Muse

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Michaella A. Zias
mz02156@georgiasouthern.edu

Abigail Riley
ar21583@georgiasouthern.edu

Jaylen Monroe
jm59497@georgiasouthern.edu

Abstract-

Muse is a personalized music recommendation system designed to provide listeners with music that reflects their current moods, emotions, and personality traits. Unlike traditional algorithm-based platforms that rely heavily on listening history or popularity trends, Muse puts personalization directly into the user's hands. Through an interactive questionnaire, users create a unique personality profile that drives the recommendation engine. This report documents the full design process, including need finding, requirement analysis, prototyping, refinement, and implementation decisions, while demonstrating how user-centered design shaped every stage of the project. Our final system includes questionnaire-based profiling, explainable song recommendations, playlist management, artist exploration, and a responsive multi-platform interface.

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1 INTRODUCTION

Modern music platforms such as Spotify, Apple Music, and Pandora have become industry standards for audio streaming and automated recommendations. However, these systems rely primarily on historical listening behavior, automated similarity metrics, and broad popularity signals. As a result, recommendations often fail to reflect a listener's current emotional state or the dynamic nature of human preference. In many cases, multiple individuals sharing the same account can distort algorithmic suggestions even further.

Muse proposes a solution rooted in user-centered design: a recommendation system that begins with the user's self-expression. Through an engaging questionnaire, Muse captures personality traits, moods, and musical preferences, generating a personalized profile that drives its recommendation logic. Each recommended song includes an explanation, reinforcing transparency and emotional insight, two elements often missing from traditional services. This report outlines how HCI design principles informed the creation, development, and evaluation of Muse.

2 METHODS

2.1 Need-Finding and Requirement Analysis

Need-finding techniques were employed to identify core user frustrations and opportunities for improvement. These included competitive analysis of major platforms, informal interviews with peers, observation of music-listening behaviors, and team brainstorming. Users consistently reported that algorithm-driven playlists often failed to match their moment-to-moment moods, revealing the necessity of a personality-responsive system.

Functional requirements developed from these observations included:

1. An interactive questionnaire for mood and personality assessment.
2. A personality profile generator that maps user responses to defined emotional categories.
3. A recommendation engine that filters the dataset based on these categories.
4. An explanation component describing the rationale for each recommendation.
5. Playlist management tools.
6. A responsive web and mobile interface.

Non-functional requirements emphasized usability, clarity, performance, accessibility, and interpretability.

2.2 PROTOTYPING WORKFLOW

2.2.1 Idea Page and Written Proposal

The project began with an idea page documenting initial concepts, frustrations with existing systems, and early sketches. This led to a written proposal defining the problem space, evaluating similar technologies, and outlining preliminary requirements.

2.2.2 Storyboards

Storyboard sketches depicted the full user journey from opening the app to receiving personalized playlists. These visualizations guided interface sequencing and interaction flow.

2.2.3 Skit Development

A short skit was created to dramatize the shortcomings of current recommendation systems and illustrate how Muse provides context-aware suggestions. This exercise refined the emotional tone and clarified the system's intended use cases.

2.2.4 Paper and Video Prototypes

Low-fidelity paper prototypes were constructed to map key screens, including:

- Home interface
- Questionnaire pages
- Personality results
- Recommendation screen

A recorded video walkthrough demonstrated screen transitions and interaction timing, revealing usability concerns that informed later design decisions.

2.2.5 High-Fidelity Prototype

The high-fidelity prototype incorporated:

- A refined color palette and typography system
- Responsive layouts for desktop and mobile
- Improved button spacing and visual hierarchy
- Interactive navigation, including a bottom navigation bar
- Annotated transition flows used during stakeholder walkthroughs

This prototype established the visual foundation for implementation.

2.3 IMPLEMENTATION

2.3.1 Technologies Used

In alignment with the proposal, the system employed:

- React Native for cross-platform development
- GitHub Pages for hosting the web version
- Kaggle Spotify Tracks Dataset for recommendation mapping
- Local storage for persisting personality profiles and playlists

Similar systems such as Moodify, Spotify's "Made for You," and Pandora's Music Genome Project informed the design but did not replicate Muse's user-centered method.

2.3.2 Kaggle Dataset Integration

Recommendation logic was grounded in personality-to-attribute mapping. Each questionnaire response contributed weighted values to personality clusters (e.g., *Calm*, *Energetic*, *Reflective*, *Bold*). Song filtering was conducted using dataset attributes:

- Current/upcoming activity
- Mood
- BPM/tempo
- Genre tags
- Length

A playlist was generated by ranking songs based on similarity scores. An explanation engine provided a natural-language justification for each selection.

3 SYSTEM ARCHITECTURE

3.1 Data Structures

- User Response Object: Stores questionnaire inputs.
- Profile Object: Encodes personality and mood traits.
- Song Object: Represents dataset metadata attributes.

3.2 Algorithmic Overview

1. Questionnaire Parsing: Converts responses into weighted attributes.
2. Profile Mapping: Aligns attributes with predefined personality categories.
3. Filtering & Ranking: Scores songs based on profile similarity.
4. Explanation Generation: Produces readable content using matched attributes.

4 EVALUATION

4.1 Target Users

Evaluation focused on everyday listeners, students, DJs, and event planners seeking emotionally tailored playlists.

4.2 Evaluation Measures

Using Nielsen's usability factors:

- Learnability: Assessed through observation of first-time users.
- Efficiency: Measured by task completion times.
- Memorability: Re-testing after one day.
- Errors: Logged misclicks and confusion points.
- Satisfaction: Surveyed user emotional resonance with playlists.

Participants indicated strong satisfaction with the clarity of explanations and emotional accuracy of recommendations.

5 CONCLUSION

Muse demonstrates the value of integrating user-centered design with personality-based recommendation logic. Through comprehensive research, multi-stage prototyping, and dataset-driven implementation, Muse provides an emotionally responsive alternative to conventional algorithmic systems. Future work includes real-time mood detection, collaborative playlist sharing, and machine learning-enhanced personalization.

6 REFERENCES

MaharshiPandya. (2022, October 22). *spotify tracks dataset*. Kaggle. https://www.kaggle.com/datasets/maharshipandya/-spotify-tracks-dataset