MoviesEngine

All your cinemas in one place

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1. Problem Statement

Nowadays, with the influx of movies, there are many different choices people have to make regarding cinema, time, pricing and seating. However, with the current system of doing this, consumers must traverse through many different cinema sites to find the ideal times, seats and prices that they want. This is an inconvenience to many moviegoers who simply just want to find the time that is most suitable for them. Taking a look at the current Hoyts website, customers are limited to just the times, seats and prices provided by Hoyts for a particular movie. Hoyts, like most cinema websites, also doesn't include any watchlist feature where customers can save movies for future reference nor does it have a recommendation algorithm based on the customer's preferred genres or previously watched movies. However, with our new system, these problems would no longer exist since for a single movie you may view all the prices and times across all cinemas nationwide on one screen. It would also allow users to add movies to a watchlist and would sort movies based on the user's preferences (if desired). We want to propose a system with the following features:

- View session times for a particular movie across various cinema sites
- Comparison of cinema prices for a particular movie
- View all now showing and all coming soon movies across all cinemas
- Filter movies by genre
- Adding and removing movies to and from a watchlist
- Sort movies by popularity, rating or by title.
- Locations of the closest cinemas (sort cinemas by distance or name)
- Viewing and providing reviews and ratings for any particular movie
- Search directly for a particular movie
- Filter a movie by showtimes and available seating
- Register and login users to use watchlist and recommendation features

2. User Stories

(1 Story Point ≈ 1 Hour)

US1 **Feature** Register **As a** Consumer **So that** I can login and use the systems added features **I want to** Register as a new user with my email address **GIVEN** I am on MoviesEngine Sign up page **WHEN** I enter all my details and click on register **THEN** I should be registered on the system and login with the provided details
3 Story Points

US2
Feature Login
As a Consumer

So that I can use the systems added features
I want to login with my registered credentials (email and password)

GIVEN I am on MoviesEngine Homepage and not signed in
WHEN I click on “Sign In” button at the top right
THEN I am redirected to the sign in page where when I enter my correct credentials I will be redirected to the homepage as signed in

2.5 Story Points

US3
Feature Login with Facebook
As a Consumer

So that I can use the systems added features
I want to login with my existing Facebook account

GIVEN I am on MoviesEngine Homepage and not signed in
WHEN I click on “Sign In” button at the top right
THEN I am redirected to the sign in page where when I click on “Login with Facebook” and authorize the request I will be redirected to the homepage as signed in

4 Story Points

US4
Feature Login with Google
As a Consumer

So that I can use the systems added features
I want to login with my existing Google account

GIVEN I am on MoviesEngine Homepage and not signed in
WHEN I click on “Sign In” button at the top right
THEN I am redirected to the sign in page where when I click on “Login with Google” and authorize the request I will be redirected to the homepage as signed in

4 Story Points

US5
Feature Filter all cinemas by location
As a Consumer

So that I can find the closest cinema to me.
I want to Enter any address and able to find cinemas near that address

GIVEN I am on the Find Cinema Page
WHEN I type in my address and click search
THEN I should see all the cinemas near my selected location

4 Story Points

US6 (Rating movie not achieved)
Feature Rate and review movies
As a Consumer

So that I can help others to select movies to watch
I want to Rate and review movies

GIVEN I am on a Movie page
WHEN I click on the “Write a review button” on the movie page
THEN I should be able to write a review and give a rating
WHEN I press submit
THEN my review should be permanently saved on to the page

3 Story Points

US7
Feature Find all cinemas showing a particular movie
As a Consumer

So that I can find the cinemas showing the movie I want to watch.
I want to Search for all cinemas showing the movie I want to watch

GIVEN I am on a Movie page
WHEN I type my location and click on “submit”
THEN I should see all the cinemas showing the movie I want to watch

5 Story Points

US8
Feature Read reviews and see ratings
As a Consumer

So that I can make informed decisions about seeing a movie
I want to Read reviews and see ratings of a movie

GIVEN I am on a Movie page
WHEN I scroll to the bottom
THEN I should see the average rating and reviews from others
AND reviews can be read sorted by sorting preference

2.5 Story Points

US9
Feature Upvote reviews
As a Consumer

So that I can help other users know the credibility of a review
I want to Upvote reviews that I find useful

GIVEN I am on a Movie page
WHEN I click on a review
THEN I should be able to upvote the review

1 Story Point

US10
Feature Filter all movies by genre
As a Consumer

So that I can find the movies which appeal to my interests.
I want to See movies of my selected genre

GIVEN I am on MoviesEngine Homepage
WHEN I click on any genre
THEN I should see all movies for the selected genre

4 Story Points

US11
Feature Add movies to watchlist
As a Consumer

So that I remember which movies I would like to watch.
I want to Add movies to my own watchlist

GIVEN I am on MoviesEngine Homepage and logged in as a user
WHEN I click on “Add to watchlist” button of any movie
THEN I the selected movie should be added to my watchlist

2 Story Points

US12
Feature Remove movies from watchlist
As a Consumer

So that I don’t confuse myself which movies I have and haven’t watched
I want to Remove movies from my watchlist

