Software Requirements Specification

Version 1.0

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AMELA

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In contract with client, Edwin Rodríguez, for fulfillment of the specified requirements for the CS 4800 Software Engineering Company.

Edwin Rodríguez	Gavin Kremer
CS 4800 Software Engineering Company CEO	AMELA CEO

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1.0 Introduction

1.1 Background

Streaming services are growing in popularity and utility nowadays with an increase in competitive streaming platforms, like Netflix, Hulu, Amazon Prime Video, and more. These companies contract with certain television networks and movie studios in order to exclusively feature their shows and movies to target specific viewers. Due to this, consumers do not have complete access to all shows and movies regularly available through cable television. Even more so, these platforms produce their own entertainment as well to create more consumer loyalty to their service as opposed to others'. To appease the lack of complete access, people pay for multiple streaming services. What is seen, then, is a movement away from cable television towards multiple streaming services, probably due to the ease, flexibility, and affordability streaming offers that traditional cable time slots cannot. However, this situation to many consumers is not ideal, as it causes them to feel as though paying for all of those services wastes their money since they are only interested in a select few programs from each service respectively. This phenomenon serves as the primary inspiration for the creation of the software described in this document.

1.2 Motivation

The purpose of this document is to present a detailed description of a new streaming service from the CEO of CS 4800 Software Engineering Company, Edwin Rodríguez, in contract with our company, AMELA. Fulfillment of the terms outlined in this document shall result in the payment of 5 dollars from CS 4800 Software Engineering Company to AMELA. Mr. Rodríguez argues that paying for multiple streaming services and needing to know which television shows and movies each platform offers can be cumbersome to the consumer. He wants to develop a platform, then, that can satisfy one's entertainment needs under a single service. Additionally, Mr. Rodríguez claims that an important component of the user experience on such a site should include user interaction and community. He proposes that the core media streaming service should also be accompanied by features akin to social media websites, most notably including unique user homepages that list their related interests, interactions with the site, and conversations with other users.

2.0 Contextual Information

2.1 Our Product

Our product is a unique media streaming web service that, among other objectives, aims to combat the rampant problem of exclusive content. Our product will interface with Netflix, Amazon Prime Video, Hulu, and other media streaming services to provide the end user with access to content that is typically exclusive to each platform. Our product will feature a monthly plan that allows 10 subscription slots for television shows. Each subscription slot permits unlimited streaming access to whichever show the user chooses. Once a user has subscribed to a show, they must wait until the end of the payment cycle to change their television show subscription for that slot. Movies will be available for 24 hour rent at flat rates. Additionally, our product will provide social media capabilities to the end user. Users will have access to integrated messaging services, be able to view other users' watch history, and have the option to leave comments on other users' profiles.

2.2 Similar Products

While no other product exists that fills the niche that ours does, there are products that have similarities. Both our product and popular streaming services (Netflix, Amazon Prime Video, and Hulu) stream television shows and movies to consumers. Steps should be taken to ensure that consumers who are used to those services do not get confused when using ours. None of those streaming services offer the social networking capabilities of our service, but game distribution services, such as Steam, and outright social networking websites, such as Facebook, Twitter, Reddit, and Instagram, offer those features. Finally, the indexing and search features of our product are similar in function to IMDb's.

2.3 Differences

The differences between our product and current options within the marketplace are both numerous and substantial. Our product will have a social media aspect to it, providing features that allow users to interact with each other. While this capability is existent within other media streaming platforms, our product will have more comprehensive social media functionality.

Additionally, our product provides a unique service plan that is unseen in other streaming platforms, as previously mentioned in *Our Product* (Section 2.1).

3.0 Scope of Project

The service consists of an internet based frontend that interfaces with a database backend. The frontend gives users access to streamed content, user specific options, and social media elements. To build the web application, we elected to use Django. According to our research, Django is a web application framework that is based in Python and facilitates fast development. This is ideal for Agile development. Django is also designed specifically for creating database centric websites and automatically handles many security aspects, which means it can handle all three of our front, middle, and back end needs. It features object-relational mapping, which makes database operations writable in Python code. Django interfaces seamlessly with many databases, which for our product will be MySQL. This language is widely used and, thus, will have ample support available, if needed.

