MusChro

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School of Art, Design and Architecture (SADA)

National University of Sciences and Technology

Islamabad, Pakistan

2024

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MusChro

Thesis Report

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A thesis submitted for evaluation to School of Art, Design and Architecture in 2024, in partial fulfillment of the requirement for degree of B.Arch.

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2024

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Thesis Report

MusChro: A station to elevate the Music Listening Experience

National University of Science & Technology
School of Art Design & Architecture, SADA

Muhammad Saad Mazhar

MusChro: A station to elevate the Music Listening Experience

Advisor: Rao Shahzaib Ali Khan

Submitted in Partial Fulfillment of the Requirement for the Degree of Industrial Design

June 2024

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June 2024

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Abstract

Waiting time in public spaces is universally perceived as a negative experience due to the absence of relaxing environments, adversely affecting overall service quality. This research explores music listening as a widely accessible and popular activity to mitigate these negative perceptions. The proposed solution involves enhancing the music listening experience by incorporating background effects into users' playlist songs, aiming to create a more immersive and soothing environment. Results indicate that tailored music significantly improves relaxation, reduces stress levels, and increases overall satisfaction among users. Additionally, the enhanced music experience is perceived as both relaxing and entertaining. Incorporating background-enhanced music in public waiting areas can transform waiting experiences, making them more enjoyable, thereby improving service quality and user satisfaction.

Keywords: waiting time, negative experience, service quality, music listening

1. Introduction

In public spaces, waiting is universally seen as a negative experience, often causing impatience and frustration among individuals. Waiting areas, in particular, are environments where this sentiment is prevalent. This research focuses on the psychological and emotional aspects of waiting in various public spaces, aiming to understand how these experiences affect overall satisfaction and exploring potential solutions to mitigate negative feelings associated with waiting.

One critical concept in this context is "pre-service recovery." Pre-service recovery involves providing positive stimuli to counteract the negative emotions experienced during waiting times. This approach aims to transform the waiting period into a more pleasant and engaging experience, thereby enhancing overall user satisfaction. By offering enjoyable activities or distractions, it is possible to alleviate the frustration and boredom commonly associated with waiting.

Understanding the significance of pre-service recovery in improving user satisfaction is a primary objective of this research. Different demographic groups, particularly varying age groups, perceive and respond to waiting differently. For instance, older adults may experience waiting more patiently but find it more physically uncomfortable, while younger individuals might become restless and more easily bored. These varying experiences highlight the need for tailored solutions that cater to the specific needs and preferences of different age groups.

The advent of the internet and the widespread use of social media have fundamentally altered how people experience waiting. These digital platforms offer numerous opportunities for individuals to stay entertained, informed, and connected, even in traditionally dull settings like waiting areas. This research examines how different age groups utilize the internet and social media during waiting times, aiming to identify ways to make these periods more engaging and satisfying for everyone.

Moreover, the study investigates the brain's natural inclination to seek entertainment during idle times. Our cognitive and emotional systems are wired to look for stimulation and engagement, especially when faced with monotony. By designing interventions that align with these natural tendencies, it is possible to create solutions that make waiting less tedious and more enjoyable.

The ultimate goal of this research is to design and implement solutions that address the diverse needs of individuals during waiting times in public spaces. By making waiting periods more entertaining and less stressful, we can significantly enhance the overall user experience. This improvement not only benefits the individuals but also contributes to the perceived quality of the service provided by the facility.

In summary, this thesis explores the negative perceptions of waiting in public spaces and investigates the concept of pre-service recovery as a means to improve user satisfaction. It considers the different ways in which various age groups experience and cope with waiting, especially through the use of the internet and social media. By understanding these dynamics and designing appropriate interventions, the

research aims to transform waiting periods into positive and engaging experiences, ultimately enhancing the quality of service and user satisfaction.

2. Literature Review

2.1. Pre-Service Recovery

Pre-service recovery is a pivotal concept in the service industries, focusing on addressing and mitigating any negative feelings or experiences customers may have before the actual service is delivered. This proactive approach seeks to enhance overall customer satisfaction by intervening during the initial stages of the service encounter, particularly during waiting periods.

In the context of waiting experiences, pre-service recovery strategies aim to improve individuals' overall satisfaction by actively addressing their emotional needs during the waiting period. Waiting is often associated with negative emotions such as impatience, frustration, and boredom. These feelings can significantly detract from the overall service experience, even before the core service has been provided. By implementing pre-service recovery measures, businesses can transform these potentially negative waiting experiences into positive ones.

