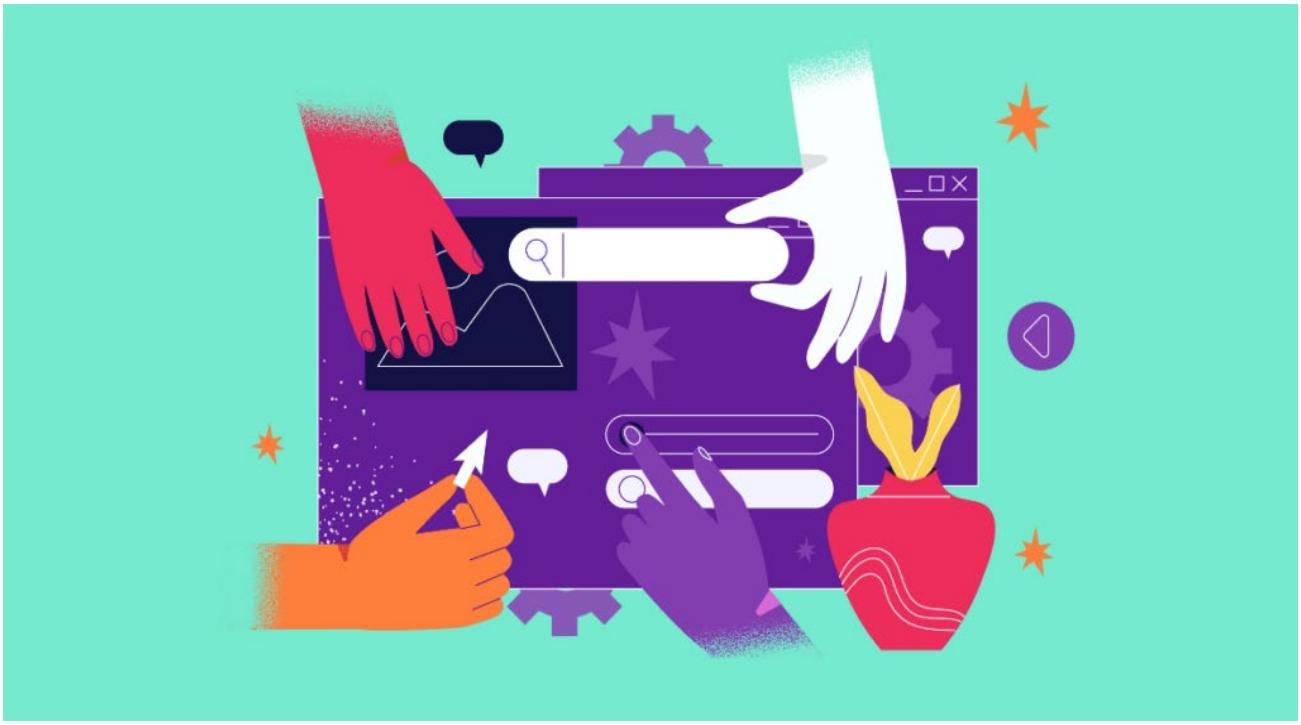
INFO3170 Project 2
User Interface Design and Evaluation Report



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Overview

Advancements in technology have profoundly transformed education by revolutionizing traditional teaching methods and expanding learning opportunities. The seamless integration of digital tools and devices into classrooms has ushered in a new era of engagement and interaction, fostering a dynamic learning environment. Key components of this digital transformation include smartboards, tablets, and a plethora of educational apps which have all made themselves inside the classroom. These innovations not only enhance the learning experience but also cater to the diverse learning styles of students, making education more accessible and effective. It is essential to recognize that this transformation extends beyond the traditional subjects and reaches into the realm of music education, offering new ways to enhance learning and break down barriers in the world of music education.

Many aspiring musicians face significant barriers to pursuing formal music education, particularly those in underprivileged areas or with limited access to traditional music institutions. The high costs associated with traditional music education, including instrument purchases and lesson fees, further supports this challenge. Formal music education often involves private lessons or group classes, which come at their own costs. Experienced music teachers typically charge for their time and expertise, and these fees can add up over time. For many, affording regular lessons can be challenging. Accessing music schools or teachers requires travel, incurring additional costs for transportation, especially for those living in areas with limited public transportation options. Geographical factors also play a role, as those in remote or rural areas have limited access to music teachers or institutions. This results in a lack of exposure to formal music education opportunities.

