Lab 1 - FlixPicks Product Description

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1. Introduction

Streaming services are a type of platform that allow users to watch movies and television shows on demand at the cost of a monthly subscription. Streaming services are becoming increasingly popular as a way to watch media at home compared to cable television. In 2022, streaming represented 34.8% of viewership, which is greater than cable television (Fischer, 2022). Cable television was previously the main way people watched television or movies in the home. However, one problem with streaming services is deciding on something to watch due to the large inventory. There are over 200 streaming platforms to pick from, each with their own library of content. (Cook, 2023). Some people are also subscribed to more than one streaming service. On average, Netflix subscribers spent 17.8 minutes a day picking something to watch in 2016 (Moscaritolo, 2016). A study conducted in 2020 revealed that subscribers spend 187 hours a year just searching for content to view, or about 30 minutes a day (Ward, 2020). The increasingly expanding libraries of streaming services creates choice overload, making it difficult for users to choose what to watch.

Streaming content is an isolating process. It removes the experience of going to a movie theater with their friends or family. FlixPicks aims to provide a solution by allowing users to build a comprehensive inventory of all their subscriptions in one place, recommend a show to watch, and allow the sharing of emotions and interactions.

2. FlixPicks Product Description

FlixPicks is a website and a mobile application that offers features to help users get recommended content from the most popular streaming services and view other available content. FlixPicks also offers an overlay that provides user-generated comments, reactions, and

shows the most replayed parts of a show or movie. FlixPicks collects data from users and sells it to streaming services.

2.1 Key Product Features and Capabilities

Upon accessing the application or website, users have limited access to features as a guest or they may opt to become a registered user to access all the features. Guests can only see HotPicks, a list of trending media from different streaming platforms, and use the CineRoll feature to pick a random piece of media. Registered users must create a Taste Profile upon signing up, which is a survey that has the user answer questions about what type of movies they like from a list to get recommendations for similar movies and genres. This taste profile can be reset at any time. Registered users can also select what streaming services they are subscribed to.

Registered users can see a library of aggregated content that is automatically generated for them based on what streaming service subscriptions they have, as well as HotPicks and their Taste Profile. Registered users can also use the CineRoll function to select a piece of random media, or they can input a list of media and have one of those chosen for them with the CineWheel feature.

When the user selects content that they want to watch from FlixPicks, it will allow them to use a Quick Click – a link that redirects them to the content hosted on the streaming service. They must then log in to that streaming service to watch that piece of media. If the user has previously logged in to the streaming service on the website or app and has not logged out, it will not make them have to log in again.

The CineMap feature is another feature limited to logged in users. It is a JavaScript extension that provides an overlay that is displayed on top of a movie or show being watched from a streaming service. The overlay is triggered when a registered user who has the extension

installed selects a piece of content to watch from FlixPicks. The overlay can be toggled on or off and allows for the user to leave comments and reactions at certain points in the media. It also keeps track of what parts are most often replayed, which are called hotspots. The user can see these hotspots and view comments and reactions that other FlixPicks users have left on the piece of media.

The data gathered from these tools will be used for analytics purposes, which will be sold to representatives of streaming services and given to FlixPicks admins. The feature list and access by type of user is shown in Table 1.

Table 1.

FlixPicks User Access and Features Table

Category	FlixPicks Feature	Guest	Registered User	Admin	Streaming Service 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

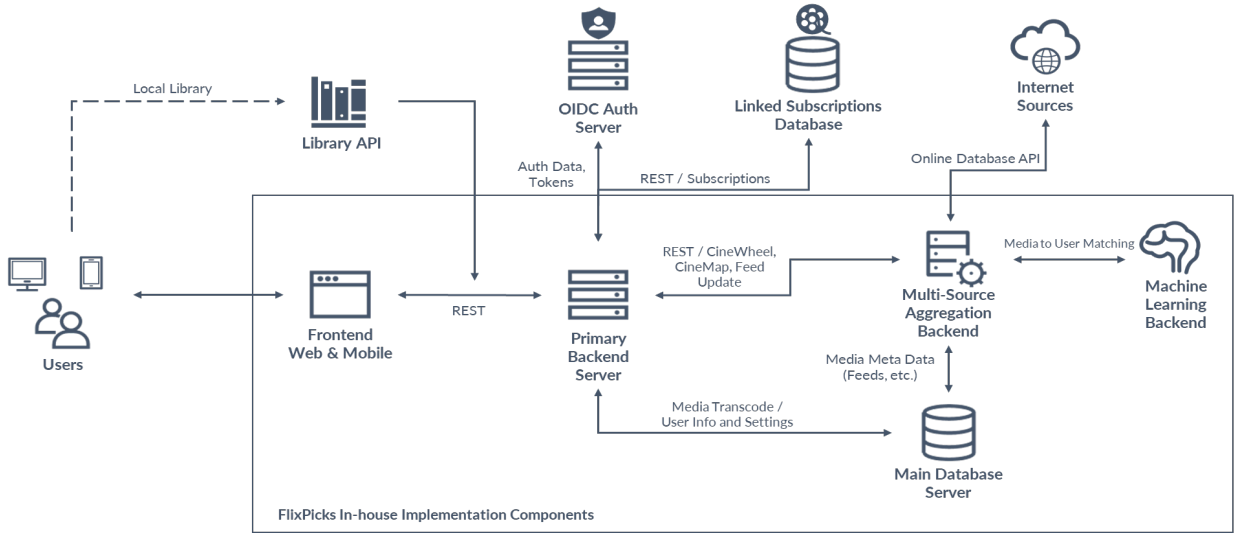
2.2 Major Components (Hardware/Software)