Effective pre-service recovery strategies can include providing engaging activities, comfortable seating, pleasant ambient conditions, and informative or entertaining content. For instance, the availability of music, internet access, or interactive displays can help distract and entertain individuals, making the waiting time feel shorter and more enjoyable. Additionally, clear and frequent communication about wait times can help manage expectations and reduce uncertainty, which is often a significant source of frustration.

Moreover, pre-service recovery acknowledges that different demographic groups have varied needs and preferences. Tailoring the waiting environment to cater to these diverse needs is essential. For example, younger individuals might appreciate digital entertainment options, such as access to social media or streaming services, while older adults might prefer more traditional forms of engagement, such as reading materials or tranquil environments.

Ultimately, the goal of pre-service recovery is to create a more positive and satisfying waiting experience, thereby enhancing the overall perception of the service. By actively addressing the emotional needs of individuals during the waiting period, businesses can foster a more favorable service encounter, leading to increased customer satisfaction and loyalty.

Pre-service recovery involves two main types: Tangible Compensation and Psychological Compensation.

2.1.1. Tangible Compensation

Tangible compensation is a vital component of pre-service recovery, providing physical or material offerings to customers to address any inconvenience or dissatisfaction experienced during their wait. This approach aims to directly offset

negative feelings by offering something of tangible value, thus enhancing overall satisfaction.

Common examples include discounts or vouchers. When customers face long waits, offering a discount on future services or a voucher for immediate use can alleviate frustration and encourage repeat business. Additionally, providing complimentary items such as refreshments, magazines, or small gifts can significantly improve the customer experience, showing that the business values their time and comfort.

Upgrades or premium services at no additional cost are also effective. For instance, in a medical facility, offering an upgrade to a private waiting area or expedited service can make waiting more tolerable and pleasant.

The effectiveness of tangible compensation lies in its ability to provide immediate, perceptible value. It not only addresses the immediate dissatisfaction caused by waiting but also enhances the perceived value of the service. By proactively offering tangible benefits, businesses can demonstrate their commitment to customer satisfaction, turning potentially negative experiences into opportunities for positive engagement and loyalty building.

2.1.2. Psychological Compensation

Psychological compensation is a crucial aspect of pre-service recovery, focusing on the emotional and psychological dimensions of the customer experience. Unlike tangible compensation, it aims to alleviate negative feelings and perceptions through empathy, sincere apologies, and positive interactions.

Recognizing and addressing customers' emotional needs is essential for overall satisfaction. Offering heartfelt apologies for inconveniences and demonstrating genuine empathy can significantly impact customers' perceptions. For example, an apology from staff acknowledging the inconvenience of a long wait can diffuse frustration and make customers feel valued.

Positive interactions and proactive communication are key components of psychological compensation. Keeping customers informed about wait times, explaining delays, and providing regular updates reduce uncertainty and anxiety, fostering trust and reassurance.

Empathetic and attentive service from staff is also vital. Training employees to recognize and respond to customers' emotional cues can lead to personalized and supportive interactions. A simple comforting word or a listening ear can transform a negative waiting experience into a more positive one.

By prioritizing empathetic communication and positive interactions, businesses can mitigate negative feelings associated with waiting. This approach enhances immediate satisfaction and improves the overall perception of the service, fostering long-term loyalty and positive word-of-mouth.

2.2. Factors for Judgement of Service Quality

The judgment of service quality is influenced by three key factors: distributive, procedural, and interactional.

2.2.1. Distributive

Distributive justice refers to the perceived fairness of the outcomes or benefits received from a service. It focuses on whether customers feel they have received value for their time and money. In the context of waiting areas, distributive justice can be assessed by how well the service compensates for the wait, such as through complimentary offerings, discounts, or upgrades. If customers believe they have been adequately compensated for their inconvenience, their perception of service quality improves. Ensuring that the benefits provided are commensurate with the inconvenience experienced is crucial for maintaining high levels of customer satisfaction and loyalty.

2.2.2. Procedural

Procedural justice involves the perceived fairness of the processes and procedures used to deliver the service. It encompasses how transparent, efficient, and consistent the service procedures are. In waiting areas, procedural justice can be reflected in the clarity of communication about wait times, the efficiency of the queuing system, and the consistency in how customers are treated. Fair and transparent processes help manage customer expectations and reduce frustration. By ensuring that procedures are streamlined and clearly communicated, businesses can enhance the perceived fairness and quality of their service, even when waiting times are inevitable.

