Lab 1 – FlixPicks Product Description

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1 Introduction

In recent years, the shift towards on-demand streaming of media from traditional cable television has stimulated the growth of streaming platforms and their ever-expanding libraries of content. As of August 2022, streaming viewership represented 34.8% of all media consumed, surpassing cable television for the first time ever (Fischer, 2022). According to one study, approximately 77% of United States adults aged 18 to 34 prefer streaming over traditional cable television (Raj, 2023). The popularity of streaming is further evident by the projected growth rate of 9% per year, compared to cable's projection of 4% per year (Raj, 2023).

There are over 200 streaming platforms available around the world, including popular services such as Netflix, Amazon Prime, Disney+, and Max (Cook, 2023). Upon subscribing to these services, subscribers are typically provided with 3,000 to 5,000 options (Clark, 2022). These vast media libraries present subscribers with an overwhelming number of options, which often leads to indecision and wasted time when selecting media to watch. A study from August 2020 reported that Netflix users spent up to 30 minutes per day, searching for media to watch (Ward, 2020). Additionally, many subscribers experience decision fatigue, a phenomenon in which a larger number of decisions or choices hinders their ability to make further choices (Natal & Saltzman, 2022). Addressing the challenges of wasted time and decision fatigue remains a persistent struggle for streaming services.

Many streaming services focus on quality and quantity of content, but often fall short in providing the parasocial experience, often supplemented by social media platforms. The nature of on-demand streaming allows users to consume content at their own pace, which diminishes the shared experience of watching a show or movie together. Social media platforms facilitate

ongoing discussion and reactions, allowing consumers to connect with the community and engage with their media. Streaming services along struggle to replicate this experience.

FlixPicks is the solution to indecision and wasted time caused by modern streaming platforms, which enhances the user experience and streamlines the process of selecting media. FlixPicks recommends media to watch utilizing a sophisticated matching algorithm and an aggregated collection of media across the user's known subscriptions. This approach reduces time spent selecting media to watch and eliminates decision fatigue by providing quality recommendations based on the user's interests.

Additionally, FlixPicks introduces a new experience to promote social interaction with media, recognizing the gap in social features in existing streaming platforms. A unique overlay offers the ability to insert reactions and comments while watching media. A history of past user interactions is graphically displayed along the timeline, highlighting key points-of-interest within the displayed media.

2 Product Description

FlixPicks is a software application for both streaming service consumers and streaming service representatives. FlixPicks offers reporting and usage statistics for streaming service representatives, providing insights regarding their media and subscriber engagement. FlixPicks provides Registered Users with quick access to media available from all their subscriptions in one convenient place. Utilizing aggregation and sophisticated recommendation techniques, FlixPicks enhances the media selection experience by generating suggestions tailored to the individual interests and watch history of each Registered User. FlixPicks transforms the movie-watching experience by introducing an interactive overlay which allows users to add comments and reactions throughout the timeline of any movie or show. Reactions are summarized and

made available to Streaming Service Representatives, in addition to learning about each Registered Users viewing habits and interests.

2.1 Key Product Features and Capabilities

As depicted in Table 1, Guests are provided with limited access to explore FlixPicks without any obligation. Registered Users benefit from personalized recommendations, derived from their Taste Profile, which is a FlixPicks feature used to learn about each user's interests and identify their subscriptions. The Taste Profile begins with a brief Survey upon first log-in and continues refining recommendations, utilizing machine learning, by observing the Registered Users viewing habits.

