Lab 2 – FlixPicks Product Specification

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Lab 2

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1 Introduction

1.1 Purpose

The consumption of video entertainment has evolved significantly since its conception. What started as a limited set of channels with a fixed airing schedule has been replaced with expansive libraries of on-demand content, readily available from almost anywhere, anytime. In August 2022, streaming represented 34.8% of visual viewership, surpassing cable television (TV) for the first time (Fischer, 2022). Streaming is projected to grow by an annual rate of 9%, while projected cable TV growth is a mere 4% annually (Raj, 2023). The continued growth of streaming services comes at a time when the average household is already subscribed to 2.8 services, costing $39 per month (Glover, 2023). As of 2023, there are over 200 paid streaming platforms available globally, giving users an overabundance of options to choose from (Cook, 2023). This includes popular services such as Netflix, Hulu, and Max. From these three services alone, a person would have the option of over 7,500 movies to watch (Clark, 2022).

The cornucopia of content ushered in by the rise of streaming has induced a paradox of choice for many streaming platform subscribers. For example, even after a subscriber has already decided to use Netflix, they spend an average of 17.8 additional minutes browsing selections each time they use the platform according to a 2016 study (Mostcaritolo, 2016). A study from 2020, estimated that the average person spends up to 187 hours a year searching for media, or roughly 30 minutes a day (Ward, 2020). This phenomenon is often referred to as Decision Fatigue and/or Choice Overload.

FlixPicks is an online application that consolidates content from many of the most popular streaming services for Registered Users, a user who has created an account. Creating a Library that is an agglomeration of content unique to the Linked Subscriptions, self-reported

ownership of a Streaming Service, for a Registered User. FlixPicks incorporates a Taste Profile, set up at the registration of a new user through a Survey, to influence content displayed to individual Registered Users. FlixPicks utilizes both Recommendation and Apriori Algorithms to dynamically change which content is displayed for a Registered User. FlixPicks main goal is to eliminate Decision Fatigue and Choice Overload through five key features: Taste Profile, HotPicks, CineWheel, CineRoll, and CineMap. The innovative design solution is defined by the Major Components (Section 2.1).

1.2 Scope

The prototype case study consists of a minimal number of simulated users, with diverse ownership of streaming services and roles. The diverse ownerships model's real-world usage provides realistic data collection. Roles include users who are Guests, Registered Users, and Representatives. All roles in the prototype are tester- driven. The FlixPicks prototype demonstrates the product's ability to eliminate Decision Fatigue and Choice Overload through the five key features.

A reduction in possible Library data is also seen in the prototype, limiting the number of movies and shows stored to a maximum of 10,000 from five Streaming Services. The chosen streaming services in the case study are Netflix, Amazon Prime, Hulu, Disney+, and Max. Beyond the specified users, the case study also presents up to 1000 generated users containing permutations of user data from the case study, ensuring data integrity, to strengthen algorithm correlations.

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1.3 Definitions, Acronyms, and Abbreviations

Administrator: A user who, beyond having access to the full slate of features a Registered user has and the data available to a Representative, can manipulate FlixPicks data.

Android: An operating system for mobile devices manufactured by Google, Samsung, and other companies.

Apache Tomcat: An open-source implementation of the Java Servlet, Java Server Pages, Java Expression Language, and WebSocket technologies. Tomcat provides a "pure java" HTTP web server environment in which Java code can run.

API: An Application Programming Interface is an interface that allows for interactions between multiple software applications or mixed hardware-software intermediaries.

Apriori Algorithm: Association mining that allows for common patterns in a users watch history to be used to help suggest content for other users.

Choice Overload: The phenomenon that choosing between a large variety of options can be detrimental to the decision-making process.

CineFeatures: CineFeatures is the collective name of the three features in FlixPicks: CineRoll, CineWheel, and CineMap.

CineMap: FlixPicks extension that is enabled when a user is watching media. It overlays their media and allows the user to see and make their own time-stamped comments and reactions that are stored on the FlixPicks DB.

