Group02

Beatify
Vision Document

Version 1.0

Revision History

Date	Version	Description	Author
30/10/2024	1.0	This vision document outlines the framework for the Beatify music streaming platform, detailing its purpose, scope, and key objectives. It serves as a reference for stakeholders, providing insights into project organization, management processes, estimates, and planning to ensure alignment and effective monitoring throughout development.	- Võ Duy Bảo: Introduction, Stakeholder and User Descriptions - Phạm Hà Hiếu: Positioning, Product Features - Trần Trung Hiếu: Product Overview, Non-Functional Requirements

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Vision (Small Project)

1. Introduction

The purpose of this document is to collect, analyze, and define high-level needs and features of Beatify. It focuses on the capabilities needed by the stakeholders and the target users, and why these needs exist. The details of how Beatify fulfills these needs are detailed in the use-case and supplementary specifications.

1.1 References

Applicable references are:

- Powerpoint slides presentation for the course “Introduction to Software Engineering”
- Youtube video example on PA1 Vision Document

2. Positioning

2.1 Problem Statement

The problem of	Limited personalization and discovery features on traditional music streaming platforms, which fail to cater to unique user preferences and niche music interests.
affects	Music listeners looking for a personalized experience, emerging artists trying to reach specific audiences, and platform administrators aiming to manage and recommend content effectively.
the impact of which is	Listeners struggle to find new music that aligns with their preferences, artists miss opportunities to connect with relevant audiences, and platform administrators face challenges in maintaining user engagement through effective content curation.
a successful solution would be	Improved user engagement through personalized music recommendations, increased visibility for emerging artists, and a more streamlined, efficient content management process for administrators. This leads to greater user satisfaction, a loyal listener base, and better audience reach for artists.

2.2 Product Position Statement

For	Music enthusiasts and casual listeners seeking a unique and personalized streaming experience.
Who	Want to discover new music tailored to their tastes and enjoy an intuitive, ad-free listening platform.
The Beatify	is a music streaming application
That	Offers highly personalized song recommendations and an intuitive interface for music discovery.

Unlike	other music streaming platforms that lack dynamic curator involvement and personalized music pitching, making discovery feel generic and uninspired.
Our product	Provides a more tailored user experience through advanced AI-driven recommendations, catering specifically to niche music preferences and allowing for deeper music discovery.

3. Stakeholder and User Descriptions

This section outlines the stakeholders and user roles for the Beatify music streaming platform. Stakeholders include project IT Development Team, advisors, and users. Within the user group, there are three primary user types:

3.1 Stakeholder Summary

IT Development Team	A team of HCMUS students from class 22CLC04: Le Gia Huy, Tran Trung Hieu, Vo Ngoc Khoa, Pham Ha Hieu, Nguyen Duy Bao	- Tasked with the core development and ongoing maintenance of the project - Ensures the software's functionality, reliability, and user-friendliness. - Implementing new features, debugging, and making updates to improve the user experience.
Instructor (Client): Mr. Ho Tuan Thanh	Theory teacher, the supervisor and guide for the IT Development Team	- A mentor and client representative, providing expert guidance, constructive feedback, and practical support to the IT team. - Mr. Thanh ensures the project aligns with both technical requirements and broader learning objectives, helping the team address any challenges encountered.
Listener	The primary end-users who visit the website to enjoy music content.	- Relies on the website's system to meet their needs for easy access to a comprehensive range of music, from new releases to timeless classics. - The platform should enable listeners to browse, play, and enjoy music with minimal effort and maximum enjoyment.
Curator	The individual responsible for managing and organizing the music catalog on the website.	- Ensures that the music library remains up-to-date and user-friendly by adding new songs, organizing playlists, and removing outdated or redundant content. - The curator keeps the music selection diverse and relevant to user preferences.
Administrator	The professional overseeing website administration and user management functions.	- Manages the user database and maintains the site's integrity by overseeing user account operations, processing payments, and implementing security protocols.

		- Monitoring site performance, resolves technical issues, and ensures a safe and seamless user experience.