Moreover, the demands of modern life, such as full-time jobs and various commitments, make it difficult for individuals to adhere to rigid, traditional learning schedules. Many prefer the flexibility of self-paced learning that can accommodate their unique circumstances. In addition to these challenges, there is a growing desire among music enthusiasts to explore and learn from diverse cultural musical traditions beyond their own. For instance, someone who is passionate about Western classical music may also want to delve into the enchanting rhythms of Indian classical music, learning to play the sitar or tabla and infusing elements of these traditions into their own compositions. Additionally, music teachers and tutors face a range of challenging responsibilities in their roles. Music teachers often need to create and manage schedules for their students. This involves coordinating lesson times that are convenient for both the teacher and the student. It can be a complex task, especially if a teacher has many students with varying availability. Balancing these schedules and ensuring that all students receive the necessary attention can be demanding. Secondly, attracting new students is crucial for music teachers, particularly those who rely on teaching as their primary source of income. This involves marketing their services, reaching out to potential students, and showcasing their qualifications and teaching style to attract a steady stream of learners. Competition can be stiff, making student recruitment a challenging and ongoing task.

This project seeks to tackle this complex issue by proposing the creation of a Music Education Website. The website would eliminate these barriers and offer a cost-effective, flexible, and inclusive solution. It would cater to a wide array of musical genres and instruments, ensuring that users can access specialized guidance and resources tailored to their unique interests. Furthermore, the website would make music education available to more people by removing geographical barriers. Users can learn from expert tutors from various musical

traditions and cultures, all within the confines of a digital platform. The core functionality of the Music Education Website encompasses song resources, dedicated sections for various music genres, instrument-specific content, tutor ratings, and the ability to schedule private sessions with expert tutors. The app would simplify the responsibilities faced by music teachers and tutors. To address the challenges of class scheduling, the system would offer an intuitive booking feature that allows teachers to manage their availability and schedule lessons efficiently. It also automates the payment process, ensuring that teachers receive timely compensation for their services. The website would also feature these tutors for visibility by regular users (customers) so it is easier for users to contact and find tutors and also allows tutors to recruit more students. By combining these features, the website provides a holistic and interactive learning experience. It encourages individuals to explore, practice, and master the art of music, offering both structured guidance and personalized support.

User characteristics

In gathering user characteristics from the potential end-users for the system, this helped not only the design team in focusing on the target audience but provided a guideline for the said team of designers of the system to ensure that the system being created carries out all the necessary functionalities.

This system will be used by people of all ages and particularly users who are involved in music whether students, music teachers(tutors) or enthusiasts. The system will be used by English-speaking users from a variety of cultural backgrounds. It is expected that the users of this system understand the basic functionalities on how to use a computer and access/maneuver through the website with ease. To afford this, we will create a user-friendly interface that is intuitive and easy to understand. We will use clear navigation menus, buttons, and icons and keep the layout uncluttered and organized, while maintaining consistency in design elements across the website.

Characteristics of Students

Diverse Skill Levels: Students in a traditional music class have a wide range of skill levels. Some are beginners with little to no prior musical experience, while others have more advanced skills. Learning materials, whether they are lessons, exercises, or sheet music, can be tagged with difficulty levels. This allows students to select materials that match their current proficiency. Beginners can start with easy content and gradually progress to more challenging material as they gain skills.

Learning preferences: Students often have different learning preferences. Some are more visual learners who benefit from instructional videos and interactive content, while others prefer text-based resources or live demonstrations. The system offers a variety of learning materials to accommodate these preferences. For visual learners, the website can offer a library of instructional videos. These videos can cover various topics, from instrument tutorials to music theory lessons. Some students prefer text-based materials. The website can provide downloadable PDFs, written tutorials, and articles covering music theory, notation, and practice techniques.

Need for Skill Improvement: Many students seek to improve their efficiency and skills in playing musical instruments, reading sheet music, or understanding music theory. The system offers resources and tutors that can address these areas of improvement.

Characteristics of Instructors:

Communication Skills: Effective communication is vital for instructors to convey musical concepts and techniques. The website would incorporate video conferencing tools for real-time virtual lessons and discussions. Instructors and students can schedule and join video sessions where they can interact face-to-face to enhance communication. t will also be required for Instructors to have good proficiency in English

Analysis of Current System

The proposed system will consider both the perspectives of the music enthusiast and the music tutor.

