs. This trend caters to design-conscious consumers who seek to integrate technology seamlessly into their living spaces, blurring the lines between functional technology and art.

Technological Expectations

Consumers are placing greater importance on seamless connectivity, smart home integration, and intuitive user interfaces. Features like Sonos' Sound Swap highlight the need for enhanced user experiences that go beyond just sound quality, focusing on ease of use and effortless interaction.

Emotional Connection

There is a growing recognition of the emotional impact of sound on mood, relationships, and productivity. This is becoming an important selling point, as demonstrated by Sonos' Brilliant Sound Survey, which emphasizes the importance of emotionally resonant sound in the modern listening experience.

Trend research

In addition to competitor analysis, broader consumer trends were analysed through desktop research:

Emotional Fixtures (The Future 100, 2024)

Consumers are increasingly designing personal spaces to evoke positive emotions such as security and calm. The home is becoming a safe space. Speakers that complement calm, welcoming interiors continue to grow.

Creator-to-Consumer (C2C) Model (The Future 100, 2024)

Consumers trust creators and influencers for product recommendations. Partnering with creators or showcasing your own creative process can increase brand visibility and authenticity.

Aesthetic Innovation (Fast Company, Wired analysing

different speaker articles)  
Growing demand for speakers that double as design objects.  
Designs that balance "tech as status pieces" with subtle, home-friendly aesthetics resonate with consumers.

Gen Z Nostalgia (Otto, 2024)

Younger consumers are looking for products with retro symbolism to counterbalance digital overload. Nostalgic designs combined with modern functionality appeal to this demographic.

Symbolism in Product Design (Kujala, 2009)

Symbolic meaning is an important factor for consumers when choosing products. Elegant designs that symbolise high quality music appeal to consumers who want to express themselves through their purchases.

Understated, Visually Appealing Designs (Markets, 2023)

Sleek, minimalist designs that blend in with home decor are increasingly favoured.

In addition, three trends are discussed in more detail.

Listening bars

The decline in the number of club venues in the UK, which has fallen by almost a third since 2010, reflects a wider shift in consumer behaviour towards investing in quality experiences rather than large entertainment venues (Hylton, 2024). A key driver of this trend is the rise of hi-fi listening bars, a concept inspired by Japan's kissa cafes. These venues, which feature carefully curated sound systems and immersive audio experiences, provide a space for people to enjoy music in an environment that emphasises both high-quality audio and a relaxed, social atmosphere.

Hi-Fi listening bars, such as those in Europe, North America and Oceania, are designed with advanced sound systems, often including elm horn speakers, premium drivers and powerful subwoofers that double as lighting features. These spaces serve coffee by day and cocktails by night, creating a unique multi-sensory experience. The Japanese influence, where listening cafes were originally built around jazz collectors and high-end stereo systems, continues to inspire, although modern iterations often incorporate social elements such as conversation, making the experience more accessible while maintaining high fidelity sound.

This trend highlights a growing desire for focused listening experiences and a deeper connection to music, which is relevant to the design of new audio devices. Consumers are looking for more than just functionality; they want to create ritualistic, immersive moments with high-quality sound in their homes or public spaces. Designing a loudspeaker for this market requires an understanding of these evolving needs - combining not only audio performance but also aesthetic value and the ability to fit into spaces where people can engage with music in a meaningful way. The success of the Hi-Fi bar trend suggests that there is a growing market for products that deliver sound quality and enhance the emotional connection with music.

Emotional wellbeing

The trend towards mental wellbeing is reshaping consumer preferences, particularly in the design of personal spaces. Consumers are increasingly creating environments that evoke positive emotions, focusing on feelings of security, calm and acceptance. This shift reflects a broader desire for emotional comfort in everyday life, with the home becoming a sanctuary for relaxation and mental rejuvenation. Companies such as Ikea, with its collaboration with designer Sabine Marcelis on the Varmblxt collection in 2023, are embracing the idea of lighting and homeware as emotional furnishings, moving away from purely functional design towards products that promote emotional well-being (The Future 100, 2024).

This consumer interest in emotional wellness extends to everyday household appliances and furniture, with a growing demand for products that contribute to comfort and serenity. This trend has led to a rise in speakers designed to complement calming, welcoming interiors, in line with the wider desire to create spaces that promote emotional wellbeing (The Future 100, 2025).

In the workplace, wellness-focused offices, often referred to as the 'hotelification' of offices, are also gaining popularity (The Future 100, 2025). Companies are now prioritising employee wellbeing by transforming offices into wellness sanctuaries and community hubs, aiming to create a positive, stress-free environment that improves work-life balance.

These trends are indicative of a broader cultural shift towards healthy lifestyles with a focus on convenience, comfort and stress-free experiences. In terms of the design of the speaker, this emphasises the importance of creating a product that not only delivers high quality sound, but also integrates seamlessly into environments that prioritise tranquillity and comfort. The speaker should complement spaces where people can unwind and promote a holistic experience that meets the growing need for emotional wellbeing in everyday life.

The analog movement

In response to the increasingly fast-paced, digital-centric world, analogue activities have gained significant traction. As noted in The Future 100 (2025), there is a growing trend to turn to analogue activities as a form of respite from the constant stimulation of digital technologies. Stefan Walters, a psychological therapist, explains that analogue activities evoke comfort and nostalgia as they reconnect individuals with more tangible, tactile experiences. He stresses that engaging with physical objects, rather than screens, provides a primal, immersive experience that fosters a deeper connection.

This trend is particularly evident among younger generations, as seen in the Luddite Mode movement (The Future 100, 2024), where people under 25 are increasingly drawn to physical formats and hands-on activities. This shift represents an act of identity assertion and a rejection of the overwhelming noise of the 24/7 digital cycle. It's seen as a desire for authenticity and meaning, as well as an antidote to the constant stream of information from social media.

Examples of this analogue revival include The Offline Club in the Netherlands, where participants give up their phones to enjoy meaningful, distraction-free connections, and the reimaging of book clubs, such as Reading Rhythms in New York, which combines reading with live ambient music to create a multi-sensory analogue experience. Similarly, in China, young people are taking up pottery, side hustles and other analogue hobbies in search of personal fulfilment and a break from the digital world (Chinadaily, 2024).

Just as people are seeking meaningful analogue experiences to counterbalance digital overload, there is an opportunity to design a speaker that delivers more than just sound. By integrating tactile interactions and ritualistic design elements, the speaker can serve as a tangible, physical product that offers a break from digital distractions and allows users to reconnect with the physicality of their environment. This aligns with the growing consumer interest in immersive, analogue experiences that promote well-being and emotional engagement.

Trend takeaways





SWOT analysis

To better understand the position of Devoonsounds' current product in the market, a SWOT analysis (Van Boeijen et al., 2013) was conducted. This analysis helped identify the product's key strengths, limitations, and opportunities for differentiation in the competitive audio landscape (see Figure 8).

Strengths

Devoonsounds’ speaker stands out through its raw, industrial aesthetic and the use of cement as a primary material—an unconventional choice that appeals to design-conscious users seeking something unique. Cement not only offers strong durability but also allows the form to influence sound quality. Additional strengths include the potential for customization and a nostalgic design language that resonates emotionally with users.

Weaknesses

Despite these strengths, several challenges were identified. Cement is not a common material for audio products, which means that consumers may require more education and reassurance about its performance and aesthetic value. The speaker’s relatively high carbon footprint compared to other sustainable materials is another concern. Devoonsounds also faces limitations due to being a relatively unknown brand with low market awareness, and its current portfolio consists of only a single product. This narrow offering may make it harder to build customer loyalty and compete with larger, more established brands like Sonos and Bang & Olufsen. Additionally, the fast pace of technological innovation increases the risk of rapid product obsolescence.

Opportunities

There is a clear opportunity to position Devoonsounds by focusing on emotional connection, tactile interaction, and sculptural aesthetics. As users increasingly value meaningful and sensory experiences over purely technical performance, the brand can carve out a distinctive space in the high-end audio market. Offering more customization and reinforcing the speaker’s tactile qualities could further differentiate it from traditional, tech-driven competitors.

Threats

The main threats include strong competition from established brands with loyal customer bases, as well as an already saturated market offering a wide range of speakers at various price points. Rapid technological developments could also challenge the long-term relevance of the product if innovation does not keep pace with evolving user needs.

Conclusion

The SWOT analysis highlights Devoonsounds' distinctive design language and emotional appeal as key strengths. To build on this foundation, the brand needs to address challenges such as limited brand awareness, unfamiliar use of materials and a narrow product portfolio. This project aims to retain Devoonsounds' sculptural identity while exploring nostalgic interaction as a way to stand out in a saturated market. Strengthening emotional engagement through tactile design and broadening the product range will be essential steps towards increasing the brand's presence and long-term viability in the high-end audio landscape.

Strengths

**Distinctive aesthetic:** The raw, industrial look of cement sets speakers apart from the competition and appeals to design-conscious consumers who value unconventional materials.

**Durable:** Cement is a highly durable material.

**Industry differentiation:** There are few direct competitors using cement as the primary material for speakers.

Helpful

**Customisation/Modularity:** Give customers the opportunity to shape the product to their vision.

**Sound box:** Enhance or diminish sound quality by shape.

**Nostalgic design:** A design that evokes nostalgia and comfort in people.

**Reduce electronic waste:** Reduce the amount of electronic waste to reduce the overall sustainable impact.

Opportunities

Figure 8. SWOT analysis matrix of current company product.

Weaknesses

**Consumer awareness/trust:** Cement speakers are a new concept and there may be a need for consumer education to explain the benefits of cement as a material, both in terms of sound quality and aesthetics.

**Limited products:** Only having one product in their brand.

**Carbon footprint:** Compared to other more sustainable materials, the carbon footprint of cement is relatively high.

**Unknown brand name:** The brand is not yet known by consumers who are looking to buy a speaker.

Harmful

**Saturated market:** Lots of competitors. Target audience often already own speakers from different brands resulting in direct competition when presenting this speaker.

**Established brands:** Competing with well-known brands such as Sonos, Bowers & Wilkins and Bang & Olufsen, which have strong brand recognition and customer loyalty.

**Technological Obsolescence:** Rapid advances in audio technology could render the product's features outdated.

Threats

Internal Origin

External Origin



Purchase customer journey

To better understand user behaviour and the SWOT weakness of consumer awareness, a customer journey map was developed to explore how consumers research and select new speakers. The findings showed that brand recognition and validation through social networks, such as friends and family, play a critical role in building trust and influencing purchasing decisions. Unlike more established competitors, Devoonsounds currently lacks strong word-of-mouth recommendations and direct exposure within consumers' immediate environments.

To compete effectively, Devoonsounds must differentiate itself during the discovery phase by offering unique value beyond brand familiarity. Questionnaires and interviews will be used to identify what consumers feel is missing in existing speaker offerings, providing opportunities for meaningful differentiation. In parallel, strengthening brand trust and visibility through strategic marketing, collaborations, and user advocacy could help build the social proof needed to support consumer decision-making.

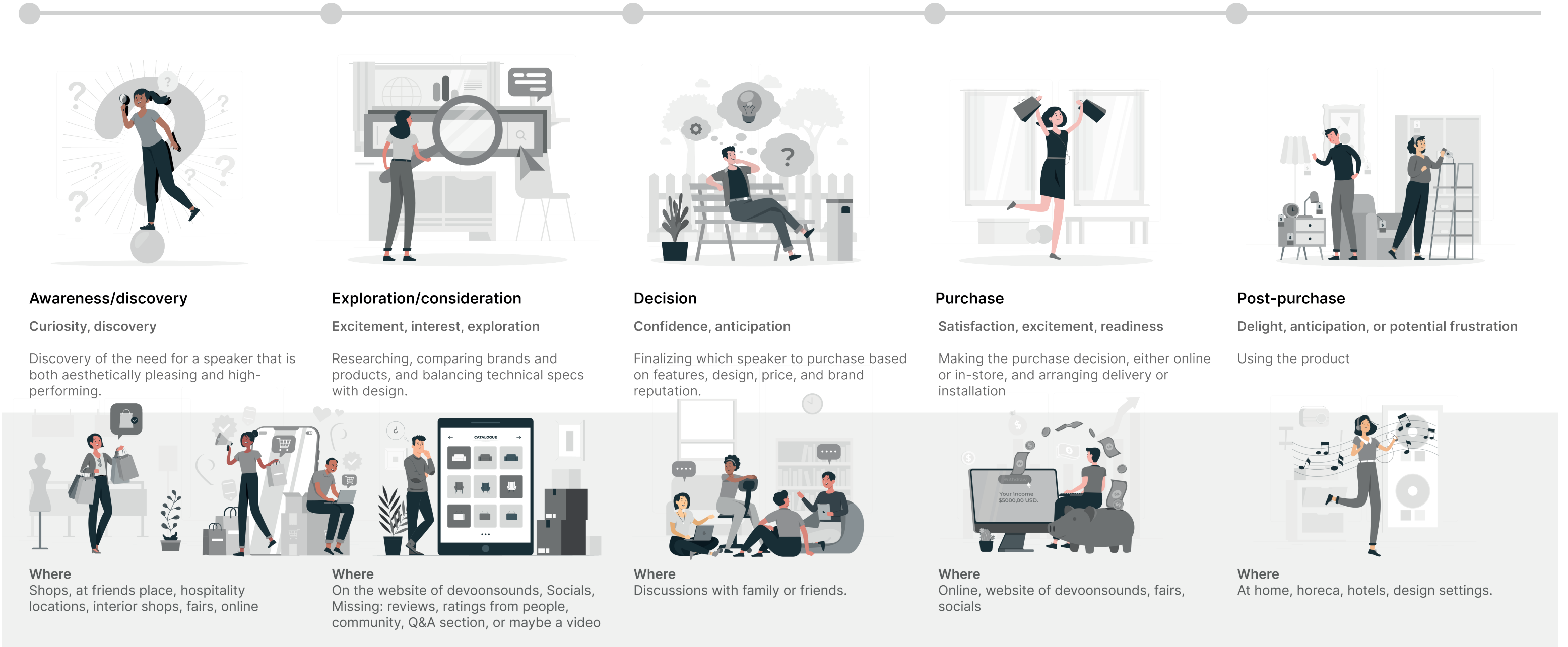


Figure 9. Purchase customer journey visualised. Pictograms sourced from Storyset (2021)

Online survey

An online survey was conducted using Google Forms to gain initial insight into consumer preferences and pain points when using loudspeakers. The survey was distributed within the personal network and received a total of 68 responses. The demographics of the respondents were as follows: 47.1% were aged 18-24, 27.9% were aged 25-34 and 25.1% were aged 35 and over (see Figure 10). The majority of respondents were male (63.2%) and 35.3% were female. The survey consisted of both open and closed questions, including rating scales from 1 to 5. The aim was to identify key issues and explore consumer desires in order to gain a better understanding of a potential market gap and target audience. The full questionnaire can be found in Appendix A.

The online survey served as an initial exploration to connect with consumers and gain insight into the speakers they currently own, as well as their needs and preferences. It helped identify common frustrations with existing speakers, as well as how and where consumers use them. The survey also included questions on frequency and context of use, providing valuable data on consumer behaviour. Respondents rated various speaker features, providing insight into the most valued aspects of speaker design. In addition, information about brands and listening devices helped to contextualise the results.

Primary activities

The most common use for speakers (see Figure 11) was background music during relaxation (40.9%), followed by working or studying (22.8%), and social gatherings (17.5%). The participants of this survey are not in line with the later identified target group, but create an understanding of the average consumer. These insights highlight the need for a versatile speaker design that can accommodate both personal and social settings.

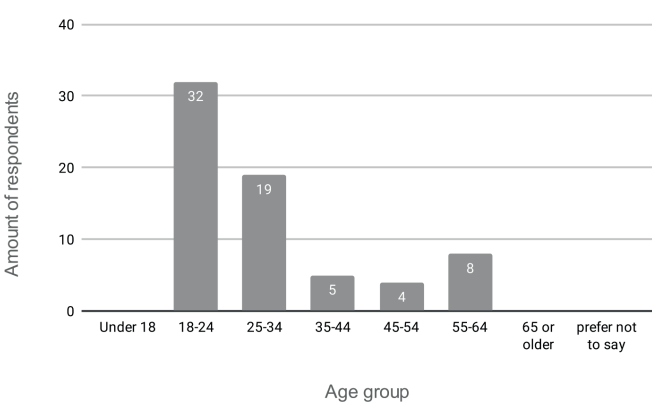


Figure 10. Age chart of survey respondents.

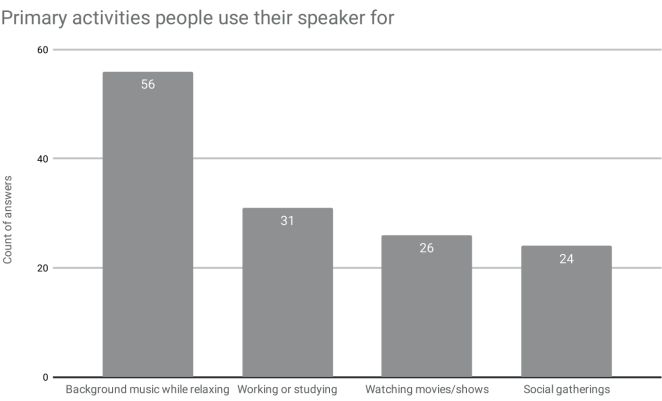


Figure 11. Chart of primary activities survey respondents use their speaker for.

Primary speaker features rated

The survey results revealed that sound quality was the most valued feature, followed by design/aesthetics, ease of use, size, and durability (see Figure 12). These findings emphasise the importance of a product that combines high-performance audio with a visually appealing and user-friendly design.

Primary speaker aspects people enjoy most

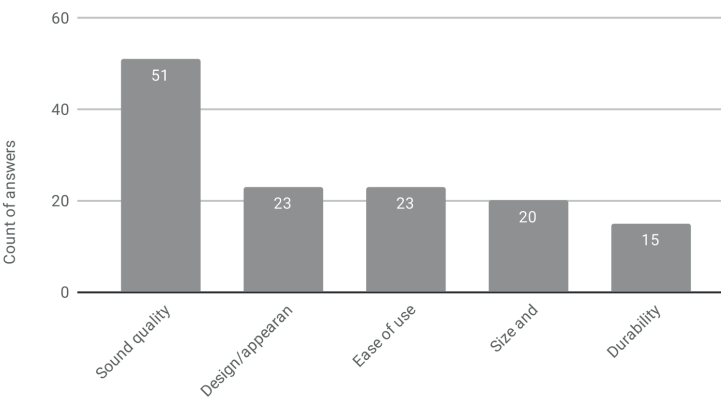


Figure 12. Age chart of survey respondents.

Conclusions and next steps

Findings from the survey include:

Design and functionality priorities

The survey affirmed that sound quality, ease of use, and aesthetic appeal are critical for the consumers. This insight gives an understanding of what criteria the new speaker design could be of interest.

Usage context

The dominant use of speakers for background music during relaxation and social settings suggests a need for a versatile design that caters to both intimate and social environments.

Target group insights

While useful, the survey sample did not fully represent the intended target group, modern nostalgists, that was later on selected. Future research will aim to gather feedback from this specific target group.

Limitations of the survey

The main limitation of this survey is the mismatch between the respondent demographics and the later on selected target group for the final product. Most respondents were young adults, predominantly male, and many were students. This difference could influence findings related to emotional engagement and product expectations. Further research will focus on gathering more targeted insights from users who align with the traits and needs of modern nostalgists, ensuring the product meets their specific desires.



Expert insights

To deepen the understanding of user preferences, a series of interviews were conducted with four distinct groups: field experts, design enthusiasts, interior designers, and modern nostalgists. These groups were selected to capture a broad spectrum of perspectives from different groups of consumers on speaker design.

Field Experts

Experts in acoustics, hi-fi and product design were consulted to gain a better understanding of the field and the diverse niche segments. They presented their areas of expertise and shared their knowledge. The following findings emerged from these interviews:

**A Hi-fi loudspeaker shop owner** was contacted to see if there was potential in designing for the hi-fi loudspeaker segment:

Gendered decision-making was noted by this shop owner, with men focusing on technology and women influencing design choices based of how it looks in their homes: “De vrouw heeft aan het einde wel inspraak over of de speakers in het huis passen (grootte, vorm, kleur), maar mannen selecteren vaak op de technologische aspecten.”

He shared the observation that customers are willing to pay more for high-quality, ethically (locally) produced products: “Mensen zijn bereid meer te betalen voor iets wat niet uit China komt.”

During this interview it became clear that in the field of hi-fi, it would mean creating a loudspeaker that is purely focused on sound quality, and that current hi-fi loudspeakers have taken many years of optimisation to achieve this level of sound quality. As achieving such a level of sound quality would require expert knowledge and time, it became clear that this would not fit within the time frame of this project.

**A specialist in acoustic metamaterials** (sound damping innovations on materials) was consulted to explore how material properties and manipulation can influence the acoustic properties of a material. The initial scope of this project was to improve sound quality through the shape and material of a loudspeaker, therefore the influence of material on sound was explored in this interview:

Introduced: the potential of acoustic metamaterials for optimising sound quality through sound-absorbing properties.

Recommended: fibre cement for its sustainability and damping properties compared to traditional cement.

Suggested: the use of simulation tools such as COMSOL for prototyping and testing acoustic performance.

As the scope of the project was later changed to focus on tactile interaction, this interview was still useful to explore the influence of perforation, surface texture and material density. This knowledge was still relevant for material knowledge.

**A specialist in 3D printing** (More Than Layers employee) was approached at Dutch Design Week to talk about the possibilities of 3D printing the final product of this project:

Shared expertise in recycled materials such as fishnets and fibreglass to improve stability and reduce shrinkage in 3D printed components.

Proposed collaborative opportunities to integrate 3D printing for sustainable, custom-designed speaker elements.

It was interesting to hear about their innovation within 3D printing and how they reuse different materials in their prints. Devoonsounds are also currently using 3D printing to produce their speakers and have been talking to them to explore innovative 3D printing techniques that could be applied to producing speakers for future products. Manufacturing is not the focus of this project, so the knowledge gained provides manufacturing opportunities, but is not detailed in this report.

Design enthusiasts

Design enthusiasts, including individuals who prioritize aesthetics in their home interiors, emphasized the need for speakers that seamlessly integrate into modern living spaces.

(N=4, F=2 and M=2):

Focus on aesthetic integration in their homes:

“Je hebt een huis en je wilt dat het mooi is.”

Desire practical designs:

“Kan niks neerzetten op de grond, want dat vind ik gewoon niet praktisch.”

Willing to invest in high-quality, customizable products that align with their interiors.

For this group, speakers are not only functional but also serve as design elements. They appreciate minimalist and sculptural forms that enhance the visual appeal of a room. They also expressed a preference for customisability, seeking products that align with their unique interior styles. These insights suggest that modern nostalgists are also highly concerned with how speakers fit into their overall home aesthetic and reflect their personal style.

Interior designers

Interior designers were approached through the clients network and highlighted the importance of early-stage planning in speaker placement when talking about their current experiences during interior jobs.

(N=2, F=2):

Stress the need for early planning to integrate speakers seamlessly into spaces:

“Eigenlijk zou iedereen bij een lichtplan ook meteen de speakers mee moeten nemen.”

Observed a lack of knowledge about speaker placement in the design community:

“Veel ontwerpers weten hier helemaal niks van af, dus ik denk wel dat daar een kans ligt.”

Emphasized the role of speakers as accessories that enhance ambiance:

“Een speaker is dan een accessoire wat ook nog eens een toevoeging geeft.”

They noted that speakers should integrate smoothly into various room layouts, emphasizing flexibility in placement and adjustability. They also pointed out the potential for speakers to act as design accessories, contributing to the ambiance of a space. This feedback suggests that the design should allow for ease of movement and customization, not just in terms of function but also for design versatility.

Modern nostalgists

Modern nostalgists were identified as individuals who own and actively use both vintage audio devices, such as vinyl players, and modern listening devices, like smartphones and headphones. The aim was to explore how they engage with audio technology and whether there is a preference for tactile, hands-on interactions reminiscent of older devices.