3.2 User Summary

User (Listener)	Default user account, the main users of the platform for music listening	- Utilize search functionality to find specific music tracks, albums, or artists. - View detailed information about songs, artist bios, album art, and release dates. - Stream a variety of music tracks across different genres, creating a personalized listening experience. - Curate playlists of favorite songs, organize them by mood or occasion, and share them with other users. - Rate songs and provide feedback to improve the platform's offerings, contributing to an enhanced user experience.	User (Listener)
Curator	Specialized users responsible for organizing and managing the music catalog on the platform. These users ensure the music library remains up-to-date and relevant to listeners.	- Regularly update the platform with new releases and popular tracks to keep the library fresh and appealing - Monitor the catalog for older songs that may no longer resonate with users and remove them when necessary - Create and organize curated playlists based on trends, themes, or user requests to enhance discoverability - Ensure all music entries have accurate and complete metadata, including artist names, song titles, genres, and release dates, to facilitate easy searching and sorting.	Curator
Admin	System administrators with full control over platform operations, responsible for ensuring the platform runs smoothly and securely.	- Oversee user registration, account management, and access controls to ensure a secure environment for all users. - Handle subscription payments and any other financial transactions securely and efficiently.	Admin

		- Troubleshoot and resolve technical problems reported by users to maintain a seamless user experience. - Analyze usage statistics and performance metrics to ensure the platform operates efficiently and effectively. - Manage permissions for curators to ensure appropriate access levels while safeguarding sensitive platform data.	

3.3 User Environment

The main users of the platform consist of students enrolled at Ho Chi Minh City University of Science (HCMUS). These individuals are generally well-educated, proficient in computer usage, and possess access to personal computing devices, including laptops and desktops, as well as mobile devices such as smartphones and tablets.

Task cycle duration

- Users typically engage in music listening sessions ranging from a few minutes to several hours, depending on their needs
- Can vary widely but averages around 30 minutes to 2 hours per session listening to music
- 10-15 minutes per session, as users curate their music selections.

Unique Environmental constraints

Mobile and Multi-Device Users often listen to music in many environments, including:

- Indoor places such as: libraries, study rooms, and dormitories,... where internet access is stable.
- Outdoor environments requiring reliable mobile connectivity and responsive application design.

System Platform in use today

- The primary platforms for user access include web applications and mobile applications
- In the future, expansion plans may include integration with smart devices to enhance user experience and accessibility

Other applications in use

- Users may currently use other music-related applications such as: Spotify, YouTube, SoundCloud,... for music listening. Integration with these platforms could enhance user experience by allowing transitions between applications or shared playlists.
- Future development may consider adding social features where users can share playlists or recommendations with their peers, fostering community interaction.

The music platform targets students from Ho Chi Minh City University of Science (HCMUS), who are typically educated, computer literate, and use laptops, desktops, and smartphones to access a diverse selection of music.

Initially focused on HCMUS students, the platform plans to expand its user base to include a wider audience globally.

Currently available on web and mobile applications, the platform aims to integrate with smart devices and popular music applications to enhance user experience. Overall,, this environment is designed to provide a robust and engaging music listening experience for its users.

3.4 Summary of Key Stakeholder or User Needs

Playlist Management	Medium	Need for effective music organization	Basic playlist creation and editing	Advanced tools for playlist organization, including sorting, filtering, and categorization options
User Analytics	Medium	Limited insights into user listening behaviors	Basic play counts tracking	Comprehensive analytics dashboard offering insights into user preferences, listening trends, and engagement metrics
High-Quality Streaming	High	Inconsistent audio quality due to bitrate limitations	Fixed bitrate streaming options	Adaptive streaming with variable bitrate options based on network speed for optimized audio quality and a seamless listening experience

3.5 Alternatives and Competition

Spotify

Spotify is a leading audio streaming and media service provider, founded on April 23, 2006, by Daniel Ek and Martin Lorentzon. It offers a vast library of music and podcasts to users worldwide.

Strengths:

- With millions of users, Spotify has built a vibrant community, making it easy to find and share playlists.
- The platform offers a broad range of music and personalized playlists, so there's something for everyone.

Weaknesses:

- While it's good, some users wish the sound quality were better compared to other services that focus on high-resolution audio.
- Some find the app a bit cluttered or complicated to navigate, which can make discovering new music a little tricky.

Apple Music

Apple Music is an audio and video streaming service developed by Apple Inc. It was launched in 2015 and is part of the Apple ecosystem, making it easy for iPhone and Mac users to access their favorite tunes.

Strengths:

- Apple Music is known for its excellent sound quality, including lossless and spatial audio options that appeal to serious music lovers.
- If you're already in the Apple ecosystem, everything just works together beautifully, from playlists to recommendations.

Weaknesses:

- Unlike Spotify, Apple Music doesn't have many ways for users to connect and share music with friends, which can feel isolating.
- Some people find Apple Music's subscription a bit pricey, especially when other services offer free options.