Music Enthusiasts: In the current system music enthusiasts must source learning materials from multiple places which includes physical books, online forums, YouTube and TikTok. The proposed system will offer all these materials in one place. In finding classes, emails and phone calls are made to various music tutors from which it is determined if the class is full, or student can afford the fee (more details in music tutor analysis). Our system will provide a list of verified tutors that users can choose from and see their prices upon which the customer(student) can make contact. This eliminates the hassle of attempting to contact a tutor by phone or email several times and then not knowing if you can enroll in the class since you are unsure of the cost.

Music Tutors: The process starts with initial contact with the student. This includes various means, including phone calls, emails, or in-person meetings. The tutor collects essential information from the students, including their name, contact information, preferred musical instrument or style, and their availability for music lessons. This information is documented in a logbook. The tutor and student then decide on the frequency of lessons, which could be weekly, bi-weekly, or any other agreed-upon schedule. The tutor checks their own availability, considering their current students and other commitments. They compare their availability with the student's preferred time slots to find a mutually suitable schedule. The tutor documents the scheduled lesson dates and times in the logbook. Each entry in the logbook includes details such as the date, time, student name, and lesson duration.

Closer to the lesson date the tutors confirm with the student via email or telephone. At the scheduled lesson time, the tutor conducts the music lesson (provided the student is there). The content of the lesson depends on the student's level, goals, and the tutor's teaching plan. The tutor may provide instruction, practice exercises, and assign homework. After each lesson, the tutor updates the logbook to record the progress made during the session. This includes notes on what is covered, areas of improvement, and homework assignments. The tutor manages the billing and payment process, ensuring that students are invoiced for their lessons at regular intervals. This may be monthly, per lesson, or as agreed upon. For our design users would be required to enter their personal information upon sign up. Sign up will only be required for users who are looking for tutors. Once a transaction is made this information will automatically be provided to the tutor and saved in a table (with other clients).