Table 1

FlixPicks Features Access Table

Category	FlixPicks Feature	Guest	Registered User	Admin	Representative	Tester
Subscription Service Management	User Account Registration	Access	N/A	Access	N/A	Access
	Account/Subscription Service Management	Unavailable	Access	Access	Access	Access
	User Subscription Integration	Unavailable	Access	Access	Access	Access
	User Tier Level Feature Access	Unavailable	Access	Access	Access	Access
Taste Profile	Taste Profile	Unavailable	Access	N/A	N/A	Access
	Taste Profile Survey	Unavailable	Access	N/A	N/A	Access
	Taste Profile Content-Based Filtering	Unavailable	Access	N/A	N/A	Access
	Taste Profile Collaborative Filtering	Unavailable	Access	N/A	N/A	Access
Recommendations	Recommendations	Unavailable	Access	N/A	N/A	Access
	Filtered Recommendations (Criteria based)	Unavailable	Access	Access	N/A	Access
Movie Library	Browse/Search Filtering	Access	Access	Access	N/A	Access
	HotPicks	Access	Access	Access	N/A	Access
CineRoll	CineRoll	Unavailable	Access	Access	N/A	Access
CineWheel	CineWheel	Access	Access	Access	N/A	Access
CineMap	CineMap Overlay	Unavailable	Access	Access	N/A	Access
	CineMap Commenting	Unavailable	Access	Access	N/A	Access
	CineMap Export Data	Unavailable	Unavailable	N/A	N/A	Access
	CineMap Data Analyzing	Unavailable	Unavailable	N/A	N/A	Access
Analytics	Data analytics testing	Unavailable	Unavailable	Access	Access	Access
	Analytics	Unavailable	Unavailable	Access	Access	Access
	Summary reporting for user/stakeholders	Unavailable	Unavailable	Access	Access	Access
Simulation	Simulation	Unavailable	Unavailable	Access	Unavailable	Access
Movie Info	Create/edit Movie Info	Unavailable	Unavailable	Access	Unavailable	Access
Feedback	Feedback	Access	Access	Access	Access	Access

FlixPicks provides Registered Users with a personalized Library of media by aggregating content available across all their known subscriptions. This Library offers traditional filtering options to search for media and is used in conjunction with the Taste Profile to generate personal recommendations for each Registered User. In addition to personal recommendations, FlixPicks provides HotPicks; a specialized tile which displays popular and trending media to both Guests and Registered Users. CineWheel addresses indecision by providing the ability to randomly choose from a set of user-provided options. Alternatively, CineRoll provides a random selection for the Registered User based on their recommended media and Taste Profile.

Once a user has selected media to watch, a direct link provides quick access to the media on the provider's service, after successful authentication through the provider. The CineMap overlay is automatically activated when media is played, allowing Registered Users to interact with their media by adding reactions and comments. These interactions are displayed along the timeline of the chosen media, highlighting moments with increased user interaction.

Administrators and Representatives are provided with analytics and reporting showing feedback captured from CineMap along with usage statistics. For example, a Representative may be interested in how frequently FlixPicks directs users to media on their service, or how often users interact positively with their media. Finally, a Tester role is established for the prototype with access to all features of FlixPicks for quality assurance and verification of functionality.

2.2 Major Components (Hardware/Software)

FlixPicks has very minimal hardware requirements and is available in three formats. A web application is available for any computer with internet access running a modern chromium-based web browser with support for extensions. A mobile application is available for Apple iOS

and Android devices. Lastly, FlixPicks is available for any Smart TV, to be installed alongside the content provider's apps.

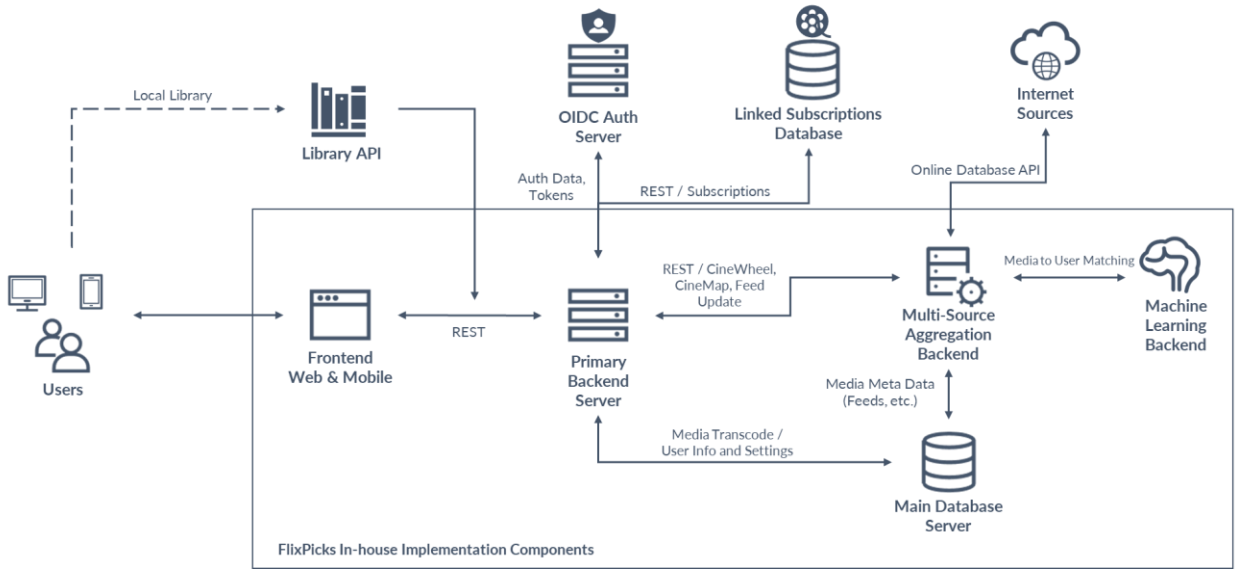
FlixPicks provides a front-end user interface and back-end server for processing and data storage components. The Major Functional Components Diagram shown in Figure 1 illustrates the interfaces between the storage and processing components of FlixPicks.