(N=4, F=3 and M=1):

Value simple, tactile experiences:

“Soms heb ik zin om verrast te worden, en dan zet ik de radio aan.” - interview

“Right now I have to connect it with cables to an amplifier and then connect with Bluetooth or my record player, which might sound like a hassle, but that’s exactly what I like about my sound system, how it is more old-fashioned.” - survey respondent

Seek disconnection from smartphones due to ‘streaming fatigue’:

“Ik vind het lekker niet altijd bezig te zijn op m’n telefoon en na te hoeven denken wat ik op ga zetten.”

Insights from this group revealed a clear demand for products that combine vintage-inspired tactile controls with the convenience of modern technology. They value speakers that offer physical interaction, such as turnable dials or touch-based adjustments, and prefer devices that serve as functional art pieces within their home.

Conclusion

The interviews gave valuable insights into the needs and preferences of different user groups, including modern nostalgists, design enthusiasts, interior designers, and field experts. While each group had its own perspective, a common thread emerged: wanting a speaker that elevates their spaces aesthetically.

From these conversations, modern nostalgists clearly stood out as the most promising target group. They appreciate the physical interaction offered by vintage audio devices but also value the ease of modern technology. They are looking for products that not only sound good but also add character to their home environment — a balance of function, emotion, and aesthetics that fits well with the design goals of this project.

Insights from design enthusiasts and interior designers further highlighted the importance of high-quality, customisable products that fit a range of interior styles. Discussions with field experts helped set realistic expectations for material use and sound performance, making sure the focus stays on creating a rich user experience rather than just technical optimisation.

Overall, these findings helped to clearly define the direction for the project: designing a speaker that offers tactile, emotionally engaging interaction combined with strong visual appeal, tailored to the lifestyle and values of modern nostalgists.

User insight session

After having identified target group modern nostalgists a session with participants fitting this demographic was selected to participate in a user insight session. After having identified the need for tactile interaction and a blend between modern and vintage listening devices this session was created to get a more indepth understanding of where this need comes from and get a better picture of their needs and wants.

Goal of the user insight session

The purpose of this session was to better understand the preferences and needs of modern nostalgists—individuals who use both vintage and modern audio devices. The session aimed to explore how this group engages with audio equipment, what features are important to them, and how they emotionally connect with music. Insights from this session will guide the design of a speaker that meets their functional and emotional needs.

Target group identification

The session involved four participants (N=4), two females and two males. These participants were selected for their experience with both vintage audio equipment (e.g., vinyl players) and modern listening devices (e.g., smartphones, wireless speakers). This group represents the modern nostalgist demographic by having the need to use vintage and modern listening devices.

Structure of the session

The session was structured with the following activities:  
Ice breaker -> Journey & Interaction mapping -> Creating analogies that describe their listening experience -> Their frustrations -> Their ideal listening moment -> Closing thoughts and feedback, see Appendix B for the full session outline.

The journey & interaction map was really insightful in exploring what kind of listening moments they have and the different needs per moment. Although each person's map was very different when discussing their maps, they were able to relate to each other and connect to each other's needs. They shared a common need of being able to have different listening moments and disconnect for a moment

Summary of findings

Music as a Daily Ritual  
Music was seen as essential to daily routines, setting the mood for various activities such as working, relaxing, and socializing. This suggests that the speaker should enhance these ritualistic listening moments.

Device Preferences and Frustrations  
Participants preferred physical controls (e.g., dials or buttons) like those found in vintage equipment. Frustrations included time spent selecting music, connectivity issues, and lack of continuity across devices.

Personalization and Discovery  
The group wanted a system that enables seamless discovery of new music and offers personalized experiences. They were dissatisfied with the lack of integration between devices, such as not being able to move music between rooms or devices easily.

Sensorial Interaction  
Tactile feedback was highlighted as a key component of the listening experience. Participants preferred physical controls like volume knobs and felt that sensory feedback (e.g., lighting) would enhance their connection with the music.

Opportunities

The user insights gathered in this session underline the importance of music as an emotional and contextual companion in daily life. Opportunities were identified to improve how users engage with music through design that adapts to personal routines, moods and preferences.

Integration into daily routines  
Users move fluidly between activities such as working, cooking or relaxing, each with different listening needs. The design should reflect this by allowing quick and intuitive adjustments to mood or contextual settings, seamlessly integrating the speaker into daily routines.

Personalisation  
The feedback highlighted the importance of accommodating different user preferences. The speaker should support customisable features, such as adjustable sound direction, positioning or acoustic profiles, that allow users to shape their own listening experience.

Physical interaction and emotional engagement  
A strong preference for tactile interaction suggests the value of incorporating physical, vintage-inspired controls. These features not only enhance usability, but also foster an emotional connection, especially for users who associate such interactions with nostalgic audio experiences.

Next steps

In response to these findings, the design will prioritise intuitive physical interaction and offer opportunities for personalisation. The aim is to create a speaker that is more than a functional device, one that invites engagement and reflects individual listening habits. Further development will include testing interaction with a group of modern nostalgists to refine both form and functionality, ensuring the design is emotionally resonant and contextually adaptable.



Figure 13. Pictures of the user insight session.

## DEFINE

# 02 Framing

The Framing phase aims to synthesise the findings from the Discover phase and translate the insights into clear, actionable goals that will guide the design process. This section focuses on defining the design problem, outlining the design brief and setting specific design goals to ensure that the project addresses both user needs and market opportunities.

## Project brief

This project is in collaboration with Devoonsounds, a company that blends craftsmanship and local production with modern production techniques to create aesthetic audio products. Devoonsounds seeks **to expand its product portfolio by designing a new speaker that can compete in the modern audio market**. The goal is to develop a product that is not only aesthetically pleasing and functionally efficient but also has the "right to exist" on the market, meaning it meets a specific gap in consumer needs and desires. The aim is **to create a product that not only fits into the competitive landscape but also offers unique value**.

## Market gap

The speaker market is currently saturated with high-tech devices that focus on advanced functionalities such as wireless connectivity, smart integration, and voice control. However, these **modern speakers often lack the tactile engagement and emotional connection that vintage devices offer**. Consumers who miss the ritualistic interaction with their audio equipment are turning to older products as found in the trend analysis and validated in the interviews, which means there is an opportunity to design a speaker that bridges the gap between vintage emotional connection and modern ease of use.

## Target group

The primary target group for this product is modern nostalgists, individuals who enjoy both vintage and modern audio equipment. These consumers seek tactile interactions with their devices as a way to disconnect from the fast-paced, digital world. They value the hands-on experience that vintage devices provide but also require the convenience and functionality of modern technology.

### Demographics & Psychographics

- Age Range: Primarily 25-45 years old.
- Tech-Savviness: Comfortable with technology, including music streaming services and smart devices.
- Lifestyle: Engages in various daily activities (e.g., cooking, cleaning, socializing) and prefers to shape their audio experience around these tasks.

### Audio Preferences

- Listening Moments: They have multiple listening moments throughout the day, where they adapt the audio experience to match their activity.
- Music Services: They use various streaming services (e.g., Spotify, YouTube, radio) and prefer to cast these services for easy music playback.
- Vintage Devices: Despite their use of modern audio technology, they continue to own and enjoy vintage listening devices (e.g., vinyl players, radios, iPods), valuing the tactile interaction these devices offer.

### Interaction Needs

The target group's desire for tactile interaction stems from a need to disconnect from the fast-paced digital environment. Physical engagement with their audio devices - especially vintage ones - helps them create a ritualistic, emotionally engaging listening experience. However, they also require modern features such as easy connectivity and streaming capabilities to meet their lifestyle demands.

## Jackie

Age: 32

Location: Urban environment

Jackie grew up surrounded by analogue devices - turntables, vintage radios and cassette players - but as technology evolved, she embraced modern devices for their convenience and advanced features. Now a professional with a deep appreciation for aesthetics and quality, Jackie strives to maintain a balance between modern technology and a sense of nostalgia. Her home reflects this: a space filled with a mix of modern and vintage furniture. She has a passion for music and design that connects her to the past, but doesn't want to sacrifice the technological advances of the present.

*Figure 14. Persona visualised by Siew Lim.*





Design goal

The goal of this project is **to design a speaker that offers both modern functionality and tactile interaction**. The speaker should provide a smooth user experience, incorporating intuitive controls, emotional engagement, and aesthetic appeal. The speaker is intended to be displayed in a living space, differentiating it from traditional boxy speakers while maintaining a balance between nostalgic interaction and the functional needs of modern users.

Scope

This project focuses on designing a speaker that prioritizes tactile interaction and aesthetic appeal. The design will explore how physical user interactions, such as tactile controls and ritualistic actions, can enhance the listening experience while integrating into modern living spaces. The scope will include product form development, interaction design, material exploration and iterative prototyping, culminating in user testing to refine the final design. The design will make use of the client-provided technology, showcasing modern connectivity standards integrated with intuitive and engaging user experience.

Phases of the project

1. Discover phase
- This phase focuses on gathering insights and understanding the target group. Activities include:
- Market research and trend analysis to find a potential market opportunity (market gap)
- Benchmarking competitors and exploring existing products
- Conducting interviews and surveys to identify user needs and pain points
- Organizing a validation session with the target group to refine insights on their needs and wishes.
2. Define phase
- Using the findings from the Discover Phase, the project will define the design parameters, including:
- Developing the project brief and identifying the market gap
- Defining the target group and their key needs
- Establishing the design goal and scope of the project
- Outlining design challenges and formulating a list of requirements for the product

3. Develop phase
- This phase focuses on concept exploration and refinement, including:
- Brainstorming different tactile interaction ideas through sketching
- Creating rapid prototypes to test the designs and iterate through prototyping
- Conducting form exploration based on existing products, mood boards and interior trends to gain an understanding of product aesthetics
- Utilizing an emotion graph and storyboard to identify the desired user journey and emotional engagement
- Testing different materials for the speaker cones to evaluate their influence on sound quality
4. Deliver phase
- In the final phase, the product concept will be refined and validated:
- Presenting the final design with visuals, including renders and prototype images
- Conducting final user testing with the target group to validate the tactile interaction. The final user testing will validate the design's functionality, emotional connection, and user satisfaction
- Analyzing insights from user testing to iterate the final concept
- Present final design with final iterations
- Providing final recommendations for future improvements

Design challenges

The design challenge lies in balancing modern technological features with tactile, emotional interaction, while maintaining usability and aesthetic appeal. Specific challenges include ensuring that tactile interactions do not compromise the speaker's functionality or connectivity, and integrating modern technology with an emotionally resonant design that appeals to modern nostalgists.

User interaction

Designing a tactile interaction that evokes ritualistic engagement, inspired by nostalgic vintage listening devices, while ensuring these interactions do not compromise the speaker's ease of use and practical functionality.

Aesthetics

Create a compact, visually striking speaker that encourages users to showcase rather than hide, with a timeless aesthetic that remains relevant and appealing in different living spaces regardless of passing design trends.

List of requirements and wishes

Requirements

User experience

- The speaker must offer an innovative tactile interaction that distinguishes it from existing products on the market.
- Interaction design with minimal learning time; users should be able to start-up the speaker within 3 minutes of first interaction.
- Users should be able to influence their listening experience through tactile interaction, allowing for intuitive adjustments.
- Emotional engagement through nostalgia and ritualistic interaction.
- Functions as a self-sufficient object, blending with modern living spaces and encouraging display over concealment. 80% of users should find it visually appealing and display-worthy.

Form

- Timeless design reflecting simplicity with minimalistic lines.
- Compact size: Max dimensions of 35cm in width and depth.

Technology

- Support for Bluetooth and Wi-Fi connectivity; users should connect within 3 minutes after turning on the device.

Manufacturability

- Feasible production cost for small series.
- Capable of small-scale production.
- The speaker must be producible locally in the Netherlands.

Wishes

User experience

- The speaker should offer customizable finishes or colors, with at least three options to allow users.
- The speaker should allow for adjustable placement.
- The tactile interaction should enhance the overall user experience beyond basic functionality, providing added value and engagement.

Emotional connection

- The speaker should facilitate moments of mindfulness or emotional resonance, encouraging users to take intentional breaks from their routine.

# 03 Ideation

## DEVELOP

The Develop phase is where design concepts begin to take shape through Form Exploration and Ideation. Building on the insights gained in the earlier stages of research, this chapter focuses on transforming abstract ideas into tangible designs.

Form Exploration involves an in-depth analysis of existing products, interior contexts and form aesthetics, with a focus on how modern and vintage designs influence the final loudspeaker form. This includes an examination of interior analysis, form analysis of existing speakers and a comparative study of modernised versions of iconic products. Moodboards are created to capture visual inspiration and guide the development of a design that meets the desires of the target audience.

Ideation follows as the creative phase where a variety of design solutions are explored through sketches, prototypes, material testing and interaction design. This process allows experimentation with shapes, materials and interactions, helping to refine the design's functionality, usability and overall aesthetic appeal.

## Form exploration

The Form Exploration phase focuses on analyzing the visual and functional aspects of the speaker design. This includes an interior analysis to ensure the product complements contemporary living spaces, as well as a form analysis of existing speakers to understand the key design elements influencing the market. Additionally, a comparative study of old versus modern product versions highlights how nostalgia and modern design principles intersect. Moodboards are created to visually represent design inspirations, guiding the development of a cohesive and aesthetically pleasing form that resonates with the target audience.

### Interior design analysis

Understanding the placement of the product in a household is important, as it must not only fulfil its function, but also complement the existing interior design. Therefore, various interior designers and trends have been analysed for inspiration on how products are placed in spaces (see Appendix C). Based on insights into contemporary interior design trends, it is clear that there is a growing demand for products that harmonise with minimalist yet warm interiors. Interior designers and architects are increasingly recommending the use of vintage furniture in contemporary spaces to create a sense of comfort, nostalgia and cosiness (Lutyens, 2023). This trend is particularly relevant to the modern nostalgist - a target group that values timeless design and the emotional connection that vintage-inspired products evoke.

Mid-century modern design (see Figure 15), a movement that emerged in the mid-20th century, provides a foundation for creating a product that resonates with this audience. Known for its clean lines, simplicity and sustainable approach, mid-century modern design emphasises functionality without sacrificing beauty. Influenced by the German Bauhaus architects, the movement's focus on affordable, well-crafted designs that prioritised practicality over ornate detail resonated during a period of significant social and technological change. Today, the style is experiencing a resurgence due to its timeless qualities and compatibility with contemporary living (WPL Design, 2024).

Characteristics of mid-century modern design, such as organic shapes, minimalism and the use of natural materials such as wood, provide a reference point for creating a speaker that appeals to the modern nostalgist. These design elements evoke a sense of connection to nature and the past, while fitting into modern interiors. In particular, the use of wood and organic materials enhances the aesthetic appeal and helps to ground the product in the timeless values embodied by mid-century

design (Mr Bigglesworthy, 2024).

For the modern nostalgist, the mid-century modern aesthetic creates an emotional connection as it evokes a time when design was seen as both art and engineering. By embracing these principles, loudspeaker design can evoke the same emotional resonance while blending into the interior design of today's homes. The clean lines and organic materials of mid-century modernism are reflected or explored in the shape of the speaker, tactile materials connect the product to the target audience's desire for meaningful, enduring objects that transcend fleeting trends.

By understanding and applying these insights, the speaker design can resonate with modern nostalgists, providing them with an object that not only fits into their home, but also evokes feelings of comfort, nostalgia and emotional connection.

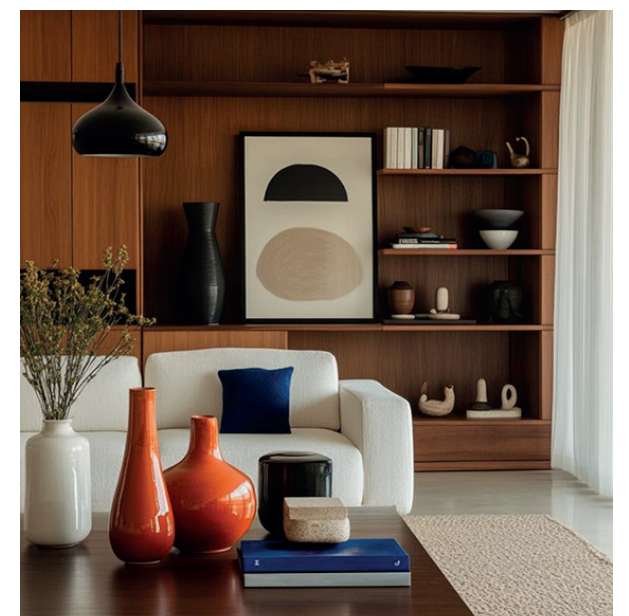


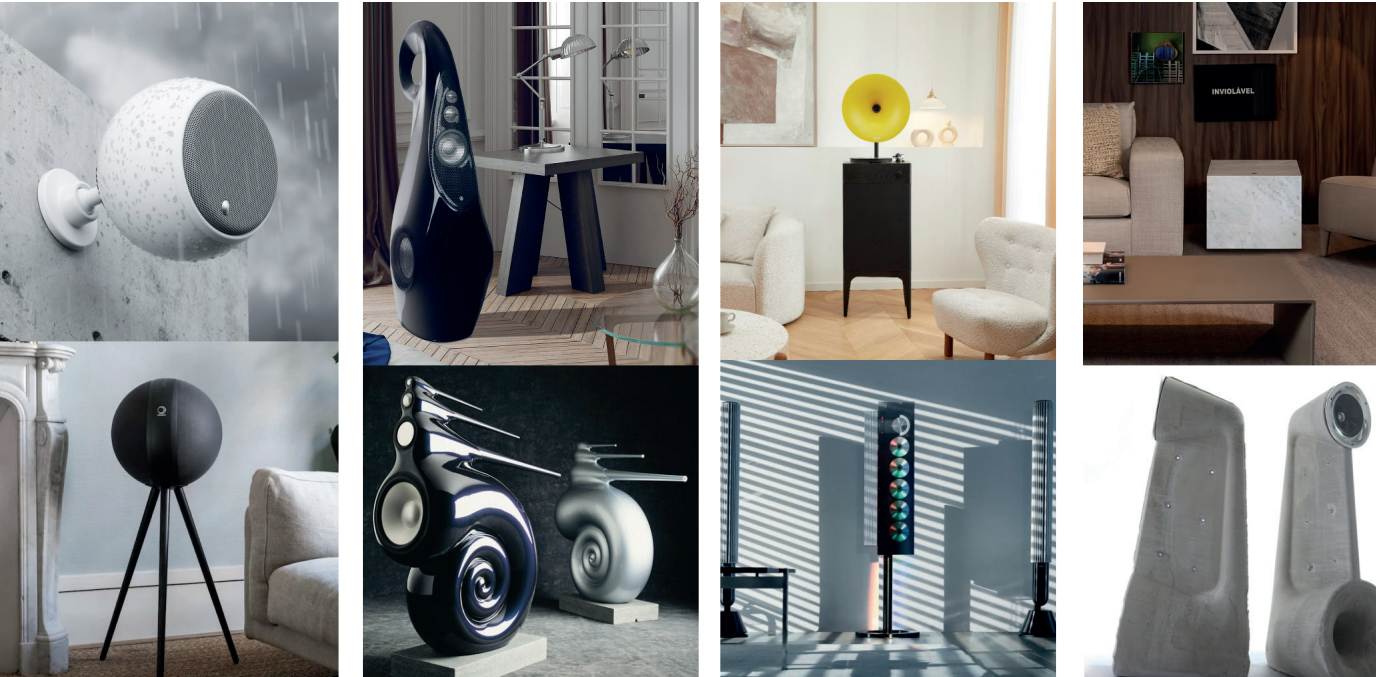
Figure 15. Examples of mid-century modern design interiors. Sourced: Helen.hjh (2024), Jamie (2025).



Form analysis of existing speakers

In order to inform the design of a speaker, research was conducted into existing speaker shapes. The aim of this research was to analyse how shape and structure affect both functionality and aesthetics. A variety of shapes were investigated, including: spherical designs, tapered tubes, high-quality materials, nostalgic and modern systems

This research was done to explore how functional elements such as resonance reduction and internal acoustics could be combined with artistic forms to offer both performance and aesthetic appeal.



- Spherical designs**

Known for reducing internal vibration and distortion, spherical shapes improve sound clarity while maintaining a visually interesting presence. (Elipson, n.d.)
- Tapered tubes**

Innovative tube designs minimise internal reflections, emphasising high performance audio while maintaining a sleek, sculptural form (Bowers & Wilkins, 2021).
- Nostalgic and modern systems**

Speakers that combine architectural and audiophile design with nostalgic elements offer a blend of emotional and aesthetic appeal (WIRED, 2024).
- High-quality materials**

Designs integrate advanced sound technology with customisable options, often using materials such as wood and stone to enhance both form and function (Linski, 2011).

Analysing old vs new designs

The aim of this analysis was to explore how iconic, nostalgic designs have been modernised, with a focus on understanding how these transformations can inform the design of a modern loudspeaker. By examining products such as the moka pot and the Volkswagen van, we can gain insight into the balance between preserving nostalgic elements and incorporating contemporary aesthetics. The aim of this analysis was to identify design patterns and principles that successfully bridge the gap between the past and the present, and offer insights into creating products that evoke emotional connections while integrating modern functionality.

In recent years, there has been a noticeable trend towards modernising iconic designs, combining nostalgia with contemporary aesthetics. This evolution is particularly evident in products with strong historical or cultural significance, such as the moka pot and the Volkswagen Transporter. A key observation in this modernisation is the softening of hard lines, with more rounded and fluid shapes replacing the sharp angles of their predecessors.

\* Images on this page were sourced from: (Hifiheaven, 2024), (elipson 2025), (HiFi Collector, 2023), (Modern studio, 2025), (So, 2024), (Design Indaba, 2025)



Figure 16. Perculator in modern and old design. Images sourced from (Bialetti Perculators, 2025)

For example, the newer version of the moka pot has a more ergonomic handle, a smooth surface and a softer, curved tip, in contrast to the older design, which had sharper edges, more pronounced seams and a rigid, segmented body (see Figure 16).



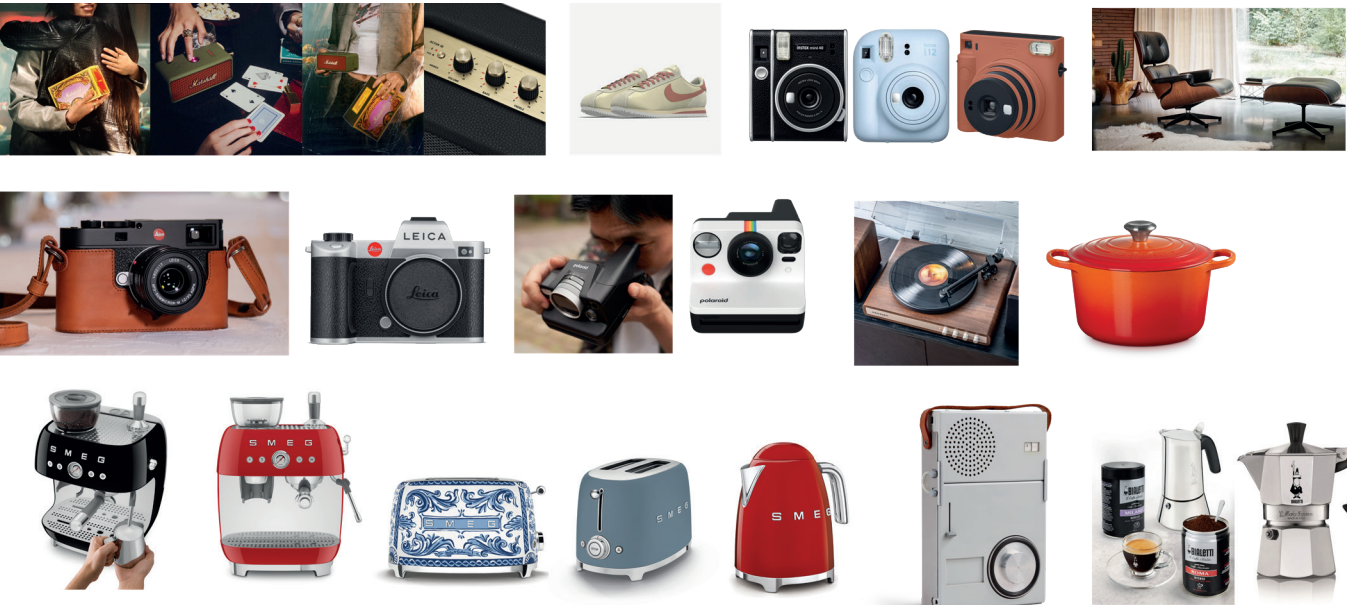
Figure 17. The iconic Volkswagen bus vintage and modern design. Source image (Volkswagen ID.Buzz, 2024).

