

VibeQueue

Lab 1 Outline

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1. Introduction

In the modern landscape of the hospitality business there is more to consider than just the quality of the menu and service, with the atmosphere of the location and the “vibe” of the setting being crucial to ensure customer satisfaction. These factors will influence potential customers to enter the location as well as determine the time that is spent in the venue and customers who stay longer tend to purchase more things. One area that is lacking for smaller scale venues is a cost effective way to control the musical aspect of their atmosphere. There are over a million independent locations selling food and drinks that lack a customer interactable method to control music within affordable ranges. These businesses are in need of such a service as that

The currently established methods that can be used to control the music of a location are divided between the expensive proprietary methods of industry leaders like TouchTunes and RockBot or the slow manual workarounds that can be done by the staff. TouchTunes utilizes expensive jukebox hardware with an upfront installation cost that is beyond the acceptable range for most small venues. Some small locations use personal musical streaming accounts and open themselves to legal liabilities due to terms of service preventing private commercial use.

These conditions mean that there is a market gap in this area and this product will be able to fill this gap without much issue. VibeQueue will be low cost and fit within the limitations of a small budget local business. Additionally, it will be hardware agnostic and able to function without any problems on any customer device with internet connection. The service will be customer-facing and maintain legal compliance. It will need to be possible for the owner and operator to veto a song selection and constraints to restrict song genres will need to be possible as well.

It is our privilege to introduce VibeQueue to solve these problems and provide customers with a way to manage their venue’s musical accompaniment to assist in maintaining the atmosphere of the location. This product will be easy to utilize and cost effective for low budget small businesses. It is a seamless and legally permissible method that can be used to offer an interactive experience at places like your local coffee shop or other small businesses. The guiding statement of this service is “Your Vibes, Managed” and we look forward to aiding small businesses in that management.

2. VibeQueue Product Description

2.1 Overview

- Top level description: VibeQueue is a software only solution that replaces expensive proprietary hardware and manual staff processes with a seamless digital music ecosystem for small local spaces

2.2 Goals and objectives:

- Give customers a frictionless way to influence the venue's music via their own smartphones
- Give owners and staff complete control over which songs can be requested
- Provide an optional secondary revenue stream (pay to request model)
- Ensure all music playback is legally licensed for commercial use
- Be deployable with zero new hardware purchase

2.3 Unique differentiators vs. competition:

- Software only runs on devices the business already owns
- Subscription based low monthly cost vs. high upfront hardware investment
- Customer facing QR interface vs. staff mediated requests
- Legally compliant via SoundMachine (ASCAP/BMI/SESAC) vs. unlicensed personal streaming

2.4 System Flow

- [Figure 2: VibeQueue Solution Process Flow (MFCD) customer scans QR > selects song in web app > Vibe Engine checks genre/constraints against Venue Database > validated song sent to Local Server > SoundMachine plays audio]

2.5 Key Product Features and Capabilities

2.5.1 QR Code Access

- Customers scan a QR code on their table to access the venue's VibeQueue portal in a mobile browser no app download required; QR links customer device to the business's specific portal

2.5.2 Song Browsing & Requests:

- Customers search and browse songs using metadata provided by the Soundcharts API; results filtered in real time based on venue's active vibe constraints

2.5.3 Vibe Engine (Custom Song Selection):

- proprietary matching algorithm built by the VibeQueue team; evaluates songs against venue's allowed genre, tempo, mood, popularity settings; rejects non matching requests before they reach the queue
- Significant because it replaces the need for the Spotify API (which has strict commercial use restrictions) with a legally safe, in house solution
- Allows venue to maintain brand atmosphere even with customer input

2.5.4 Business Control Center:

- owner/staff facing dashboard the core management interface
 - Set genre allowlists and blocklists (e.g., “acoustic only,” “no hip hop”)
 - Block explicit content automatically
 - Manage live song queue (skip, reorder, remove)
 - Manage user sessions (ban abusive users)
 - View analytics: most requested songs, peak request times

2.5.5 Dynamic Vibe Moderation:

- integrated content filters applied system wide; owners configure tempo range, mood tags, and explicit content rules once; system enforces automatically on every request

2.5.6 Pay to Request:

- optional monetization feature; customers pay a small fee (e.g., \$0.99–\$1.99) to boost a song to the top of the queue; automated payment processing
 - Revenue split: business keeps majority; VibeQueue takes a 5% platform cut to sustain development
 - Unique no competitor offers customer facing paid interaction at this price point for small businesses

2.5.7 Licensed Streaming via SoundMachine:

- all audio playback routed through SoundMachine, which holds commercial music licenses (ASCAP, BMI, SESAC); ensures VibeQueue is fully legal for business use

2.5.8 Hardware Agnostic Deployment:

- runs on any internet connected device the business already owns staff phones, existing tablets, a dedicated laptop; no proprietary console purchase required

2.6 Major Components (Hardware/Software)

2.6.1 Hardware requirements:

- No proprietary or dedicated hardware required

- Runs on any internet connected device (tablet, smartphone, laptop/desktop) the venue already owns
- Venue speaker system connected to the device running SoundMachine (existing audio setup)