Amazon Web Services will be used for our content hosting. Amazon provides cheap, convenient hosting solutions and even provides support for on-demand media streaming, which is exactly what we need for this product. Streaming services provided by AMELA will be handled through Amazon Web Services. Using this platform will also keep downtime to a minimum, as Amazon provides services to a plethora of other content providers.

AMELA will also have to create their own financial transaction tools. Mr. Rodríguez insists that existing financial services are unfit for this product and cannot be used, specifically for the reason: “existing financial tools interact with actual banks. This product should not do that.”

4.0 Functionality

4.1 Login Features

4.1.1 Functional

4.1.1.1 Functional requirement

ID: FR1.1

Title: Create an Account

Description: A user should be able to create a new account by registering with a valid email address, a username, and a password. The email address and username must not already have an associated account.

Rationale: To allow users to create an account

Dependencies: None

4.1.1.2 Functional requirement

ID: FR1.2

Title: Log In to Account

Description: A user should be able to log in to an existing account by providing their username and password.

Rationale: To allow users to log in to their accounts

Dependencies: FR1.1

4.1.1.3 Functional requirement

ID: FR1.3

Title: Log Out of Account

Description: A logged-in user should be able to log out of their account in a single action.

Rationale: To allow users to log out of their accounts

Dependencies: FR1.1, FR1.2

4.1.1.4 Functional requirement

ID: FR1.4

Title: Reset Account Password

Description: A user should be able to enter their email and have their password changed to a random temporary password that is then emailed to them.

Rationale: To allow users who have forgotten their passwords to reset them

Dependencies: FR1.1

4.1.1.5 Functional requirement

ID: FR1.5

Title: Password Change

Description: Logged-in users can change their password by providing their old password and a new password.

Rationale: To allow those who have used FR1.4 to change their password back to something secure, or to allow those who wish to change their password to do so

Dependencies: FR1.1, FR1.4

4.1.2 Non-Functional

4.1.2.1 Non-Functional requirement

ID: NFR1.1

Title: Login Security

Description: All usernames and passwords will be secured on the server to ensure that accounts and other confidential information cannot be accessed or viewed by other users.

Rationale: To prevent data breaches

Dependencies: FR1.1

4.2 User Media Subscriptions

4.2.1 Functional

4.2.1.1 Functional requirement

ID: FR2.1

Title: Subscription Slots

Description: Each user that has an active service plan (hereafter known as “paid users”) has a certain number of subscription slots for television shows. Once a show is selected for a slot, it is locked in and cannot be changed until a time period has passed.

Rationale: To track and control how many shows someone has access to

Dependencies: FR1.1

4.2.1.2 Functional requirement

ID: FR2.2

Title: Subscription Slot Auto-Renew
Description: By default, the subscription in each slot will auto-renew at the end of that time period, automatically locking in their slots for the television shows previously selected. A set amount of time before the time period ends, the user will be sent a notification (via email, their user inbox, or both, depending on their preference) informing them of when their subscription will end and what will happen when their subscription does end (such as auto-renewal or a chance to switch a slot to a new television show).
Rationale: To easily allow for continual show watching
Dependencies: FR2.1

4.2.1.3 Functional requirement
ID: FR2.3
Title: Additional Subscription Slots
Description: Paid users may also purchase individual slots at a fixed rate per slot in addition to the set amount provided by the basic subscription. There are no limits on the number of additional slots that a user may purchase.
Rationale: To allow users to subscribe to more television shows
Dependencies: FR2.1

4.2.1.4 Functional requirement
ID: FR2.4
Title: Movie Rentals
Description: Slots only give access to television shows. If a paid user wishes to access movies, they may be rented individually for a certain time interval at a flat rate per movie.
Rationale: To allow for movie watching
Dependencies: FR1.1

4.2.2 Non-Functional

4.2.2.1 Non-Functional requirement
ID: NFR2.1
Title: Subscription Slot Duration and Quantity
Description: Paid users are given 10 subscription slots that are locked in for a duration of one calendar-month. If the user wishes to change their slot to a different show, they must wait until

the end of their calendar-month subscription or may purchase additional slots for an additional fee.
Rationale: To ensure that users have limited access, and to give a reason for buying additional subscription slots
Dependencies: FR2.1