Similarly, the redesign of the Volkswagen Transporter features smoother surfaces, rounded contours and contrasting coloured lines, replacing the sharp points and chrome elements of the older model (see Figure 17). The modern version emphasises seamless design with reduced visual complexity and incorporates elements such as metallic finishes that create a glowing effect, enhancing the appeal of the vehicle while retaining its nostalgic essence.

By blending familiar, nostalgic elements with contemporary design principles, these modernised products resonate with consumers seeking a balance between tradition and innovation. The key takeaway is the importance of retaining recognisable, nostalgic forms while updating the design for modern sensibilities. This includes softening edges, reducing visual complexity and integrating new materials or finishes to enhance the tactile and emotional appeal of the product.



In order to understand how to integrate nostalgia in the design of modern products existing products were analysed (see Figure 18). The chosen products have a nostalgic design aesthetic while being currently desired products.



An analysis of these products reveals how contemporary design harnesses nostalgia through simplified forms, vintage-inspired materials and colour palettes that convey warmth, comfort and authenticity. These nostalgic elements are skilfully balanced with modern touches such as sleek finishes, advanced technology and functional updates. This duality of nostalgic aesthetics and contemporary utility is increasingly sought after, as consumers want products that are not only functional, but also have an emotional resonance with the past.

The Leica camera embodies this balance through its minimalist details (see Figure 19). The lens placement and visible buttons evoke the timeless simplicity of vintage cameras, while the brown leather accents on the strap hint at a time when materials and craftsmanship were important. This subtle use of leather reinforces the vintage aesthetic and creates a lasting link to the past.

The Smeg espresso machine has a curvy, retro shape reminiscent of the mid-century modern appliances that defined both functionality and style in the 1950s. The machine maintains a minimalist aesthetic with its smooth curves and clean profile, ensuring it complements modern interiors without overwhelming them. The chrome detailing, evokes nostalgia for retro kitchens and cafes. Additionally, the machine does not have any digital elements which gives the user an analog user experience while having the modern technical features of bean grinder and milk foamer.

Marshall speakers embrace the brand's rock 'n' roll heritage with a vintage-inspired, boxy form. The rectangular shape, iconic gold detailing and textured grille evoke the classic audio equipment of the past, often associated with rock culture. The industrial appeal of the sturdy form reinforces its nostalgic feel, while functional elements such as the knobs, toggle switches and leather handle provide both practicality and visual appeal. Despite its vintage appearance, modern refinements such as Bluetooth capability ensure the speaker's relevance today, seamlessly blending nostalgia with contemporary convenience.

Figure 18. Modern products that still have a sense of nostalgia. Images mainly sourced from crosley, leica, fujifilm, smeg, le creuset, nike, polaroid, marshall, braun radio, bialletti and eijerkamp.



Figure 19. Leica camera, Smeg espresso machine, Marshall speaker. Image sources: (Leica, 2025), (Smeg, 2020), (Marshall, 2025).

Trend: Elemental in design

The 'elemental elegance' trend marks a shift towards understated tones that evoke comfort, harmony and a connection with nature (Future 100, 2025). As colour specialists rally around these new neutral tones, the focus moves away from bold, vibrant colours such as 'brat green' and towards softer, more grounding tones that offer a sense of calm. This trend is seen in a growing preference for warm, homely palettes that are increasingly being seen in paint choices and interior design.

Pantone's selection of Mocha Mousse, a rich, chocolatey brown, as the colour of 2025 underlines this movement. Described as underpinned by our desire for everyday pleasures, it is inspired by the indulgence of luxurious desserts and evokes a sense of quiet luxury. The colour reflects a broader mood for the year: a preference for sophistication coupled with a sense of comfort - a move away from maximalist aesthetics and bright, bold colours towards more subtle, elegant experiences.

For product design, this trend suggests a focus on creating items that offer a grounded, understated elegance. The desire for luxury without the flashiness of bold designs calls for a balance of natural textures and refined forms, with an emphasis on refined simplicity. This shift aligns with a growing consumer demand for reassuring yet confident design choices that feel both pampering and calming.

Conclusion of form exploration

These examples highlight key design elements that will inform the design of my own speaker. To appeal to consumers looking for both nostalgic visual appeal and emotional connection, the key takeaways from the form and colour analysis are as follows:

Shape: The integration of smooth, organic curves paired with clean, minimalist lines creates a harmonious and timeless form. Drawing inspiration from the interplay between soft, flowing shapes and more defined, angular edges will ensure a product that is both modern and nostalgic. In addition, the incorporation of tactile, engaging design elements, such as texture and proportion, will enhance the emotional connection with users.

Colour: The use of warm, rich tones such as leather browns and deep metallics can evoke feelings of nostalgia and luxury, while bold accent colours such as red and black can add energy and indulgence to the design. A balance of muted and bold colours will be central to achieving both visual appeal and emotional warmth, ensuring that the speaker fits seamlessly into modern interiors, while providing a sense of comfort and familiarity.

In this project, these insights will be used by prioritising a design that blends soft, rounded shapes with subtle angles, and using a colour palette that conveys warmth and timeless elegance. To create a product that not only fulfils its functional purpose, but also evokes a deeper emotional connection, resonating with modern nostalgics who seek both aesthetic value and personal significance in their everyday objects.

Main findings

Smooth, organic curves paired with clean, minimalist lines

A balance of muted and bold colours

Tactile, engaging design elements, such as texture and proportion



## Moodboards

To translate the form analysis into a visual design direction, a series of moodboards were developed. These boards serve as a tool to explore and communicate the desired emotional tone, material qualities and formal language of the product. Each board focuses on a specific aspect: colour, form and tactile experience. They provide a reference for key design decisions throughout the development process.

The colour palette mood board balances muted tones with bold accents to evoke a sense of calm and visual clarity, while allowing for moments of vibrancy. The shape moodboard explores how soft, organic curves can coexist with clean, minimalist lines to create a speaker that feels both warm and refined. Finally, the tactile qualities moodboard emphasises textures, proportions and materials that enhance the sensory experience, reinforcing the project's aim to create a speaker that not only integrates visually into the home, but also engages emotionally through interaction.

These moodboards helped to define the aesthetic direction of the concept, supporting a design language that reflected the findings of the form analysis.



A balance of muted and bold colours

This moodboard explores the use of a colour palette that balances muted tones with bold accents. This combination aims to evoke an emotional connection, where subtle shades enhance a sense of calm, while bold hues energise the design and provide a striking visual contrast.



Smooth, organic curves paired with clean, minimalist lines

This mood board shows how soft, organic curves can be combined with minimalist lines to create a sophisticated design. The curves evoke warmth and comfort, while the minimalist lines maintain a sense of clarity and refinement, contributing to both the beauty and usability of the product.



Tactile, engaging design elements, such as texture and proportion

This moodboard emphasises the importance of tactile elements such as texture and proportion in creating a meaningful interaction with the product. It focuses on materials and proportions that engage the user's senses and ensure the product feels as good as it looks.



Material test

After looking at materials mainly from a visual perspective in the form analysis, this section shifts focus to how different materials affect the listening experience. A material test was set up to explore how speaker cone materials influence the perceived sound quality. The following materials: cardboard, felt, wood, plastic and felt combined with cardboard were tested (see Figure 20).

Together with a baseline measurement where the speaker had no cone. Participants (N=6, F=3, M=3) rated each material based on bass performance, midrange clarity, high-frequency clarity and soundstage using four different song samples. The purpose of this testing was to identify how and if the materials influence the sound profile of a speaker.

- After doing a test run the following things were adapted/found:
- Blindfolding the person helps them focus on the sound.
  - Instead of listening to whole song use small sections for easier comparison between materials.
  - Randomly include the first material again without the participant knowing since the first material gets a score without reference to other materials. Varying the order in order to get a blind test with the materials.
  - Speaker as is without a cone is randomly included in the test as a baseline.
  - When people are in doubt they can request to go back.
  - Making people sit in the same place and asking them not to move too much, not leaning forward/backward for each sound sample.
  - Not indicating in advance that the speaker will be heard even without a cone, people got the feeling from this that they could give a wrong answer.
  - Talking during switching cone to mask sound, asking their opinion on sound track.

For the final test these adaptations were implemented and the full user test guide can be found in Appendix D. In summary, participants were asked to blindly rate the different cones on a scale of 1-5 (see Figure 21).

Test results

- Bass performance: Felt emerged as the best performer in bass response with a score of 4, offering the clearest and richest bass. The baseline measurement followed closely at 4.08, while plastic scored the lowest at 3.58, indicating poor bass reproduction.
- Midrange clarity: Cardboard provided the clearest midrange frequencies, scoring 4.67, followed by wood at 4.08. Plastic and felt + cardboard received lower ratings, with plastic ranking lowest at 3.5.
- High-frequency performance: Felt and felt + cardboard both excelled in high-frequency clarity, scoring 4. Wood and plastic lagged behind, with scores of 3.25 and 3.5, respectively.
- Soundstage: Felt performed the best in soundstage with a perfect score of 4, indicating a wide and immersive sound. Cardboard and felt + cardboard followed with similar scores. Plastic received the lowest rating at 3.75, suggesting a less immersive sound experience.
- Overall score: Felt + cardboard achieved the highest overall score at 3.88, competing with the baseline at 3.95. Plastic scored the lowest overall at 3.58, indicating its overall inadequacy for high-quality sound reproduction.

See Appendix E for all scores. In the table below the summative scores are presented.

	Overall score
Baseline measurement	3.95
Cardboard	3.90
Felt + Cardboard	3.88
Felt	3.80
Wood	3.65
Plastic	3.58

There are no significant differences between the scores when averging the scores of all participants. Participants did have different preferences individually giving the individual scores more significance.

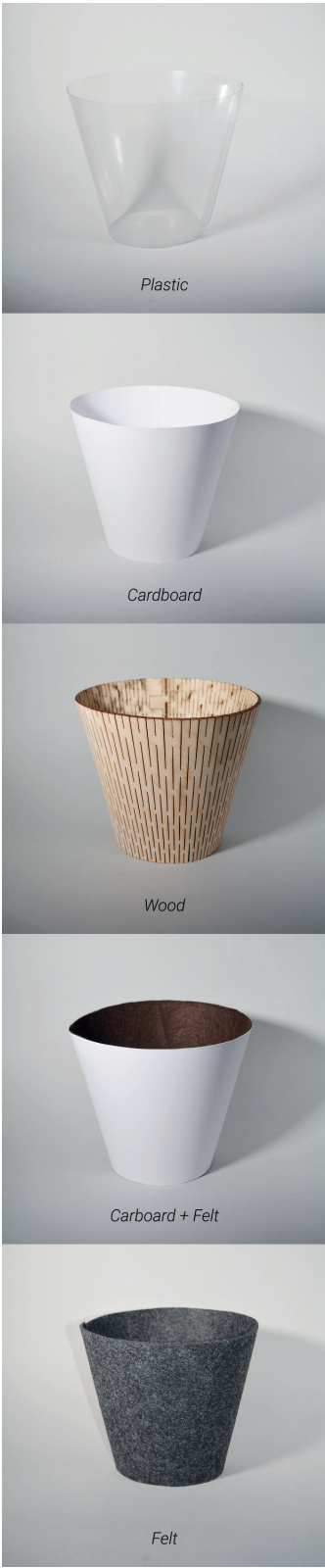


Figure 20. The different material cones used in the material test.

Findings

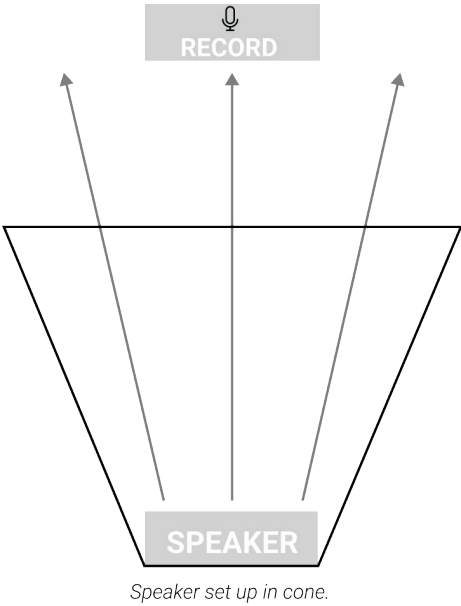
- Best performing material: Cardboard showed strong results in bass, high frequency, and soundstage performance, making it an interesting material for the final design.
- Least effective material: Plastic underperformed across all categories, particularly in bass and high-frequency reproduction, and is less suitable for the speaker design.
- Midrange clarity: Cardboard excelled in midrange clarity, with wood providing a solid alternative.
- Market implication: Since the materials were differently perceived per individual having multiple option caps would be most interesting. Giving the user the opportunity to play with different materials and their preference in sound.



Figure 21. Test set-up with the participants.

Further implementation

The material test showed that participants had very different preferences in how they perceived the sound from each material. Since the average scores between materials were very close, there was no clear winner or best-performing material. This suggests that the choice of material will mainly depend on personal preference rather than a clearly superior option. Because the final shape of the speaker cap will also affect how sound is reflected, it is recommended to repeat the test once the cap design is finalised, to better understand how material and form together influence the listening experience.



Interaction design

Having explored the visual form of existing products, this section shifts the focus to the tactile interaction that modern nostalgists indicated they value. Vintage listening devices, such as vinyl players and radios, offer physical interactions that create a more personal and ritualistic user experience that they indicated during user research. To better understand how to translate this into the new speaker design, this subsection explores the tactile characteristics of vintage devices. These insights help to provide a foundation for designing meaningful, hands-on interactions that resonate with the target audience.

To gain a better understanding of how different tactile interactions are included in current product on the market a break down was made of the use of different products. In this break down the different user steps were visualised to see the tactile interaction involved. The interaction design explored tactile controls such as rotating knobs and sliding panels that allow users to engage physically with the speaker. These features were designed to evoke a ritualistic experience, similar to vintage devices.




























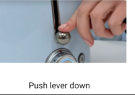


















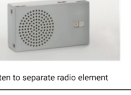




 Marshall speaker	 Leica camera	 Fujifilm instax camera	 Smeg toaster	 Crosley vinyl player	 Le creuset dutch oven	 Bialetti percolator	 Braun radio
 Turn the speaker on	 Opening up the lens	 Receiving the picture printed directly	 Putting bread into the toaster	 Selecting a vinyl	 Prepare food into the pan, close the lid	 Open up the percolator	 Carry product at the handle
 Connect with phone	 Touchscreen	 Aiming of the camera	 Turning knob	 Opening the lid on the player	 Lifting the lid to check the food	 Fill bottom with water	 Slider to start the pin
 Insert aux + aux button	 Rotary knob	 Replacing the picture films	 Push lever down	 Put on a vinyl	 Carry the pan by its handles	 Fill basket with coffee	 Listen to vinyl playing
 Turning knobs to adjust levels	 Turning the lens to zoom in or out	 Clicking the button	 Push button turning knob	 Put the needle on the vinyl	 Present the pan at dinner table	 Swipe coffee flat	 Slide element of the frame
 Listen to the music	 Push button	 Turn lens to zoom in or out	 Taking bread out the toaster	 Turning the knob to tune levels		 Screw top on to bottom	 Listen to separate radio element
 Turn the speaker off	 Directing the camera			 Closing the lid on the player		 Brew the coffee on gas	

Figure 22. Overview of user interaction of different products.

This interaction analysis of various vintage and iconic products aimed to uncover patterns in tactile engagement that could inspire the interaction design of the new Devoonsounds speaker. By mapping and comparing interactions, several insights were identified:

- Rotational and button-based controls: Many products rely on tactile controls such as turning knobs, sliding mechanisms, or pressing buttons. Notably, rotational controls offer users a sense of precision and freedom, allowing them to fine-tune settings to their personal preferences. This type of interaction is associated with more deliberate and satisfying user engagement compared to simple button presses.
- Handling of product: Some products encourage active handling and repositioning (e.g., portable radios, cameras, Dutch ovens), suggesting that physical interaction with the product itself contributes to stronger user attachment.

- Materiality and tactile quality: The materials used in these products, such as textured metals, woods, and plastics, enhance the tactile experience, making interactions more memorable and distinctive.
- Preparation rituals: Several products involve preparatory actions before use, such as opening lids, inserting materials (e.g., vinyl records, coffee grounds), or assembling parts. These small rituals build anticipation and strengthen the emotional connection between the user and the device, enhancing the overall experience.
- Physical feedback and sequential interaction: Interactions often involve multiple sequential steps that offer immediate physical feedback (e.g., turning, clicking, locking mechanisms). This layered engagement creates a richer, more mindful user experience.

*\* Images sources on this page: Marshall (2025), Leica (2025), Fujifilm instax (2025), Smeg (2020), Crosley Radio Europe (2025), Le creuset braadpannen (2025), Bialetti Percolators (2025), Braun Audio (2025).*

User insights

Earlier user research revealed that participants valued the manual interactions offered by vintage listening devices. These tactile actions, such as turning a knob or turning on a device, created a moment of preparation that allowed users to disconnect from everyday distractions and be fully present in the listening moment.

Participants highlighted the importance of having control over aspects such as volume and device positioning, allowing them to personalise their listening environment according to their mood or activity. The preparation ritual of vintage listening devices themselves was seen as helping to build anticipation and emotional connection before the music even began, compared to modern loudspeakers.

Material qualities and tactile textures also played an important role. Users preferred physical interaction over purely digital controls, and valued the sensory feedback provided by interacting with the speaker. They also appreciated the ability to easily reposition the speaker for different activities or environments, supporting a more flexible and personalised listening experience.

Both the product interaction analysis and user research highlight the importance of tactile engagement and preparation rituals. Users valued manual actions helped them disconnect and build anticipation for the listening experience. Material textures and the ability to reposition the product further strengthened emotional connection. The handling of the product with active repositioning and tactile actions to prepare the device were also important to create the ritual part of the user interaction. These insights directly informed the decision to design a tactile opening interaction for the new Devoonsounds speaker, creating a meaningful preparation moment that enhances user engagement. Meaning:

**To design an opening interaction to create a preparation ritual while including tactile feedback through material selection while giving the user opportunity to reposition the speaker to personalise their listening moment.**



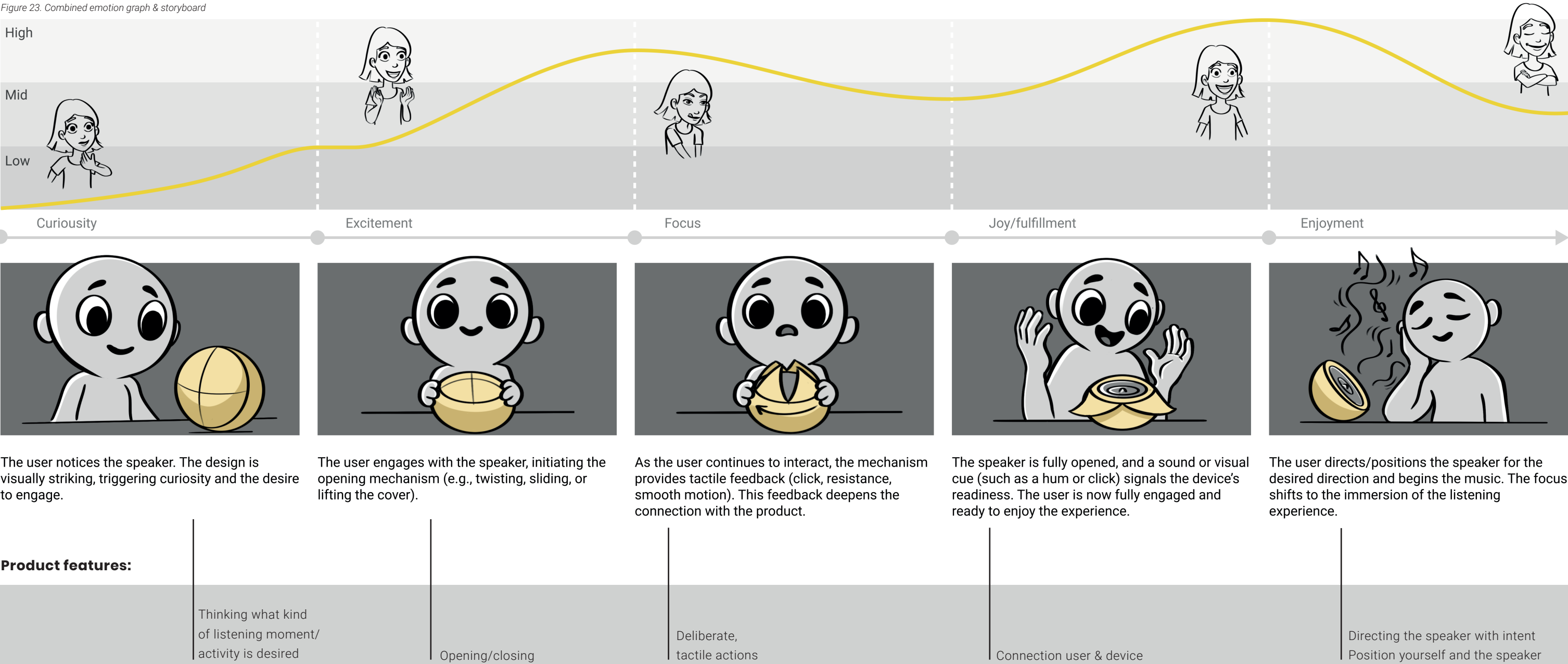
### Combined emotion graph & storyboard

To better understand how tactile interaction could be incorporated into the speaker design as an opening sequence, an emotion graph and storyboard were created (see Figure 23). The aim was to capture the needs and preferences of modern nostalgists, who value deliberate, hands-on rituals when using their listening devices.

The emotion graph, inspired by the emotions of the Product Emotion Measurement Instrument (a non-verbal self-report instrument that measures seven positive and seven negative emotions (Premo | Pieter Desmet, n.d.)) was adapted for this project to add the emotions of curiosity, excitement and focus. It maps the user's emotional journey during key moments such as starting up, adjusting and interacting with the loudspeaker. The storyboard complements this by visualising the physical steps the user would take, focusing on tactile actions such as opening and positioning the speaker.

This combination helped to explore how tactile engagement could reflect the ritualistic experiences of vintage devices. The insights from this visual provided an early direction for shaping the interaction design of the speaker, and was the first step in developing concepts that would bring emotional value and intuitive ritual into the final product.

Figure 23. Combined emotion graph & storyboard



# Brainstorm exploration

Building on the user research findings that highlighted the value of tactile, ritualistic interaction for modern nostalgists, the ideation phase explored ways to translate these needs into the interaction design of the new speaker. A brainstorming session generated a wide range of ideas, which were clustered into four main themes: Framing, Stacking, Expanding and Rotating (see Figure 24).

Clustering the ideas allowed for a more structured evaluation of how each interaction type could contribute to both functional value and emotional engagement.

## Frame

The Frame cluster explored concepts where the speaker moves within or along a static frame structure, allowing for repositioning. This interaction supported functional use, but was less relevant to the emotional engagement goals of the project as it lacked the ritualistic quality that the target group was looking for in the interaction. The movement of the frame is mainly functional (repositioning) rather than emotional (ritualistic).

## Stacking

The stacking cluster considered modular concepts where multiple speakers could be stacked or separated. Although this offered flexibility in personalising the sound experience, market research showed that similar products already existed. After consulting with Devoonsounds, stacking was ruled out due to the brand's preference for a wired stereo setup over modular wireless systems.

## Expanding

Expanding explored concepts where the speaker would physically open or expand during use, introducing a ritual of preparation before listening. This unfolding action resonated with the emotional needs of modern nostalgists for visual feedback. Expanding offered a tangible ritual that increased the user's involvement before the listening moment.