To use the FlixPicks website or extension for desktop computers, a computer with an internet connection and a modern web browser that supports the extension is needed. The

extension is supported by Chromium-based web browsers, such as Google Chrome and Microsoft Edge, as well as Firefox, due them both having compatible extension formats. There is also an app for iOS and Android and for smart televisions. Figure 1 shows the software components of FlixPicks.

Figure 1.

FlixPicks Major Functional Component Diagram



The website is written in HTML, CSS, and JavaScript, and the browser extension is solely JavaScript. The app is written in Swift for iOS and Apple TVs, and Kotlin for Android devices and Android smart televisions. The API it uses to generate information about the shows and movies that are streaming is from the Youtube API for Youtube movies and from a third-party provider to get information from Netflix and other streaming services. The application server uses Apache Tomcat, while the database server uses MySQL Server. To run machine learning services for the recommendation algorithm, an AWS server dedicated to machine learning for these types of algorithms called Amazon Personalize is being used. The collaborative filtering algorithm is being used for the recommendations. The version control system is Git,

with the repository being GitHub. For managing the project and tracking issues, GitHub and functions provided by the VSCode and Eclipse IDEs are used.

3. Identification of Case Study

The primary target audience of FlixPicks is people who are subscribed to multiple streaming services who have trouble deciding on what to watch. Other targeted audiences are people only subscribed to one streaming service, groups of friends having trouble picking a movie together, and people looking to find new content to watch. These groups can use FlixPicks to get recommendations on what to watch. Additionally, FlixPicks can benefit representatives of streaming services who wish to collect analytics on what people watch and watch services they are subscribed to. People who are not subscribed to any streaming services that want to have help picking one will also benefit.

Table 2.

FlixPicks Case Study Table

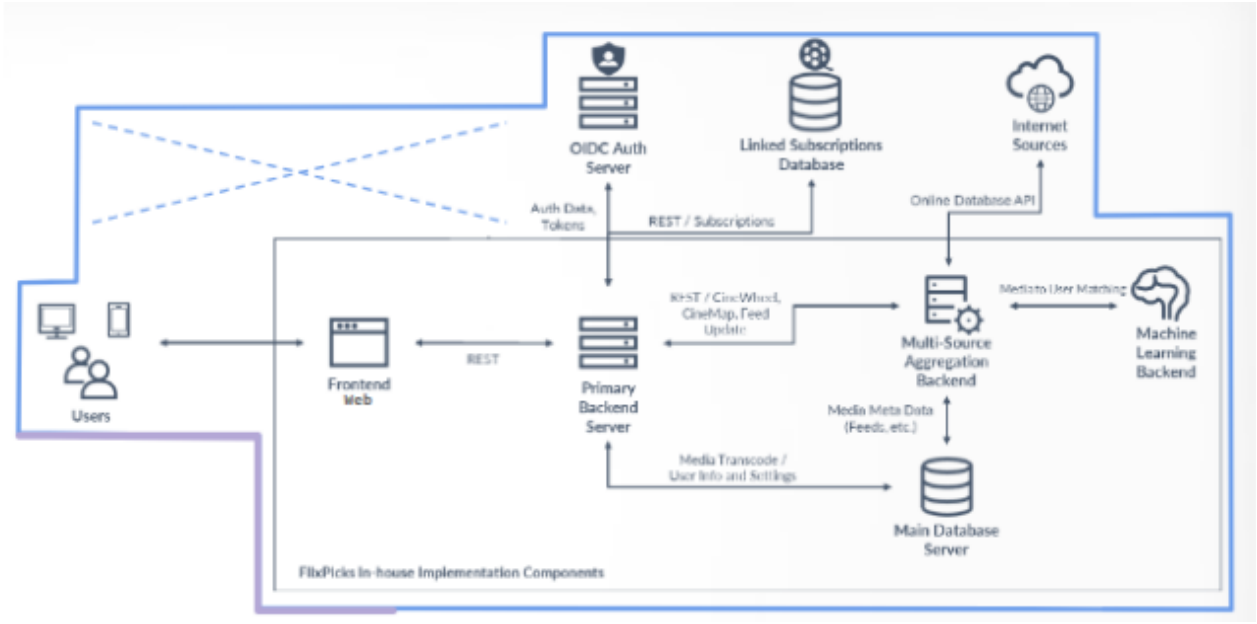
Name & Information	Description
John Doe, Registered User	- John is subscribed to Netflix, Amazon Prime, and Hulu. - He constantly finds himself annoyed due to switching between platforms looking for something to watch. - Because of work, he only has a few hours left for entertainment at the end of the day. - John watches with his family.
Jane Doe, 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.
Jen Eric, Guest User	- Jen is not subscribed to any streaming services. - She regularly finds himself unsure what content he wants to watch. - She wants to find good shows to watch but doesn't know where to start without being subscribed to anything.
Moe Vee, Registered User	- Moe is subscribed to Netflix. - 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 content he watches.
Nick White, Representative	- Nick is a marketing 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.
Michael Hawkins, Administrator	- Michael is one of the admins of FlixPicks. - He needs to know how users interact with parts of movies and shows using FlixPicks.

