Lab 1 - FlixPicks Product Description

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1 Introduction

Most adults in America have turned 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 alternative to cable. Many users also enjoy the extensive selections of movies and films compared to the options available on cable TV. Over three-quarters of American adults prefer streaming to cable TV (Raj, 2023). The growth of streaming increases at a rate of 9 percent every year. While streaming becomes more popular, cable's growth is significantly smaller at 4 percent (Raj, 2023). This difference in growth shows that cable is slowly phasing out, making it obsolete. For the first time, 34.8 percent of viewership of media comes from streaming rather than cable (Fischer, 2022). Most people are familiar with the most common streaming platforms. Netflix, Hulu, and Disney+ are among the most popular options. In reality, there are over 200 streaming platforms available (Cook, 2023). The number of selections increases when free streaming platforms like Tubi & Pluto TV are brought into the picture. These paid subscriptions have a variety of different price points. Each streaming service tends to have different tiers of payment that include different features. Most subscription services have a base rate that allows you to watch most of their media library with ads. To watch without ads or to access their full library, the price begins to go up from there. From there, you have access to their library of offered media. Most libraries consist of on-demand media or even offer live TV streaming (Cook, 2023). Live TV streaming replicates the cable TV experience by including a limited variety of TV channels like the news & and sports channels.

With the vast amount of streaming options available, finding a show has become considerably difficult. Cable TV presented people with a limited amount of options and every piece of media had its time slot in a schedule. But streaming shows a large quantity of choices that are readily available at any time of the day. Finding something to watch is like finding a needle in two hundred different haystacks,

trying to find that small needle has revealed that most people spend nearly 187 hours a year looking for something to watch (Ward, 2020). That averages about thirty minutes a day. That is how long an average episode of your favorite show is. Then once you finally find your piece of media, the watching process is more isolating than cable TV. With cable, everyone would tune in at the same time every day to watch whatever was popular. Finding entertaining and engaging media is becoming increasingly tedious because of the large amount of available streaming services and their libraries. FlixPicks is the solution to streaming indecision.

2 FlixPicks Product Description

FlixPicks is an application that will show a collection of all of your media options across all streaming platforms that have active subscriptions. It does not stream media directly from the app but redirects you to your desired platform. FlixPicks will be designed to have a proper recommendation algorithm that suggests unique and new media to users while still being faithful to their particular tastes. Along with that, a variety of features will be readily available to users the eliminate the struggle of indecision. FlixPicks features will allow users to choose a random piece of media from the library or a hand-picked selection of media. Additionally, FlixPicks will offer a method of direct interaction with chosen media via comments, hotspots, and emotional reactions.

2.1 Key Product Features and Capabilities

Upon the launch of FlixPicks, users have the option to make an account, sign in, or use the app under a guest profile. Guest profiles have limited access and functionality. When an account is created, users are prompted to fill out a survey called a Taste Profile. A Taste Profile is a one-time survey that gathers information on the types of media the user likes. The Taste Profile is a form of initial data collection. Afterward, FlixPicks will adjust their recommendations based on the content the user decides to watch. Something unique to the FlixPicks is that the user can decide to reset their Taste Profile if they

no longer like their personalized library. To reset their Taste Profile, users would have to complete another survey.

Alongside the Taste Profile, the user is asked to input all of their paid subscriptions. After that, an aggregated library of all media across inputted streaming providers is created as a library of available content. Within the library, FlixPicks will provide a general recommendation based on shows and movies that are currently popular. FlickPicks also provides a personalized library of recommendations based on the user's Taste Profile. With each of the available libraries, users can also search using filters for fields such as genre or release year.

FlixPicks offers three unique features that help users decide what to watch and connect with other people watching the same things as them. The first feature is called CineRoll. CineRoll randomly selects a movie or show based on the user's Taste Profile. It is an effective way to eliminate indecision and to locate something to watch rather quickly. CineRoll's selection can be refined through the use of filters.

The second feature is called CineWheel. 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 cannot narrow down. With CineWheel, the user inputs multiple media options into the wheel and then spins it. The choice the wheel makes is completely random. Both CineWheel and CineRoll allow users to continue rolling and respinning until they are satisfied.