4.2.2.2 Non-Functional requirement

ID: NFR2.2
Title: Additional Subscription Slot Duration in case of Cancellation
Description: In the event that a user possesses additional slots, but cancels their service plan, the additional slots will only remain usable until the end of their active plan. After a user's plan has expired, they will forfeit the additional slots purchased.
Rationale: To ensure that users can not bypass the base fee
Dependencies: FR2.3

4.2.2.3 Non-Functional requirement

ID: NFR2.3
Title: Subscription Slot Renewal Calendar Month Safety
Description: If the user has purchased a basic subscription or additional subscription slots, and the current month has fewer days than the month of purchase, the subscription will instead end on the last day of the month. For example, if the user purchases their basic subscription on January 31st, their subscription will, then, end on February 28th, since it is impossible to end the subscriptions on the 31st of February.
Rationale: To ensure that users do not encounter problems when nearing the ends of months
Dependencies: FR2.3

4.2.2.4 Non-Functional requirement

ID: NFR2.4
Title: Movie Rental Duration
Description: If the user wishes to access movies, they may be rented at a flat rate per movie for a period of 24 hours. Once 24 hours have passed, the user must once again pay the rental fee to access the movie again.
Rationale: To ensure that users watch movies within a reasonable time
Dependencies: FR2.4

4.3 Media Streaming

4.3.1 Functional

4.3.1.1 Functional requirement

ID: FR3.1

Title: Media Streaming

Description: Users who have access to media shall be able to initiate playback of the media at their discretion, and it will be streamed to their device.

Rationale: This is the purpose of the service

Dependencies: FR2.1, 2.4

4.3.1.2 Functional requirement

ID: FR3.2

Title: Media Streaming Controls

Description: Streamed media will be scrubbable and can be paused at any point during playback.

Rationale: To allow for a comfortable streaming experience

Dependencies: FR3.1

4.3.1.3 Functional requirement

ID: FR3.3

Title: Media Streaming Placeholding

Description: Users who are streaming a piece of media shall be able to stop playback of the media and resume at a later point in time, if they still have access, and the media will automatically resume at whatever point they stopped at.

Rationale: To allow for users to split media across viewing sessions

Dependencies: FR3.1

4.3.1.4 Functional requirement

ID: FR3.4

Title: Media Streaming Autoplay

Description: When a user who is streaming a show reaches the end of an episode, and there is a further episode that the user has access to, then that episode will automatically play unless

the user manually stops it.
Rationale: To allow for users to watch multiple episodes of a show without intervention
Dependencies: FR3.1

4.3.2 Non-Functional

4.3.2.1 Non-Functional requirement
ID: NFR3.1
Title: Media Streaming Delay
Description: For users who select a piece of media to stream and have a decent internet connection, playback should initiate no more than one minute after playback is requested.
Rationale: User comfort
Dependencies: FR3.1

4.4 Media Indexing

4.4.1 Functional

4.4.1.1 Functional requirement
ID: FR4.1
Title: Media Index
Description: All shows and movies available will be indexed with metadata about the content.
Rationale: To allow for users to know more information about the media
Dependencies: None

4.4.1.2 Functional requirement
ID: FR4.2
Title: Media Search
Description: Users will be able to search for media by its metadata. For example, if a user searches without specifying any attributes, all shows and movies are returned. If a user searches for content with a title of “Acorn”, then all movies and shows that contain “Acorn” in their title will be returned.
Rationale: To allow for users to find particular pieces of content
Dependencies: FR4.1

4.4.2 Non-Functional

4.4.2.1 Non-Functional requirement

ID: NFR4.1

Title: Media Metadata Types

Description: Media metadata that is stored and searchable include title, cast, year, genre, studio, and the external streaming service the media is being provided from.

Rationale: Better searching capabilities

Dependencies: FR4.1

4.4.2.2 Non-Functional requirement

ID: NFR4.2

Title: Media Links

Description: Users can click on a piece of media from the search page, directing them to the media's specific page.

Rationale: To allow users to get more information about specific pieces of content

Dependencies: FR4.3

4.4.2.3 Non-Functional requirement

ID: NFR4.3

Title: Media Search Pagination

Description: Search results will be spread out across multiple pages, and the user can easily move to the pages before and after the current page, as well as to any particular page.