2.2.3. Interactional

Interactional justice pertains to the quality of interpersonal interactions between service providers and customers. It includes aspects such as politeness, respect, empathy, and the provision of adequate explanations. In waiting areas, interactional justice is demonstrated through courteous and attentive service, genuine apologies for delays, and empathetic communication. Positive interpersonal interactions can significantly mitigate the negative impact of waiting and enhance the overall service experience. By training staff to engage empathetically and respectfully with customers, businesses can improve perceptions of service quality, fostering a more positive and satisfying customer experience.

2.3. Perception of Time

The perception of time during waiting is a dynamic interplay between actual time, actual waiting time, and perceived time. Firstly, actual time represents the objective measure of time elapsed, a quantifiable metric that remains constant. However, the core of the waiting experience lies in the actual waiting time, which is the longest duration a consumer is willing to accept in a specific environment. The waiting time is subjective, influenced by factors such as the context, expectations, and

the nature of the waiting environment. In comparing actual time and actual waiting time, asymmetry often arise. What may seem like a brief period objectively (actual time) can feel prolonged subjectively (actual waiting time) based on individual perceptions and contextual factors. This disjunction is further pointout the perceived time, which constitutes the subjective judgment of time elapsed. Perceived time is influenced by one's mental state, engagement levels, and the overall experience of waiting.

For instance, in a well-designed and engaging waiting environment, perceived time might align more closely with actual time, as positive stimuli and distractions contribute to a more favorable perception of the wait. On the contrary, an unstimulating or uncomfortable setting might lead to a noticeable difference between actual time and perceived time, making the wait feel longer.

The comparison between actual time and perceived time within the context of waiting underscores the nature of the waiting experience. Effective management of actual waiting time through thoughtful design and engagement strategies can align perceived time more closely with actual time, enhancing the overall waiting experience for individuals in diverse environments. Recognizing the subjectivity of perceived time becomes crucial in tailoring waiting environments to meet consumer expectations and contribute to a positive and satisfactory experience.

2.4. Factors Affecting Perceived Time

Following are some major factors affecting the perceived time.

2.4.1. Environmental factors

Environmental factors play a crucial role in shaping the perceived time during waiting. The ambiance, design, and overall atmosphere of the waiting area significantly influence how individuals experience the passage of time. Several key factors contribute to the environmental dynamics affecting perceived time:

2.4.2. Ambiance and Comfort

The overall ambiance of the waiting area, including factors like lighting, seating and comfort can greatly impact how individuals perceive time. A comfortable and aesthetically pleasing environment tends to create a more positive experience, making the wait feel less difficult.

2.4.3. Entertainment and Distractions

The presence of entertainment options or distractions in the waiting area can significantly alter the perception of time. Engaging activities, reading materials, or digital displays can make the wait more enjoyable and contribute to a sense of time passing quickly.

2.5. Occupied Time

Refers to personal engaging activities individuals undertake while waiting, and these activities significantly influence the perceived time during the waiting experience. Three key factors that contribute to occupied time and affect the perception of waiting duration include reading, using smartphones, and shopping.

2.5.1. Reading

Immersing oneself in reading material is a common way to occupy time during a wait. Whether it's a book, magazine, or digital content, reading provides a mentally engaging and absorbing activity that can effectively distract individuals from the passage of time. The enjoyment derived from reading contributes to a positive perception of the wait, making it feel shorter.

2.5.2. Smartphone Usage

Smartphones have become universal companions during waiting times. Individuals often turn to their smartphones for various activities such as browsing social media and playing games. The interactive and multifunctional nature of smartphones allows for personalized and entertaining experiences, effectively reducing the perceived length of the wait.

2.5.3. Music Listening

Music listening is a common activity for many individuals during waiting times. It provides a readily accessible source of entertainment and relaxation, helping to alleviate the boredom and frustration typically associated with waiting. With the ubiquity of personal devices such as smartphones and headphones, listening to music has become an easy and convenient way for users to enhance their waiting experience, making it more pleasant and less tedious. This practice underscores the potential of music to transform waiting periods into more enjoyable and bearable moments.

2.6. Unoccupied Time

Refers to the experience of waiting without engaging in specific activities. However, incorporating elements like art displays or cultural exhibitions into the waiting environment can significantly impact the perceived time. In this context, the two factors affecting perceived time during unoccupied moments are art displays and cultural exhibitions.