4. Product Overview

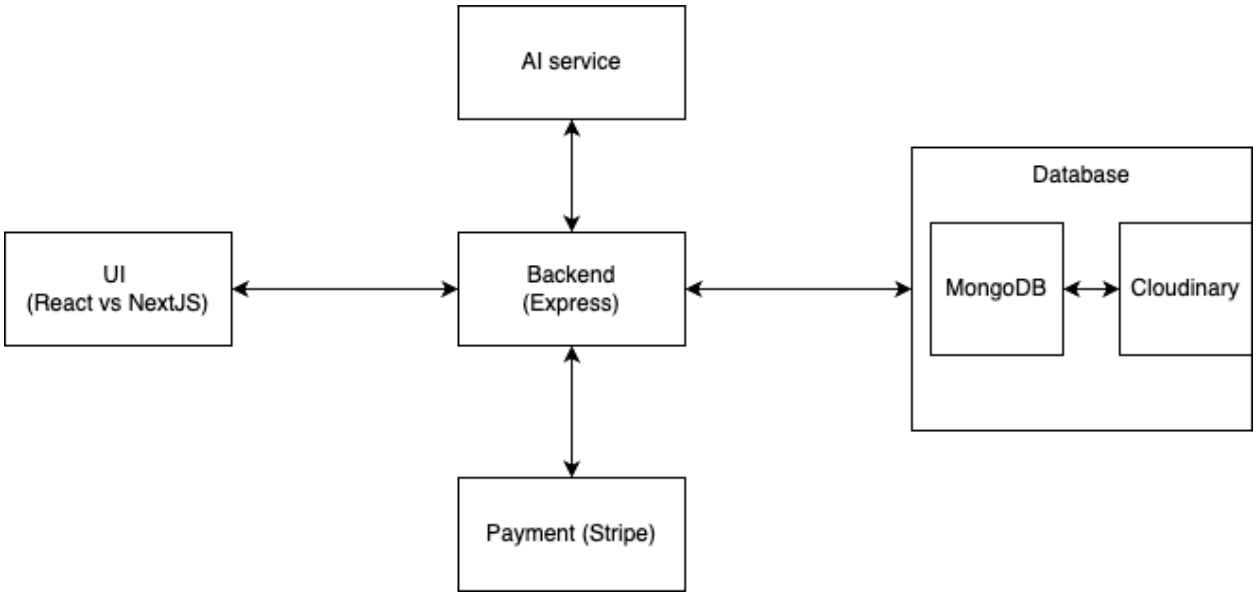
This section provides a high-level view of the product capabilities, interfaces to other applications, and system configurations.

4.1 Product Perspective

Our online music streaming application is designed as an independent platform that offers a diverse and personalized music listening experience, similar to Spotify and Apple Music.

Key Components and Interactions:

- **User Interface:** Built using **NextJS** and **React**, providing an intuitive, user-friendly interface compatible with various devices (desktops, smartphones, tablets).
- **Database:** Utilizes **MongoDB** to manage user information, songs, albums, playlists, and other related data.
- **Payment Processing:** Integrated with **Stripe** to handle payment transactions and manage subscription plans (free and premium).
- **Personalization Features:** Employs AI algorithms to recommend songs based on users' listening habits, enhancing music discovery experiences.
- **Diagram of components:**



4.2 Assumptions and Dependencies

Assumption:

- The application will be developed with a responsive design, ensuring that users can access and use it seamlessly on mobile phones, tablets, and desktops.

Dependencies:

- **Stripe:** For handling payment transactions and managing premium subscription plans. The stability and security of Stripe are critical.
- **PostgreSQL**: For managing and storing user data, songs, and other related information.
- **AI Services:** Utilizing existing AI libraries and services to implement personalized recommendation algorithms.

5. Product Features

Order	Feature	Description
1	Home Page	The Beatify platform's main page displays featured music, playlists, and basic functionalities like registration, login, and music search. It also briefly introduces the platform and showcases trending or recommended songs.
2	Login Page	This page is used to access user accounts on the platform. Registered users can log in by entering their username and password. Depending on the user's role (regular user or admin), they will have different access rights within the system.
3	Registration Page	This feature allows users to sign up for an account on Beatify. Users can create a new account by providing the required details such as email and password. After registering, they can log in using their credentials. Different registration flows may exist depending on the type of user