## Conclusion

Based on the analysis:

- Frame interaction was found to lack ritualistic qualities and was therefore deprioritized.
- Stacking was ruled out due to its prevalence in the market and Devoonsounds' preference for a wired stereo product.
- Expanding presents strong potential for creating a meaningful preparation ritual.
- Rotating supports user personalisation and draws emotional analogies to valued vintage interactions.

As a result, expanding and rotating were selected for further development, as they aligned best with the project's goals: **Creating meaningful, tactile engagement and personalised user experience.**

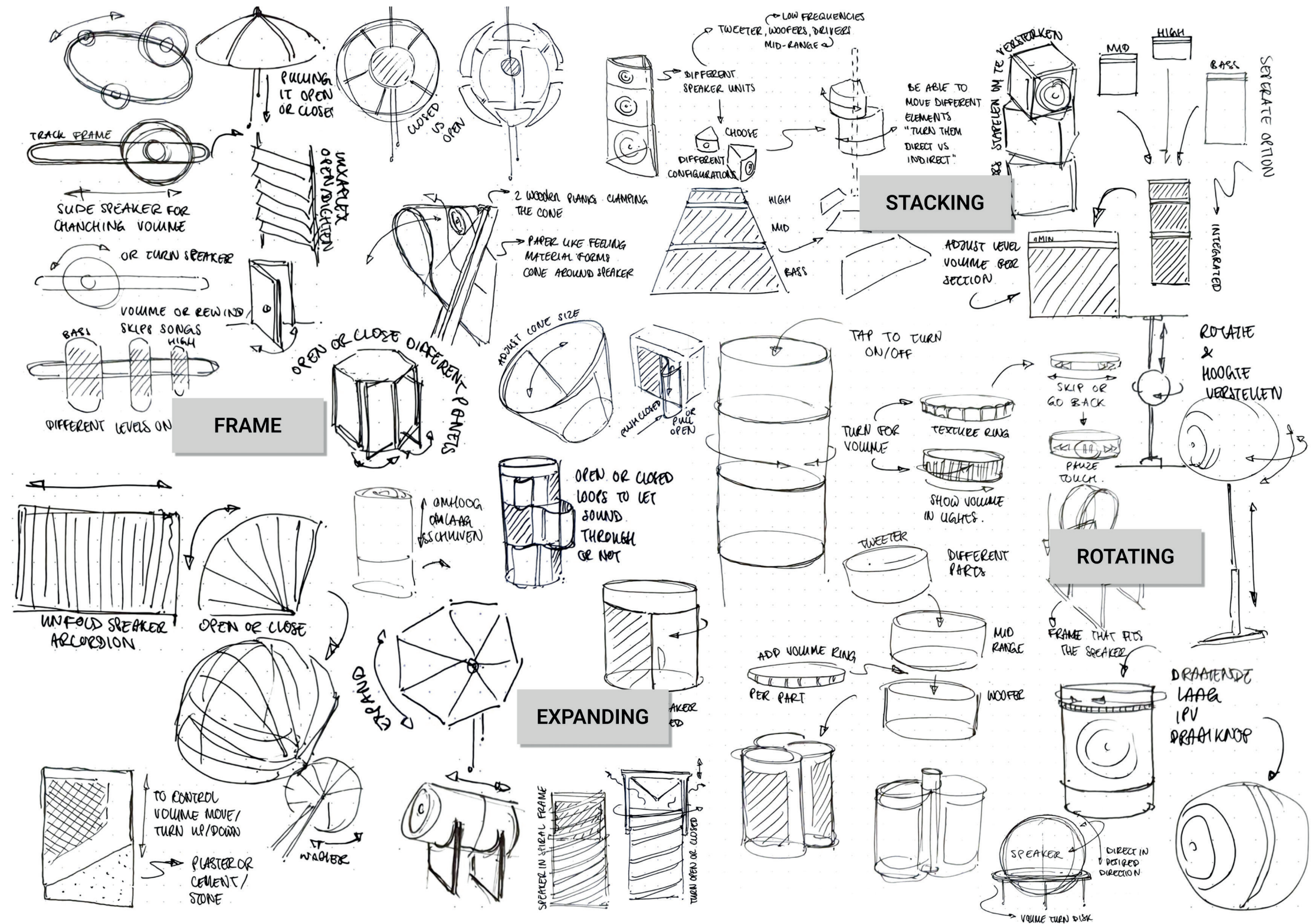


Figure 24. Brainstorm sketches that were clustered.



# Rapid prototyping

A series of rapid prototypes were created to test the potential of expanding and rotating interactions, which were selected as the most potential interaction directions. These prototypes helped to translate early concepts into tangible experiences, allowing the interactions to be evaluated more realistically.

## Prototype expanding mechanisms

The first expansion prototype used K’nex to test an umbrella-like expansion movement (see Figure 25). Although the movement was smooth, the prototype felt oversized and unnecessarily complex for the speaker’s intended use, leading to the search for simpler solutions.

A second prototype combined a 3D-printed mechanism with origami-inspired arms to facilitate opening and closing which was a more compact iteration on the umbrella mechanism (see Figure 26). While functionally effective, the closed form was tall and visually dominant, conflicting with the goal of a minimal visual footprint.

Finally, a cardboard prototype explored downward expansion using string-tensioned arms (see Figure 27). While conceptually interesting, the mechanism lacked smoothness, and the vertical tube form restricted speaker directionality. These limitations indicated that expansion mechanisms needed further refinement to better suit the emotional and functional goals of the project.

### Common interaction qualities

Across the various prototypes of the extension, a recurring quality was the sense of unveiling and anticipation - similar to the opening of a gift. This unfolding action created a moment of discovery that temporarily slowed down the user experience and invited more deliberate engagement. Such a ritualistic and rewarding experience resonated well with the needs of the target audience, modern nostalgists looking for deliberate, hands-on interactions. This insight highlighted the potential of designing an opening interaction that not only served a functional purpose, but also emotionally enhanced the experience by creating a moment of surprise and connection with the product.



Figure 25. K'nex prototype.

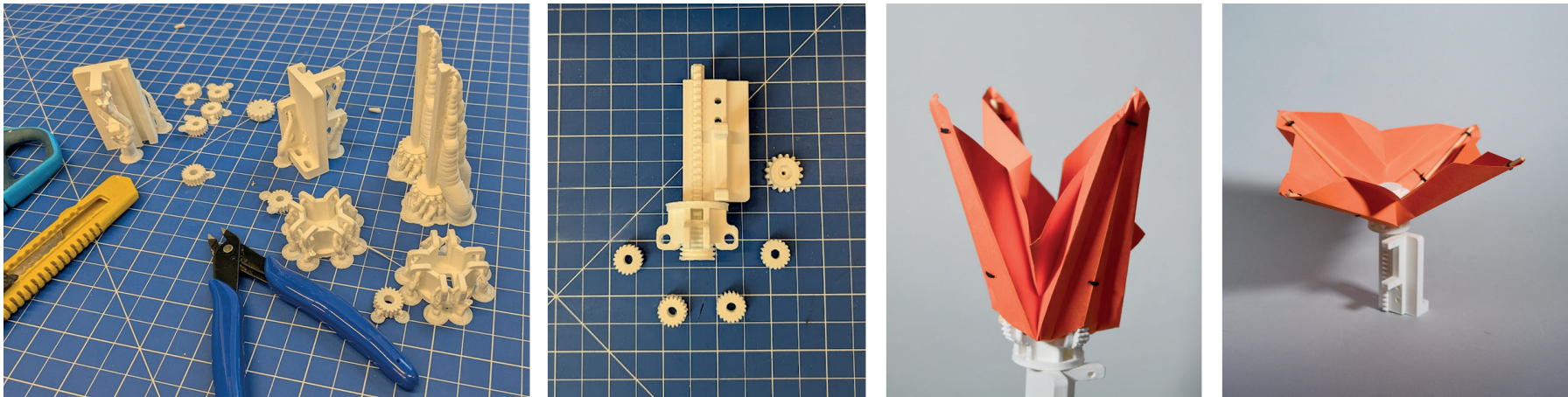


Figure 26. 3D printed mechanism prototype



Figure 27. Cardboard prototype



Prototype rotating mechanisms

Rotational mechanisms

A rotary prototype was developed using 3D printing to test the interaction of rotating speaker elements (see Figure 28). After initial printing failures, improvements to the design thickness and print quality resulted in a smooth, low-friction rotary motion. Tactile cues, such as indentations, guided user interaction naturally, creating a satisfying physical feedback loop. Turning the mechanism felt deliberate yet natural, creating a more engaging interaction experience. This direct, intuitive engagement resonated with previous user feedback about the lack of hands-on controls in modern devices. The rotational motion invited a more personal connection by allowing users to fine-tune the positioning of the speaker, reinforcing the idea of ritualistic, hands-on use.

Sphere movement tests

A simple ball prototype explored the interaction of repositioning a spherical object (see Figure 29) . Users naturally picked up, rotated and directed the ball, reinforcing the idea that a spherical shape intuitively invites engagement. Compared to rigid, boxy speakers, the sphere encouraged playful, personal interaction, perfectly in line with the goal of creating a speaker that feels alive and adapts to a space.

Conclusion

Prototyping confirmed the emotional strength of the expanding interaction, which created a rewarding preparation ritual, and the rotational interaction, which encouraged intuitive user control.

While the expanding prototypes enhanced emotional engagement, the rotating prototypes enhanced adaptability and personalisation.

Therefore, the final design strategy will combine both principles: a spherical speaker shape for intuitive rotation and a tactile, opening ritual to create a deliberate, emotional listening moment (see Figure 30).

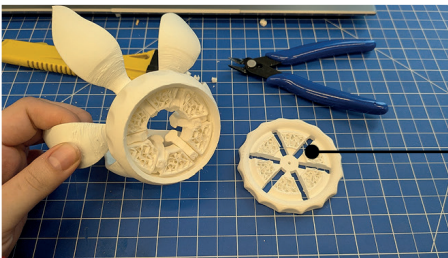
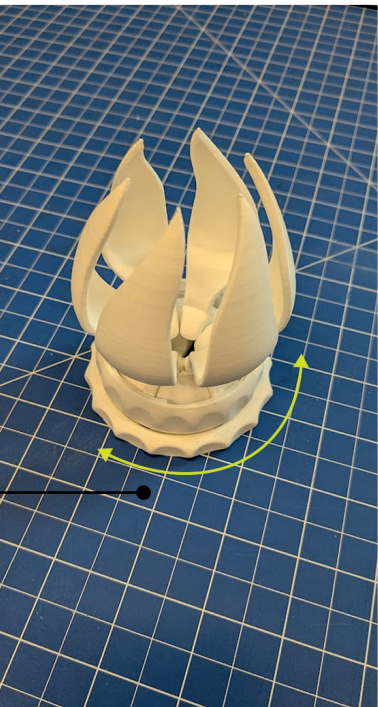


Figure 28. 3D printed rotary prototype.



Twist two rotational layers

3D printer: Anycubic Kobra 2 Max



Used too much force which broke upper from base



Figure 29. Prototype to test bal interaction.

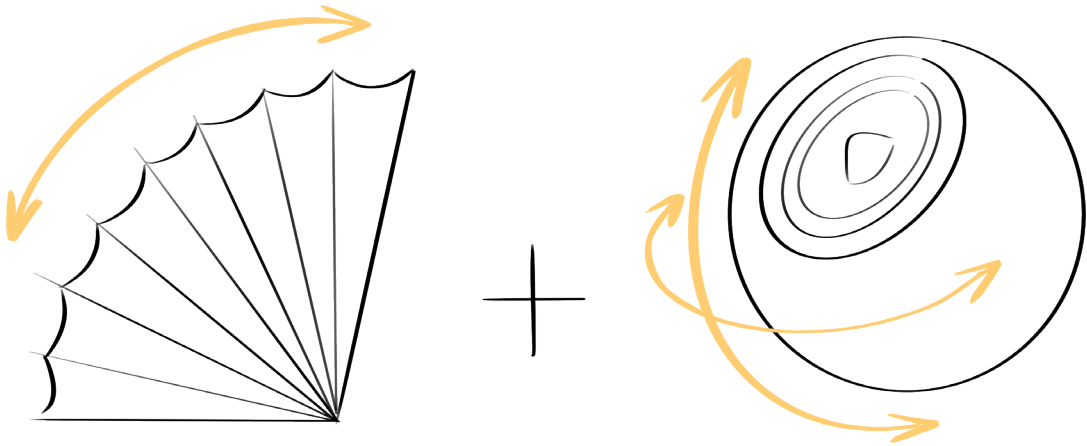


Figure 30. Combining expanding and rotation.



## Prototyping a spherical speaker

To integrate rotational interaction into the design, a spherical speaker form was chosen. The spherical shape reduces internal vibration and distortion, improving sound clarity while maintaining a visually interesting presence (Elipson, n.d.). Two bamboo bowls served as the enclosure, while the electronics were provided by the client. The full building process can be found in Appendix F.

To improve sound quality, acoustic damping material was added inside the speaker during prototyping (see Figure 31). The process involved experimenting with different materials (Visaton polyester wool and 3 mm thick felt) and placements to optimize clarity and bass performance.

Initially, the enclosure was filled completely with Visaton damping material, but this resulted in overly dampened, unclear sound. By removing the material in front of the driver, clarity improved significantly. To further adjust the bass, a layer of felt was added at the back, but this made the bass sound rough and uncontrolled. Ultimately, the best results were achieved by using only Visaton damping material selectively, balancing clarity without compromising the bass response.

### Findings

- Overfilling with damping material reduced clarity.
- Removing material near the driver improved mid- and high-frequency performance.
- Adding felt at the back negatively impacted bass quality.
- Careful placement of damping material enhanced tonal balance without over-damping the speaker.

These experiments showed that acoustic treatment can significantly refine sound quality but must be applied sparingly to avoid deadening the speaker’s liveliness. Final material placement decisions will be revisited after the cap design is finalized, to further fine-tune acoustic performance in the complete prototype.

The placement of the power button was determined by ergonomic testing. The most natural position for the button, where fingers naturally fall, was determined by holding the speaker (see Figure 32). With the driver facing the user, the button was placed about three quarters of the way back from the front, allowing easy access while still being visible when facing the speaker. This position was chosen over placing the button on the back to ensure both visibility and comfort. The power input was placed on the back because it is a less frequently used feature.

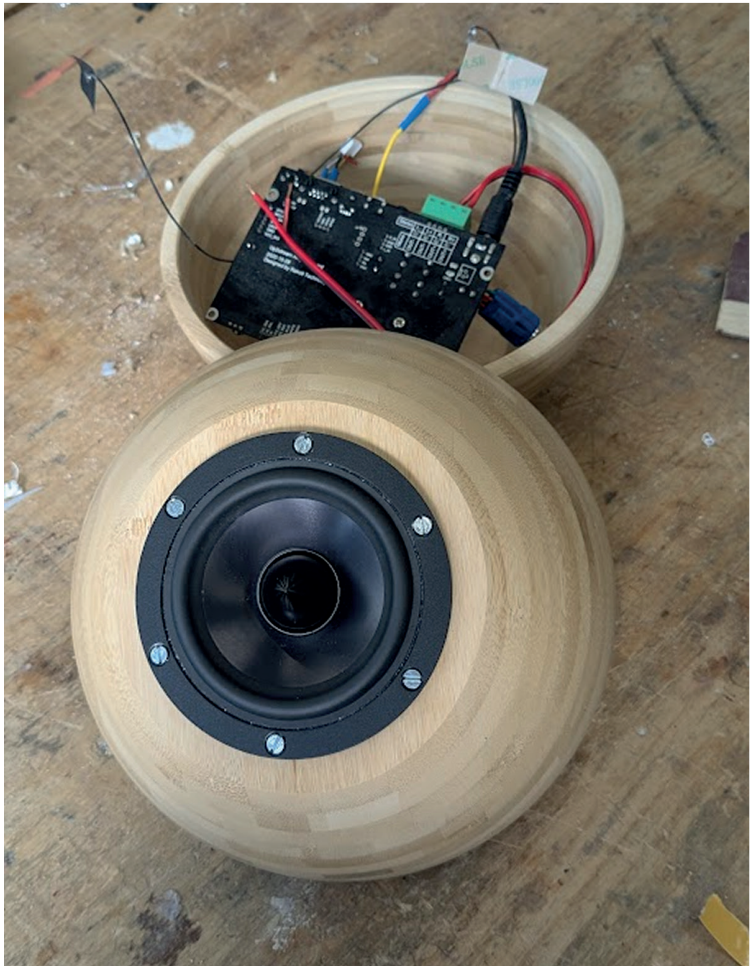


Figure 31. Building pictures of the prototype.

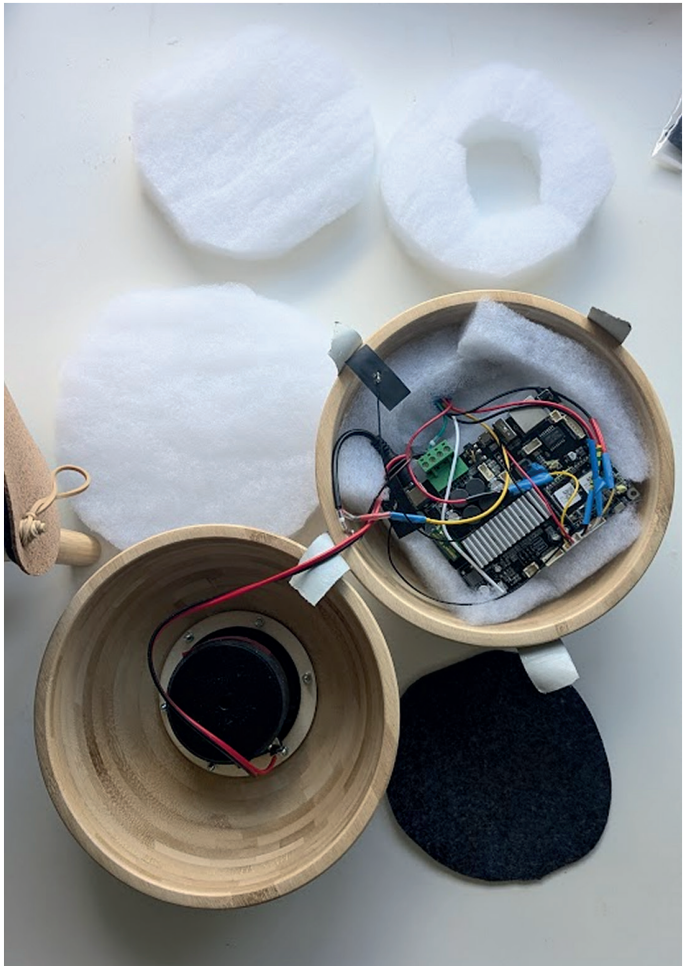


Figure 32. Placement of the power button, decided by hand placement.



## Prototyping the cap

To translate the expanding interaction into a functional prototype, an initial cap was constructed from heavy-weight paper folded using an origami technique (see Figure 33). While this form effectively captured the idea of unfolding as part of an opening ritual, it introduced acoustic issues. The angular, segmented surface of the origami structure created irregular sound reflections, resulting in muddled audio output.

To address this, the focus shifted to smoother cap surfaces that could preserve the intended ritualistic interaction while improving acoustic performance. New prototypes were constructed using heavyweight paper, cardboard, cork and felt materials suitable for rapid iteration and tactile evaluation (Figure 34). To simulate the opening gesture, the caps were mounted on the stand using bamboo pins inserted into drilled holes, allowing the cap to be manually placed and removed.

The smooth surface caps showed improved sound clarity compared to the origami prototype, confirming the influence of surface geometry on acoustic reflection. Importantly, the physical act of placing or removing the cap still created a deliberate moment of interaction, reflecting the ritual of preparation and supporting the design goal of encouraging mindful engagement.

However, limitations in movement became apparent. The fixed position of the caps on the stand restricted the freedom of speaker orientation and partially obstructed the audio output. This highlighted the need for increased user flexibility, particularly through rotational movement, to allow the cap to move without interfering with sound projection. These findings informed the next iteration of the stand design, with the aim of providing a smoother, more dynamic interaction with greater freedom of movement.

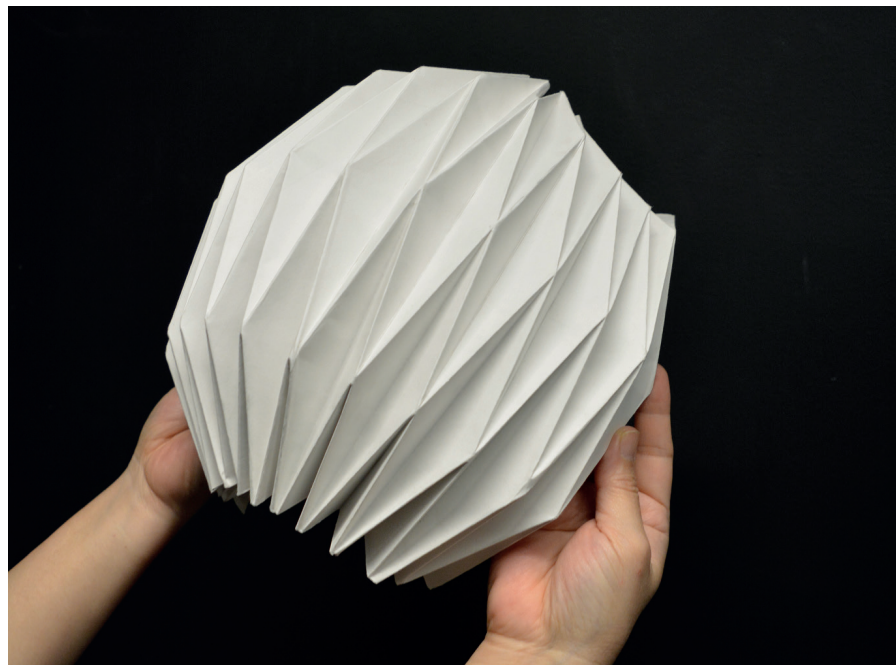


Figure 33. Origami cap iteration



Figure 34. The different cap iterations, exploring different materials.



Opening cap design

Following the interaction ideation and rapid prototyping phase, the opening cap was conceptualized to translate the expanding interaction into a functional element of the speaker. The aim was to support a preparation ritual that adds emotional value to the listening experience. Building on earlier insights, the design aimed to combine tactile engagement with acoustic functionality, while ensuring that the interaction felt intentional and fit into the everyday use of the product. Early iterations explored different combinations of material and form, from angular origami structures to smoother curved surfaces. While the origami prototype effectively captured the unfolding gesture, its segmented shape negatively impacted sound clarity due to uneven reflections. Smoother cap designs improved acoustics while still allowing for a moment of physical interaction, reinforcing the ritualistic quality sought by modern nostalgists.

Throughout prototyping, the caps were tested for ease of placement, impact on the sound and visual coherence with the spherical shape of the speaker. Manually placing and removing the cap provided a deliberate, hands-on moment that was in keeping with the design objective of creating a meaningful start to the listening experience.

However, the limitations of fixed cap positioning, such as restricted speaker orientation and partial sound obstruction, highlighted the need for more freedom of movement. These findings informed the direction of the next iteration, where the stand design would play a greater role in enabling flexible, dynamic interaction between the speaker and the cap. Therefore different cap designs with different stands were sketched, including different shaped caps with different degree of freedom and stands to fit the cap design.

The caps and mechanisms explored were intended to add value, not only in terms of their functional purpose, but also by contributing to the overall visual appeal of the speaker. This approach aims to ensure that the speaker is not just an object of utility, but a feature of the interior that integrates with the environment and complements the user's space. To help evaluate these interaction concepts not only on functionality but also on visual appeal, AI-generated renders were created from earlier sketches, allowing for a more immersive exploration of form and integration (see Figure 35). These visuals helped to assess both the aesthetic and functional impact of the proposed solutions in a contextualised way. A weighted objectives (reference DelftDesign Guidepagina 151) was used to select the most promising idea to further elaborate (see Table 1).