2.6.1. Digital Displays

Digital displays serve as distraction tools in waiting areas, engaging users during unoccupied time. These screens offer diverse content, from advertisements to interactive games, capturing and holding attention while reducing boredom and impatience. Whether displaying flight information or promotional content, digital

displays inform and entertain waiting passengers, making the time feel shorter and more enjoyable.

2.7. Psychology of human brain

The phase on the psychology of the human brain focuses on how our minds function when we're waiting. It's crucial to grasp how people see and handle waiting to come up with better ways to make it more bearable. This part of the research examines different psychological factors that affect how we behave and feel while waiting, such as how we perceive time, the ways we cope, and how the environment around us influences our emotions. By understanding the inner workings of our minds and emotions during waiting, we aim to discover valuable insights. These insights can then be used to design waiting areas that are more user-friendly and ultimately increase satisfaction for those who have to wait.

2.7.1. Human Brain Flow

The varied ways in which individuals of different age groups navigate waiting times reveal distinct thinking patterns and preferences. Adolescents, aged 13 to 19, exhibit heightened awareness of their surroundings, often turning to social media as a means to navigate and express their emotions during periods of waiting. Meanwhile, adults in the 20 to 39 age range show a tendency for technological engagement, utilizing gadgets and social media for both work-related and leisure pursuits. This age group manages a diverse range of emotions, utilizing the digital realm as a multifaceted tool for emotional expression.

Contrastingly, older adults, aged 40 to 59, approach waiting moments with a sense of balance, effectively managing their emotions. Their coping mechanisms often involve immersive activities such as reading or reflective thinking, contributing to a sense of tranquility during waiting times. Recognizing and comprehending these age-specific behavioral tendencies is imperative for creating waiting environments that resonate with diverse needs, ensuring a positive experience for everyone involved. (Mabale, n.d.)

Understanding the diverse personal strategies employed by various age groups during waiting times allows for the customization of waiting environments to cater to their distinct preferences. For teenagers, crafting socially engaging spaces becomes important, acknowledging their preference for interactive settings. In contrast, adults may derive satisfaction from digital ficilities that enhance productivity, aligning with their preferences for efficiency and task-oriented engagement. On the other hand, older adults may find relief in calming atmospheres furnished with reading materials, catering to their inclination for more enjoyable waiting experiences.

By tailoring waiting environments to the specific needs of each age group, we not only acknowledge their unique preferences but also actively contribute to making waiting times more pleasant and accommodating for everyone involved. This

understanding of age-specific patterns in thinking and coping fosters a more inclusive and positive waiting experience for individuals across the diverse spectrum of age demographics.

2.7.2 Influence of Internet

The Internet has a big impact on how we think and feel, especially when we're waiting for something. The remarkable adaptability of the human brain, driven by neuroplasticity, becomes evident as we engage with processes online. This adaptability allows our brains to embrace new ways of thinking and feeling, transforming our cognitive landscape during periods of waiting. However, what captivates our attention in the digital realm extends beyond the mere quality of content; the design itself plays a pivotal role. The way information is presented online significantly influences our focus and perception. (Firth et al., 2019)

Constantly navigating between various online stimuli, particularly in the formative years, poses challenges to our ability to concentrate and think coherently. The continuous switching between different online activities can potentially hinder our attention spans and cognitive processes. This observation underscores the profound impact of the Internet on how we allocate attention and comprehend information, particularly during moments of waiting.

Understanding the intricate relationship between the Internet and our cognitive processes during waiting times is instrumental in elevating online experiences. Recognizing the adaptability of the brain and the influential role of design empowers content creators to craft engaging and user-friendly digital environments. Moreover, this awareness emphasizes the critical need for -- healthy online habits, particularly among younger users. A thoughtful and deliberate approach to design not only ensures a positive impact on our waiting moments but also contributes to the overall well-being and cognitive health of individuals navigating the dynamic online landscape. As we delve deeper into the digital age, the thoughtful consideration of design and its implications on our cognitive states becomes paramount, shaping not only our waiting experiences but also the broader landscape of online engagement.