GIVEN I am logged in as a user and on my Watchlist page
WHEN I click on “Remove” button on any movie
THEN I the selected movie should be removed from my watchlist

2 Story Points

US13
Feature View all movies in Watchlist
As a Consumer

So that I can find which movies I added to my watchlist.
I want to View all movies I added to my watchlist

GIVEN I am on MoviesEngine Homepage and logged in as a user
WHEN I click on “Watchlist”
THEN I should see all the movies I added to my watchlist

2 Story Points

US14
Feature Search for a movie
As a Consumer

So that I can save time finding a movie
I want to Search for a movie

GIVEN I am on MoviesEngine Search tab and enter the name of a movie on the search bar
THEN I should see the movie's information and which cinema is playing the movie

5 Story Points

US15
Feature See upcoming movies
As a Consumer

So that I can get an early ticket
I want to See all upcoming movies

GIVEN I am on a MoviesEngine Homepage and click on the "Coming Soon" tab
THEN I should see a list of upcoming movies

5 Story Points

US16
Feature See Now Showing movies
As a Consumer

So that I can buy a ticket
I want to See currently showing movies

GIVEN I am on a MoviesEngine Homepage and click on the "Now Showing" tab
THEN I should see a list of all movies which are in the cinemas right now

5 Story Points

Unachieved User Stories

US16- Not achieved
Feature Find available seating
As a Consumer

So that I can sit in the best possible spot
I want to Be able to book a seat after I have chosen a movie and a cinema

GIVEN I am on the MoviesEngine homepage
WHEN I click on seating
THEN I should be redirected to the seating map of the original cinema showing all taken and not taken seats.
WHEN I click on a seat
THEN I should be able to book the seat

8 Story Points

US17- Not achieved
Feature Compare prices on different days
As a Consumer

So that I can find the cheapest ticket possible
I want to See ticket prices at different cinemas on different days

GIVEN I am on a Movie page
THEN I should see the ticket prices at different cinemas on different days

7 Story Points

18- Not achieved
Feature Filter cinemas by price
As a Consumer

So that I can find the ticket within my budget.
I want to Filter my cinema search result according to the price range of a cinema

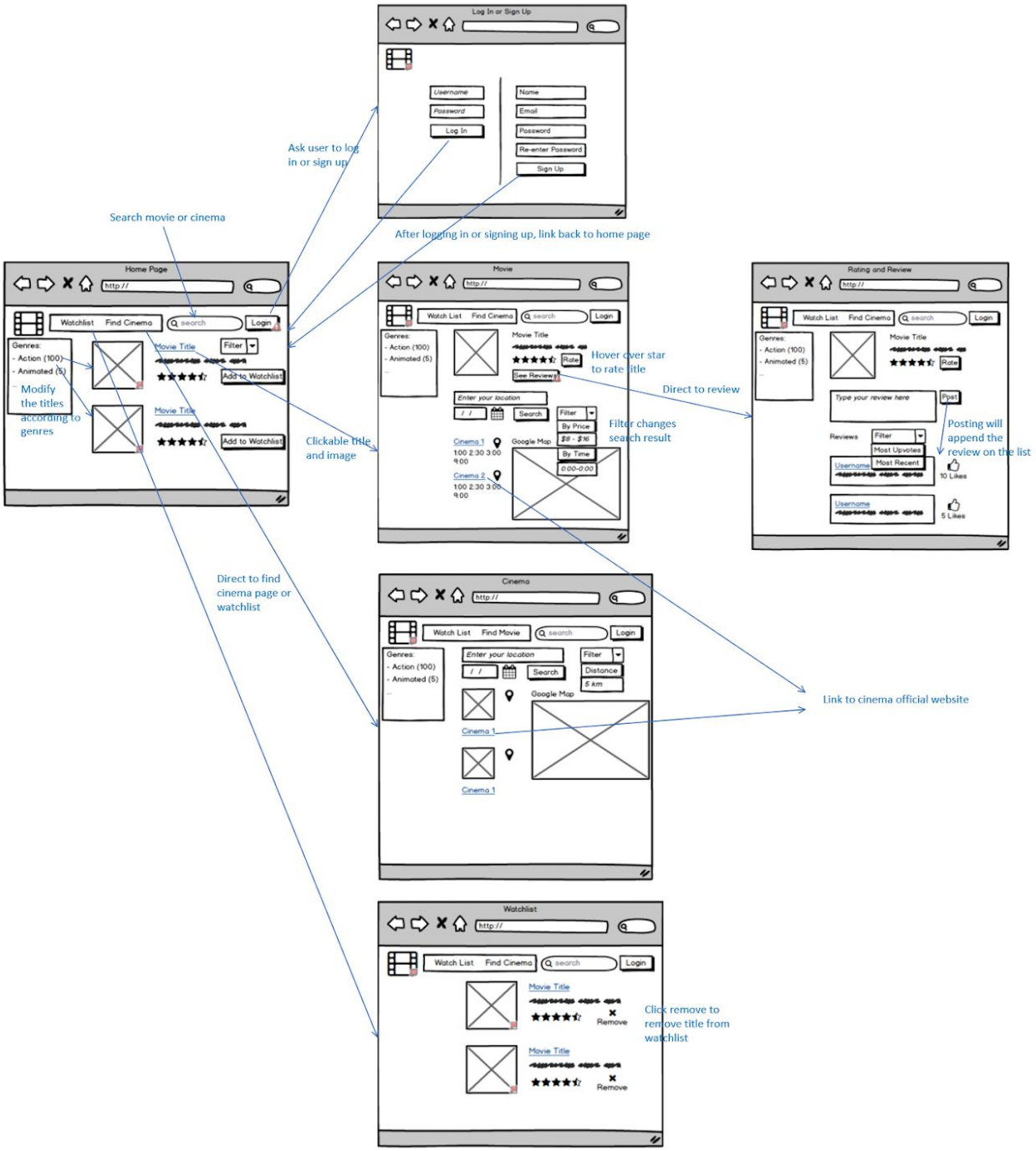
GIVEN I am on MoviesEngine Homepage
WHEN I click on “filter cinemas”
THEN I should see a drop-down list