Table 1. Weighted objectives to rate the different cap designs

weight from 1-5 rating from 1-10	Weight	Concept 1	Concept 2	Concept 3
Innovative tactile interaction that fosters emotional engagement	4	6	6	7
Ease of use (minimal learning time)	3	7	8	7
Visual appeal and ability to function as a display piece	5	7	7	7
Timeless design, minimalistic lines	4	4	8	6
Compact size (visual weight)	2	3	8	6
Adjustable placement	2	8	9	7
Easy to assemble or adjust	1	5	7	6
Integration with form and overall speaker design	3	3	8	6
Total score		132	182	158

A weighted objectives analysis was used to evaluate three cap concepts against design criteria such as tactile quality, visual appeal, ease of use, and adjustable placement. Concept 2 emerged as the most promising, scoring highest overall due to its balance between interaction freedom, minimalistic aesthetic, and spatial efficiency, as seen in Table 1. This phase concluded that a cap with a large degree of movement and a minimalist design offers the best balance between emotional engagement and usability. The selected concept (Concept 2) enables flexible placement without compromising the speaker's compact footprint or visual appeal, making it well-suited for integration into modern interiors. These findings set the direction for refining the interaction in the final prototype.

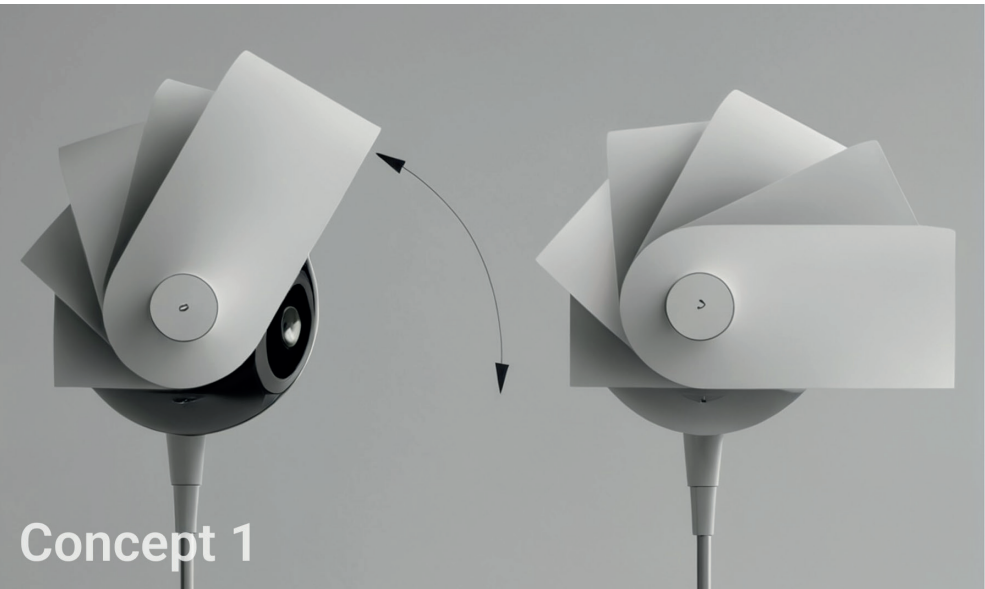


Figure 35. Different cap ideations that were rendered from sketches into materiales designs with the help of AI.

## Stand design

Building on the knowledge gained from the cap development phase, the stand design was explored to enhance the freedom of movement and visual coherence of the speaker. The primary goal was to support height adjustability and directional flexibility, allowing users to position the speaker according to their personal preferences and acoustic needs.

Equally important was the aesthetic integration of the stand into the living space. Many consumers are reluctant to bring large, visually unappealing audio equipment into their homes. Therefore, the stand was designed with a minimal visual footprint and clean, sculptural lines that complement the spherical shape of the speaker without overpowering the interior environment.

AI-generated renderings were used to iterate on form, materiality and balance, allowing for rapid visual evaluation, (see Figure 36). To test the visual independence of the speaker's form, initial stand concepts were developed without the cap. This clarified how the speaker could function independently, while still providing room for later integration of the cap.

This research informed not only the mechanical feasibility but also the overall emotional appeal of the speaker as an object. The result is a stand that subtly supports the speaker while allowing for repositioning, a key requirement identified earlier for user-controlled personalisation.



Figure 36. Different stand designs rendered from sketches to materialised designs with the help of AI.



# User testing interaction

The final phase of the project focuses on refining and validating the design by translating earlier research and ideation into a working prototype. Central to this design is the integration of tactile interaction, a feature valued by the target group, modern nostalgists. This interaction, particularly the act of opening the speaker, is intended to create a preparation ritual that enhances the emotional connection to the listening experience.

In order to assess whether the proposed interaction achieves this goal, a physical prototype has been developed. This prototype allows for testing of the following elements: the cap opening mechanism, speaker repositioning and tactile controls. Testing these features in context was done to ensure that the product not only meets functional requirements, but also resonates emotionally with users.

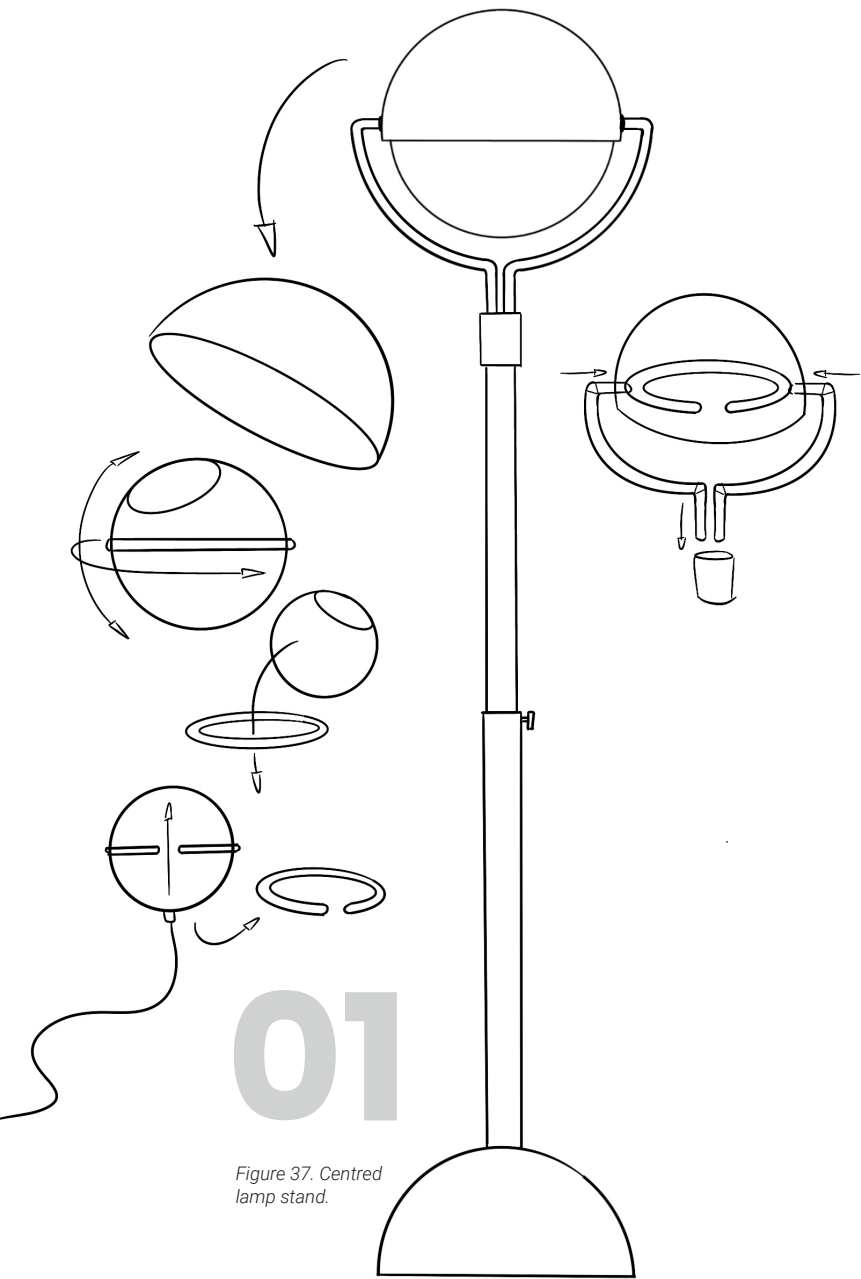


Figure 37. Centred lamp stand.

This chapter introduces the interaction prototype, presents an interaction test with users and outlines the final design decisions. By observing how users interact with the product, the design can be evaluated for desirability, feasibility and usability. This ensures that it meets both the practical needs and emotional expectations of the intended audience.

## Stand prototype exploration

In order to test the rotational interaction of the speaker in a physical prototype, two stand concepts were explored. The aim was to find a solution that would support both vertical rotation and horizontal rotation, while remaining structurally feasible and quick to prototype within the project timeframe. Therefore, different concepts were explored for prototyping.

### Centred support stand

This design reuses an existing stand (e.g. lamp, music or photo stand) for rapid prototyping. The speaker is mounted directly above the vertical support, minimising torque and mechanical stress on the structure (see Figure 37). This arrangement allows both vertical and horizontal adjustment, supporting the intended interaction. The compact geometry reduces the risk of deformation and simplifies testing. Although a ring-based frame was considered, space was required for the front driver and rear power input, making a ring with two cut-outs structurally vulnerable. It was therefore decided to clamp the loudspeaker rather than balance it on a ring.

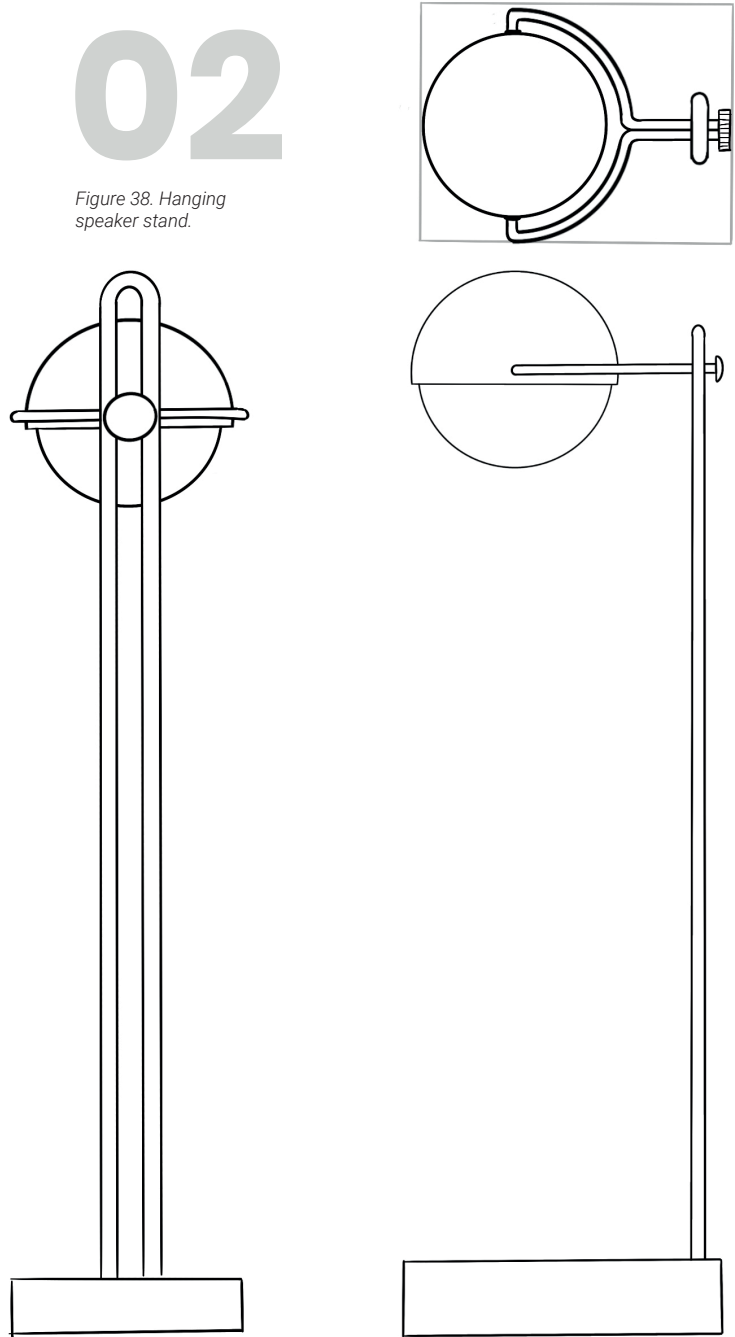


Figure 38. Hanging speaker stand.

### Offset frame stand

The second concept uses an offset frame, with the speaker placed to the side of the vertical shaft (see Figure 38). While this provides a visually distinctive appearance, it presents challenges. Due to the cantilevered position, a heavy counterweight or reinforced base would be required to prevent tipping. The unique frame geometry would also require significant time to fabricate. Although the concept allows for both vertical and horizontal rotation, the structural complexity made it less suitable for early-stage prototyping. However, the way the speaker appears to float and creates visual tension makes it a unique design.

## Design decision

The first stand concept was chosen because the primary goal of the prototype was to test user interaction, specifically the act of directing and repositioning the speaker. It allowed for easier assembly, maintained the necessary degrees of motion, and met the short-term goal of validating the interaction. Although less visually sophisticated, its simplicity made it the more practical choice for functional testing at this stage of the design process.

Prototyping speaker stand

Various second-hand lamp and camera stands were investigated to prototype the interaction of the speaker's direction (see Figure 39). Since the primary goal of the prototype is to test movement, specifically the rotational and vertical positioning of the speaker, the stand itself did not need to be custom designed. Instead, it could be repurposed for efficiency.

- Criteria for evaluating used stand
- Stability and overall robustness
  - Ability to move the lamp head up and down
  - Ability to allow horizontal rotation
  - Compatibility with a mounting mechanism for the speaker

Most lamp stands enabled height adjustment, but only one allowed for repositioning the speaker head by directly interacting with the speaker itself, rather than adjusting the stand. A camera tripod was also considered for its rotational flexibility and modularity, but its design was less aligned with the envisioned user experience.

In the end, a second-hand lamp stand was chosen. It met both the aesthetic and functional requirements of the prototype phase, offering a clean vertical pole and simplified setup. This stand allowed 360° horizontal rotation and simple vertical adjustment through direct interaction with the speaker. Compared to the earlier dual-pole concept, it offered greater freedom of movement while maintaining a minimal visual footprint.

The speaker design was accordingly adapted to this simplified frame, aligning the physical prototype with the intended interaction scenario (see Figure 40).



Figure 39. Various second-hand lamp stands.

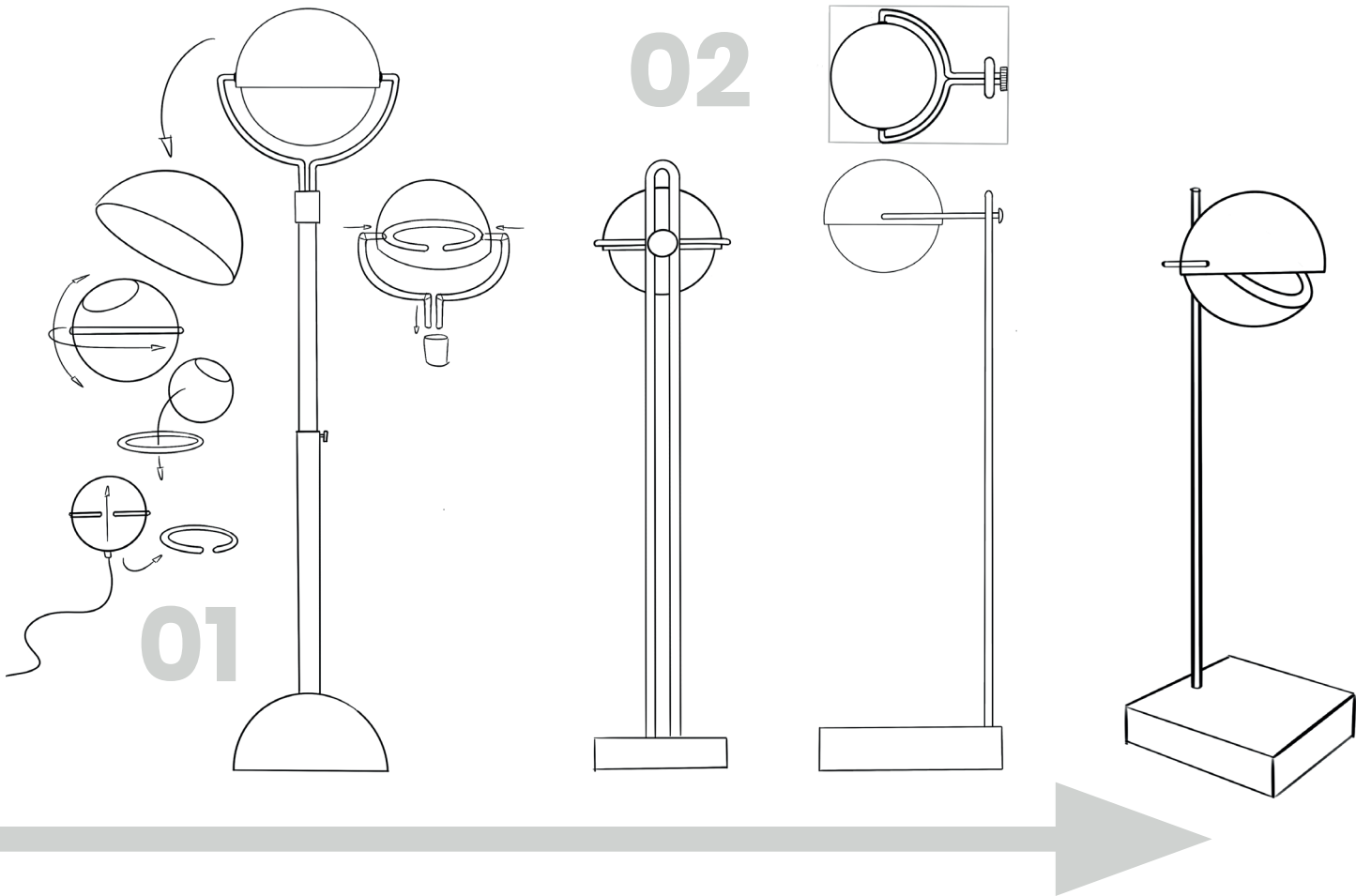


Figure 40. Adaptation of the speaker stand.



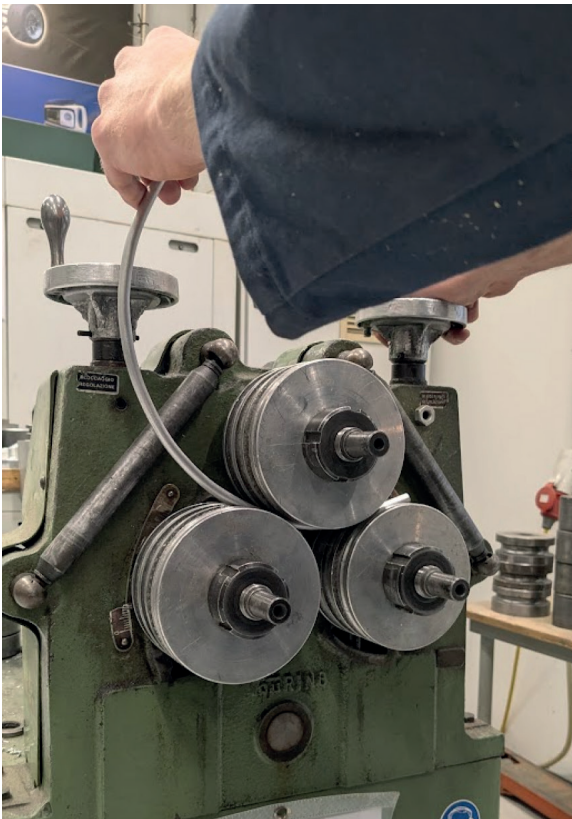
Prototyping speaker clamping

In order to mount the speaker to the stand, a custom mounting system was prototyped using inserts and aluminium components to combine with the secondhand stand (see Figure 41). In Appendix G the full prototyping can be found.

The original mounting mechanism from the repurposed lamp stand was partially plastic and deformed under the weight of the speaker. To ensure structural integrity, this part was replaced with a machined aluminium alternative.

The final assembly allows the speaker to be securely clamped in place while maintaining freedom of movement. The speaker can be rotated both horizontally and vertically. Furthermore, it can be adjusted in height on the stand as well. This allows full directional adjustment within the prototype which is essential for validating the interaction concept.

Figure 41. Building pictures of prototyping the clamping on the stand.





Cap prototype iterations

Following the development of the spherical shape of the speaker and the tactile interaction concept, a series of rapid prototypes were made to explore the design of the cap for the interaction prototype (see Figure 42). The cap plays a critical role in shaping the user's interaction with the speaker and influencing how the sound is reflected into the room. This phase focused on exploring different cap shapes and material approaches to support intuitive movement around the sphere, while maintaining the acoustic and aesthetic qualities of the design. Iterative prototyping enabled hands-on testing of form, movement and sound reflection to guide further refinement towards the final product.

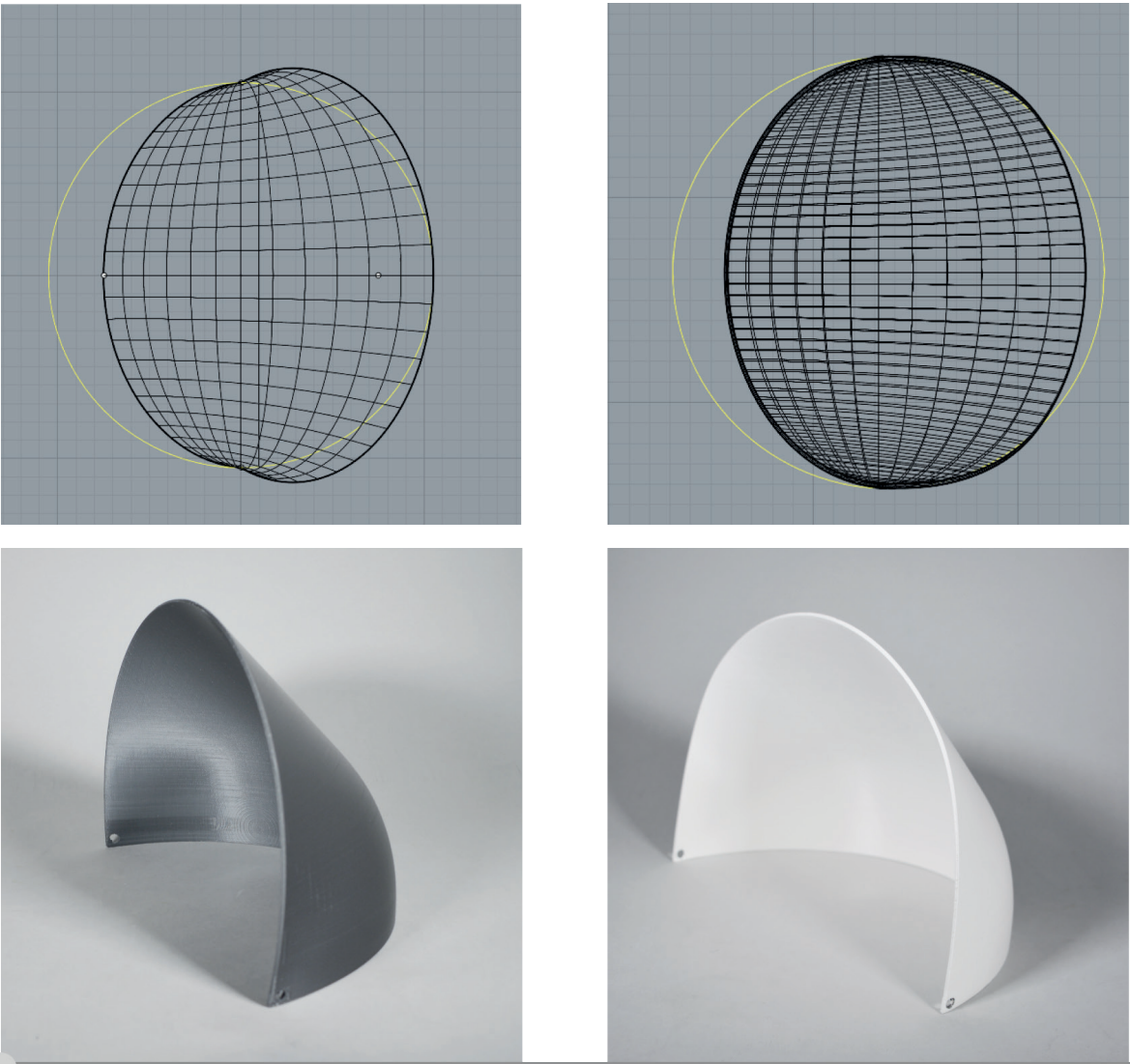
Figure 42. Overview of the different cap prototype iterations



Initial prototypes were made from paper mache, cardboard, and 3D printed materials to quickly test basic shapes. These prototypes replicated semi-spherical caps that were designed to integrate with the spherical speaker shape of the previously presented design (see Figure 43). During testing, however, it became clear that a half-sphere cap obstructed the sound path in combination with the spheric speaker, preventing the sound from being effectively reflected back into the environment. This highlighted the need to adapt the cap design to better facilitate indirect sound projection for user testing. Tactile interaction is a priority, but testing the influence of the cap and seeing how users react and interact with this feature is also of interest during the user test. Therefore the cap is iterated to be able to reflect the sound within the prototype.