Use Case for Booking System: Music Tutor

1.1. The Music Tutor picks up the call from a potential client.

2.1. The Music Tutor checks the calendar for available slots.

2.2. If no slots are available, the Music Tutor informs the client, and the system returns to step 1.

3.1. The Music Tutor proposes suitable dates to the client.

4.1. The Music Tutor enters the client's personal information into the system.

5.1. Once a date is agreed upon, the Music Tutor schedules the class in the calendar.

6.1. The Music Tutor has the option to cancel the booking if needed.

6.2. If a booking is canceled, the Music Tutor will notify the client.

7.1. The Music Tutor confirms the receipt of payment from the client.

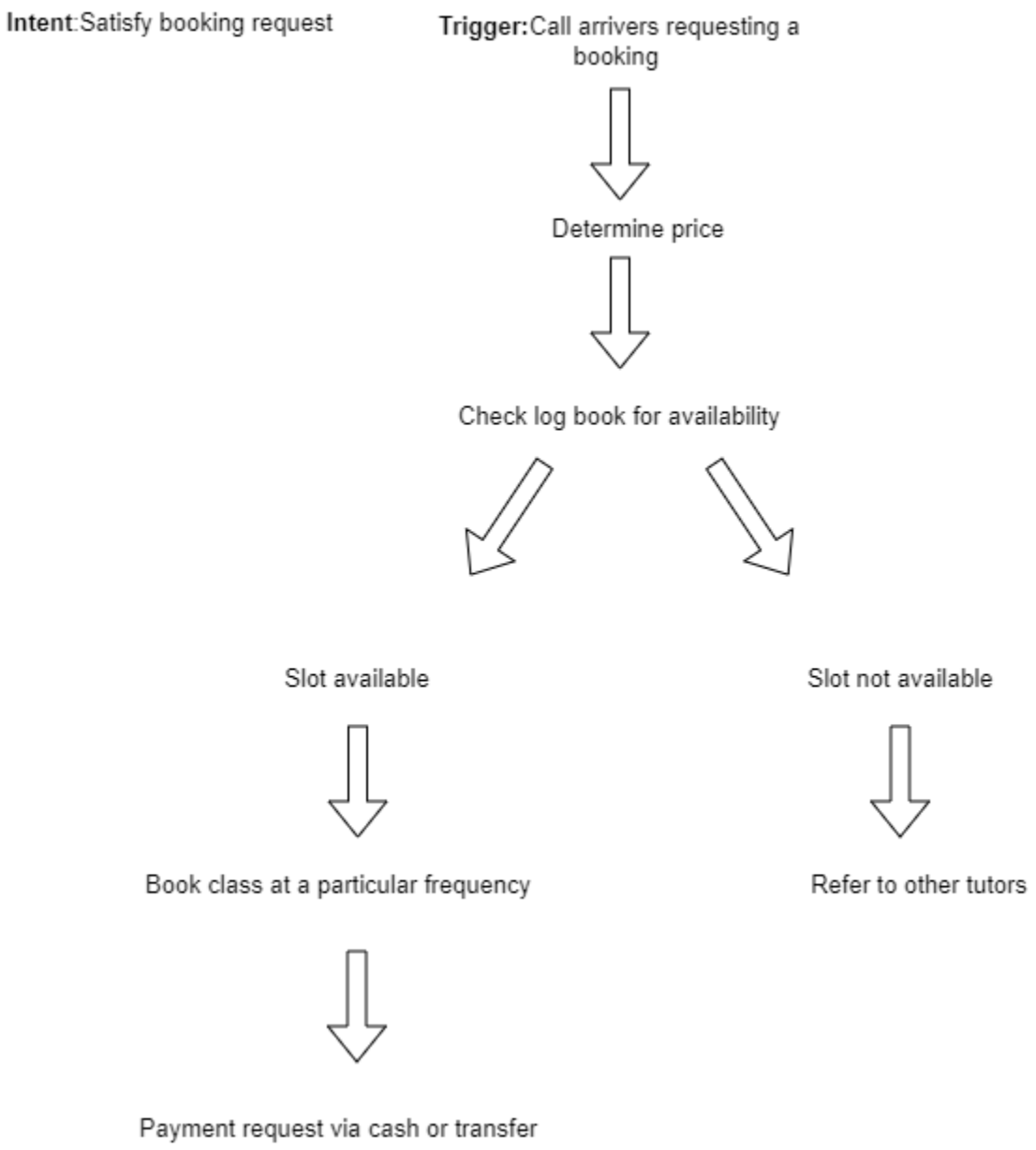

Figure 1: Sequence model showing a typical booking process.

From our sequence model we can see a typical process that takes place in booking a client.

Consider the following scenario.

Scenario: Jane, a music tutor, has been using a manual system to manage her music classes. She receives a call from a potential new student, Mark, who is interested in taking piano lessons. Mark inquires about the cost of the lessons, and Jane explains her pricing. While still on the call, Jane checks her logbook to see if she has any available slots for piano lessons. Jane finds an open slot on her schedule for a weekly piano lesson with Mark. She suggests that they meet every Saturday at 10:00 AM. Mark agrees to the schedule and asks how he can pay for the lessons. Jane gives him the option of making payments either in cash at the beginning of each lesson or through a bank transfer. If she had no available slots however, in very rare cases she would organize group lessons, otherwise Jane would refer mark to another qualified tutor in her network.

TASK ENVIRONMENT

Some tutors go to students' houses to conduct lessons while others have a physical space where students come to take lessons. A music room would have musical instruments, and cabinets with sheet music. The room is well lit, so it is easier to read music sheets and allows instructors to observe students' postures while playing an instrument.

