

D424 – Software Capstone

Task 2



Capstone Proposal Project Name: _____ Music Catalog Web Application (MCWA) _____

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Business Problem

The Customer

The customer is an independent musician named Alex Strummer, who runs a small music business. The business focuses on producing high-quality music and engaging directly with fans through online platforms. Alex's mission is to consistently release music to his audience while maintaining full control over his music distribution and revenue streams. The short-term goal is to increase fan engagement and revenue, while the long-term goal is to establish a sustainable and scalable platform for music distribution and fan interaction.

Alex's music business currently relies on multiple online platforms to distribute his music, which makes it difficult to manage and control his content and revenue efficiently.

Short-term Goals:

- Improve fan engagement by providing a centralized platform for music access.
- Increase revenue by offering exclusive content directly to fans.
- Simplify the management of music distribution.

Long-term Goals:

- Establish a scalable platform for music distribution.
- Enhance fan interaction and engagement.
- Maintain control over music distribution and revenue streams.

Alex aims to build a robust online presence and grow his fan base. By focusing on providing high-quality music and engaging directly with his fans, Alex expects to see sustained growth and to build a stronger reputation in the music industry.

Business Case

Alex currently faces several challenges with music distribution and revenue generation. His music is scattered across various platforms, making it difficult for fans to find older songs after listening to newer releases. Additionally, revenue generation is hindered by platform fees and the low payout rates of streaming services, which only pay artists a small fraction of a cent per stream.

The Music Catalog Web Application will address these challenges by providing a centralized, web-based platform for housing Alex's entire music catalog, handling payments for exclusive content, and integrating social media links to enhance fan engagement.

The MCWA will offer the following functionalities:

Music Catalog Web Application (MCWA)

- **Centralized Music Catalog:** Consolidate all of Alex's music into a single platform, making it easy for fans to access both new and old releases.
- **Payment Integration:** Generate payment links for exclusive content, allowing fans to support Alex directly and access new releases before the official release date.
- **Social Media Integration:** Integrate social media links to enhance fan engagement and allow for easy sharing of music content.
- **Content Management:** Provide a secure and efficient way to manage and update music content, including song titles, album names, and release types.

By implementing the MCWA, Alex will improve operational efficiency, streamline music distribution, and enhance fan engagement. This will result in increased revenue, higher fan satisfaction, and a stronger online presence.

Fulfillment

The MCWA will be designed to fulfill Alex's needs by providing a user-friendly and an efficient platform for managing his music catalog. Key aspects of the application include its appearance and basic functions.

The MCWA will feature a simple and modern user interface with intuitive navigation. The application will be optimized for both desktop and mobile devices, allowing fans to access music from any location at any time.

- **Main Page:** The MCWA will feature a main or “home” page that provides an overview of the music catalog, displaying the number of available releases. This will allow users to constantly access music easily.
- **Music Streaming:** Users will be able to stream songs directly from their web browser through embedded music players.
- **Exclusive Content Access:** Payment links will be generated through a payment processor such as PayPal or Stripe. Vercel serverless functions and the payment processor API will be utilized to allow fans to purchase access to new releases.
- **Content Management:** The application database will allow administrators to create, update, and maintain music content, including song titles, album names, and release types.

By fulfilling these needs, the MCWA will empower Alex to optimize his music distribution, enhance fan satisfaction, and achieve his mission of providing high-quality music and engaging directly with his audience.

SDLC Methodology

Given the nature of the MCWA and the need for continuous improvement and adaptation, the Agile methodology is a suitable choice for managing the project. Agile is an iterative, incremental approach to software development, which allows for flexibility, collaboration, and rapid adaptation to change.

Phases of Agile Methodology:

- **Sprint Planning:** In this phase, the team will compile a list of features and user stories, prioritizing them based on importance and feasibility. They will then identify which features can be developed within the duration of a sprint (typically one week) and create a detailed plan for the sprint.
- **Sprint Execution:** The team will work on developing the planned features during each sprint. This involves coding, testing, and integrating the features into the application. Collaboration is key during this phase, with team members working closely together to implement the features and perform unit tests to ensure functionality.
- **Daily Stand-ups:** Team members will briefly meet each day to share updates on their progress, discuss any obstacles they're encountering, and coordinate their tasks. These meetings help keep the project on track and allow the team to address any issues promptly.
- **Sprint Review and Retrospective:** At the end of each sprint, the team will present the completed features to the customer for feedback. They will also hold a retrospective meeting to reflect on the sprint, discussing what went well, what challenges were faced, and how the process can be improved for the next sprint.
- **Iterative Development:** The team will continue to work in successive sprints, continuously improving the MVP based on feedback from the customer and insights gained during development. This iterative approach ensures that the final product is well-aligned with the customer's needs and expectations.

Deliverables

- **Project Scope Document:** Outline the objectives, high-level requirements, and goals for the MVP.
- **Wireframes and Mockups:** Create low-fidelity and high-fidelity designs to visualize the application.
- **User Stories and Prioritized Feature List:** Document user stories and prioritize features for the MVP.

Music Catalog Web Application (MCWA)

- **Source Code:** Write and manage the complete source code for the MCWA MVP, following best practices.
- **Deployment Instructions:** Provide a guide on how to deploy the MVP.
- **User Guide:** Create a guide to help administrators understand and use the application.
- **Test Cases and Results:** Document test cases and results to ensure the MVP functions as expected.

Deployment Plan and Outcomes

The deployment plan for the MCWA will focus on a streamlined and efficient process to put the software into the Vercel production environment.

