# Lab 2 - FlixPicks Product Specification

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## 1 Introduction

The options for viewing media content at home have always had many options. Adults in America have begun to subscribe to streaming services to replace cable TV (Fischer, 2022). Streaming is quickly becoming the most popular method to watch media because it is considered a cheaper and more convenient alternative to television. Subscribers also enjoy the extensive selections of on-demand movies and films compared to the limited options available on cable TV. Over three-quarters of American adults prefer streaming to cable TV (Raj, 2023). The declining popularity of cable TV has shifted the movie-watchers to streaming services instead.

At-home streaming services like Netflix, Hulu, and Disney+ are the most selected when it comes to choosing a subscription. There are over 200 streaming platforms available (Cook, 2023). The number of selections increases when free streaming platforms like Tubi & Pluto TV are introduced into the selection pool. There are free subscriptions and paid subscriptions; Each streaming service tends to have different tiers of payment that are dependent on the volume of ads. Customers have access to the library of offered media most libraries consist of on-demand media or offer live television streaming (Cook, 2023). Live television streaming replicates the cable television experience by including a limited variety of television channels like scheduled events.

The vast number of streaming options makes deciding on a show considerably more complicated. Cable television presents people with a limited number of options and every show has its fixed viewing time in the schedule. However, streaming provides a large quantity of choices that are readily available on demand. Selecting media has become a time-consuming task that study shows people spend nearly 187 hours a year looking for something to watch (Ward,

2020). That averages about thirty minutes a day, which is the average length of an episode of a television show.

Once a piece of media is finally found, the watching process is more isolating than cable television. With streaming media, a shared viewing experience is more difficult compared to program television, such as cable. Streaming services are on demand for more convenience while programmed television provides the opportunity for scheduled group gatherings. The act of watching media has become increasingly isolating to consumers.

FlixPicks reinvents streaming. It addresses the indecision of selecting media to watch with cohesive machine learning algorithms and eliminates the isolation created by streaming services. FlixPicks connects users through time-stamped content sharing using comments and reaction buttons. All of these aspects improve the user's viewing experience by allowing a faster selection of media and interaction with the content.

### 1.1 Purpose

FlixPicks is an application that will ease the use of streaming services by reducing the amount of time for users to find media to view. The application will provide features that allow users to better choose content to view and eliminate decision fatigue. It will ease the feeling of isolation by allowing users to see and make time-stamped comments and reactions during streaming. FlixPicks creates a master library of all media options across streaming platforms. The application does not stream media directly but has a single-click application that transfers users to a streaming platform that allows the media to be played. There are three primary features that aid in media selection. They are called CineRoll, CineWheel, and CineMap. Collectively, they are called CineFeatures.

Upon the launch of the FlixPicks application, users have the option to make an account, sign in or use the application as a guest. Guest profiles have limited access and functionality. Users registering a new account are required to fill out a one-time survey called a Taste Profile. The Taste Profile is the initial method of data collection. It shows users a variety of movies that they can rank with either a thumbs up or a thumbs down. The Taste Profile also collects which streaming services users are subscribed to. The Taste Profile will calibrate the recommendation algorithm based on their like and dislikes selections. The Taste Profile is the start of user recommendations. If users no longer like their recommendations, they can reset their Taste Profile and take it once again. FlixPicks will provide recommendations called HotPicks. HotPicks retrieves media from the database and displays popular and trending media to users.

FlixPicks' CineFeatures helps users decide to watch and connect with other users viewing the same media. The first feature, CineRoll, randomly selects a movie or show based on the user's recommendations. Filters, like genre, can refine CineRoll's selection. The second feature, CineWheel, is similar to CineRoll, except that its intended purpose is to be used in a social setting or if the user has multiple options that they would like to randomly select from. Both features allow users to continue rolling and respinning until they are satisfied with their selection. The last feature, CineMap, provides the user an opportunity to enable an overlay on top of their selected media. This overlay allows users to interact, make comments, and view other user interactions at time-stamped locations. CineMap can also show a timeline that highlights parts of media that had high points of interaction.

**1.2 Scope**

FlixPicks's prototype will allow users to create an account or use FlixPicks under a guest profile. Upon creation of the account, users are required to fill out a Taste Profile survey which

movies are ranked with a like or dislike button. These movies are added to the user's watch history and serve as the first data collection to start the recommendation algorithm. Once the Taste Profile is completed, users are redirected to the homepage. The homepage displays generated recommendations. The homepage will allow users to access their account settings, watch history, and the CineWheel overlay option. The user has access to CineRoll and CineWheel on the homepage which are labeled with icons.

The FlixPick prototype will demonstrate the product's ability to function with a variety of users. Generated data will be utilized in the prototype to simulate a variety of people with varying interests. The simulation enables testing, risk mitigation, and analytics.

**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 user's 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**

The prototype for FlixPicks demonstrates the majority of features planned for real-world application, including the CineFeatures. A user survey and Taste Profile are included to enable the Apriori recommendation algorithm. The FlixPicks prototype serves as a proof of concept. The prototype is implemented to facilitate practical testing and presentation. Data is generated

for demonstration. The model and simulation enable testing and risk mitigation. This generated data also aids in the presentation of analytics and feedback statistics.