2.8. Impact of COVID

The COVID-19 pandemic have shown distinct alterations in human behavior, evident in both physical and digital world. One tangible transformation is observed in the world of physical activity, where an intriguing shift in walking patterns has emerged. Notably, individuals have exhibited an increase in walking speed, characterized by a measurable rise in step length. This phenomenon is exemplified by the statistical shift from an average walking speed of 1.23 m/s in 2019 to a slightly accelerated 1.25 m/s by 2020. (Obuchi et al., 2021)

Simultaneously, the digital world has undergone notable adjustments in response to shifting attention patterns. Social media platforms, acting as primary hubs

for online content consumption, have dynamically evolved. Taking TikTok as an example, a platform known for its concise 15-second videos, there was a strategic extension of video length to 60 seconds in 2019. Likewise, Instagram adapted to the changing digital landscape by introducing Reels in August 2020, commencing with a brief 15-second duration. Subsequently, the platform extended Reels to 60 seconds in 2021 and further expanded it to 90 seconds by 2023. YouTube followed suit with the introduction of Shorts in September 2020, echoing the trend of concise videos with an initial length of 15 seconds. As a response to evolving user preferences, Shorts eventually reached a maximum length of 90 seconds by 2023.

These shifts in video lengths across various platforms represent more than just adjustments in technical specifications. They signify a dynamic response to the altered attention spans and consumption behaviors brought about by the COVID-19 pandemic. The extended duration allow for more delicate storytelling, suggesting a recognition of a desire for deeper engagement and varied content experiences.

2.9. Digital Engagement and Technological Barriers

In the contemporary landscape, distinct patterns emerge in the utilization of personal gadgets for entertainment, particularly in the context of waiting. The teenagers and young adults, invests a substantial amount of their time engaging with various social media platforms through their personal gadgets. This reliance on digital platforms serves as a primary source of entertainment for the youth, shaping their waiting experiences.

Conversely, adults exhibit a more restrained approach to social media engagement during waiting times, primarily attributed to technological barriers. The older generation often faces challenges in navigating and adopting new technologies, limiting their access to and use of social media as a means of passing the time. This technological barrier introduces a distinct divergence in the waiting experiences between the younger and older age groups.

Moreover, an interesting layer to this contrast involves the dominance of specific fingers across age groups. Older adults typically display dominance in the forefinger of their hand, while adults and teenagers lean towards the thumb as the dominant finger. This physiological aspect contributes to the varied ways individuals interact with their personal gadgets. The thumb-dominance in the younger demographic aligns seamlessly with the digital navigation demands of smartphones and touchscreens, facilitating effortless engagement with social media platforms.

Understanding how people of different ages use phones and digital devices while waiting helps make places welcoming for everyone. When we consider what each generation likes and any challenges with technology, we can design spaces and services that meet everyone's needs. Recognizing how age, technology, and even our bodies work together helps make waiting areas better for people of all ages. This

doesn't just make waiting areas easier to use but also ensures they are enjoyable and welcoming for everyone.

It shows that the Internet affects how we think and feel when we wait. It points out age differences, tech challenges, and how our bodies work as important factors. The adaptability of the digital world to global changes is a big theme, showing how people's habits change after COVID-19. By understanding these things, we can design conclude that the design solution should be able to work well for everyone, making the experience more enjoyable and inclusive.

3. Primary Research

The primary research phase of this study aims to investigate the current experiences and perceptions of individuals in public waiting areas. This phase is essential for understanding the emotional and psychological impacts of waiting, identifying common pain points, and exploring how different demographics experience and cope with waiting periods. By gathering firsthand data through surveys and observations, the research seeks to build a comprehensive picture of the waiting experience in various public spaces.

3.1. Research Methods

The primary research phase of this study aims to investigate the current experiences and perceptions of individuals in public waiting areas. To achieve this, a combination of interviews, observations, and surveys were utilized as research methods. These methods are essential for understanding the emotional and psychological impacts of waiting, identifying common pain points, and exploring how different users experience and cope with waiting periods. By using these approaches, the research seeks to build a comprehensive picture of the waiting experience in various public spaces and identify the strategies users employ during waiting times.

Interviews

Interviews were conducted with individuals in various public waiting areas to gain in-depth insights into their personal experiences and feelings about waiting. These open-ended conversations focused on participants' emotional responses, coping mechanisms, and suggestions for improving the waiting experience. By encouraging individuals to share their thoughts and preferences, the research aimed to uncover nuanced aspects of the waiting experience, providing rich, contextual data that complemented the quantitative findings from surveys and observations.