WHEN I click on “By Price” and select the max and min prices **AND** I press the “search” button **THEN** I should see all the cinemas selling tickets within my price range
3 Story Points

US19- Not achieved **Feature** Filter cinemas by time **As a** Consumer **So that** I can find all movies in all cinemas at the time that is most ideal for me. **I want to** Filter my cinema search result according to my preferred time **GIVEN** I am on MoviesEngine Homepage **WHEN** I click on “filter cinemas” **THEN** I should see a drop-down list **WHEN** I click on “By Time” and select my preferred time **AND** I press the “search” button **THEN** I should see all the cinemas selling tickets for movies at my selected time
4 Story Points

3. Interface Design

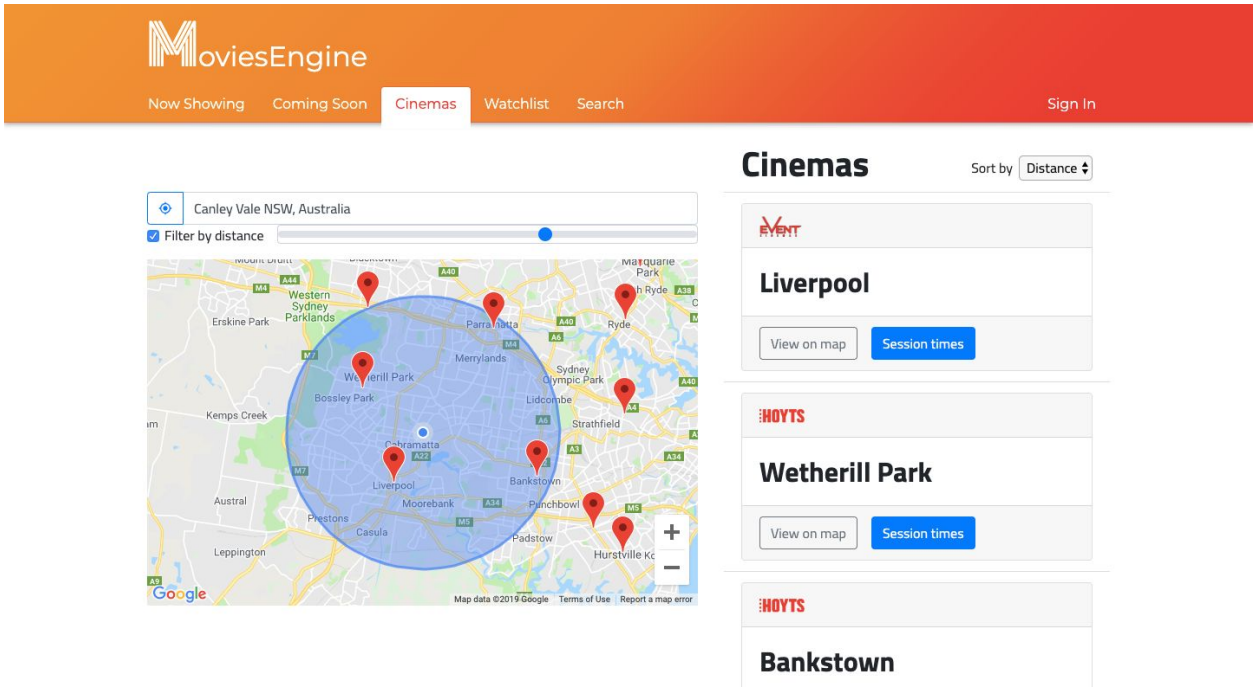
3.0. Low-fidelity prototype



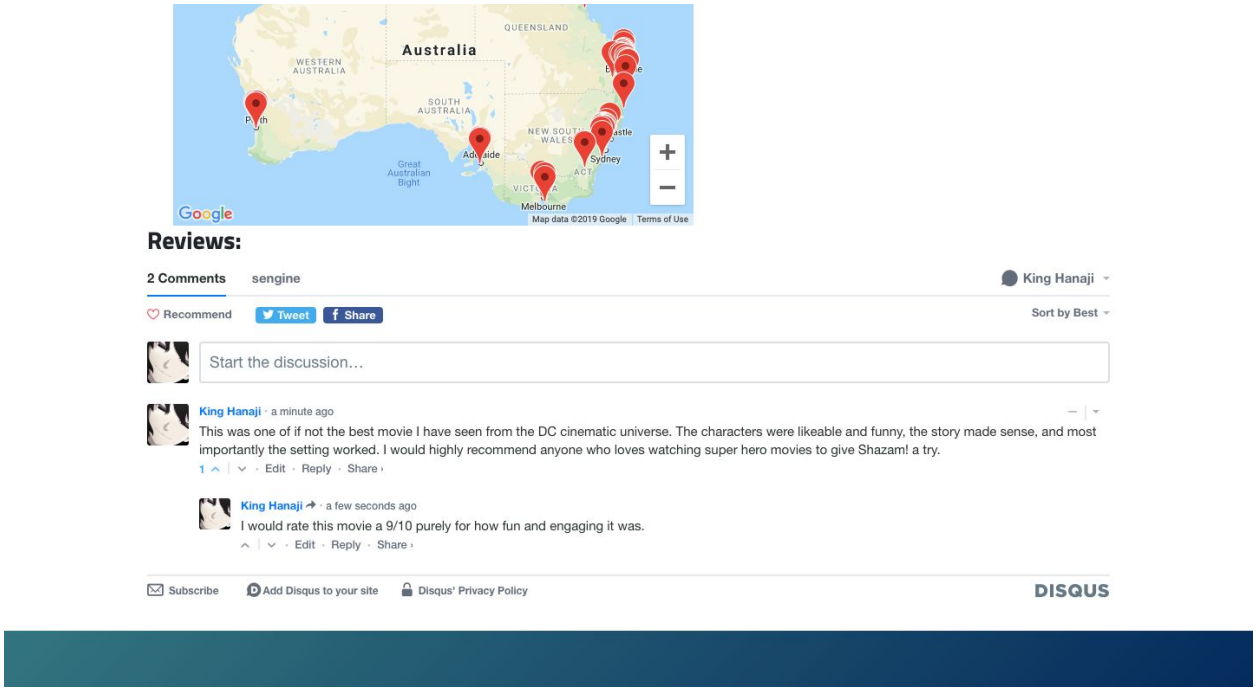
3.1. High-Fidelity Prototype

https://focd2s.axshare.com