4. FlixPicks Prototype Product Description

Figure 2.

FlixPicks Prototype Major Functional Component Diagram



The FlixPicks prototype is a proof of concept that will demonstrate the CineMap overlay functionality in the form of a browser extension. A mockup website will also be made allowing a demonstration user to log in and fill out a taste profile, see HotPicks, and use the CineWheel and CineRoll functions. A database has been set up to allow simulation of users and data for the prototype. The FlixPicks will only list content from a limited amount of streaming services such as Netflix, Hulu, and Amazon due to the reduction in scope. The prototype has a reduced scope compared to the real-world product because it is focused on demonstrating the key features in a proof-of-concept fashion rather than building the final product.

4.1 Major Components (Hardware/Software)

The hardware required by the prototype is any device with a modern web browser capable of running the extension. To make the prototype, the web and database server

provisioned from the Old Dominion University Computer Science department is being used. The prototype does not have support for smart television devices or a smartphone application, while the real-world product will. The prototype uses a server supplied by Old Dominion University, while the real-world product will Apache Tomcat and MySQL Server to run on dedicated servers.

For software, Docker containers for Apache, SQLite DB, and Python are used to make the backend and the database along with HTML, CSS, and JavaScript for the frontend. The VSCode and Eclipse IDEs are being used with GitHub to track issues and serve as a repository for the code. The same software will be used in the real-world product. The prototype does not use the Amazon Personalize platform or Swift and Java because the recommendation algorithm is handled by the database and mobile applications are not being developed for the prototype.

Table 3.

FlixPicks Real World Product Versus Prototype Features Table

Category	FlixPicks Feature	RWP	Prototype
Subscription Service Management	Account/Subscription Service 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
Reccomendations	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

4.2 Prototype Features and Capabilities

In the prototype, guest users will not be able to see general recommendations from streaming services based on popularity. Guest users will be able to see all available features but

can only use the CineWheel function. Registered users can see and use all the available features, including CineRoll and CineMap, and will have a taste profile. FlixPicks will analyze a survey taken by the user to create initial recommendations and use collaborative filtering to give better recommendations as the user continues to use FlixPicks. The prototype will have partial support for analytics and user feedback. The prototype will have the ability to create and edit movie data and simulate users and interactions, which will be cut from the final product due to only being necessary for the prototype.

4.3 Prototype Development Challenges

The development of the prototype will have challenges that need to be overcome. Getting the database set up properly in Docker and having the frontend section and the backend section communicating can be a challenge. There is a limited number of third-party APIs that are available for free and have the needed data for development. Another challenge is learning to use collaborative filtering, machine learning tools, and the required programming languages to be able to effectively construct the prototype. Identifying and handling time conflicts must also be done for the development team to work together effectively. FlixPicks must also demonstrate the features and analytics correctly in the prototype.

5. Glossary

Administrator: An administrator of FlixPicks that can manipulate data on the website.

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.

CineRoll: A feature that selects a movie at random or based on the user's taste profile.

CineWheel: A feature that randomly selects a movie from a list of movies selected by the user.

CineMap: An overlay that goes over top of media streamed from a streaming service to provide comments and show the most replayed parts.

Collaborative Filtering: An algorithm that uses the similarities between media and similarities between users to generate recommendations.

CSS: Cascading style sheets is a markup language used for customizing the appearance of a document written in another 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.

Guest: A user that has not signed into or created an account with FlixPicks.

HotPicks: A list of popular and trending media from various streaming services.

Hotspot: A part of a movie or TV show that is often replayed or revisited.

HTML: 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 dynamically generated when a user logs in based on what is available on their subscriptions and on their taste profile.

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 can be used in CineMap to express an emotion.

Registered User: A user that has created a FlixPicks account.

Representative: A representative from a streaming service to whom data from FlixPicks will be sold.

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 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 streaming service that the user pays in monthly installments for access to the content it has.

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

Taste Profile: A profile made for a user by the FlixPicks service to tailor recommendations to them.

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

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