3.1.1. Observation

Researchers conducted direct observations in various public waiting areas to record and analyze behaviors and interactions. The focus was on noting signs of restlessness, engagement with surroundings, and social interactions, as well as assessing the use of amenities like seating and Wi-Fi. Visible indicators of discomfort

or stress, such as fidgeting and frequent checking of the time, were also observed. These real-time observations provided objective data to complement the insights from interviews and surveys, offering a comprehensive view of the waiting experience.

3.1.2. Surveys

Structured surveys were distributed to individuals in various public waiting areas to gather quantitative data on their waiting experiences. The surveys included questions designed to measure levels of comfort, stress, and overall satisfaction during the wait. They also captured demographic information and inquired about participants' attitudes and behaviors, such as how they spent their time while waiting and their coping strategies. This quantitative approach allowed for the identification of significant patterns and trends, providing a broad understanding of the common issues and experiences associated with waiting in public spaces.

3.2. Research Questions

1. What is your age, and what is your gender?
2. On a scale of 1 to 10, how comfortable do you feel while waiting in this area?
3. On a scale of 1 to 10, how satisfied are you with your overall waiting experience?
4. On a scale of 1 to 10, how stressed do you feel while waiting in this area?
5. What aspects of the waiting environment contribute most to your bad experience?
6. How do you typically spend your time while waiting?
7. How effective do you find some engaging activities in making the wait more tolerable?
8. Do you feel that the amenities provided are adequate?
9. What improvements would you suggest to enhance the waiting experience?
10. Do you interact with other people while waiting?
11. On a scale of 1 to 10, how would you rate your level of frustration while waiting?
12. What, if anything, helps reduce your frustration during the wait?
13. What do you mostly do while waiting?

3.3. Discussion

The primary research reveals that individuals employ a variety of personal strategies to cope with waiting in public spaces, influenced by personal preferences and the specific environment. Common strategies include digital engagement with smartphones or tablets, reading books or magazines, social interaction with fellow waiters, passive observation of surroundings, and mindfulness or relaxation techniques. The nature of the waiting area also impacts strategy choice, with more quiet activities in medical waiting rooms and more interactive behaviors in transportation hubs. Understanding these strategies can inform the design of public waiting areas to better accommodate diverse needs, such as providing free Wi-Fi, comfortable seating, good lighting, and designated quiet zones. By addressing these preferences, waiting experiences can be made more pleasant and less stressful for all users.

3.4. Conclusion

Music listening emerges as the most common and easily approachable activity for individuals during waiting times in public spaces. This research highlights that music provides a simple yet effective means to enhance the waiting experience. The effects of music are twofold: it offers relaxation by reducing stress and anxiety, and it provides entertainment, making the waiting period more enjoyable and less monotonous. By incorporating music into public waiting areas, not only can the overall atmosphere be improved, but individuals can also benefit from a more pleasant and less stressful waiting experience. This suggests that music is a valuable tool for pre-service recovery, helping to transform typically negative waiting times into positive, engaging experiences.

4. Design Objectives

The research conducted contributes to achieving design objectives focused on improving the user experience.

4.1. Integrate user's playlist

Listening to playlist songs is a common personal strategy for users during waiting times. Music is perceived as both relaxing and entertaining, making it essential to integrate users' playlists into the solution.

4.2. Individual Experience

As music listening is a personal experience for each user in waiting areas, the enhanced experience should also be individualized. What one person enjoys may not be the same for others, highlighting the need for tailored music enhancements.

4.3. Cognitive inputs

The user interaction should be intuitive, allowing the user to understand the task flow and actions without needing to learn new processes.

4.4. Space efficient design

The design should be space-efficient, ensuring it does not disrupt the overall ambiance of the waiting area while providing sufficient space for user interaction.

5. Ideation and Development

Considering the research and design objectives, the solution is developed according to user preferences and needs. Various user flows are designed to make interaction more interesting, and multiple task flows are iterated to enhance the overall user experience.

5.1. Concept 1

This concept involves playing the instrumental version of any song the user chooses. The user can connect their chosen song, and a visual guide will continuously direct them to play the instrumental version on one of four available instruments.