Figure 43. Previous selected cap design.



To address the reflection issue, the cap was redesigned with an outward extension away from the sphere. This new shape allowed the sound to be reflected back towards the user and into the room, creating a richer listening experience. The outward movement of the cap also maintained the concept of encasing the speaker, reinforcing the ritualistic interaction intended by the design. While the outward-facing cap improved sound reflection, it introduced friction when rotating around the spherical speaker. In response, a second iteration was developed that changed the geometry of the cap to a more linear, surface-hugging profile. This change reduced resistance during rotation, providing a smoother and more intuitive tactile interaction, while still supporting indirect sound projection.



**Prototype detail pictures**

This page presents close-up views of the physical prototype, highlighting key functional elements of the design. The images show the integration of the cap and speaker shell within the clamping frame, detailing how the frame attaches securely to the speaker.

*Figure 44. Detail pictures of the clamping part of the prototype.*





## Prototype pictures

This page presents the full interaction prototype, illustrating the rotational movement and adjustable height of the speaker. The images show how users can position both the cap and the speaker to suit different listening scenarios. While the current stand has allowed for testing, it does show some bending under the weight of the speaker. For the final design, the pole will be reinforced for stability and paired with a heavier base to ensure secure placement. These visuals reflect the intended interaction qualities: adjustability, directional control and tactile engagement.



Figure 45. Full prototype pictures.



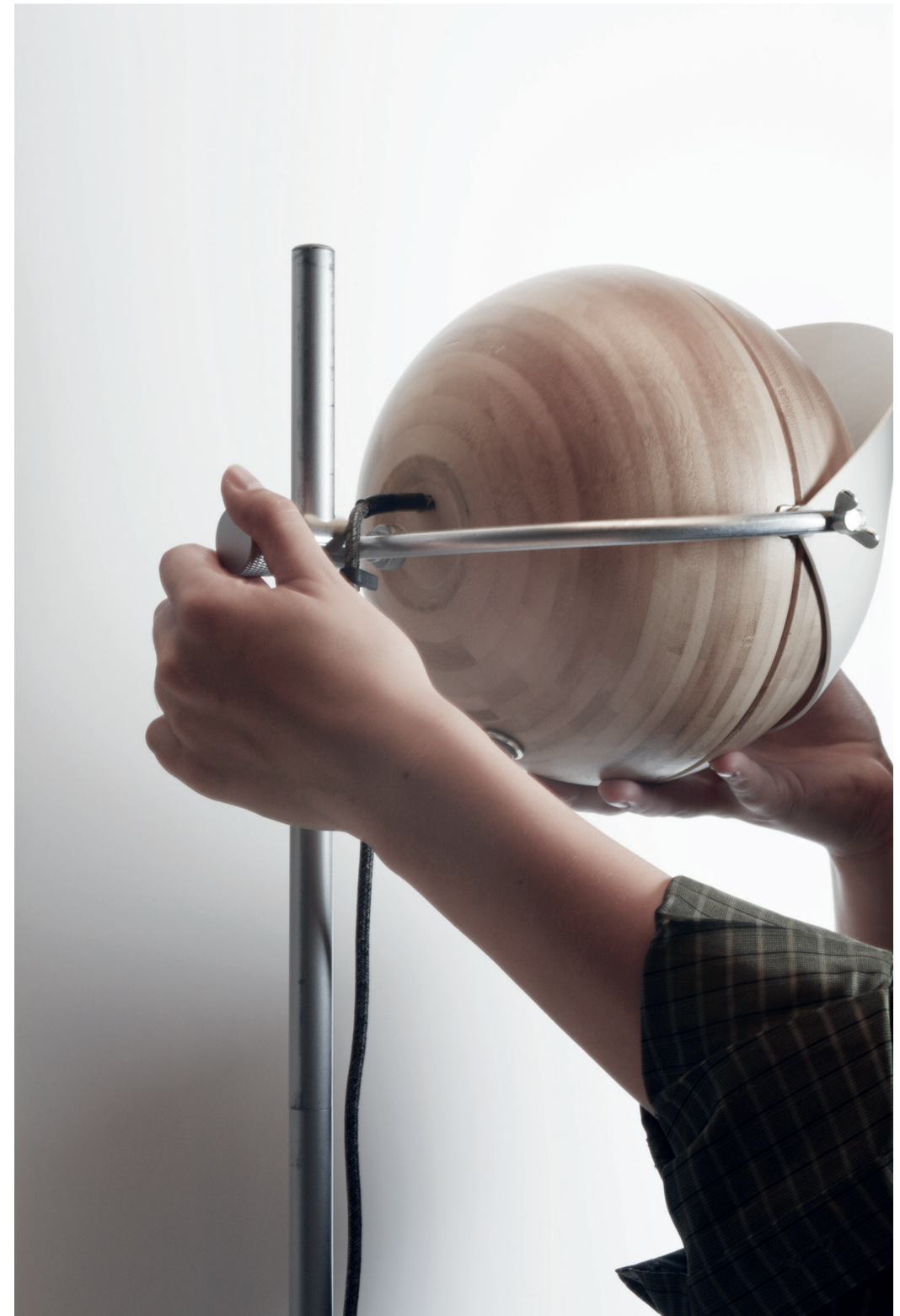


## Prototype interaction

This series of images illustrates how users interact with the prototype through tactile engagement. The images highlight how the user engages with the product: grasping, rotating and repositioning the speaker and cap to adjust direction and listening experience. The gesture of opening the cap mimics a ritualistic moment of preparation, enhancing the emotional connection. Users can easily reposition the spherical speaker by rotating or tilting it, allowing personal control over the direction of sound. In addition, the cap can be moved away from or over the speaker to playfully change the sound experience from direct to indirect. These images confirm the intended experience, a simple, hands-on interaction that feels intuitive, intentional and in tune with the nostalgic qualities valued by the target audience.



Figure 46. Interaction pictures with the prototype.





User testing with prototype

With the prototype assembled and the interaction mechanisms refined, the next step was to evaluate how these design choices worked in practice. As tactile interaction and directional control are central to the product's value proposition, a user test was set up to assess their clarity, usability and emotional impact. The aim was not only to validate functional aspects, but also to explore how the prototype supports a more mindful, personalised listening experience.

Objective

This user test focuses on how people interact with the speaker prototype, particularly looking at the tactile features, how easy it is to use, and whether the design feels emotionally engaging. The aim is to see how users connect with the speaker through its tactile elements and whether it feels intuitive to use.

Pre-test questionnaire

Participants will complete a short questionnaire aimed at gathering demographic data to ensure the sample represents the target group. The questions will include age, gender, how often they use audio devices and how often they use vintage audio devices.

Tasks

Participants were asked to complete a series of tasks to assess usability, tactile interaction, emotional resonance and aesthetic appeal (see Figure 47). They are asked to 'think out loud' during the user test. A voice recording was made to reflect on the feedback given during the user test, but no transcript is included in this report to maintain anonymity. The voice recording allowed the observer to be present in the moment to analyse the user interaction, rather than notulating. Participants were asked to complete the following tasks:

- 1. Start-up and connectivity  
Task: Power on the speaker and connect it via Bluetooth to their mobile device.  
Goal: Assess the ease of initial setup and connectivity.  
Measurement: Time taken to complete the task, qualitative feedback on ease of setup, and any difficulties encountered.
- 2. Tactile interaction with directional control  
Task: Use the tactile controls to adjust the speaker's direction (rotation) and vertical height.  
Goal: Evaluate if the speaker's adjustable features are intuitive and functional.  
Measurement: User feedback on the ease and satisfaction of interaction, including any difficulties or preferences with movement.
- 3. Influence on listening experience:  
Task: Test the interaction by adjusting the speaker's position for different listening moments.  
Goal: Determine if users can adjust the speaker to improve their listening experience (e.g., positioning for optimal sound).  
Measurement: User feedback on the effectiveness of these adjustments and how they impact the listening experience.
- 4. Emotional resonance & engagement:  
Task: Engage with the speaker during a short listening session.  
Goal: Evaluate if the interaction evokes an emotional response or mindfulness experience.  
Measurement: Observations of user behavior (e.g., body language, facial expressions) and qualitative feedback on whether the interaction felt engaging or ritualistic.

Post-test interview

After completing the tasks, participants were asked to share their thoughts on the experience of using the speaker. These questions were intended to gather insights into how the tactile interaction, ease of use, and emotional connection to the product worked in practice. Here are the questions:

- 1. Opening question  
How did you find your overall experience with the speaker?  
How does this speaker compare to others you've used before?
- 2. User understanding:  
How easy was it to use the speaker and its features (e.g., tactile controls)?  
Were there any parts that confused you?
- 3. Functionality and usability:  
Where there any moments where you felt frustrated or confused?
- 4. User interaction:  
On a scale of 1 to 5, how easy was it to use the speaker? (1 being very difficult, 5 being very easy)  
Did the interaction feel enjoyable? Why or why not?
- 5. Impact on listening experience:  
Did adjusting the speaker's position change your listening experience? How so?
- 6. Suggestions for improvement:  
If you could change something to improve the speaker, what would it be?  
Any other comments or feedback?

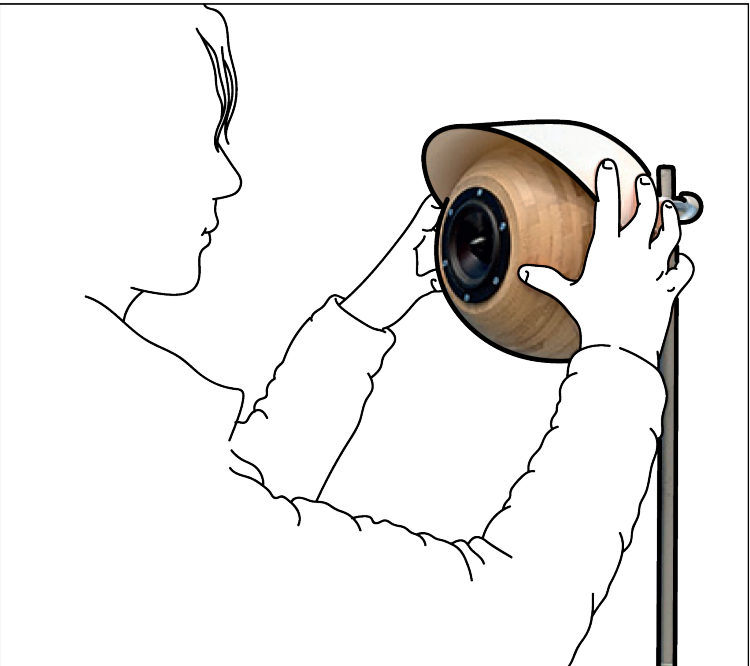
Outcome

The user test revealed a range of interaction preferences that underline the importance of personalisation in the speaker experience. Some participants actively repositioned the speaker in multiple directions, while others preferred it to remain aligned with the stand, valuing visual balance over flexibility. This variation confirms the need to support both expressive and restrained interaction styles in the final design. Vertical height adjustment along the pole was not immediately recognised by all users. However, once the function was pointed out, it was understood without further instruction, indicating that while the mechanism is intuitive, additional visual or physical cues could improve its discoverability. Communicating affordances more clearly will be essential in the next design iteration.

Participants consistently prioritised the visual appeal of the product. Many commented that they appreciated the speaker as an interior object first, comparing it to a lamp or sculptural piece, before recognising it as a functional audio device. This reinforces the goal of integrating the speaker into home environments as both a design element and a functional product.

The cap interaction was particularly well received. Participants found the act of adjusting the cap engaging, with several noting its impact on the perceived sound direction and tone. The tactile and performative nature of the cap movement invited playful behaviour, helping to establish an emotional connection with the product.

These insights provide valuable directions for the next phase of development. The final design iterations will focus on enhancing interaction cues, refining visual integration into interior spaces, and reinforcing the tactile and emotional qualities of the speaker. This will ensure a balanced blend of form, function and personal expression.





# DELIVER

## 04 End result

The Deliver phase focuses on refining and finalising the design based on the insights gained throughout the project. This section outlines the stand design and opening cap mechanism, key components that enhance both functionality and user interaction. Incorporating user input from user testing, this phase ensures that the design meets the needs of the target audience while also considering practical usability. The final design is presented, incorporating feedback with a focus on creating a product that combines aesthetics, functionality and emotional connection for the modern nostalgist.

### Final design steps

Building on insights from the user testing phase additionally to earlier found findings, the final design iterations focus on deepening the speaker's integration into everyday living spaces. Participants frequently perceived the prototype as a piece of furniture or interior object, such as a lamp, highlighting its potential to function as more than just a speaker. In this chapter the final design decisions are addressed and a final design is presented.

## Stand design

To improve overall stability, several stand variations were brainstormed (see Appendix H). The final iteration features a heavier base and a repositioned pole, now centred to better balance the speaker's weight and reduce tipping risk.

In response to user feedback that the speaker resembled a furniture object, the stand was reimagined as more than a structural support. By integrating the functionality of a side table, the design reinforces the speaker's role as a domestic object, one that contributes visually and functionally to the living space.

This page presents concept sketches exploring potential secondary uses of the stand, such as storing books, holding cups, or concealing remotes. These multifunctional features aim to enhance the product's desirability and increase its perceived value by aligning it more closely with the habits and aesthetics of everyday home life.

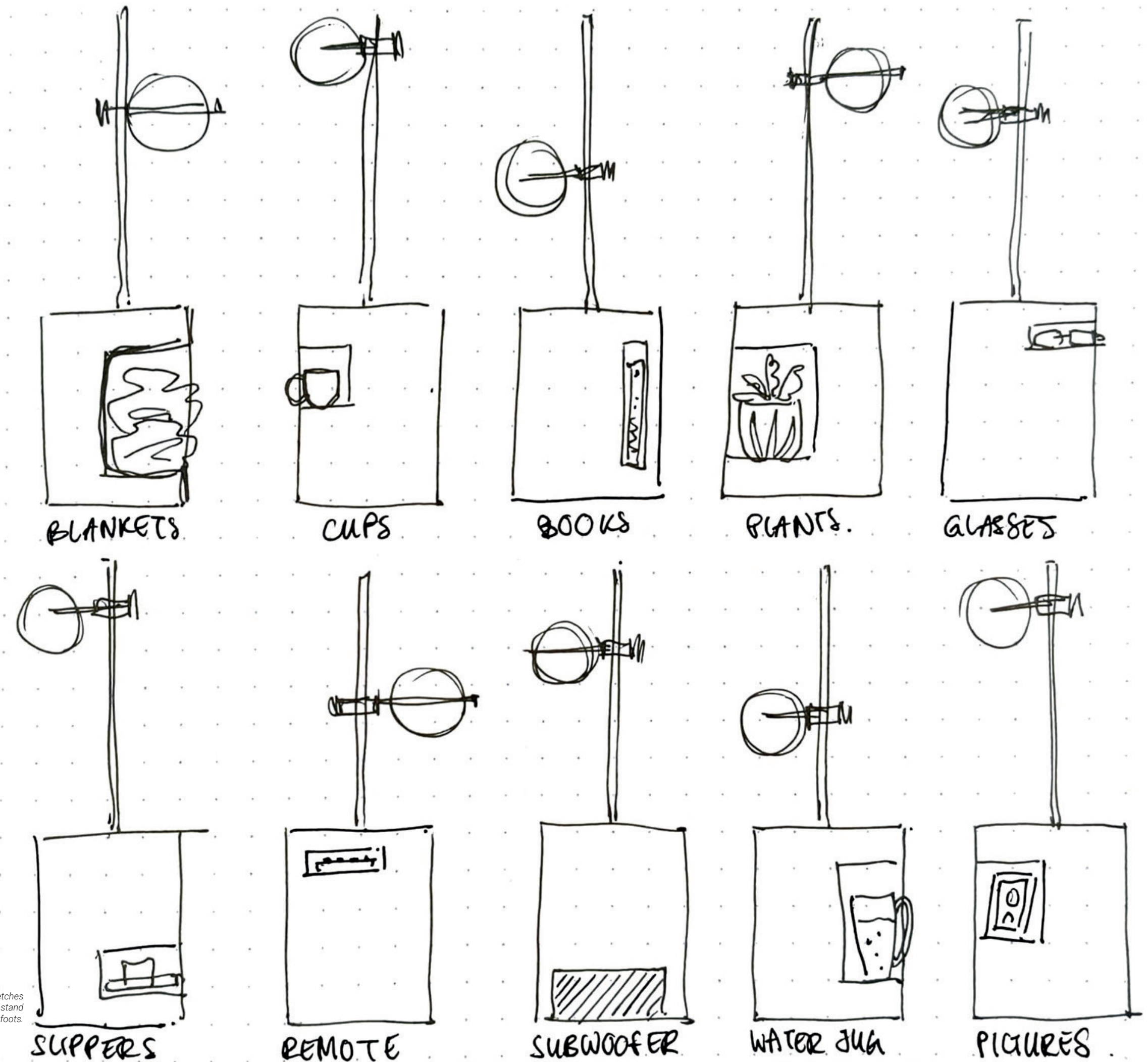


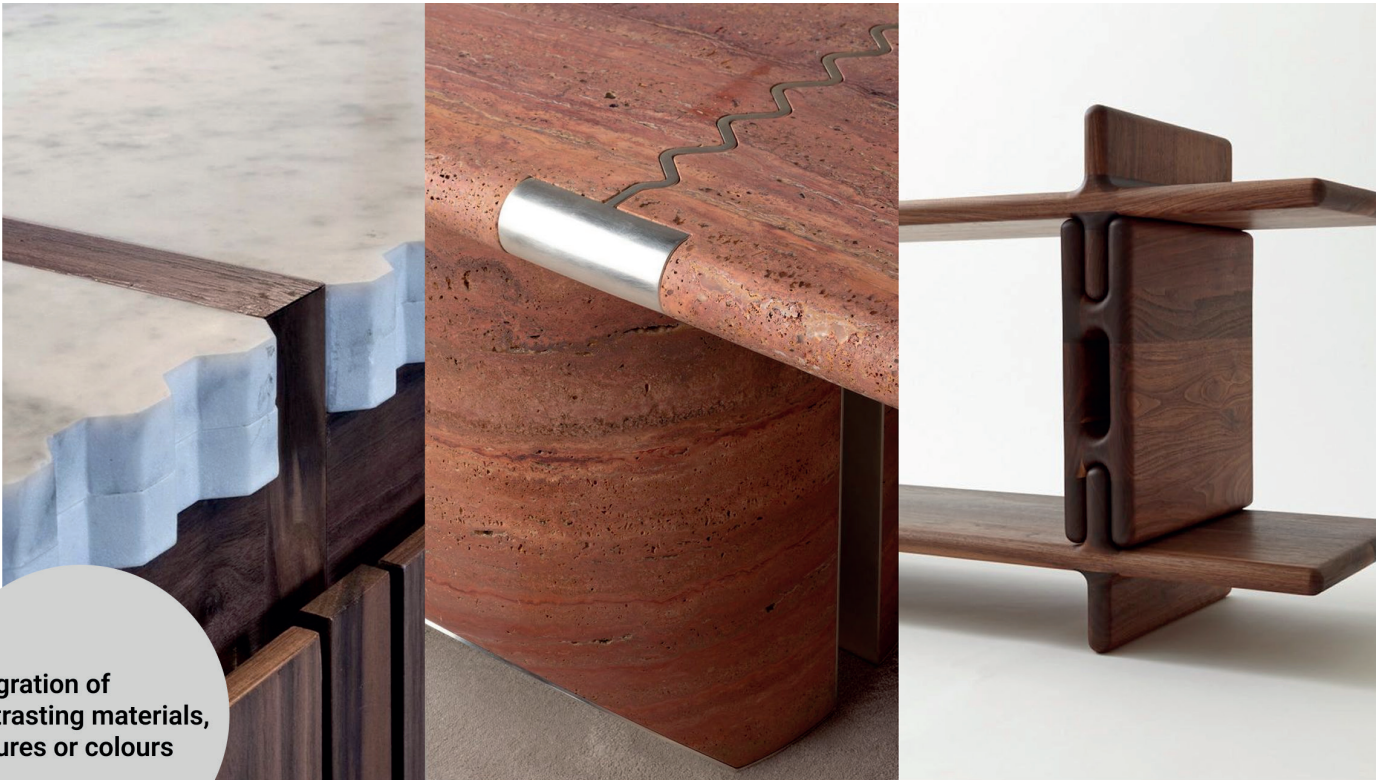
Figure 48. Sketches of different stand foots.



Contrasting materials

The shape of the base of the speaker stand has been designed with a number of considerations in mind to balance space efficiency with visual appeal. While square shapes are space efficient, fully rounded shapes are often more inviting in a living environment. In addition, they better complement the rounded shape of the speaker. To bridge these qualities, a square volume with softened, filleted edges was chosen. Additional compartments were added to the base to support multi-functional use, allowing the stand to double as a small storage or display unit.

Having defined the shape of the base, the connection between the pole and the base was explored through the integration of contrasting materials (see Figure 49). The combination of different materials creates a dynamic visual tension that enhances the presence of the product without compromising its minimalist character. This intentional combination of materials creates uniqueness and tactility, reinforcing the speaker's identity as a design object that combines function with timeless aesthetics (see Figure 50).



Integration of contrasting materials, textures or colours

Figure 49. Examples of integration of contrasting materials or parts fitting together. Sources: David & Nicolas (2024) and Vonnegut & Kraft (2025).



Figure 50. Integrating contrasting materials into the stand design.

User cues - knobs

To support a more intuitive interaction with the speaker stand, additional user cues have been incorporated to distinguish between elements intended for rotation and those intended for assembly only. These cues are based on the texture of the material to increase ease of use.

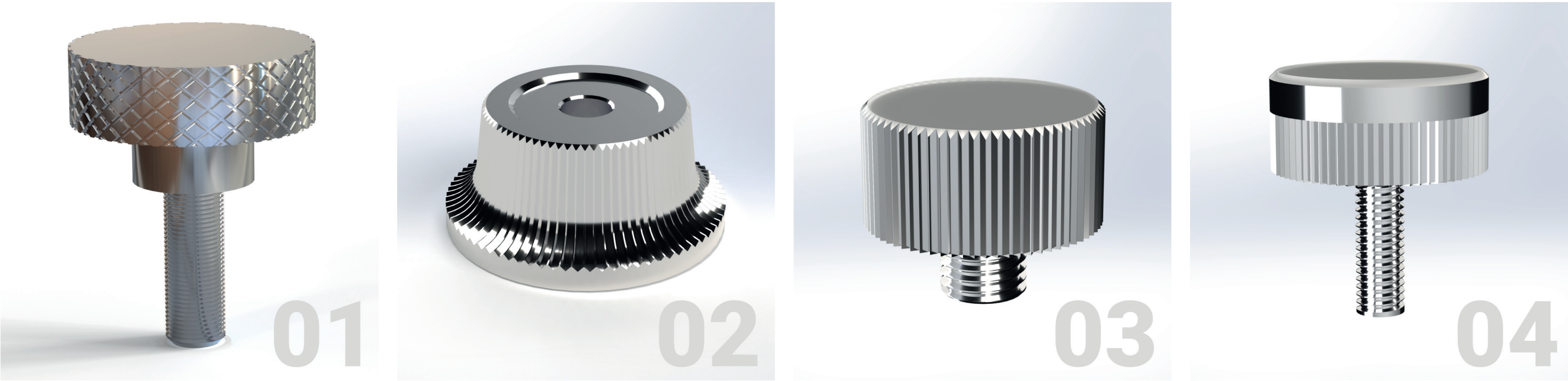


Figure 51. Different knob designs, exploring how to integrate user cues.