Rationale: To limit bandwidth usage for searches

Dependencies: FR4.3

4.5 Media Pages

4.5.1 Functional

4.5.1.1 Functional requirement

ID: FR5.1

Title: Media Pages

Description: Each piece of media will have a media page that shows information particular to

that piece of media.
Rationale: To allow users to focus on one particular piece of media
Dependencies: None

4.5.1.2 Functional requirement
ID: FR5.2
Title: Media Ratings
Description: From a media page, users can rate that media as well as view the average rating for that media.
Rationale: To allow users to get an idea of the quality of any particular piece of media
Dependencies: FR5.1

4.5.1.3 Functional requirement
ID: FR5.3
Title: Media Comments
Description: From a media page, users can leave a text comment about that media as well as view comments left by other users. Comments are tagged with the username of the person who left them.
Rationale: To allow users to talk about any particular piece of media
Dependencies: FR1.1, FR5.1

4.5.1.4 Functional requirement
ID: FR5.4
Title: Media Page Subscription Unaccessible
Description: From a media page, paid users who do not have access to the media are presented with the necessary options to access that media: use an open subscription slot for shows, or rent a movie. This will occupy a subscription slot if the media is a show, or bill the user if it is a movie.
Rationale: To allow users to easily buy any particular piece of media
Dependencies: FR1.1, FR5.1

4.5.1.5 Functional requirement
ID: FR5.5
Title: Media Page Subscription Accessible

Description: From a media page, users who do have access to the media are presented with the option of streaming that media.
Rationale: To allow users to easily watch any particular piece of media
Dependencies: FR1.1, FR5.1

4.5.2 Non-Functional

4.5.2.1 Non-Functional requirement
ID: NFR5.1
Title: Media Rating Scale
Description: Media is rated on a 5 star scale, with 1 star being the worst and 5 stars being the best.
Rationale: To follow an industry standard
Dependencies: FR5.2

4.5.2.2 Non-Functional requirement
ID: NFR5.2
Title: Media Information Displayed
Description: All metadata information about the media will be displayed on its media page (title, cast, year, genre, studio, and the external streaming service the media is being provided from) as well as any synopsis or description.
Rationale: To allow users to better understand the media
Dependencies: FR5.1

4.6 User Pages

4.6.1 Functional

4.6.1.1 Functional requirement
ID: FR6.1
Title: User Page
Description: All users will have their own user page that features details about their media experiences. Users will have the ability to see other users' pages.
Rationale: To allow users to interact socially with one another

Dependencies: FR1.1

4.6.1.2 Functional requirement

ID: FR6.2

Title: User Following

Description: From another user's page, users have the option to follow or unfollow them.

Rationale: To allow users to interact socially with one another

Dependencies: FR6.1

4.6.1.3 Functional requirement

ID: FR6.3

Title: User Messaging

Description: From another user's page, users have the option to send a message to them.

Rationale: To allow users to interact socially with one another

Dependencies: FR6.1

4.6.1.4 Functional requirement

ID: FR6.4

Title: User Inbox

Description: Messaging will be available to all users through an inbox that will hold such conversations. The inbox will have notifications for the user to see that they have new, unread messages.

Rationale: To allow users to interact socially with one another

Dependencies: FR1.1

4.6.1.5 Functional requirement

ID: FR6.5

Title: User Preferences

Description: All user preferences can be modified in a user settings page.

Rationale: To allow users to change their preferences

Dependencies: FR1.1

4.6.2 Non-Functional

4.6.2.1 Non-Functional requirement

ID: NFR6.1

Title: User Page Details

Description: The details that can be seen from a user page include username, favorite movies, favorite tv shows, latest media watched, and latest rating given.

Rationale: To allow other users to view one's related interests, interactions with the site, and conversations with other users

Dependencies: FR6.1

4.6.2.2 Non-Functional requirement

ID: NFR6.2

Title: User Settings Details

Description: User preferences include opting in to or out of emails, changing password, and cancelling their subscription. Their preferences will display the date of which their monthly subscription ends.

Rationale: To allow users to change their preferences

Dependencies: FR6.5

4.6.2.3 Non-Functional requirement

ID: NFR6.3

Title: User Message Delivery

Description: Messages sent by our service to users will, in addition to appearing in the user inbox, be sent to their registered email address, unless they opted out of emails in user preferences.