Lazer emitters and receivers are utilized, working in pairs. When the signal from an emitter is received by its corresponding receiver, no sound is produced. However, when the user follows the visual guide and touches the laser, the connection between the emitter and receiver is disrupted, producing sound. This interactive setup allows users to create instrumental music in a guided and engaging manner.
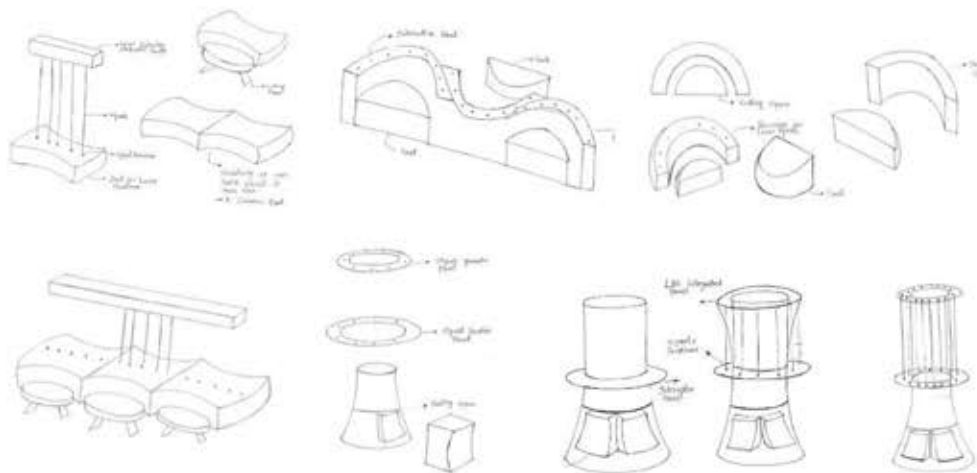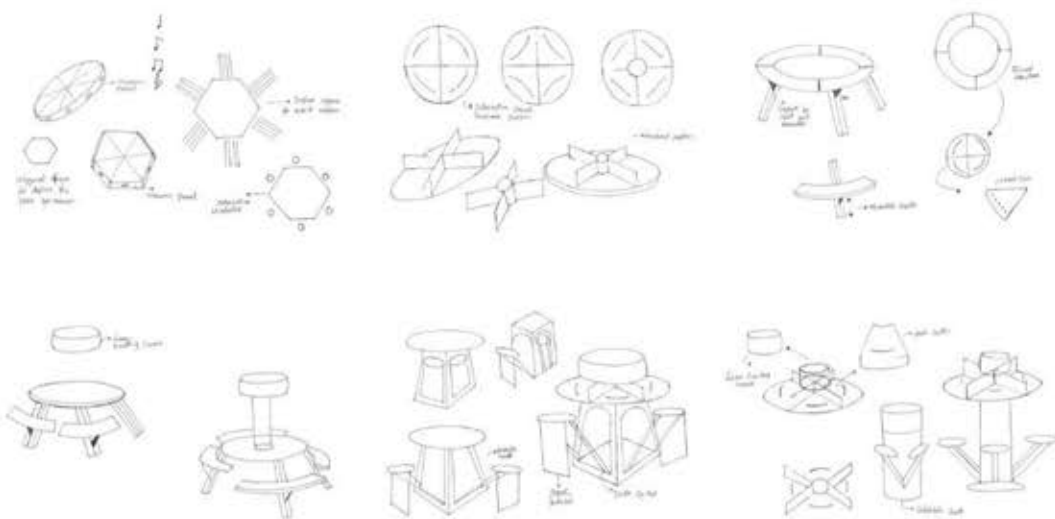
3D Renders

5.2. Concept 2

This iteration builds upon the previous idea, which centered on the concept of laser emitter and receiver connection. However, it addresses potential user discomforts by resolving common pain points. For instance, the issue of limited seating is alleviated by ensuring that ample open spaces are available for users. Additionally, concerns about constrained leg space are addressed by providing generous legroom, allowing users to enjoy their music listening experience in a more relaxed and comfortable environment.

3D Renders

6. Final Design

The final design simplifies the previous concept, recognizing music as a source of relaxation and entertainment. By integrating the user's personal playlist, individuals can enhance their listening experience by adding natural background effects to their songs. This creates an enriched experience of entertainment and relaxation. IR sensors are utilized instead of laser emitters and receivers, offering a simpler and more intuitive control method. By moving the hand near the sensor, the

intensity of the effects increases, while moving the hand away decreases it—a natural and intuitive interaction.