A series of knob designs were explored (see Figure 51), each investigating how surface texture and shape can guide user behaviour:

- Design 01 uses a crosshatched texture to maximise grip. However, the visual noise makes it feel overly technical and less refined for a home environment.
- Design 02 softens the look with curved edges and a simpler linear texture, providing a more straightforward visual cue for interaction.
- Design 03 refines this further with clean vertical knurling (textured lines) inspired by vintage audio equipment. This evokes tactile familiarity while maintaining a minimalist aesthetic.
- Design 04 builds on the third design but removes the texture from the top cap to visually communicate that this part is only for assembly, not regular handling. The contrast helps to differentiate between functional and static components.

Designs 03 and 04 were chosen for the final design because of their clarity, nostalgic references and balance between usability and simplicity. Their material qualities help to reinforce the product's tactile identity and emotional resonance with users.



Material choice

This section outlines the material choices for the speaker shell, cap, stand, and foot. Each selected to balance acoustic performance, tactile identity, manufacturing feasibility, and overall user experience.

Speaker shell

The speaker shell plays a central role in shaping both the sound and visual identity of the product. Materials were evaluated based on their acoustic behaviour, tactile expression, and suitability for small-scale production. See Figure 52 for material samples. A spealer cabinet should have high density and good vibration abortion to minimize vibration and resonance. In order to produce a calmer and non-resonating sound (Wilson, 2014).

Acoustic considerations

Materials with high density and surface texture, such as Jesmonite and cement-based composites, were prioritised to minimise internal resonance while preserving clear sound projection (add source). This aligns with the brand’s heritage of using sculptural, damping materials like cement, enabling expressive forms without compromising audio quality.

Tactile and visual qualities

To remain true to Devoonsounds’ brand language, materials were chosen for their raw, tactile textures and natural variation. Jesmonite and similar terrazzo-like composites provide a handcrafted aesthetic that resonates with the target audience of modern nostalgists.

Feasibility and production

Given the intended small production run, mouldability and ease of manufacturing were essential. Jesmonite supports custom forms with low tooling cost, making it well-suited for flexible production. For the structural frame, aluminium was chosen due to its lightweight durability and ability to support directional speaker movement with minimal visual intrusion.

Cap

The speaker cap serves both an aesthetic and functional role, visually completing the spherical form while influencing how sound is projected into the space. From an industrial design perspective, selecting the right material for the cap required balancing acoustic behaviour, visual coherence, manufacturability, and user experience.

Acoustic considerations

Materials with high density and small surface texture, such as jesmonite and cement-based composites, were prioritised to minimise internal resonance while maintaining clear sound projection. This is in line with the brand's heritage of using sculptural, damping materials such as cement, allowing for expressive forms without compromising sound quality.

Tactile and visual qualities

To stay true to Devoonsounds' brand language, materials were chosen for their raw, tactile textures and natural variations, similar to the speaker shell. Jesmonite and similar terrazzo-like composites provide a handcrafted aesthetic similar to Devoonsounds' current products and fit within the brand's product portfolio.

Feasibility and production

As with the speaker shell, formability and ease of manufacture were essential in view of the small production volume. Jesmonite supports custom shapes with low tooling costs, making it well suited to flexible production.

Future opportunities

Looking ahead, future iterations may integrate more sustainable material streams, such as shell composites or waste-based ceramics, to reinforce long-term design integrity and environmental responsibility, but for current availability and implementation jesmonite will be selected.



Jesmonite



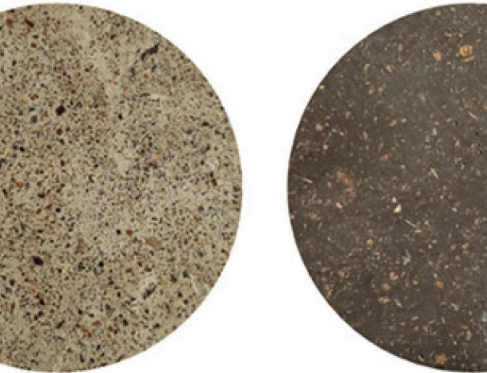
Made by hand using bark dust from the timber industry waste (Giria).



Material made from demolition waste, produced by Waste Epiphany.



Red mud from Studio ThusThat.



Frumo is a sustainable material made from food waste and natural resin.



Shell material from Malakio.

Figure 52. Samples of the materials to display the visual qualities of the materials

\*Images on this page were sourced from: Plasterite (2024), Demolition Waste From Waste Epiphany (2024), Giria (2025), Red Mud (2025), Gp-award (2024), Malàkio (2025)



## Wiring ideation

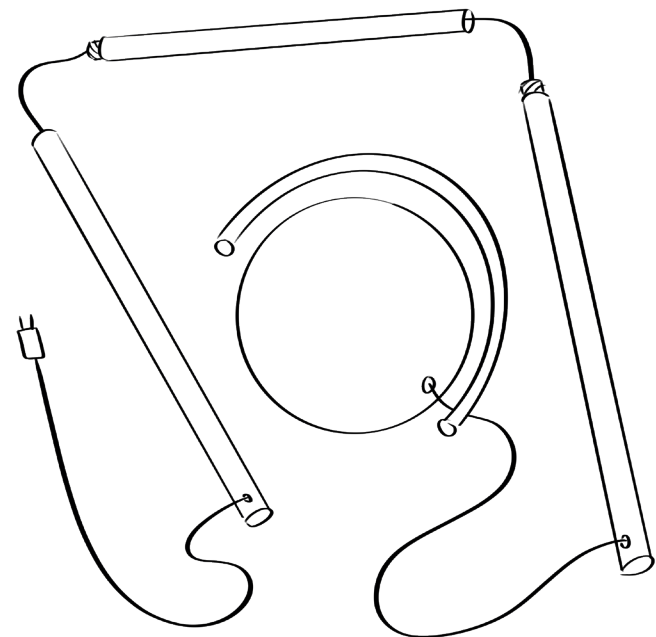
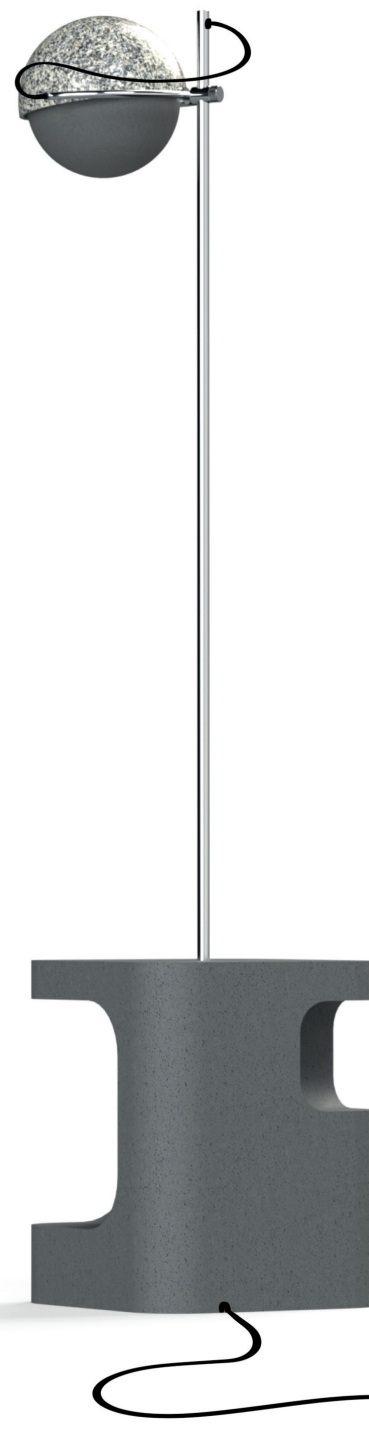
In the development of this speaker concept, integrating the power cabling in a visually coherent and technically feasible way was a design challenge. The aim was to maintain a clean appearance while ensuring a safe and reliable connection. Various strategies were explored, drawing inspiration from high-end lighting products (see Figure 53) where the cable is deliberately exposed and treated as a design feature, textured, tactile and expressive, rather than hidden. Complete concealment of the cable was considered, but due to the moving part of the speaker, this was not considered for this phase as it would mean more complex internal wiring mechanisms. Therefore, for this conceptual design, the cabling is inspired by existing products.

The design envisions the wiring entering through the top or side of the vertical pole stand. Early mock-ups suggest that routing the wire internally through the pole may provide a cleaner result, but introduces technical uncertainties regarding cable flexibility, connector durability, and heat dissipation. Alternatively, leaving the cable partially visible could emphasise its function and materiality, potentially making it an accent element through the use of bold colour or textile sleeving.

This stage remains conceptual. A final design solution requires expert input to ensure compliance with safety standards and to refine details of connector accessibility, internal routing and potential modularity. Further testing is also required to determine the optimum wire thickness and anchoring points to avoid visual clutter or strain at connection points.

In summary, while the current research provides initial design directions, the integration of wiring will require further refinement to ensure the product is both market ready and visually resolved.

Figure 53. Different ways products are wired. Sourced: Manufactum (2024), Libre (2022), Fiuza (2025), Avery (2014).





Manufacturing

The design has been developed with small-scale manufacturability in mind, balancing aesthetic precision with feasible manufacturing techniques. Important components of the speaker, such as the cap, body and base, are designed for low-volume casting, while modular parts ensure streamlined assembly and maintenance (see Figure 54).

Components and Production Methods

Cap and speaker body

Both the upper cap and the lower body of the speaker are intended to be manufactured using a shaped Jesmonite process. Jesmonite offers an aesthetic fit with the brand identity, providing a stone-like texture with improved sustainability and reduced weight compared to traditional concrete. Custom moulds would be used to cast each half-shell, ensuring consistent shape and acoustic quality. The moulds could be made from silicon or 3D printed.

Foot stand

The base of the speaker is similarly designed for Jesmonite casting, using a durable mould with structural reinforcement where required. The sculptural form not only adds visual interest, but also simplifies demoulding while providing sufficient weight for stability.

Aluminium parts

The frame components, including the rod and bracket, are made from aluminium using CNC machining or standard extrusion and tube joining techniques. These parts provide structural rigidity and allow the speaker element to rotate freely.

Electronics

The speaker uses off-the-shelf electronic components, including a full-range audio driver, internal wiring, and a detachable power cord. These elements have been selected for their reliability, availability and ease of integration. The electronics are housed within the Jesmonite speaker body. By using standard components, the design supports easy assembly, maintenance and future upgrades if required.

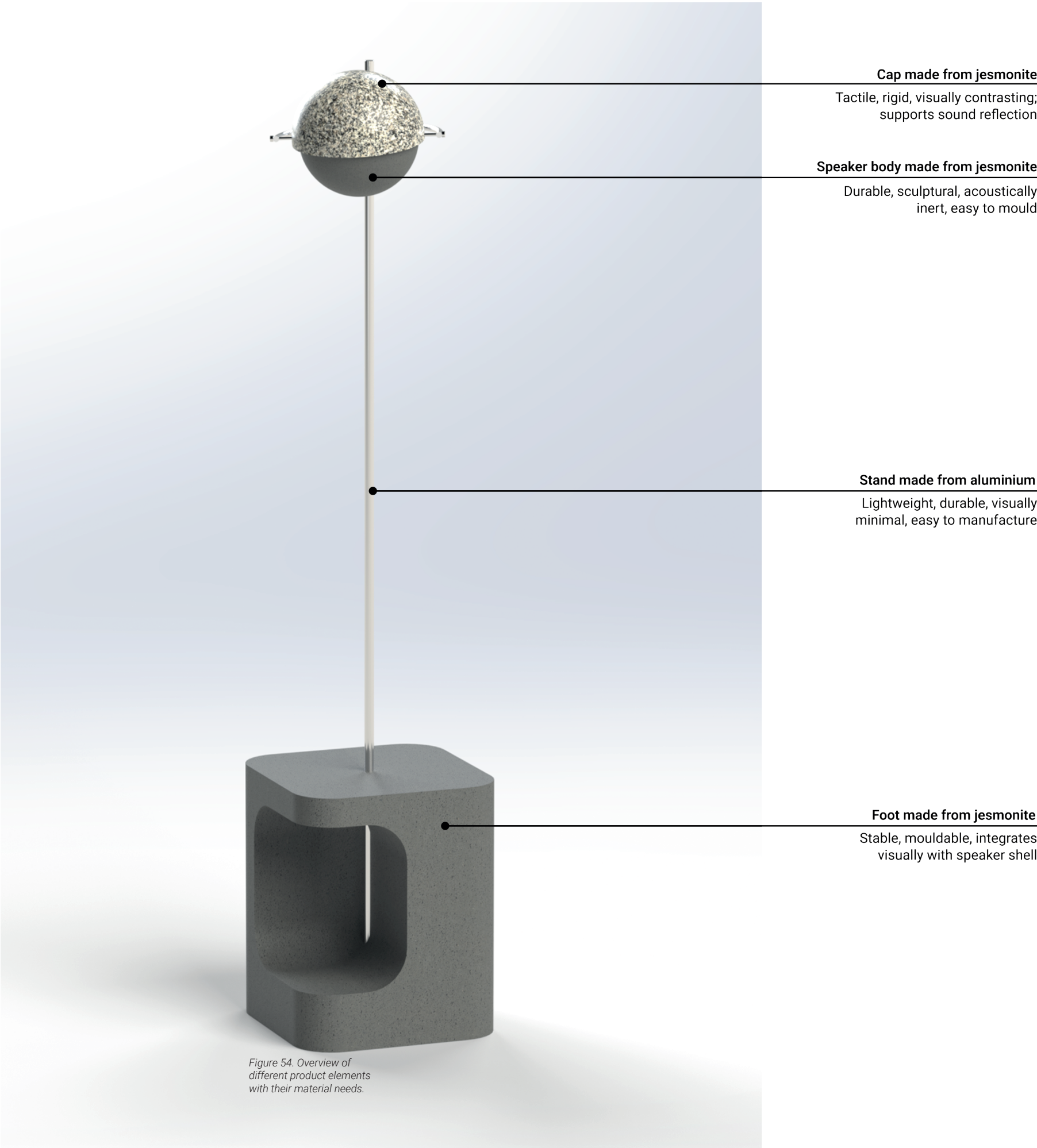
Manufacturing assembly

The speaker driver and electronics are assembled into the Jesmonite speaker body. Wiring is completed and tested before the speaker is sealed with the driver, which is secured with screws. Aluminium ring brackets are attached to the speaker body. Aluminium ring brackets are attached to the speaker body.

User assembly

The user assembles the aluminium pole by screwing modular segments together. The pole is inserted into the base. The speaker frame is clamped onto the ring bracket. Finally, the frame slides onto the pole, allowing vertical adjustment.

This approach allows for efficient packaging, easier shipping and a sense of user engagement through tactile placement. This is in alignment with the ritualistic positioning of the product. The proposed manufacturing approach aligns with Devoonsounds' current capabilities, particularly the use of moulding techniques. This makes the production of the cap, speaker body and base both feasible and scalable for low volume production. The sourcing of aluminium parts and standard electronic components further supports an efficient assembly process. Production on an order-by-order basis provides additional flexibility and allows for colour personalisation of the moulded components, enhancing both brand identity and user appeal.





## Final design

The final design brings together earlier findings to create a speaker that combines functional audio performance with a tactile presence in the home. The product is designed to be both a listening device and an interior object, integrating into living spaces while providing meaningful interaction for the user.

This page presents the final design, highlighting the spherical shape of the speaker and the contrasting palette of materials (see Figure 55). The speaker can be repositioned through rotation and directional adjustment, offering a personalised sound experience. The weighted base adds physical presence and interior value, while the open cap design invites user interaction and emotional engagement.

The design prioritises tactile quality, visual coherence and material honesty, reflecting Devoonsounds' brand identity and appealing to modern nostalgists seeking emotional connection through physical interaction.



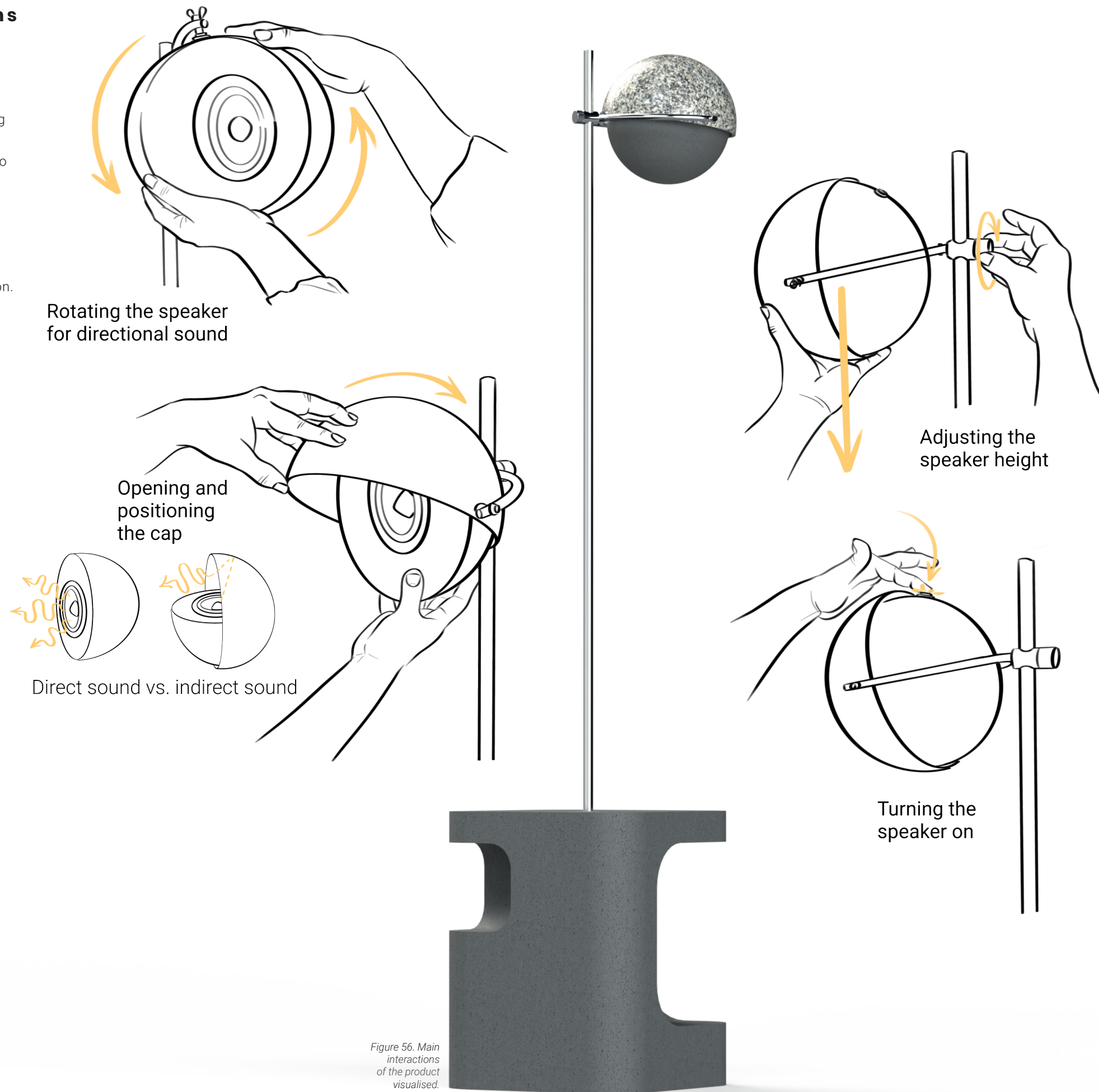
Figure 55. Final design renders.





## Product interactions

This section outlines the important physical interactions that define how users engage with the speaker. These interactions, such as adjusting orientation, repositioning the cap, or turning on the device, are designed to support intuitive use and encourage user interaction (see Figure 56). By incorporating tactile gestures into the design, the speaker enables a personalised listening experience while encouraging active participation. These actions contribute not only to functional control, but also to the perception of the product as an integrated and adaptable element within the living environment.



## Storyboard

This storyboard visualises key user interactions with the speaker, highlighting its tactile and personalised nature (see Figure 37).

Based on findings from user testing, the interaction sequence is not fixed: users engage with the product in a fluid, exploratory way. Actions such as opening the cap, reorienting the speaker or changing its height are part of a continuous and intuitive process shaped by individual listening preferences.

The storyboard captures this dynamic: from the initial setup (turning on and casting audio), through the engagement with the directional and acoustic characteristics of the speaker, to its integration as a functional interior object. Together, these steps reinforce the product's identity as an interactive, ambient device that invites both touch and presence in everyday use.

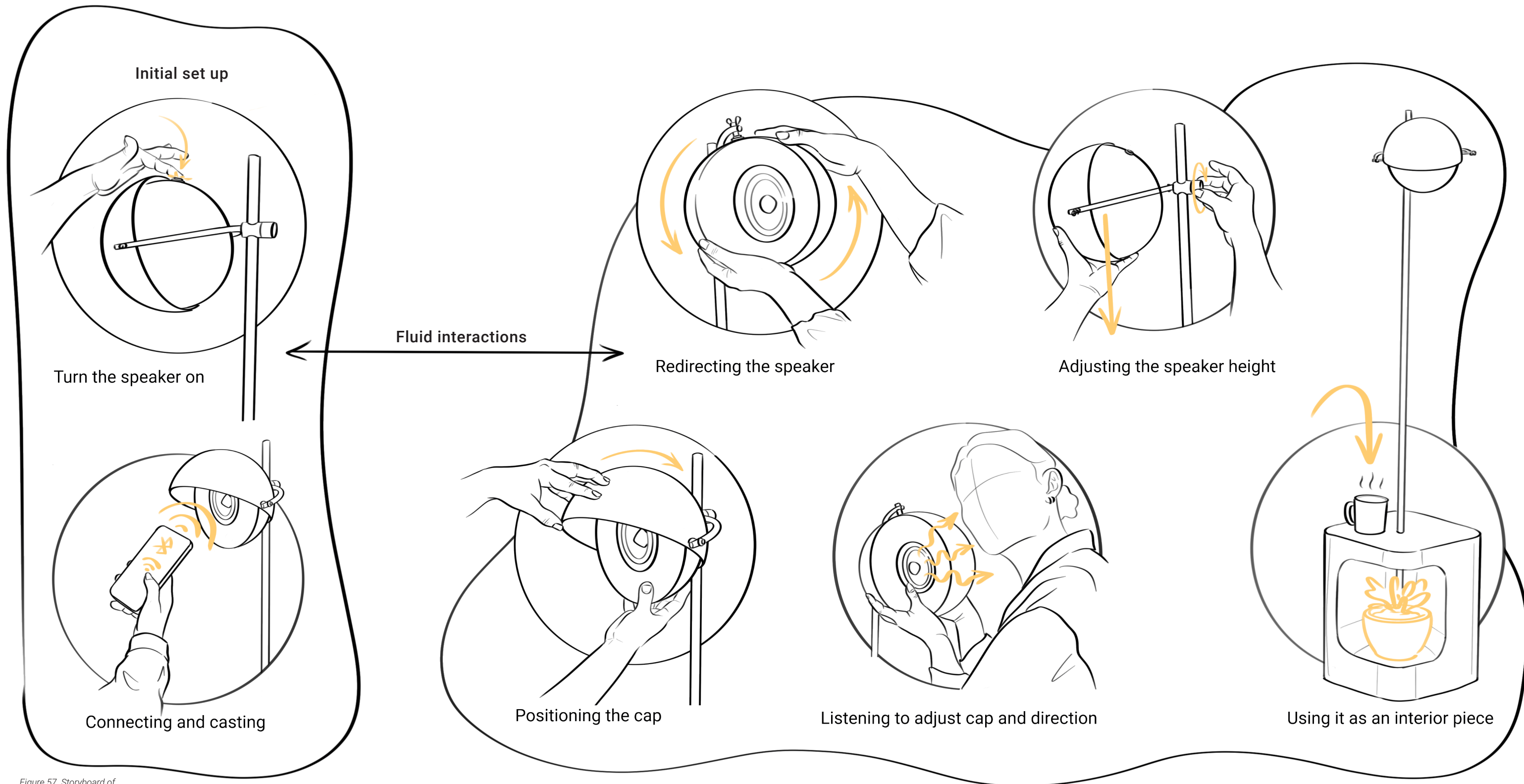


Figure 57. Storyboard of the final concept design.