Rationale: To have active communication between our service and the user

Dependencies: FR6.4

4.7 Billing

4.7.1 Functional

4.7.1.1 Functional requirement

ID: FR7.1

Title: Billing

Description: Users will be charged for the basic service plan and any additional fees for add-on slots or movies. The charge for the basic service plan will be applied monthly.
Rationale: To allow the service to be monetized
Dependencies: FR1.1

4.7.1.2 Functional requirement
ID: FR7.2
Title: Billing Notification
Description: Users will be notified of billing via email, their user inbox, or both, depending on their preference.
Rationale: To allow the service to be monetized and to have active communication between out service and the user
Dependencies: FR7.1

4.7.1.3 Functional requirement
ID: FR7.3
Title: Subscription Cancellation
Description: The user can cancel their subscription at any time from their settings page, in which case the service will last until the end of their current pay period.
Rationale: To allow users to cleanly sever ties with the service
Dependencies: FR7.1

4.7.2 Non-Functional

4.7.2.1 Non-Functional requirement
ID: NFR7.1
Title: Paid Features
Description: All users must have an active basic service plan in order to interact with all features of the site.
Rationale: To ensure that users pay money
Dependencies: FR7.1

4.7.2.2 Non-Functional requirement
ID: NFR7.2

Title: Payment Details
Description: The service only accepts credit/debit cards as form of payment.
Rationale: To simplify the payment process
Dependencies: FR7.1

4.7.2.3 Non-Functional requirement
ID: NFR7.3
Title: Billing Stipulations
Description: Users must have a form of payment saved on their account at all times for auto-renewal. Defaults on payments will result in automatic cancellation of service.
Rationale: To ensure that users actually pay money
Dependencies: FR7.1

4.7.2.4 Non-Functional requirement
ID: NFR7.4
Title: Terms and Conditions
Description: Terms and conditions will be clearly outlined at the time of the subscription purchase.
Rationale: To avoid legal trouble
Dependencies: FR7.1

4.8 Security

4.8.1 Functional

4.8.1.1 Functional requirement
ID: FR8.1
Title: General Security
Description: Information that users provide us must be protected and secure. Our product will employ special services and practices to ensure that user data is safe, by both securing transmission of that data and preventing account compromises.
Rationale: Data breaches harm customer loyalty and public image
Dependencies: None

4.8.2 Non-Functional

4.8.2.1 Non-Functional requirement

ID: NFR8.1

Title: Data Encryption

Description: Data exchanged through our servers will be encrypted.

Rationale: Data breaches harm customer loyalty and public image

Dependencies: None

4.8.2.2 Non-Functional requirement

ID: NFR8.2

Title: Password Security

Description: All passwords will be salted and hashed before being stored in the server. No plaintext passwords will be stored in any way.

Rationale: Storing unhashed passwords worsens the results of data breaches

Dependencies: None

4.8.2.3 Non-Functional requirement

ID: NFR8.3

Title: Password Strength

Description: A password policy will be enforced to compel users to make a secure password and reduce the chance of their account being compromised. This policy will be clearly shown on any password creation screen and gives feedback to users as to whether the password meets the policy.

Rationale: Weak passwords are easier to brute-force by attackers

Dependencies: None

4.8.2.4 Non-Functional requirement

ID: NFR8.4

Title: SSL Certificate

Description: An SSL certificate will be obtained for parts of our product that handle user data, such as the login screen.

Rationale: To allow for secure transmission of sensitive details between our servers

Dependencies: None

4.9 Logging Information

4.9.1 Functional

4.9.1.1 Functional requirement

ID: FR9.1

Title: Logging

Description: Our product will log information about user interaction with the product.

Rationale: This information will serve for analytical purposes and will also assist our company in expediting the development process

Dependencies: None

4.9.2 Non-Functional

4.9.2.1 Non-Functional requirement

ID: NFR9.1

Title: Timestamped Logs

Description: Each piece of information logged should be time-stamped.