Steps:

- **Validation and Verification:** Conduct integration testing once the MVP is complete to ensure components work together seamlessly.
- **Preparation and Coordination:** Collaborate with Alex to determine the appropriate time for deployment, ensuring minimal disruption.
- **Deployment to Production Environment:** Deploy the application on Vercel. The team will oversee the deployment process and handling of the technical aspects.
- **User Training and Support:** Provide a user guide and schedule a training session to walk administrators through the application's features.
- **Post-deployment Monitoring and Support:** Remain available to address any issues or concerns during the initial days of operation, providing prompt support and bug fixes.

Project Timeline

Phase	Milestone/Task	Deliverable	Description	Dates
Planning	Task 1	Project Scope Document & Wireframes	Meeting with customer and procedure review	6/1/2024 – 6/3/2024
Design	Task 2	User Stories/Prioritized Feature List	Create user stories and prioritize features	6/4/2024 – 6/6/2024
Development	Task 3	Source Code	Write and manage the complete source code	6/7/2024 – 6/14/2024
Documentation	Task 4	Deployment Instructions	Provide a guide for deployment	6/15/2024 – 6/21/2024
Documentation	Task 5	User Guide	A user guide for administrators to add/manage music releases within database	6/22/2024 – 6/30/2024
Documentation	Task 6	Test Cases & Results	Document test cases and results	6/22/2024 – 6/30/2024
Deployment	Task 7	Deployed Application	Deploy to production environments	6/22/2024 – 6/30/2024

Environments and Costs

Programming Environment

- Hardware:
 - Developer workstations (Windows or Mac)
 - Server infrastructure for database and AWS S3 storage
- Software:
 - React
 - Vercel for deployment
 - MongoDB or DynamoDB for the database
 - AWS SDK for S3 storage integration
 - Payment processor API (e.g., PayPal, Stripe)
 - Code Editor (e.g., Visual Studio Code)
 - Version Control System (e.g., Git)
 - Modern web browser (e.g., Google Chrome)

Environment Costs

For the MCWA MVP, the costs associated with the software application can be categorized into initial setup costs and recurring costs:

- Initial Setup Costs:
 - Development Tools: Most tools are open-source or free (React, Vercel free tier)
 - Domain registration is \$20.
- Recurring Costs:
 - Database: Estimated \$50/month for database hosting.
 - AWS S3 Storage: Estimated \$25/month for digital content storage.
 - Payment Processor: Transaction fees as per the processor's rate.
 - Deployment Platform (Vercel): Free tier for basic usage, potential upgrade costs for higher usage.
 - Domain Registration Renewal: \$20/year

Overall, the infrastructure costs for the MCWA are relatively minimal, to ensure that the application provides a long-term sustainable solution for an independent artist such as Alex to distribute music directly to consumers at a competitive price, and still be able to maximize revenue.

Human Resource Requirements

To complete the MCWA MVP with two developers working part-time during planning, design, and deployment, and full-time during development, the labor costs can be calculated as follows:

- Full-time (Development, documentation) hours: $2 \text{ weeks} * 40 \text{ hours} = 80 \text{ hours}$
- Part-time (Planning, design, deployment) hours: $2 \text{ week} * 4 \text{ hours} = 8 \text{ hours}$
- Total hours worked: Part-time hours + Full-time hours = 88 hours
- Labor cost per person: Hourly rate * Total hours worked.
- Labor cost per person: $\$50/\text{hour} * 88 \text{ hours} = \$4,400$
- Total labor costs: $2 \text{ people} * \$4,400 = \$8,800$

Hence, the time required to complete the application is 88 hours per person, and the total human resources cost for the project is equal to \$8,800.



Validation and Verification

Methods

Unit Testing: As features are developed, unit tests will be conducted to verify that each individual component functions as expected. This involves writing and executing test cases for the smallest testable parts of the application, such as functions or methods. Developers will focus on testing various input scenarios, edge cases, and error handling to ensure robustness. By isolating components during testing, the team can quickly identify and fix defects at the source, ensuring that new code additions do not introduce bugs.

Integration Testing: Integration testing will be carried out to ensure that components work together seamlessly. This phase involves testing the interactions between different modules and verifying that data flows correctly through the system. Integration tests will cover scenarios where multiple components interact, such as payment verification and processing. The goal is to identify any issues arising from component interactions that might not have been evident during unit testing.

User Acceptance Testing (UAT): User Acceptance Testing (UAT) will be conducted with a select group of fans who represent the end-users of the application. This phase aims to gather feedback on the application's usability, performance, and overall user experience. The selected users will be given access to the application and asked to perform typical tasks, such as streaming music, purchasing exclusive content, and navigating through the site. Their feedback will be collected through surveys, interviews, or direct observation. This process ensures that the application meets user expectations and provides a satisfactory user experience.

Functional Testing: Functional testing involves validating that the application provides all the required functionalities as specified in the project requirements. This phase will cover a broad range of use case scenarios, ensuring that each feature works as intended under various conditions. Test cases will be designed to mimic real-world usage to ensure the application handles all expected user interactions correctly.

Bug Fixing and Re-testing: During the testing phases, any issues or bugs discovered will be logged in a bug tracking system. Each bug will be assigned a priority level based on its impact on the application's functionality. Developers will address these bugs promptly, applying fixes and updating the codebase. Once a bug is fixed, the relevant test cases will be re-executed to ensure that the issue has been resolved and no new problems have been introduced.

By implementing these comprehensive validation and verification methods, the Music Catalog Web Application (MCWA) will be thoroughly tested to ensure it meets all functional and non-functional requirements.