2.6.2 Software architecture (ref: MFCD diagram, Figure 2):

- **Web App UI:** customer facing interface accessed via QR code; built as a responsive web app; search interface connected to Soundcharts API
- **Vibe Engine:** custom built song selection and validation logic; receives customer song request > queries Soundcharts for metadata > checks against Venue Database constraints > returns validated/rejected result
- **Soundcharts API:** third party music analytics service; provides commercially safe metadata (genre, tempo, mood, popularity, explicit flag) for song lookup and vibe matching
- **SoundMachine:** third party licensed commercial streaming service; handles actual audio playback in the venue; ensures ASCAP/BMI/SESAC compliance
- **Local Server:** handles audio signal routing, playback status feedback, and communication between Vibe Engine and SoundMachine
- **Venue Database:** stores venue specific vibe settings (genre rules, explicit flags, tempo limits), song queue state, and transaction/revenue data
- **Business Control Center Dashboard:** owner/staff interface for real time queue management, constraint configuration, and analytics viewing

2.6.3 Technologies, APIs, and frameworks:

- Tech stack: LAMP (Linux, Apache, MySQL, PHP)
- Soundcharts API music metadata
- SoundMachine API licensed audio playback
- QR code generation library (venue specific portal linking)
- Web based front end (mobile first responsive design)
- Architecture note: Initial prototype explored Spotify API; pivoted due to strict Spotify commercial use licensing restrictions; current architecture uses Soundcharts + SoundMachine to eliminate legal risk

3. Identification of Case Study

- 3.1 WHO
 - “Brewpoint Café” single location independent coffee shop; owner (Jamie) + 2 barista staff; ~30 seats; primarily serves morning commuters and remote workers 7 AM–2 PM

- 3.2 WHAT PROBLEM

- Baristas are interrupted 10–15 times per morning rush by verbal song requests; owner loses control of the café’s intended “acoustic/lo fi” vibe when staff accommodate requests; no revenue is generated from music engagement

- 3.3 WHICH FEATURES TESTED

- QR Code Access (on each table card)
- Song Browsing & Requests (Soundcharts powered search)
- Business Control Center (genre restrictions: acoustic, indie, lo fi only; explicit content blocked; max tempo 120 BPM)
- Dynamic Vibe Moderation (auto enforcement of genre and tempo rules)
- Pay to Request (\$0.99 boost option during morning rush)

- 3.4 HOW (Scenario):

- Customer “Alex” sits down, notices QR card on table, scans with phone
- VibeQueue portal opens in browser no download needed; Alex sees current queue and search bar
- Alex searches “Golden Hour” by JVKE; Vibe Engine checks: genre = pop/indie (allowed), explicit = no (pass), tempo = 98 BPM (under 120 BPM limit, pass) > song added to queue
- Alex optionally pays \$0.99 to boost song to top of queue; payment processed automatically
- Staff receive zero interruption; song plays through SoundMachine on café speakers
- Owner Jamie logs into Control Center on the counter tablet during slow period; reviews queue, sees request analytics, adjusts genre allowlist for afternoon shift
- [Figure 3: Case Study scenario flow Alex scans QR > searches song > Vibe Engine validates > song queued > SoundMachine plays > staff uninterrupted]

- 3.5 FUTURE EXPANSION:

- Scale to small cafe chains (5–10 locations) using centralized Control Center with per location vibe profiles
- Expand to adjacent markets: college dining halls, hotel lobbies, waiting rooms, fitness studios, barbershops
- Potential B2B SaaS licensing model for venue management companies
- Add loyalty/gamification features: customers earn “vibe points” for requests that stay in the queue

4. Glossary

- **API (Application Programming Interface):** a set of rules and protocols that allows different software applications to communicate with each other
- **ASCAP (American Society of Composers, Authors, and Publishers):** a U.S. performing rights organization that licenses music for commercial use
- **BMI (Broadcast Music Inc.):** a U.S. performing rights organization that manages commercial music licensing on behalf of songwriters and publishers
- **Business Control Center:** VibeQueue's owner facing web dashboard for configuring vibe constraints, managing the song queue, and viewing analytics
- **Hardware Agnostic:** software designed to run on any existing device without requiring specific or proprietary hardware
- **LAMP:** an open source web development stack comprised of Linux (OS), Apache (web server), MySQL (database), and PHP (scripting language)
- **MFCD (Major Functional Component Diagram):** a visual representation of a system's major components and the data flows between them, as defined in CS 410
- **QR Code (Quick Response Code):** a type of two dimensional matrix barcode that can be scanned by a smartphone camera to open a URL or application
- **SESAC (Society of European Stage Authors and Composers):** a U.S. performing rights organization providing commercial music licensing
- **SoundMachine:** a third party commercial music streaming service that holds ASCAP/BMI/SESAC licenses; used by VibeQueue for legal audio playback in venues
- **Soundcharts API:** a third party music analytics API that provides commercially safe song metadata including genre, tempo, mood, popularity, and explicit content flags
- **Vibe Engine:** VibeQueue's proprietary, in house song selection and validation algorithm; evaluates customer song requests against venue's configured constraints before allowing them into the queue

5. References

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