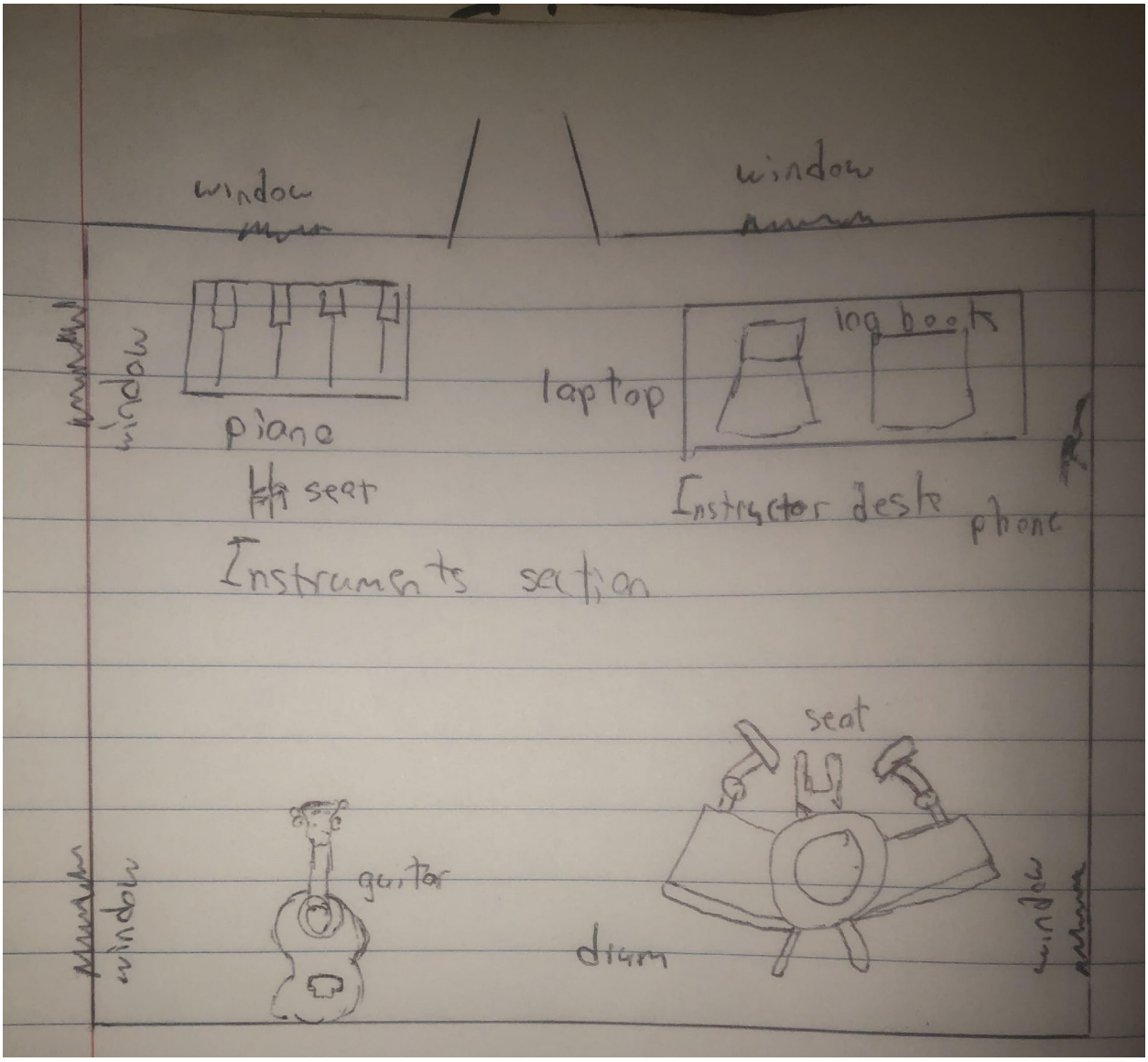

Figure 3: Physical context diagram of a music room

System Functionalities

The proposed system is designed to provide a comprehensive set of functionalities that cater to the diverse needs of music enthusiasts and learners while ensuring a user-friendly experience.

1. Song Resources: The website must enable users to search for songs and access a variety of resources, including community-contributed sheet music, YouTube tutorials, and other relevant materials. Moreover, the website should offer users the functionality to both download and upload sheet music, ensuring a seamless and interactive experience for its users.
2. Instrument-Specific Content and tutors: The website should offer dedicated sections for a range of musical instruments, allowing users to access instrument-specific tutorials, tips, and resources tailored to their selected instrument. This feature should be inclusive of various instruments, including but not limited to the piano, guitar, violin, and others. Within each genre section, users must be able to locate expert tutors who can provide specialized guidance and resources tailored to the musical style.
3. Tutor Ratings: The website must incorporate a feature that allows users to rate their interactions and experiences with tutors. A comment feature as well if possible.
4. Private Sessions: The website shall provide users with the capability to schedule private sessions with expert tutors, facilitating personalized guidance and fostering accelerated musical growth. These private sessions will be subject to a fee.
5. Manage Booking: The website must keep a log of all students registered to a particular tutor on a table. A tutor will be required to set available times that customers can choose from. If there’s no tutors available, the system will provide an option to allow notifications to be sent to the user once an available tutor is found.

Usability Criteria/Principles

Usability is of utmost concern to the overall success of the website and as such the proper user-friendliness design principles have been set in place.

- Efficient - The website will be carefully designed to minimize distractions and provide a streamlined, uncluttered interface, making it effortless for users to access music lessons, tutorials, and practice tools.

- Learnable - The website will be designed for ease of adaptation, ensuring that users, whether beginners or advanced musicians, can quickly grasp its operation and begin their learning journey without a steep learning curve.

- Intuitive - User-friendly buttons, headings, and help/error messages will be integrated into the interface to make navigation and content discovery straightforward, enabling users to access resources with ease.

- Accessible - The website will be thoughtfully designed to reduce cognitive load, ensuring that users can focus on their musical education without unnecessary distractions or frustrations, thereby enhancing their learning experience.