CineRoll: FlixPicks feature that generates random selections based on a user's interests. CineRoll uses the Taste Profile to generate selections for a user based on their recommendations and chooses one for the user. The user has the option to reroll if they aren't satisfied with the selection.

CineWheel: FlixPicks feature that randomly selects from a set of user-inputted choices. The user provides the feature with media options and the feature randomly selects from a maximum of ten options.

CSS: Cascading Style Sheets is a style sheet language used for customizing the appearance of a document written in a markup language such as HTML. CSS is a cornerstone technology of the World Wide Web, alongside HTML and JavaScript.

Decision Fatigue: The fatigue from deciding what to watch can take the joy out of watching anything.

Git: Software for tracking changes in any set of files, usually used for coordinating work among programmers collaboratively developing source code during software development.

Guest: An unregistered user who has limited access to features offered by FlixPicks.

HotPicks: A micro-experience tile for showing popular and trending media. Dynamically creates the list upon page refresh. Available for registered users and guests.

HTML: Hyper Text Markup Language. HTML is the standard markup language for creating web pages. HTML elements tell the browser how to display the content and define the structure of web pages.

IDE: An integrated development environment is a software application that provides comprehensive facilities to computer programmers for software development.

iOS: An operating system used for mobile devices manufactured by Apple Inc.

JavaScript: A scripting or programming language that allows you to implement complex features and interactivity on web pages.

Library: Aggregated content that is shown to users. Guest users only have access to HotPicks but registered users can see aggregated content from HotPicks and their personalized recommendations.

Linked Subscriptions: User's subscription data that will be used to filter what media is shown in the Library, users can change this in settings if they want to only view their subscriptions.

MySQL: An open-source relational database management system.

Netflix: A subscription-based streaming service that allows members to watch TV shows and movies on internet-connected devices.

Quick Click: A link from FlixPicks that redirects the user to the selected streaming media.

Reactions: Small images that the user attaches to their comment to describe a variety of emotions that the user feels about the media.

Recommendation Algorithm: An algorithm that uses a dynamically built input library and information filtering system based upon the Taste Profile that provides suggestions for media content that is most relevant to a particular user.

Registered User: A user who completed registration and Taste Profile Survey, having full access to features offered by FlixPicks.

Representative: A user who is an affiliate of a particular streaming service who has access to non-account-specific data analytics of Registered Users.

Stakeholder: A person with interest or concern in something, especially a business.

Streaming: A method of transmitting or receiving data over a computer network as a steady, continuous flow, allowing playback to start while the rest of the data is being processed.

Streaming Service: A streaming service is a digital platform that delivers multimedia content over the internet, allowing users to watch or listen to it in real-time without downloading. Examples include Netflix, Spotify, and Disney+.

Subscription: A user's enrollment with a Streaming Service provider, providing them access to media available through the service.

Survey: A questionnaire to establish the initial information for recommendations in the Taste Profile.

Taste Profile: A user profile on FlixPicks that stores data about user streaming subscriptions, recommended media, and user preference information. As a user makes selections the Taste Profile recommendations become more refined to the users' preferences.

User Roles: Guest, Registered User, Representative, and Administrator are the user roles for FlixPicks.

Watch History: A comprehensive list of past content viewed by a user.

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1.5 Overview

This product specification provides the hardware and software configuration, interfaces, and features of The FlixPicks prototype. The remaining sections will provide a detailed description of the features required for the implementation of the FlixPicks prototype.

2 General Description

The FlixPicks prototype includes a majority of the functionality of the real-world product (RWP), depicted in Table 1. The FlixPicks prototype serves as a proof of concept. Simulation of user data is used in the prototype, providing analytics and allowing for risk mitigation. The prototype is crucial in demonstrating that FlixPicks is an innovative solution to the problem.