Cost price estimation

To evaluate the financial viability of this speaker concept, a preliminary cost estimation was conducted based on a rough bill of materials. The estimation includes all structural and electronic components used in the prototype, considering low-volume batch production. Each part was listed (see Table 2) with indicative quantities and known supplier prices where available, aligning with a small-scale manufacturing strategy.

Table 2. Bill of materials

Item No.	Part name	Quantity	Price
1	Aluminium pole clamp	1	
2	Aluminium bracket	1	
3	M5 pins	2	
4	M5 cap	1	
5	M8 bolt	1	
6	Speaker shell	1	
7	Full-range woofer	1	€52,45
8	Stand foot	1	
9	Pole stand M+cap	1	
10	Pole stand F+M	2	
11	Pole stand F+cap	1	
12	Cap	1	
13	Power cord	1	€5,50
14	Amplifier board	1	€99,95
15	Power button	1	€0,62

Cost drivers include the full-range woofer (€52.45), amplifier board (€99.95) and power cord (€5.50), which together account for the majority of the cost of the electronic components. The cost of electronics depends on where they are sourced.

Where possible, prices have been based on known retail or supplier sources for similar materials. Where parts are custom made (e.g. the moulded base), prices have been estimated by reference to similar products or by projecting material and tooling costs over small batches. For example, lamp stands with similar aluminium tubing and weighted bases were benchmarked at around €100 in the retail sector, giving an indication of a feasible manufacturing cost.

The total cost of parts, although not finalised in detail, is estimated to be within the expected range for a premium speaker. Taking into account additional factors such as assembly, packaging and a modest profit margin, the product can be positioned in a retail price segment of €1000-1300, which is in line with the target price range defined during the benchmarking exercise. A target price of €1285 is proposed, placing it just above Devoonsounds' current offering, while remaining competitive in the high-end audio market.

This higher price is justified by the added functional value of the design. Unlike many competitors who focus on aesthetics alone, this speaker integrates tactile interactions and adjustable sound direction, features that support greater user engagement and personalisation. These differentiators make the concept more than a passive audio object and reinforce its identity as a meaningful piece of interior design.

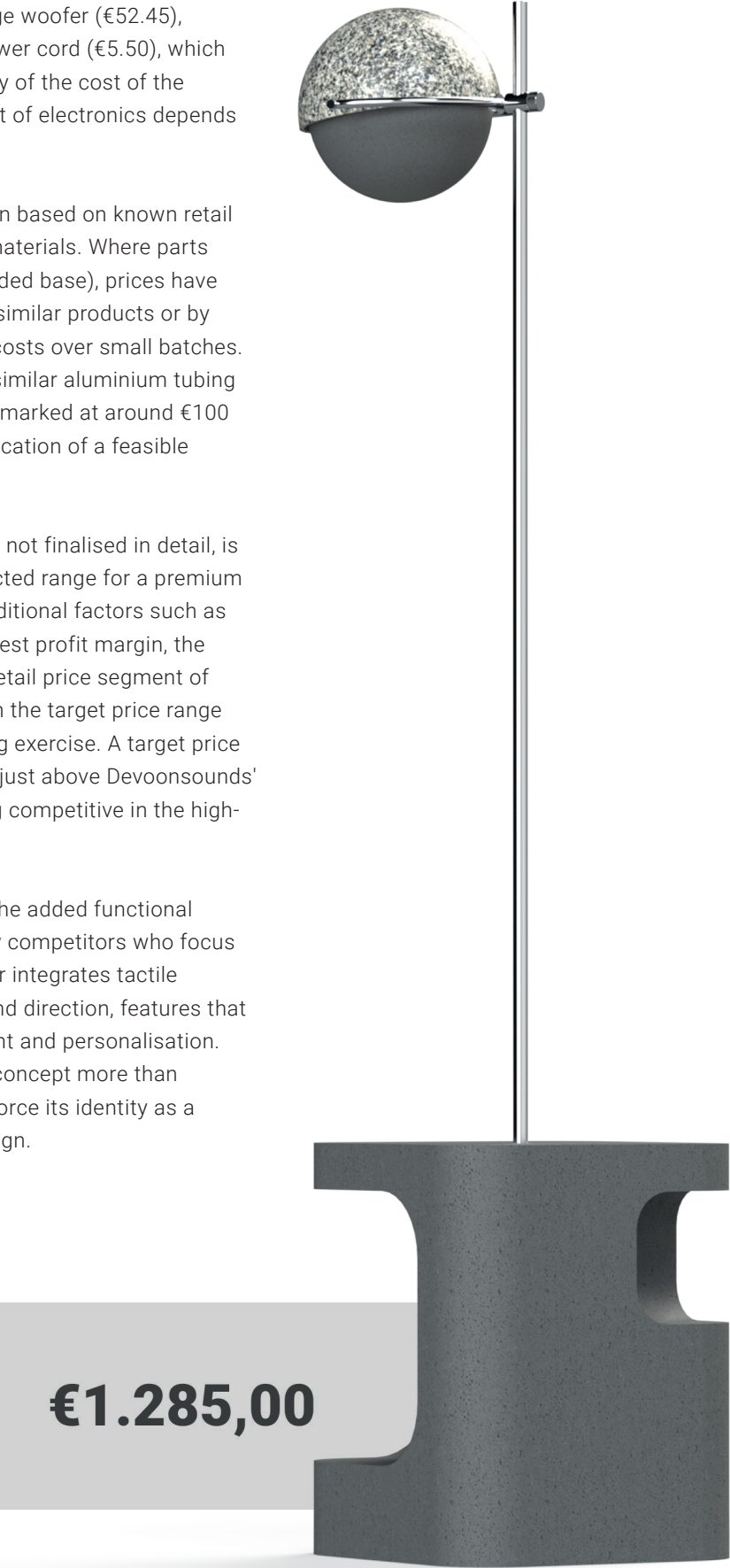


Figure 58. Product with estimated cost price.

Evaluation

This section reflects on how the final design meets the predefined goals of the project, based on the program of requirements and wishes. The evaluation is structured around key categories: user experience, form, technology and manufacturability. Both core requirements and additional wishes were evaluated.

Requirements	Wishes
<p><b>User experience</b></p> <div><div>+</div><div>The speaker must offer an innovative tactile interaction that distinguishes it from existing products on the market.</div></div> <div><div>+</div><div>Interaction design with minimal learning time; users should be able to start-up the speaker within 3 minutes of first interaction.</div></div> <div><div>+</div><div>Users should be able to influence their listening experience through tactile interaction, allowing for intuitive adjustments.</div></div> <div><div>+</div><div>Emotional engagement through nostalgia and ritualistic interaction.</div></div> <div><div>—</div><div>Functions as a self-sufficient object, blending with modern living spaces and encouraging display over concealment. 80% of users should find it visually appealing and display-worthy.</div></div> <p><b>Form</b></p> <div><div>+</div><div>Timeless design reflecting simplicity with minimalistic lines.</div></div> <div><div>—</div><div>Compact size: Max dimensions of 35cm in width and depth.</div></div> <p><b>Technology</b></p> <div><div>+</div><div>Support for Bluetooth and Wi-Fi connectivity; users should connect within 3 minutes after turning on the device.</div></div> <p><b>Manufacturability</b></p> <div><div>+</div><div>Feasible production cost.</div></div> <div><div>+</div><div>Capable of small-scale production.</div></div> <div><div>+</div><div>The speaker must be producible locally in the Netherlands.</div></div>	<p><b>User experience</b></p> <div><div>+</div><div>The speaker should offer customizable finishes or colors, with at least three options to allow users.</div></div> <div><div>+</div><div>The speaker should allow for adjustable placement.</div></div> <div><div>+</div><div>The tactile interaction should enhance the overall user experience beyond basic functionality, providing added value and engagement.</div></div> <p><b>Emotional connection</b></p> <div><div>+</div><div>The speaker should facilitate moments of mindfulness or emotional resonance, encouraging users to take intentional breaks from their routine.</div></div> <p><b>Reflection</b></p> <p>The criterion that 80% of users should find the design visually appealing and “display-worthy” remains partially untested. The prototype was primarily designed to validate interaction quality, not visual aesthetics. This requirement should be revisited in future user studies with refined visual prototypes. However, initial feedback from the user interaction test on aesthetics was positive.</p> <p>Compactness was a requirement that evolved during development. Initially, a small footprint was prioritised, but the concept shifted towards an interior piece that acts as a multi-functional object with additional side table functionality. As a result, the form factor of the speaker increased. Although the footprint is larger, this change is in line with the new role of the speaker as an integrated piece of home furniture.</p> <p>This evaluation confirms that the design meets most of the key objectives, particularly in terms of interaction quality, emotional resonance and feasibility. Areas such as visual validation and product compactness have evolved through the design process and offer opportunities for refinement in future iterations.</p>

Conclusion

This thesis explored how tactile interaction can enrich the emotional and functional qualities of a modern speaker, with the goal of creating a product that resonates with the modern nostalgist, users who value both sensory engagement and timeless design. By grounding the design process in iterative prototyping, user testing and material experimentation, the project resulted in a speaker that invites intuitive interaction, supports personalisation and complements the living space as an interior object.

Desirability

The appeal of the design lies in its alignment with the values of the modern nostalgist: users who actively seek meaningful, sensory experiences in contrast to the impersonal nature of many modern audio products. User testing confirmed that the physical interaction with the cap, described as a ritualistic "unwrapping" moment, resonated with this group. The ability to directly reposition the speaker and adjust its acoustic character using the cap added emotional depth to the listening experience. These interactions reflect a shift in consumer preference towards slower, more deliberate modes of use and tie in with a growing trend towards designing for presence and tactility in the household environment. By embedding this philosophy into the design of the speaker, the concept meets the expectations of a niche but growing audience and positions it as a desirable alternative in the increasingly homogenised audio market.

Feasibility

From a manufacturing perspective, the design is based on accessible methods. The use of jesmonite for the shell and cap allows for low volume casting with aesthetic consistency and structural integrity, without the overhead of industrial tooling, supporting Devoonsounds' scale and capabilities. Aluminium was chosen for its strength to weight ratio and visual neutrality, supporting both function and manufacturability. Prototype testing confirmed that core components and interactions could be executed using off-the-shelf electronics and simple assembly techniques, validating the feasibility of the concept with current tooling and production capabilities.

Viability

A preliminary cost estimate, combined with market benchmarking, supports the placement of the product in the €1000-1300 premium segment. This positions the speaker competitively, while leaving room for small series production and personalised finishes. The design offers not just a product but a differentiated experience, an increasingly valuable proposition in an already saturated audio market.





# 05

## Final thoughts

### Discussion

The aim of this project was to explore how tactile interaction could enhance the design of a modern loudspeaker by strengthening the emotional connection between user and product. Through iterative prototyping, material exploration and user testing, the design process moved beyond aesthetic refinement to actively consider user behaviour, sensory engagement and contextual use. While the outcome is consistent with the initial goals of creating a contextual, emotionally engaging speaker, several limitations and considerations remain.

**Scope and sample limitations**

The user testing involved a limited number of participants, most of whom already identified with the 'modern nostalgist' target audience. While their insights were valuable, the lack of demographic diversity limits the generalisability of the findings. Broader testing across different user profiles and environments is needed to validate the usability and emotional appeal of the concept at scale.

**Focus on interaction vs. technical functionality**

The primary focus is on physical interaction and design expression, with aspects such as audio fidelity, advanced sound settings and long-term durability less explored. Although the prototype provided satisfactory acoustic feedback in controlled tests, further technical input would be required to ensure high-end sound performance in different environments.

**Material and manufacturing assumptions**

Material selection and manufacturing strategies were based on small-scale feasibility and known supplier data. However, estimates of production costs, durability and material longevity are preliminary. For example, bespoke moulding may result in unanticipated costs or challenges in larger scale production. The integration of the wiring into the rotating system also proved to be complex and would require more attention for further development.

**Optimisation of cap design**

While the result shows potential in both form and experience, several limitations must be acknowledged. Firstly, the cap design, which plays a key role in shaping the sound projection, has not yet been acoustically optimised. Although users responded positively to the interactive nature of the cap, the actual influence of its geometry and material on sound reflection requires further evaluation. Iterative testing with different materials and geometries is required to ensure that the acoustic quality matches the visual and tactile promise of the product.

**Design trade-offs**

Some design compromises were made to support interaction. For example, the requirement for compactness has been moderated in favour of improved furniture-like integration. Similarly, while visual affordances have been improved, clearer user cues, particularly for height adjustment, remain an area for refinement.

**Emotional resonance vs. practical use**

Although the loudspeaker successfully engaged users on an emotional level, it was found that some functions (adjusting the cap) were discovered more intuitively than others (adjusting the height of the loudspeaker). This suggests that ritualistic interaction can increase engagement, but also introduces a degree of unclarity. The balance between playfulness and functional clarity remains a key design tension.

**Future validation**

The potential of the concept lies in its emotional value and personalisation, but this remains speculative without extended use or long-term engagement studies. It is unclear how novelty or tactile pleasure might be sustained over time. Further validation in real-life household contexts is recommended to assess sustained desirability and performance.

Overall, the project represents a promising direction for embedding emotional interaction in product design, particularly in the audio segment. However, more rigorous testing, cross-disciplinary collaboration and production-oriented refinement are required to fully realise the product's potential.

# Design recommendations

Building on the results of the project, several opportunities have emerged to strengthen the attractiveness, functionality and long-term adaptability of the product. These recommendations serve as a guide for further refinement and strategic development:

**Refine interaction cues**

Subtle but intentional adjustments such as material textures, tactile indicators and visual contrast should be incorporated to help users intuitively locate and operate interactive elements. This is particularly relevant for the vertical adjustment mechanism, which was not immediately understood during testing.

**Explore material variation**

Offering variations in colour, texture or finish for components such as the cap and base could increase the aesthetic versatility of the product (see Figure 60). These material choices can be aligned with interior design trends or used for limited edition releases, increasing perceived value.

**Add modular cap options**

To enrich the listening experience, future versions could include multiple interchangeable caps, each designed to reflect and shape sound differently. Concepts such as layered caps or caps with different acoustic profiles can give users more control over their sound environment.

**Design with spatial flexibility**

The introduction of different base designs could support different placement within a home, such as low side tables, corner placements or central room dividers (see Figure 59). This reinforces the speaker's role as a multi-functional piece of furniture and supports different user preferences.

**Enabling compatibility with vintage equipment**

Given the nostalgic appeal of the speaker, offering input options for analogue sources such as turntables or tape decks would strengthen its emotional resonance and broaden its usage context. This reinforces the concept's identity as a modern tribute to vintage audio rituals.

**Integrating a subwoofer into the base**

Exploring the integration of a subwoofer into the base could improve bass performance without disrupting the visual balance of the design. Embedding audio functionality into structural elements maintains the clean aesthetic while enhancing depth and richness of sound.

**Develop a modular system**

Future iterations could benefit from a wider ecosystem of add-ons, such as lighting elements, storage integration or cap variations, transforming the speaker into a more ambient and multi-functional object. This would also support ongoing post-purchase engagement with the product..

**Address integration of power wiring**

During the design process, various approaches to integrating power wiring were explored, aiming to keep cables unobtrusive while maintaining safe and reliable connectivity. However, this aspect requires further technical development and collaboration with an expert in electrical integration to ensure compliance with safety standards and maintain design integrity. A more in-depth engineering phase is recommended to resolve this aspect in the final product. Enhance onboarding experience To support intuitive discovery, the user experience should begin at unboxing. Designing packaging that visually and physically communicates key interactions (e.g., opening the cap or rotating the speaker) could reinforce the ritualistic qualities users appreciated.

The next steps will involve refining production methods, validating user cues through iterative testing, and conducting market trials to assess user preferences and price sensitivity. Together, these efforts will support a successful transition from concept to small-series production, ensuring that the final product maintains its distinct identity while remaining feasible, desirable, and commercially viable.

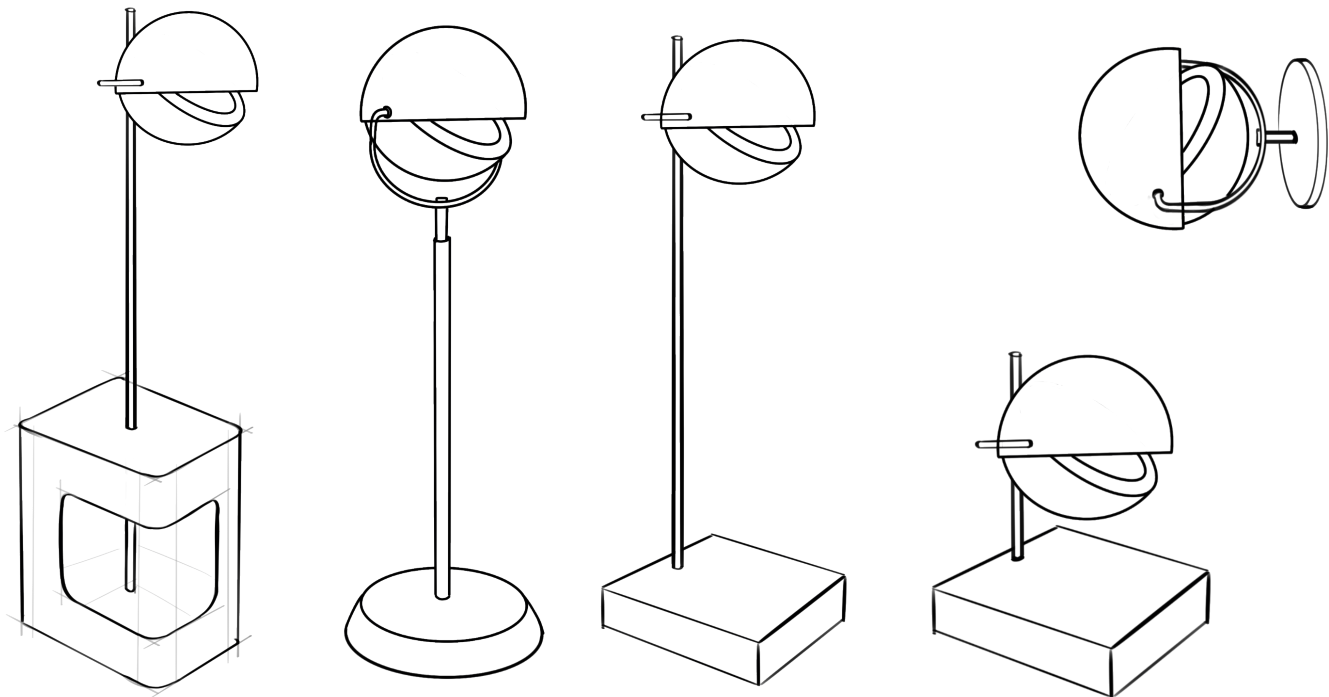


Figure 59. Different stand configurations.



Figure 60. Look into different material options and combinations.



# 06

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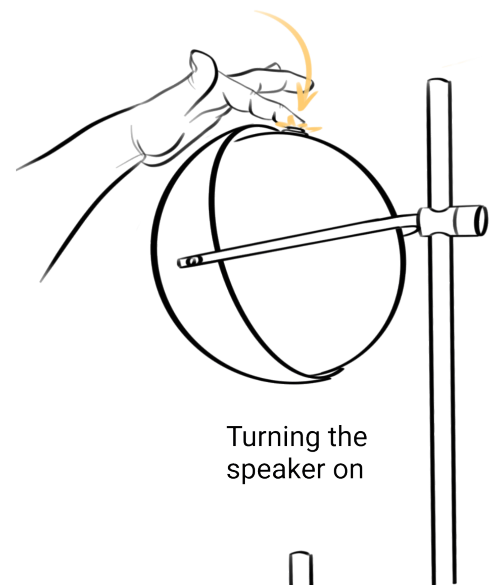
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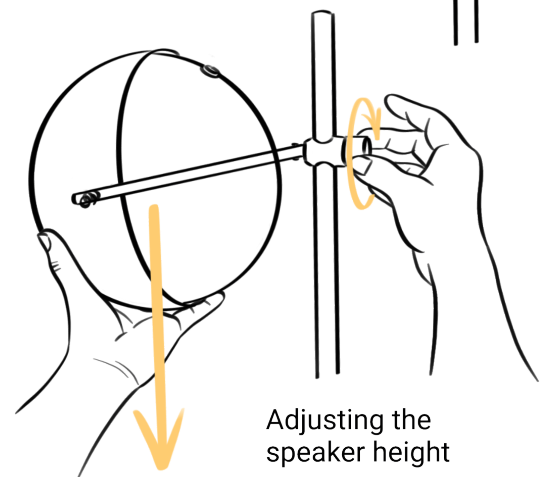
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# Appendices

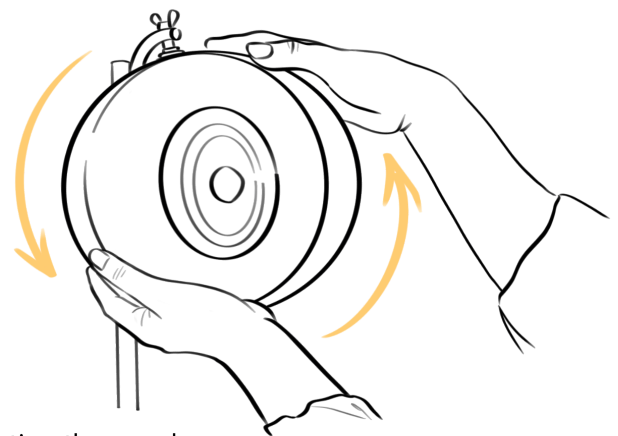




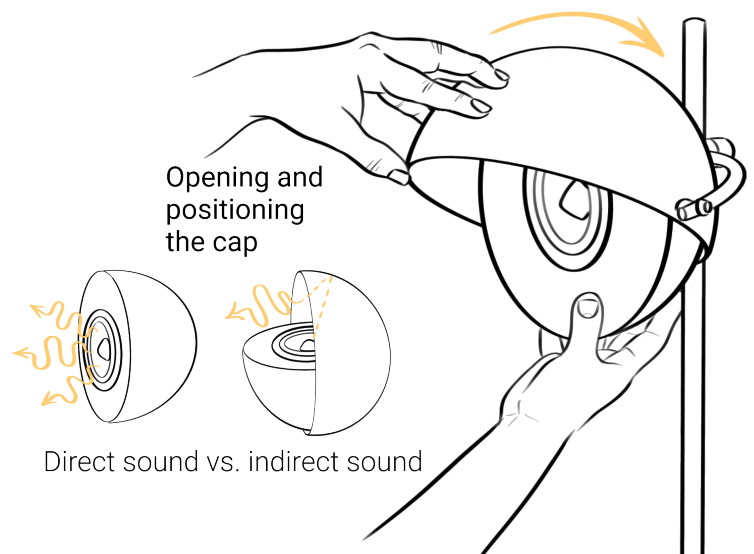
Turning the speaker on



Adjusting the speaker height



Rotating the speaker for directional sound



Opening and positioning the cap

Direct sound vs. indirect sound