The last feature is called CineMap. CineMap is an optional overlay that is displayed over top of the media that the user has selected to watch. This overlay allows users to interact, make comments, and even view other user interactions. CineMap also shows a timeline that highlights points of interest based on other user activities. Even if the user decides to hide the overlay on their desired piece of media, they are still able to leave comments while they are watching.

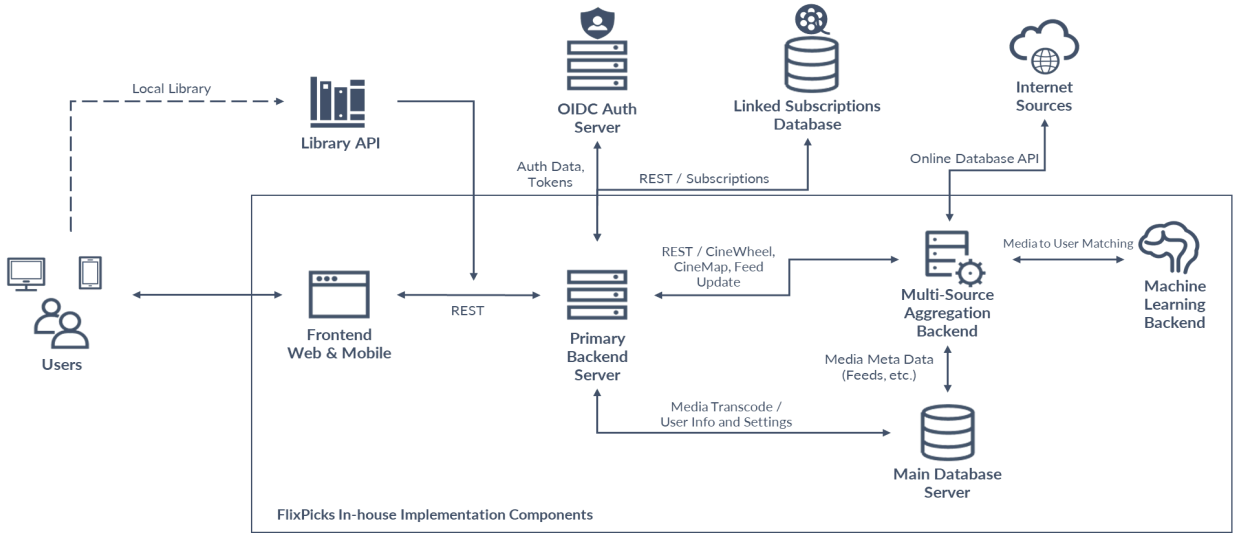
2.2 Major Components (Hardware/Software)

FlixPicks is an application that runs on the client's hardware. A device with internet and a supporting browser is all that is needed. Browsers like Google Chrome or Firefox are ideal. FlixPicks is

also available on iOS and Android devices that have an internet connection. FlixPicks may also be used on a Smart TV that is connected to a network and can support a browser-based app

The Web portal and browser extension needed for FlixPicks will require HTML, CSS, and Javascript. The application itself will be developed in Swift, which is compatible with iOS and Apple TVs. It will also be developed in Kotlin, which is specific to Android devices. The APIs used will be the 3rd party Netflix API along with the YouTube Data API. These APIs will allow us to have access to data about movies and TV shows that are already available. The application server will use Apache Tomcat and MySQL server will be used in the database. AWS will be utilized with the machine learning within FlixPicks. AWS is the Amazon Web Services and it is a platform that provides scalable cloud computing solutions. Our application will be securely hosted. GitHub will be used to keep track of version control and the repository. Lastly, VSCode and Eclipse IDEs will be used to keep track of project management and to track any issues that occur within the code.

FIG 1. Major Functional Component Diagram



Users interact with a graphical user interface front end. User information is authenticated through OIDC to support login functions and user data is securely hosted in the backend server. FlixPicks does not provide direct authentication to streaming services. At that point, their information will be authenticated

through OIDC to allow them to log in to their account. Users will have to authenticate directly on their streaming services app, as it is not housed within FlixPicks. After the authentication is complete, library aggregation, and CineFeatures all occur within the implemented components provided by FlixPicks.