2.1 Prototype Architecture Description

The prototype is hosted on the Old Dominion University infrastructure. Data is collected from TMDB for subscription services. The FlixPicks prototype consists of a web application and browser extension. Figure 1 illustrates the functional components of the FlixPicks prototype

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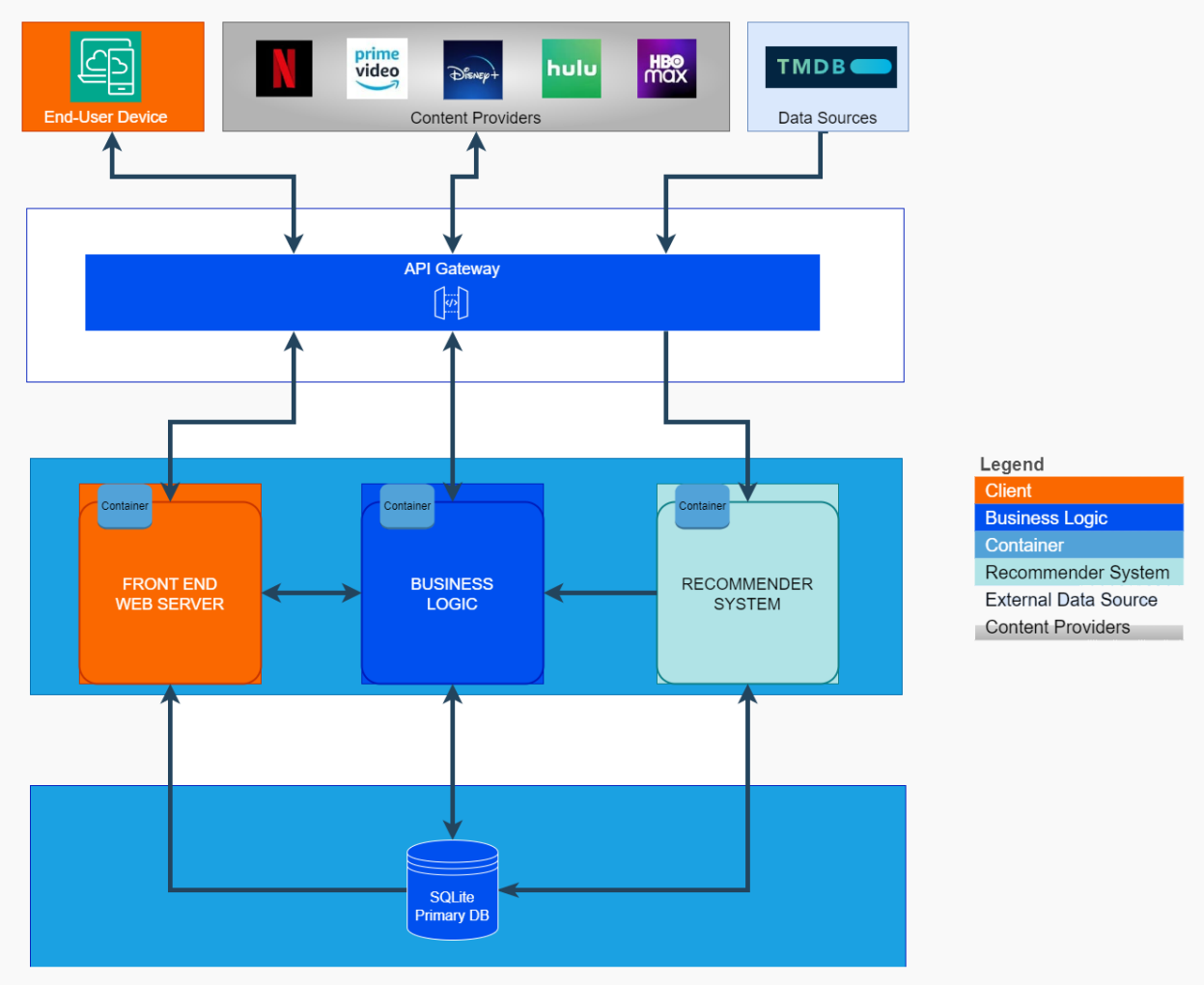
Figure 1

FlixPicks Prototype Major Functional Component Diagram



FlixPicks prototype uses an ODU Linux-based virtual machine. The prototype back-end is developed in Python. SQLite is implemented as the database and Docker is used for facilitating data management. The front-end is written in HTML, CSS, and JS and is connected using Flask. GitHub is used for version control. VSCode and Eclipse are used as the IDEs for project management and issue tracking.