The FlixPicks website and browser extensions are constructed using HMTL, CSS, and JavaScript. The iOS and Apple TV applications are built using Swift, while Java is used for Android based applications. VSCode and Eclipse IDEs are used as the primary development environment, and a GitHub repository is used for version control.

FlixPicks is hosted using an Apache Tomcat application server and MySQL database. The AWS Machine Learning platform called Amazon Personalize is used to generate recommendations for users. Additionally, third-party APIs (YouTube Data API, ReelGood, and IMDB) are used as catalog sources to track content available across streaming platforms.

Figure 1

FlixPicks Major Functional Component Diagram



3 Identification of Case Study

The prototype case study consists of three unique fake users who, by design, allow for demonstration of the goals and objectives of FlixPicks. This set of users establishes the default set of Libraries for testing the in-the-box components of FlixPicks. The details of this case study are defined in Table 2.

Table 2

FlixPicks Prototype Case Study

Name(s)	Description
John Doe, Registered User	• John is subscribed to Hulu, Netflix, and Amazon Prime Video. • He constantly finds himself annoyed switching from different streaming platforms while browsing for content to watch. • Because of work, he only has a few hours left to consume entertainment at the end of the day. • He watches with his family.
Jane Plain, Registered User	• Jane is subscribed to Hulu and Netflix. • She regularly hangs out with groups of friends and one of their regular activities is watching a movie as a group. • Her and her friends constantly find themselves disagreeing over which movie to watch together.
Tim Brown, Guest User	• Tim is not subscribed to any streaming services. • He regularly finds himself unsure what content to watch. • He wants to find good shows to watch but doesn't know where to start without being subscribed to anything.
Jack Smith, Registered User	• Jack is subscribed to Hulu, Netflix, and Amazon Prime Video. • He regularly watches movies and shows at home by himself. • After watching something he typically searches YouTube reviews to see what others thought about specific parts of the movies he watches.
Nick White, Representative	• Nick is an advertising representative for Netflix. • He is looking for user data about the most interacted with parts of movies and shows. • Netflix doesn't provide interactions during viewing of media, so he needs to outsource this data.

FlixPicks is designed primarily for people subscribing to multiple streaming services but is equally useful for those subscribed to a single streaming service. FlixPicks benefits those experiencing indecision, who need help choosing media to watch. Generally, this product is great for people struggling to make decisions or prefer others to do so for them. FlixPicks also benefits those who want to explore content available on specific streaming platforms, helping them to explore new content and subscriptions.

FlixPicks provides numerous benefits for both streaming consumers and streaming service representatives. FlixPicks gathers information about how users interact with their media which can prove useful to competing streaming platforms. Additionally, select streaming platforms can be promoted or advertised for those interested in exploring new content.

4 Product Prototype Description

The FlixPicks prototype serves as a proof of concept, incorporating many functionalities present in the real-world product (RWP), including innovative features CineRoll, CineWheel, and CineMap. The prototype provides simulations of users and user interactions to support testing and risk mitigation strategy demonstration. The prototype provides analytics and reporting which reflects user interactions to demonstrate the capabilities of FlixPicks. The prototype implements a reduction of scale and scope to demonstrate FlixPicks as a viable solution to the problem.