		(e.g., premium or regular).
4	Music Search	Users can search for music by song title, and artist name, and filter songs by genre or rating. Administrators can add or modify music genres, enabling users to efficiently search and filter tracks based on their preferences for a more personalized experience.
5	Music Playback	Users can stream music directly on Beatify with essential playback controls such as play, pause, next, previous, shuffle, and repeat. This feature allows for a seamless listening experience, ensuring users can enjoy their favorite tracks with ease.
6	Playlist Management	Users can create, manage, and organize their playlists. They can add or remove songs, rearrange track order, and save playlists for future listening. This feature enables users to customize their listening experience by curating playlists based on their musical preferences.
7	Admin Page	This page provides administrators with tools to manage the platform, such as adding or editing music genres, managing user accounts, reviewing playlists, and overseeing content. Admins can also manage platform settings, view usage statistics, and handle premium subscriptions, ensuring smooth operations and a high-quality user experience.
8	User Profile Page	The user profile page displays the user's personal information, including their playlists. Users can view and manage their playlists, see their listening history, and update account details. This feature allows users to track and organize their musical preferences, making it easy to revisit favorite songs and playlists.
9	Premium Subscription System	This feature allows users to subscribe to a premium plan for additional benefits, such as an enhanced audio experience, ad-free listening, and access to exclusive content. Payments are managed through Stripe, and users can choose between various subscription plans. The system also handles subscription renewals, cancellations, and upgrades, ensuring a smooth and secure transaction process for premium users.
10	Song Recommendations	Beatify can offer personalized song suggestions based on users' listening habits, genres, or favorite artists. This feature can be powered by AI, which analyzes user preferences and listening history to recommend new tracks, albums, or playlists tailored to their tastes.
11	Equalizer	The equalizer feature allows users, particularly premium subscribers, to customize their audio experience by adjusting various sound frequencies. Users can modify settings such as bass, treble, and midrange to suit their listening preferences. The equalizer can also include preset modes (e.g., Rock, Jazz, Pop) for quick sound adjustments, enhancing the overall listening experience on Beatify.

6. Non-Functional Requirements

6.1 Standards, Hardware, and Platform Requirements

Web Standards Compliance: The application must adhere to the latest W3C web standards to ensure compatibility, accessibility.

Supported Browsers and Devices:

Browsers: Google Chrome (latest two versions), Mozilla Firefox (latest two versions), Safari (latest two versions), and Microsoft Edge (latest two versions).

6.2 Performance Requirements

Response Time: The application should load the main interface within 2 seconds under standard broadband conditions.

Concurrency: The system should handle up to 100 concurrent users without significant performance degradation.

Uptime and Availability: Ensure 99.9% uptime, guaranteeing that the application is accessible to users almost all the time.

6.3 Environmental Requirements

Hosting Environment: Deploy the server component on a reliable cloud platform (Vercel) to ensure availability and reliability. (Note: This will be further evaluated based on feasibility.)

Scalability: Design the system with scalability in mind to accommodate growth in the number of users and data over time.

Energy Efficiency: Optimize the application and server infrastructure to be energy-efficient, minimizing environmental impact and operational costs where possible.

6.4 Quality Attributes

Usability: The application must feature an intuitive and user-friendly interface, enabling users to navigate and utilize features with ease.

Reliability: Ensure consistent and dependable performance, with mechanisms in place to handle errors gracefully and prevent data loss.

6.5 External Constraints and Dependencies

Third-Party Services:

- **Stripe:** Dependence on Stripe for payment processing; any changes in Stripe's API or service terms may impact payment features.
- **AI Services:** Reliance on AI libraries and services for personalized recommendations; updates or changes in these services may require adjustments in the application.

6.6 Documentation Requirements

User Manuals: Provide comprehensive user guides detailing how to use the application's features, available both online and as downloadable PDFs.

Installation Guides: Offer step-by-step instructions for installing the client software on non-college devices, accessible via the website.

API Documentation: Supply detailed documentation for any exposed APIs to facilitate integration with external developers and services.

Packaging and Labeling: Ensure that any downloadable software packages include necessary documentation and installation files, clearly labeled for ease of use.

6.7 Priority of Requirements

Security (Highest Priority): Protecting user data and financial transactions is paramount to maintain trust and comply with legal standards.

Performance (High Priority): Ensuring fast response times and smooth streaming is critical for user satisfaction and retention.

Usability (High Priority): An intuitive and user-friendly interface is essential for attracting and retaining users.

Scalability (Medium Priority): While important for growth, scalability considerations can be addressed progressively as the user base expands.

Maintainability (Medium Priority): Ensuring the codebase is maintainable supports long-term sustainability and ease of updates.

Documentation (Medium Priority): Comprehensive documentation is important for user support and developer integration but does not directly impact immediate user experience.

Energy Efficiency (Low Priority): While beneficial, energy efficiency is a lower priority compared to core functionalities and user experience.