Rationale: Having the date and time of each piece of information will help better understand the context of the information

Dependencies: FR9.1

4.9.2.2 Non-Functional requirement

ID: NFR9.2

Title: Details Logged

Description: The following will be logged: all purchases and service plan updates, playback requests, actual playback, messages sent, ratings given, preference changes, and user logins.

Rationale: This is the information that will be helpful to the client

Dependencies: FR9.1

4.9.2.3 Non-Functional requirement

ID: NFR9.3

Title: Log Persistence

Description: Logs will not automatically be purged after a given date.

Rationale: This information will still be useful long after it is created
Dependencies: FR9.1

5.0 User Interface

5.1 Interface Theme, Elements, and Appearance

AMELA is hereby granted full discretion over decisions involving the appearance, elements, and overall theme of the user interface. This includes color theme, interface component appearance and usage, fonts used, graphics displayed, and other aspects of the interface that serve to accomplish the requirements described in *Functionality* (Section 4.0). When asked if he had any preference at all, Mr. Rodríguez insisted it was entirely up to us and stated that he wanted the site to reflect the design preferences of AMELA. By signing this document, it is agreed that AMELA will make all decisions strictly regarding the appearance and layout of the user interface over the course of the development cycle as they see fit, although CS 4800 Software Engineering Company reserves the right to veto the design decisions should said designs prove disagreeable.

5.2 Interface Requirements

Mr. Rodríguez specified important features the user interface must have. The log-in screen must include two fields for the user to enter their username and password in, respectively. The media subscription page should visually represent the user's television show subscription slots. The search page should feature a search box for users to search for specific media and be able to click on the name of the media to be directed to its respective page. That media page should include a representative graphic for the media and an interactive section for users to post certain information about the movie and their ratings. Similarly, user pages should include another interactive section and display user details. The specific details for these requirements are defined in *Functionality* (Section 4.0).

6.0 Hardware Specifics

AMELA will be utilizing an Amazon Web Service instance, or AWS instance. AWS features a Content Delivery Network that allows live video streaming of media files stored within an AWS instance.

Media files will be uploaded through an AWS account. Once uploaded, AWS Elemental MediaConvert will take the original file and change the size, resolution, or formatting as necessary for streaming to various connected devices (cell phones, computers, etc.).

Once the file has been appropriately converted, the Content Delivery Network can give the user access to the media in two different ways. It can deliver the entire video file to the device before playing it, or it can stream it to the device as the user watches.

While the first option is much easier to implement, AMELA will be using the second option to improve the user's experience. Playback starts more quickly, fast-forwarding is more efficient, and the user's bandwidth is not wasted, as the user only downloads what they watch. In general, the Content Delivery Network fetches content a few seconds ahead of when it will be needed.

The specific Amazon instance intended for use is an Amazon S3, which provides both a repository for internet data (this case being media files) and on-demand streaming. The hardware for Amazon S3 is not public knowledge but guarantees low-latency and high-throughput.

7.0 Performance

The performance specifications detailed in this section are by no means a guarantee, and thus, AMELA is not bound to meet nor exceed said specifications. The performance specifications are meant to serve only as rough approximations for performance metrics.

AMELA will use Amazon Web Services to both host and facilitate streaming. As such, content

delivery is expected to be smooth and without interruption. Amazon has a phenomenal track record with extremely limited instances of downtime. Because they are responsible for content delivery for an abundance of services, any downtime experienced as a result of Amazon will be resolved quickly.

As previously mentioned, AMELA has elected to use Django. The Django framework boasts fast speeds, which will help mitigate any bottlenecks experienced. Additionally, Django is well known for interfacing conveniently with databases. Because AMELA will not have to worry too much, then, about database specifics, our focus can shift to other aspects of the codebase, ultimately resulting in a higher quality product. The result of this decision leads to an overall better experience for the end user.

8.0 Maintenance

Upon completion of the product, CS 4800 Software Engineering Company will be responsible for upkeep and maintenance of all media streaming services as described in this document. AMELA will not be responsible for updating this product, with the exception of fixing critical bugs and software issues discovered no more than 14 days after the completion of the project, which are not the result of the product becoming outdated due to progressing technologies or changing internet protocols.

If it is determined at a later date that AMELA did not fully deliver the product as outlined in this document at the original time of completion, they will be responsible for updating and fixing the product until it matches the specified requirements of this document.