- Performant - Videos will play seamlessly, interactive features will respond promptly, and system reliability will be maintained.

- Engaging - The system will be attention-grabbing and will enable the user to be willingly attentive to all content being presented.

Social and Technical context

Technical - The design of the proposed system, which is a website application, is influenced by various constraints within its technical environment. One of the primary constraints is the reliance on a stable internet connection for the website's functionality. In regions where internet access is unreliable or slow, users may encounter compromised user experiences. While we cannot regulate a user's internet connectivity, we can accommodate individuals experiencing low connectivity issues by enabling content to be uploaded in a compressed format, reducing its size. Additionally, we can minimize the utilization of icons, pictures, or images that rely on internet loading to enhance the user experience in low-connectivity scenarios.

Another critical constraint involves the need for robust and secure database systems. The website will handle the storage of user profiles and various types of content. In the event of database failures, there is a significant risk of disruptions to essential processes such as scheduling lessons and processing payments. Therefore, a dependable and secure database system is imperative to maintain the system's integrity. To address potential system failures, the website should incorporate backup systems. These backups serve as safeguards against data loss and other critical information in cases of unexpected system failures. By having these backup mechanisms in place, the system ensures the preservation of user data, lesson schedules, and other vital information. These constraints within the technical environment need to be carefully considered and addressed in the system's design to provide a reliable and efficient user experience.

Social - The social context for this website is characterized by a diverse user base. Music enthusiasts and music tutors of varying ages, backgrounds, and musical abilities will be accessing the platform. For the time being, the website will just serve Jamaica, as we now need to support multiple languages, making a wider scope more difficult to implement. This diversity necessitates an intuitive and user-friendly interface that accommodates users with different levels of technological proficiency. Also, the website should consider accessibility features to accommodate users with disabilities.

Justification of Data gathering process

The rationale for our data collection approach involved a careful consideration of the sequence and combination of interviews and electronic questionnaires to comprehensively understand the daily challenges faced by musicians and to identify their specific needs, which could be successfully incorporated into the suggested online music education app.

We chose to conduct interviews before electronic questionnaires for several reasons. Interviews provided us with an initial in-depth exploration of the challenges and needs of musicians. By engaging with participants in one-on-one conversations through platforms like Zoom, we were able to establish a rapport and gain a profound understanding of their experiences. The open-ended nature of interviews allowed us to explore areas that might not have been covered in a structured questionnaire. Questions for example “What motivates you to improve your musical skills?”, helped us in Understanding their intrinsic and extrinsic motivations helps in tailoring the app to provide features that align with these motivations.

After the interview phase, we designed electronic questionnaires to target specific areas and gather structured quantitative data that could be statistically analyzed. Questions like “What instruments do you play?”, allows us to analyze the most used instruments so we can cater to them first on the website. The questionnaires allowed us to collect data from a more extensive and diverse group of participants, including international musicians who might not have been accessible for interviews due to geographical constraints. By employing electronic questionnaires, we ensured that a larger sample size provided a quantitative perspective that complemented the qualitative insights obtained from the interviews.

Conclusion

In conclusion, the development of a music education app is guided by a deep understanding of the challenges and needs faced by musicians and learners. This project offers a unique opportunity to create an accessible, engaging, and efficient platform that caters to a diverse user base. By considering the current task environment, analyzing existing systems, and prioritizing usability goals, we are implementing the app as a valuable resource that enhances music education, inspires learners, and encourages the exploration of diverse musical traditions.

We have learned that proper lighting was essential for music lessons, allowing students to read sheet music and instructors to observe posture. The website interface will be meticulously designed with readability in mind. Users will have the ability to adjust brightness settings to optimize their experience when viewing digital sheet music. This feature ensures that users can adapt the website's display to their specific preferences and lighting conditions, offering a user-friendly and customizable learning environment. The app will incorporate features that will enable students to record their practice sessions and receive feedback from their instructors based on their posture, replicating this valuable aspect of in-person learning.

The development of the music education app will serve as a valuable resource, enhancing music education, inspiring learners, and promoting the exploration of musical traditions. It will empower users to pursue their musical passions and achieve their educational goals effectively and enjoyably. The app will be designed to meet the evolving needs of musicians and learners, leveraging technology to provide accessible, engaging, and efficient music education. With its intuitive, learnable, and user-centered design, it will encourage users to embark on educational journeys with confidence and enthusiasm.

Appendix

https://drive.google.com/drive/folders/1zRaRBfM8czltJXK1TJSu_7Jali0v6g0n?usp=drive_link