2.2 Prototype Functional Description

The prototype of FlixPicks includes full implementations of CineWheel, CineRoll, and Taste Profile. CineMap is limited in implementation with restrictions on data exportation and analysis. All user data is simulated. Movie data is both simulated and pulled through third-party APIs. Table 1 defines functional differences between features in the real-world product and the prototype.

Table 1

FlixPicks Feature Description and Prototype Implementation

Category	FlixPicks Feature	RWP	Prototype
Subscription Service Management	User Account Registration	Fully Implemented	Fully Implemented
	Account/Subscription Service Management	Fully Implemented	Fully Implemented
	User Subscription Integration	Fully Implemented	Partially Implemented
	User Tier Level Feature Access	Fully Implemented	Partially Implemented
Taste Profile	Taste Profile	Fully Implemented	Fully Implemented
	Taste Profile Survey	Fully Implemented	Fully Implemented
	Taste Profile Content-Based Filtering	Fully Implemented	Fully Implemented
	Taste Profile Collaborative Filtering	Fully Implemented	Fully Implemented
Recommendations	Recommendations	Fully Implemented	Fully Implemented
	Filtered Recommendations (Criteria based)	Fully Implemented	Fully Implemented
Movie Library	Browse/Search Filtering	Fully Implemented	Fully Implemented
	HotPicks	Fully Implemented	Fully Implemented
CineRoll	CineRoll	Fully Implemented	Fully Implemented
CineWheel	CineWheel	Fully Implemented	Fully Implemented
CineMap	CineMap Overlay	Fully Implemented	Fully Implemented
	CineMap Commenting	Fully Implemented	Partially Implemented
	CineMap Export Data	Fully Implemented	Partially Implemented
	CineMap Data Analyzing	Fully Implemented	Partially Implemented
Analytics	Data analytics testing	Fully Implemented	Partially Implemented
	Analytics	Eliminated	Fully Implemented
	Summary reporting for user/stakeholders	Eliminated	Fully Implemented
Simulation	Simulation	Eliminated	Fully Implemented
Movie Info	Create/edit Movie Info	Fully Implemented	Partially Implemented
Feedback	Feedback	Fully Implemented	Partially Implemented

Real-world user restrictions are adhered to in the prototype. Testers have access to pre-populated Registered User credentials, which include User Taste Profiles, Watch History, movies, genres, and interactions. Algorithms and machine learning to generate recommendations for users are fully implemented using simulated data.

2.3 External Interfaces

FlixPicks, an online application, uses various interfaces to allow for demonstration of the prototype as an online desktop application.

2.3.1 *Hardware Interfaces*

FlixPicks will be designed for computers with Google Chrome and will be compatible with similar web browsers for desktops.

2.3.2 *Software Interfaces*

FlixPicks prototype includes interfaces to databases, third-party API's, and simulation engines.

2.3.3 *User Interfaces*

FlixPicks prototype utilizes user information while accessing the FlixPicks website or having the CineMap extension enabled. The prototype will need to use User clicks for prototype analytics, Watch History for recommendations, CineMap extension tracking for explicit and implicit User interactions, keyboard input for search functionality, and a monitor display so the User can utilize the application.

2.3.4 *Communication Protocols and Interfaces*

Flixpicks utilizes TMBD as a third-party API to gather movie information that is stored in the database.

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Appendix A – Site Map