Users can easily connect their own playlists via Bluetooth, and headphones are provided for individualized experiences, ensuring that others are not disturbed. This streamlined design prioritizes user comfort and convenience while enhancing the overall waiting experience.
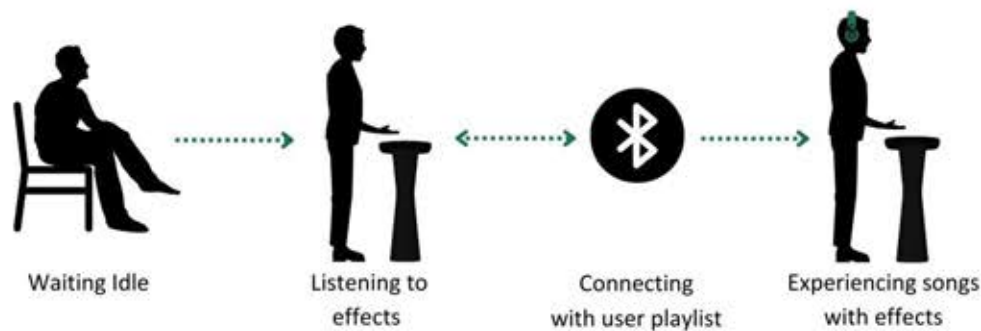
3D Renders

Scenario Renders

6.1. Features

The final solution incorporates intuitive features that allow users to enhance their music listening experience. Effect intensity is seamlessly controlled through the movement and position of the hand, offering a dynamic and engaging interaction. By simply moving their hand, users can add effects to their songs, adding a personalized touch to their listening experience. Additionally, users have the freedom to select songs from their playlist, putting them in control of their music journey. These features combine to create a user-centric solution that empowers individuals to tailor their music experience to their preferences, fostering a deeper connection with the music they listen.

6.2. User flow

The user flow indicates user journey how the user connect with the solution.

| Waiting Idle | Listening to effects | Connecting with user playlist | Experiencing songs with effects |

7. Prototype

The prototype phase marks a pivotal juncture in the development process, where theoretical concepts are transformed into tangible, interactive models. This phase involves the integration of all electrical components into a sensor panel, seamlessly blending craftsmanship with technology. Utilizing techniques such as metal bending for the base, designers carefully incorporate essential components like Arduino, ESP32, IR sensors, and ultrasonic sensors into the sensor panel. Through meticulous integration and technical expertise, designers create functional prototypes that accurately simulate the intended user experience. These prototypes serve as the foundation for testing and validation, enabling designers to assess the feasibility and effectiveness of their design solutions. Additionally, prototypes allow for iterative refinement, providing opportunities to fine-tune design elements and address any technical or usability issues. By embracing the prototype phase and integrating all electrical components into the sensor panel, designers can iteratively optimize their designs, ensuring the development of a robust and user-centric final product.
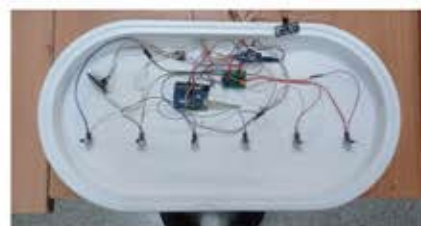
7.1. Base
a) Metal sheet cutting and bending

b) Smoothening surface and paint

7.2. Sensor Panel

External view   Internal view

7.3. Final Prototype
A packed station with all the electronic components packed in the sensor panel.

8. Conclusion

This thesis report explored innovative solutions to enhance the waiting experience in public spaces, particularly through music listening. Recognizing the universal negative experience associated with waiting, the research identified the potential of music to transform this negative experience into a more enjoyable and relaxing one. By incorporating background effects into users' playlist songs, the proposed solution aims to createthe user's playlist more relax and unique.

The primary research phase, involving surveys, interviews, and observations, revealed that music is a common and accessible activity for many individuals during waiting

periods. Enhanced music listening, tailored to individual preferences, was found to significantly improve relaxation and overall satisfaction. Observational data supported these findings, showing increased user engagement and a more positive atmosphere in waiting areas where enhanced music was introduced.

The design and prototype phases further validated the feasibility of this solution. Through the integration of electronic components such as Arduino, ESP32, IR sensors, and ultrasonic sensors into a sensor panel, a functional prototype was developed. This prototype demonstrated the practical application of the solution, allowing for real-time control of music effects through hand movements.

In conclusion, incorporating background-enhanced music into public waiting areas presents a promising approach to mitigating the negative aspects of waiting. This solution not only enhances relaxation and entertainment but also improves the overall perception of service quality and by addressing the psychological and emotional needs of users, the proposed solution has the potential to make waiting periods more pleasant.

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