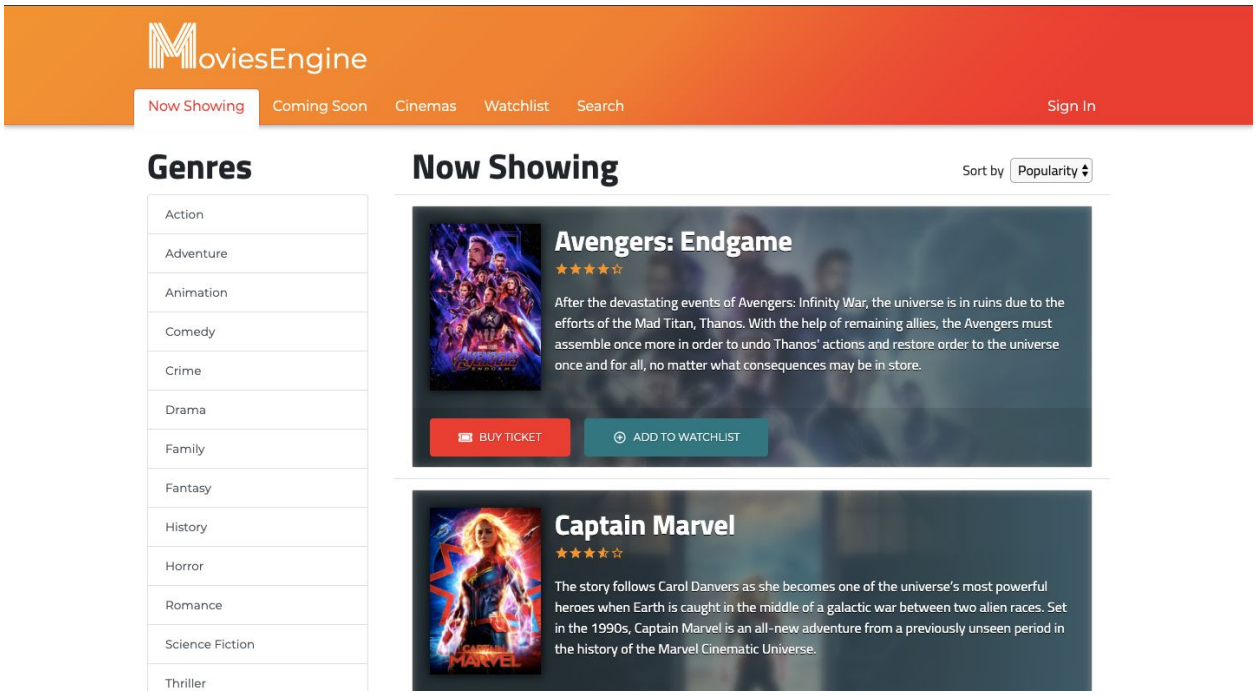
3.2. Final Interface



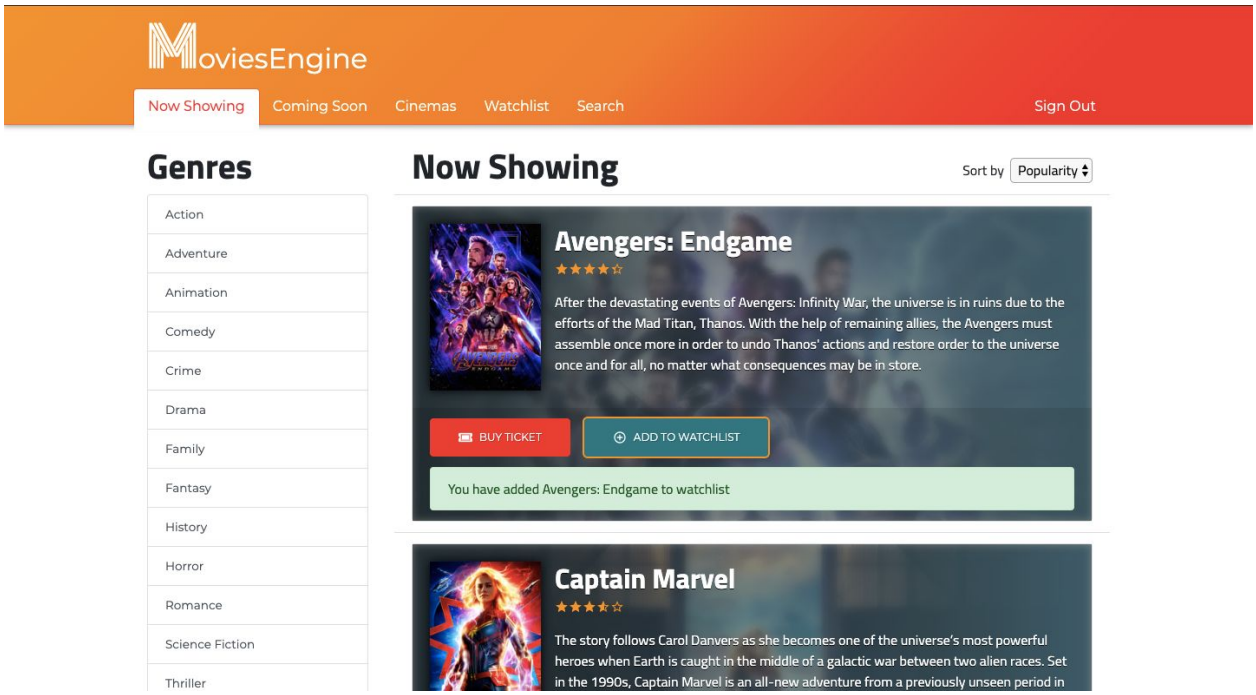
Here, the user can see the cinemas around their location. The distance that the map covers depends on the slider. The cinemas can be sorted by distance or name on the right hand side.



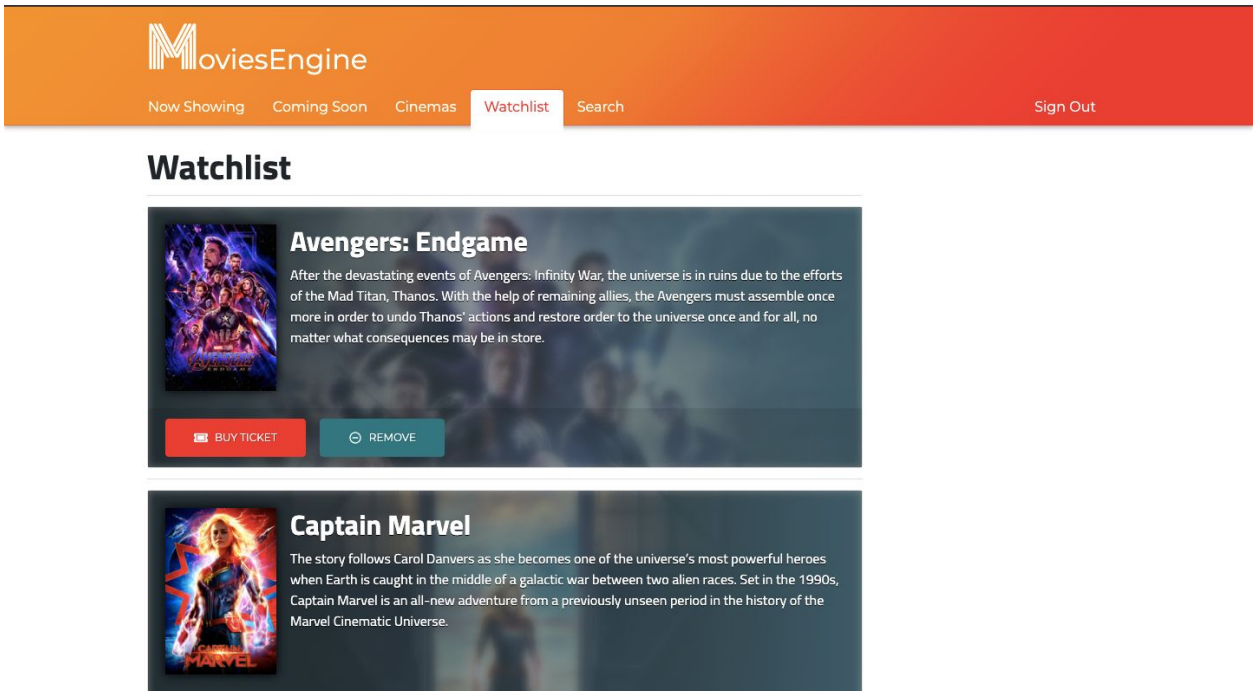
Here the user is able to comment on a movie, as well as read other comments. The user can also choose to reply to a comment or upvote a comment.