# 2 General Description

The FlixPcisk prototype serves as a proof of concept that demonstrates the majority of the features planned for the real-world application, including the CineFeatures. The prototype implements the user survey and Taste Profile that are used to enable the demonstration of the Apriori machine learning algorithm that provides recommended media for the user's viewing. The prototype additionally facilitates the data creation for use in the prototype demonstration and of the front-end, back-end, and algorithms created to provide the proof-of-concept.

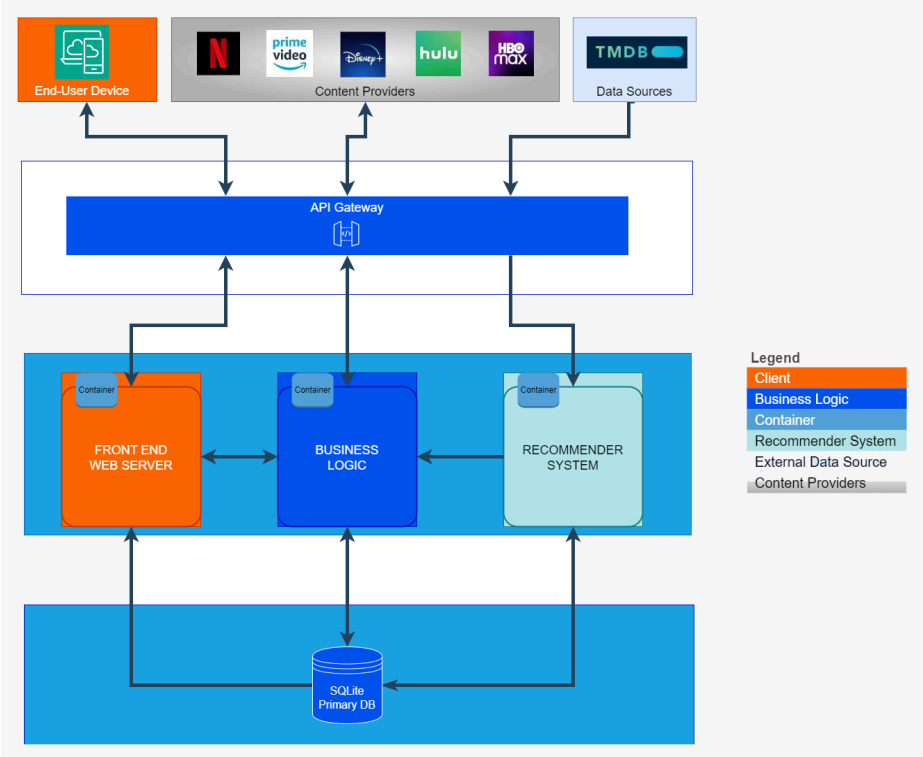
## 2.1 Prototype Architecture Description

The FlixPicks prototype operates on any device that has a browser-based web interface. This includes smartphones, tablets, laptops, and select smart televisions. The type of web browser is not specific. FlixPicks operates on Google Chrome and Firefox.  FlixPicks operates on a virtual machine provided by the Old Dominion Computer Science Department. The prototype uses a Docker LAMP server. Docker LAMP is used for its containers, which run all programs simultaneously. One container consists of the Apache Tomcat program for the web API. Another holds the SQL database where all of the application data is held. Docker keeps everything cohesive and organized. HTML, CSS, and JavaScript for website development, while Python is used for application development. VSCode and Eclipse are used in conjunction with GitHub to keep track of the repositories.

For the prototype, Library APIs for media data, along with the use of generated data will support the demonstration of the application's functionality, support testing, and demonstration of risk mitigation.

**Figure 1**

*FlixPicks Prototype Major Functional Component Diagram*




## 2.2 Prototype Functional Description

The CineFeatures that make up the functionality of FlixPicks are implemented in the prototype and the RWP. Stimulated user data is critical to the prototype. It is used to show the full functionality of the application without fully implementing certain features. Analytical data and subscription data are partially implemented into the prototype because of the stimulated user data. For the RWP, those data elements will be fully implemented and the data simulation will be

eliminated. Table 1 shows a list of features included in the prototype as compared to their implementation in the RWP.

**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 |

## 2.3 External Interfaces

As a web application, FlixPicks uses various interfaces to allow demonstrations of the prototype on a desktop application.

### *2.3.1 Hardware Interfaces*

FlixPicks is designed for applications with web browser access, like computers and mobile devices.

### *2.3.2 Software Interfaces*

FlixPicks utilizes Docker to run concurrent programs simultaneously. SQL organizes databases and Apache is utilized for web API.

### *2.3.3 User Interfaces*

FlixPicks requires users to have an inputting device such as a mouse and keyboard on computers or a touch screen on mobile devices.

### *2.3.4 Communication Protocols and Interfaces*

FlixPicks requires WiFi or cellular data to work.

## Appendix A – Site Map