3 Identification of Case Study

The prototype case study consists of a single young adult, Hazel Nutt. She currently is enrolled in university and lives away from home. Her family is paying for four subscription services they all share, though they have individual profiles for each family member and then one shared family profile. Hazel Nutt spends most of her day in classes or working her part-time job. After work, she has a limited amount of time to watch her choice of show but struggles with finding something she wants to watch. On the weekends, she usually hosts a movie night with her friend group, though most of their time is spent struggling to find something to watch.

Looking at this case study, FlixPicks can eliminate the problems that Hazel Nutt is experiencing. FlickPicks can provide a library of available content from the four streaming apps her family pays for. The aggregation of the content from each streaming service combined with the functionality of the Taste Profile and collaborative filtering will aid Hazel Nutt in picking something to watch much more easily than flipping through multiple apps. Along with that, the features CineRoll and CineWheel can help her make decisions individually or with her group of friends on the weekend. If she is watching by herself, CineMap will enhance the movie-watching experience. She will be able to see what other people say about the film and even leave her comments while watching. This eliminates all of the previously mentioned problems that Hazel Nutt was experiencing.

4 FlixPicks Prototype Product Description

The prototype for FlixPicks will show functions for our application as a registered user and a guest user. Our three features, CineWheel, CineRoll, and CineMap will also be demonstrated in the prototype. Other features like the Taste Profile and library aggregation will

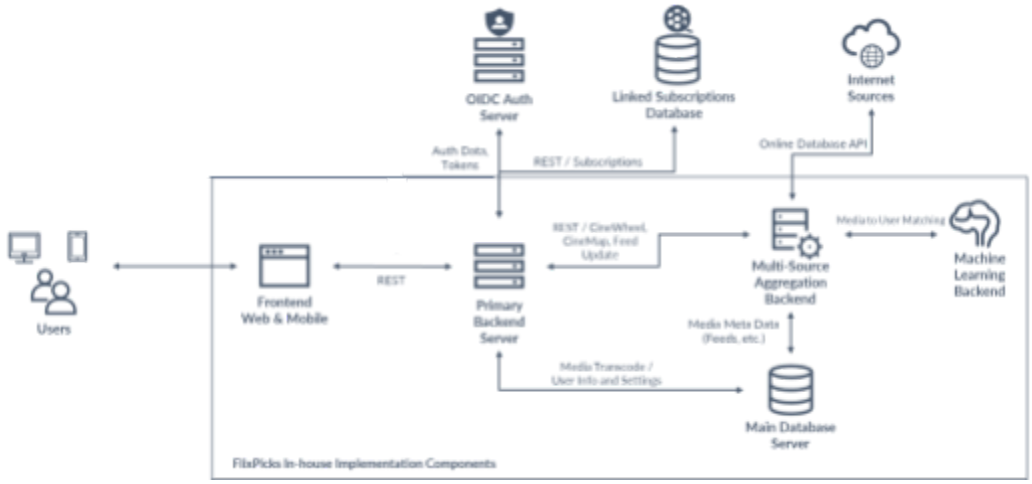
also be developed. The FlixPIcks proof of concept will demonstrate the majority of the features planned for the real-world application with exceptions noted in the prototype features table. We will be implementing the prototype so it is practical for proper testing and presentation, and data will be generated for demonstration. The generated data will allow us to test and demonstrate risk mitigation tactics. This generated data will also aid in the presentation of analytics and feedback statistics. Though there will be manipulation of the application, it will still demonstrate key functionality that is marketed towards users.

4.1 Major Components (Hardware/Software)

The FlixPicks prototype can operate 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 can operate on Google and Firefox. FlixPicks will operate on a virtual machine provided by the Old Dominion Computer Science department. The prototype will also be using a Docker LAMP server. Docker LAMP will be used for its containers, which will keep all our programs in place. One container will consist of the Apache Tomcat program for the web API. Another will hold our SQL database where we will have all of our data. Docker will keep everything together and organized. We will be utilizing HTML, CSS, and JavaScript for our website development, while Python will be used for application development. VSCode and Eclipse will be used in conjunction with GitHub to keep track of our repositories.