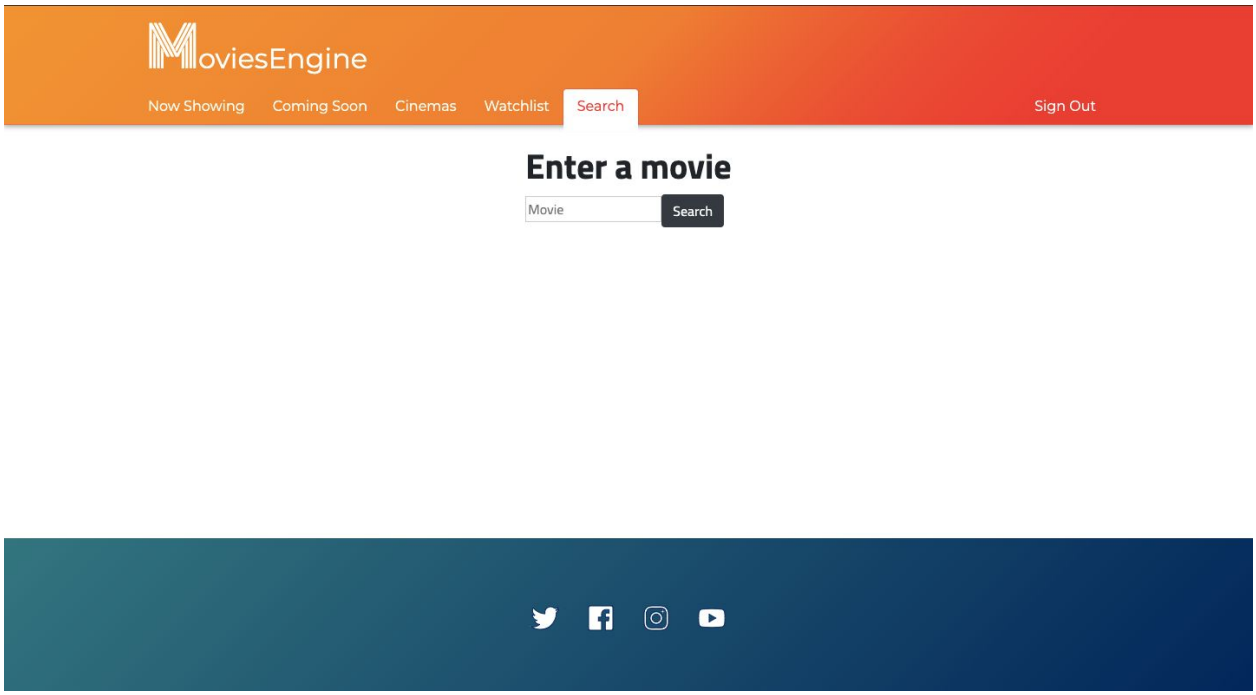
Here the user can browse through movies that are currently showing in cinemas. The movies can be sorted by title, popularity or rating.