4.1 Prototype Architecture (Hardware/Software)

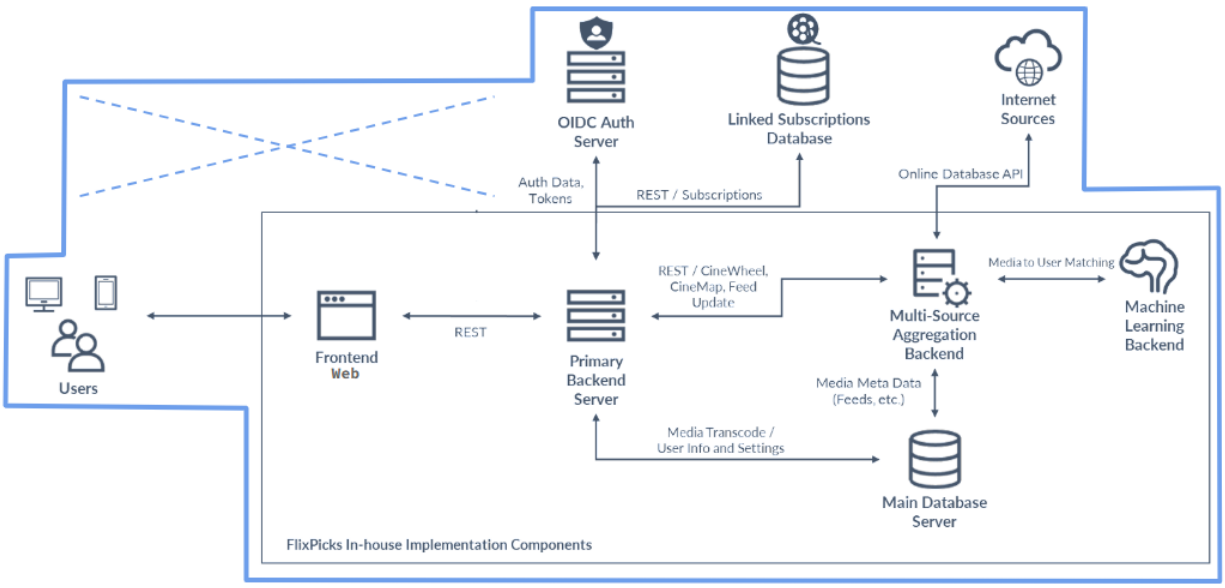
Much like the real-world product, the prototype has minimal hardware requirements for client devices. The prototype is reduced in scope to implement only the web-based application, which is sufficient to demonstrate FlixPicks as a viable solution to the problem. The web-based

application requires a computer with internet access, running a modern chromium-based web browser with support for extensions.

The prototype is hosted by a virtual machine provided by the Old Dominion University Computer Science Department. The web application is hosted using an Apache HTTP server operating the Flask framework and SQLite database. VSCode and Eclipse IDEs are used as the primary development environment, and a GitHub repository is used for version control. The application front-end is constructed with HTML, CSS, and JavaScript. The web application back-end components are developed in Python. Figure 2 depicts the major functional component diagram for the FlixPicks prototype.

Figure 2

FlixPicks Prototype Major Functional Component Diagram



4.2 Prototype Features and Capabilities

The FlixPicks Prototype implements the key innovative features CineRoll, CineWheel and CineMap along with necessary supporting features as depicted in Table 3. Simulated users and user interactions are key components of this prototype and are eliminated in the real-world

product. Features marked partially implemented have components omitted from the prototype which have been simulated to support testing.

Similar to the real-world product (RWP), the guest interface introduces users to FlixPicks and provides limited access to CineWheel and a generic Library. The registered user interface provides access to CineRoll, CineMap and establish the user's Taste Profile. The Taste Profile Survey is used to establish initial recommendations for new Registered Users, which is later refined using collaborative filtering as they continue to use FlixPicks. The CineMap overlay allows Testers to view and generate reactions and comments to develop analytics and reports which mimic users watching and interacting with media.

Table 3

FlixPicks RWP vs Prototype Table

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

4.3 Prototype Development Challenges

Key challenges faced during development of this prototype are related to collaborative filtering, generating simulations, and data management. Machine learning components used to implement collaborative filtering require immense knowledge and technical skill, which is the biggest challenge. Additionally, building and configuring the database in support of machine learning requires a skilled team and a large amount of reliable data. Another challenge includes simulating third-party API sources and demonstrating changes to library content which reflect the real world. Similarly, more challenges are related to generating meaningful simulated user data for testing and interpreting feedback.

5 Glossary

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.

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

CineFeatures: The collective name of the three core 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.

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

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

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 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.

Stakeholders: 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 received.

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 survey 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.

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