Real-world implementation would require the usage of Library APIs to gather data from streaming services. For the prototype, we will still be implementing Library APIs along with generating our own data to put the prototype under certain constraints and stressors to demonstrate functionality. Because of that, the MFCD has changed to reflect the change.

FIG 2 Prototype Major Functional Components Diagram



4.2 Prototype Features and Capabilities

FlixPicks has a variety of features. The ones that provide the functionality of the app, like the CineRoll, will be implemented for the prototype and the RWP. Then there are features, like the manipulation of movie information, that will only be implemented for the sake of presenting the prototype. The table below shows a detailed list of features included in the prototype versus the RWP.

Table 1 - Prototype Features Table

Category	FlixPicks Feature	RWP	Prototype
Subscription Service Management	Account/Subscription Management	Fully Implemented	Fully Implemented
	User Account Creation/Registration	Fully Implemented	Fully Implemented
	User Subscription Integration	Fully Implemented	Partially Implemented
Taste Profile	Taste Profile	Fully Implemented	Fully Implemented
	Taste Profile Form Pop-Up	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
Filtering	Browse/Search Filtering	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	Fully Implemented
	CineMap Export Data	Fully Implemented	Partially Implemented
	CineMap Data Analyzing	Fully Implemented	Partially Implemented
Analytics	Data Analytics Testing	Fully Implemented	Partially Implemented
	Analytics	Fully Implemented	Partially Implemented
Simulation	Simulation	Eliminated	Fully Implemented
Movie Info	Create/Edit Movie Info	Eliminated	Fully Implemented
Reporting	Summary Reporting for User/Stakeholders	Eliminated	Fully Implemented
Feedback	Feedback	Fully Implemented	Partially Implemented

Feature availability is also dependent on whether the user has a registered account or if they are a guest user. Guest users cannot see general recommendations from each streaming service. They also do not have access to all of the Cine features available, only CineWheel. Registered users can see and use all features and can create and manipulate their Taste Profile. The Taste Profile consists of a user survey to create initial recommendations that will be immediately available to users. As the user continues to use FlixPicks, the algorithm builds better commendations using collaborative filtering. With CineRoll, FlixPicks randomly selects recommended content for user viewing. The CineMap overlays the user's selected media, which enables them to leave and view comments, and like and dislike their media while viewing.

4.3 Prototype Development Challenges

The first challenge that will come with the development of FlixPicks is the database configuration. Finding a third-party API that will give access to data for multiple streaming services will also be difficult because not all streaming services will have API available. Generating user data for testing and feedback will also be a bit challenging as we have to make a large quantity of data available for us to use. The ability of the development team to implement machine learning within FlixPicks will be dependent on the team's ability to learn the ML algorithm, generate sufficient data to use in the algorithm and utilize the results to provide recommendations within the course timeline. Lastly, scheduling and avoiding time conflicts with other group members will prove to be difficult.

5 Glossary

Amazon Web Services(AWS): A cloud provider that allows application providers, ISVs, and vendors to quickly and securely host applications.

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.

CineMap: CineMap is an optional overlay that allows FlixPicks users to interact, make comments, and view other users' interactions. It shows a timeline that highlights points of interest throughout a movie based on activity.

CineRoll: CineRoll is a FlixPick 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.

CineWheel: CineWheel is a FlixPick feature that randomly selects from a set of user-inputted choices. CineWheel is a tool to use when a user or multiple users in a group are indecisive.

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.

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.

MySQL: An open-source relational database management system.

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

RWP: Real World Product. A product that can be used in full functionality by consumers.

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 processed.

Taste Profile: A user profile on FlixPIcks that has access to their subscriptions, recommendations, and other settings. The taste profile recommendations grow as a user makes selections on the website and can be reset at any time by the user.

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