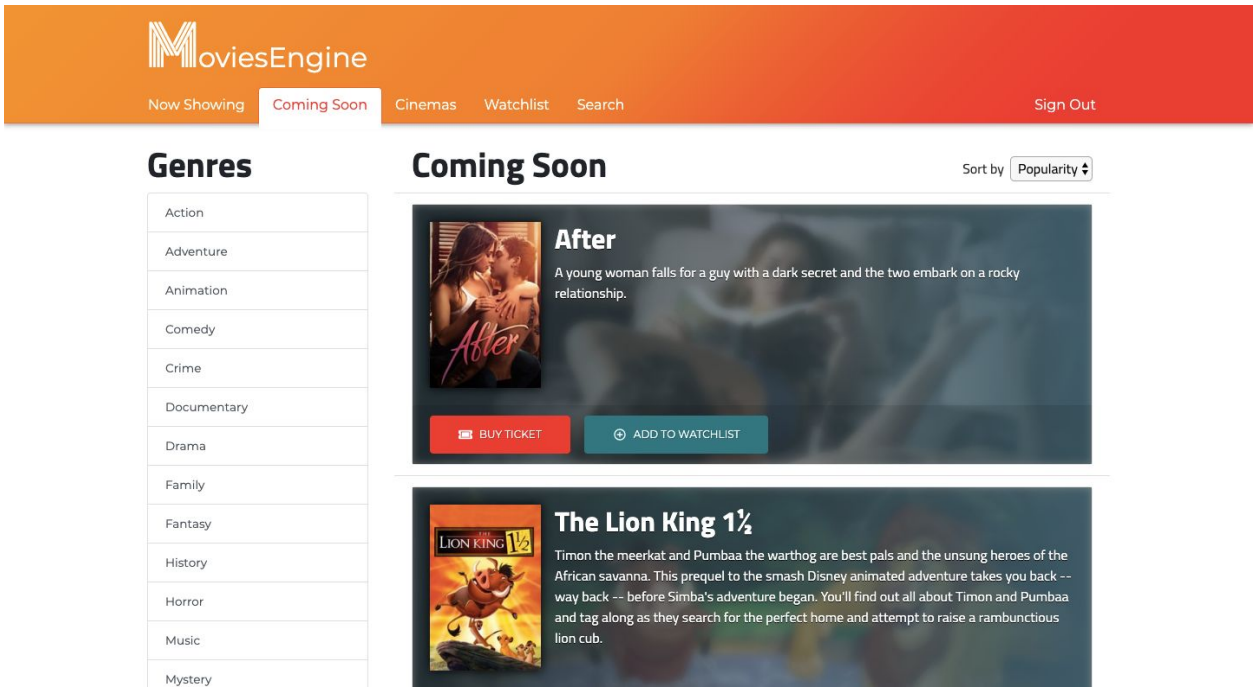
Here the user can add a movie to their watchlist, which can later be viewed on the watchlist tab.



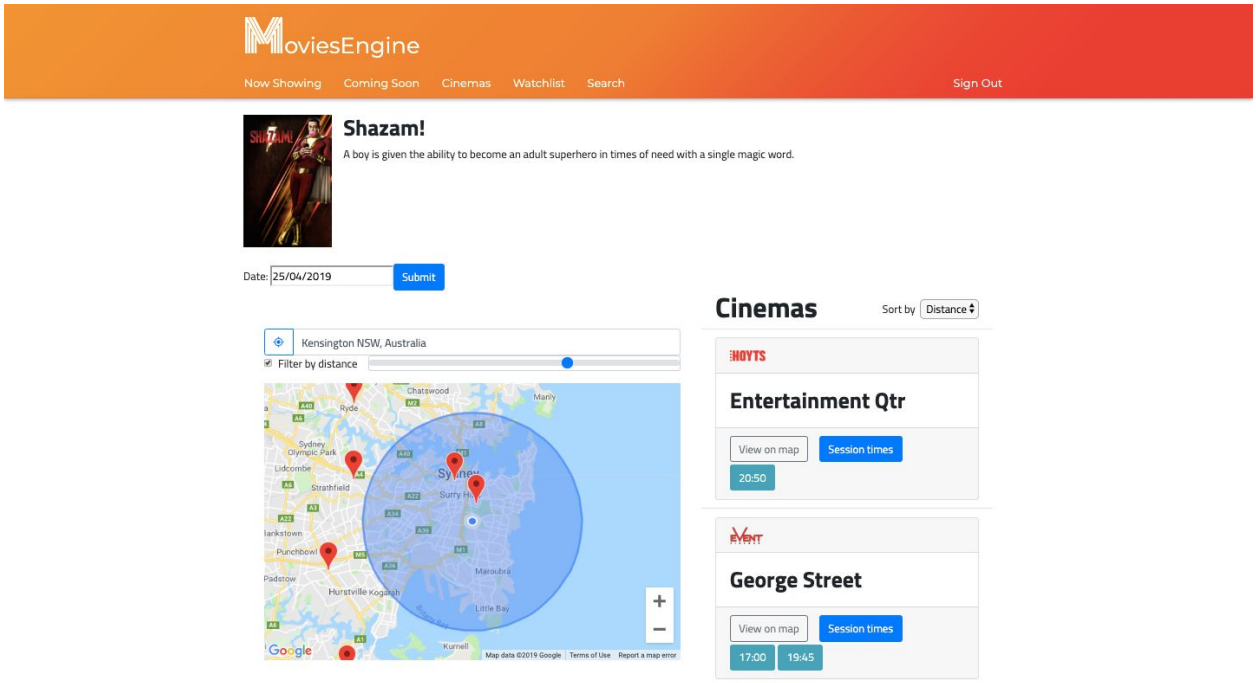
All the movies that have been saved to the watchlist can be viewed on one page. Users can choose to remove a movie at anytime.



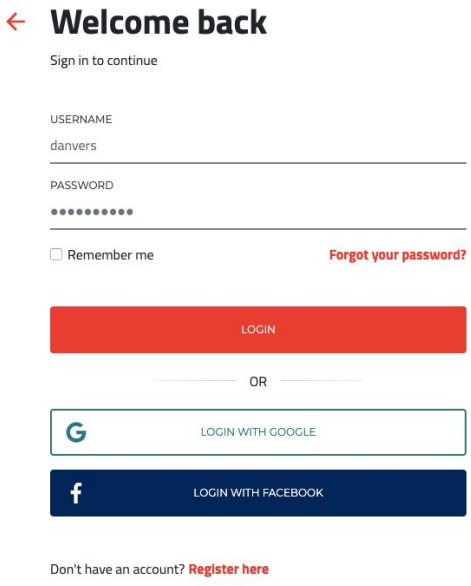
Here the user can search for a movie to see whether it is available in the cinemas right now. A movie can still be returned even if the user makes a minor typo in spelling the movie.



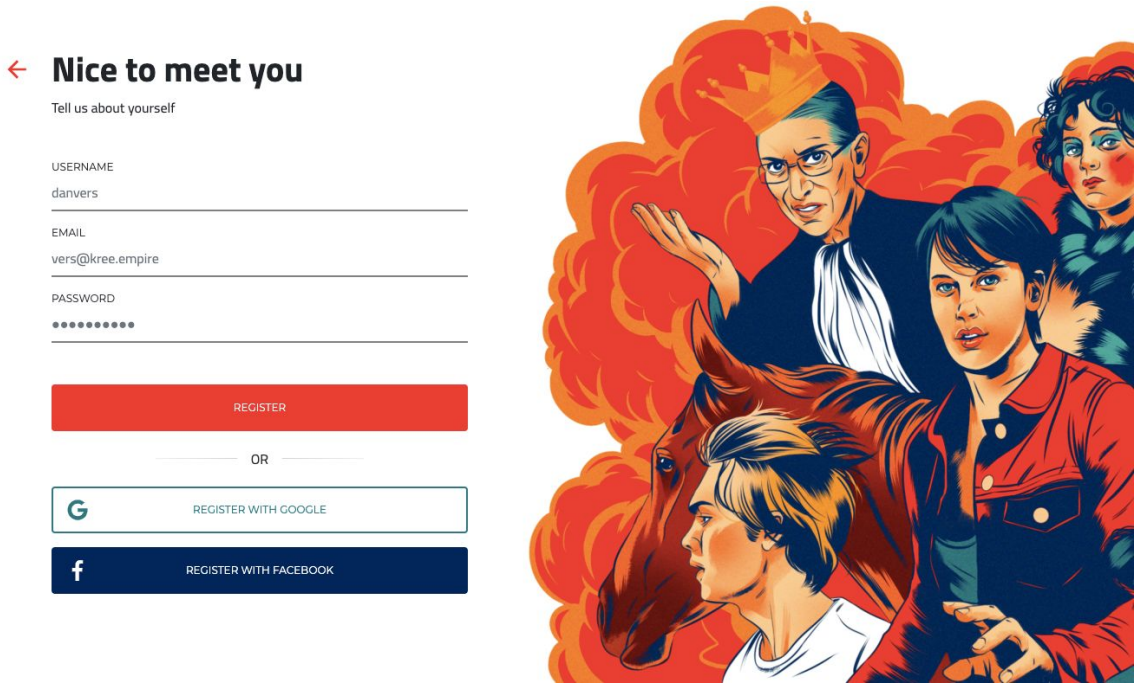
Here users can see all the movies that are coming soon so that they can buy an early ticket for it.



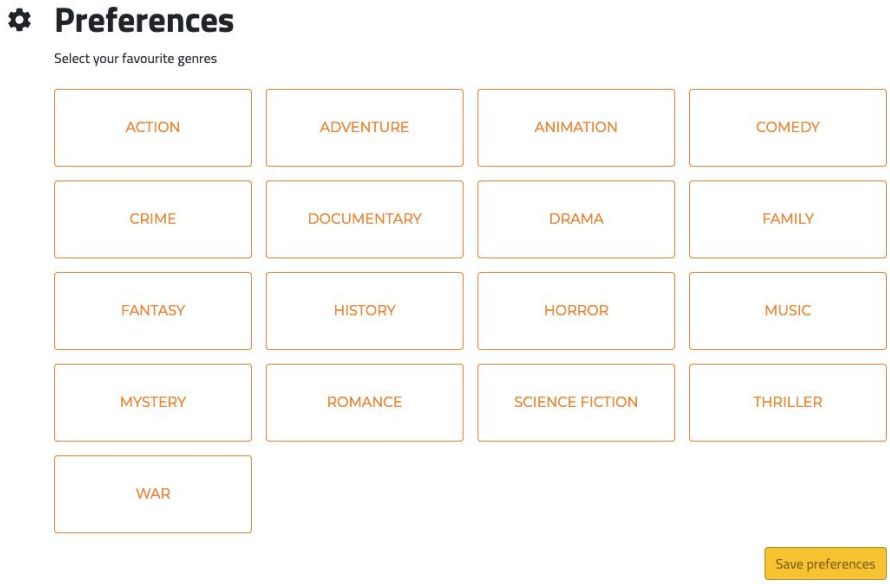
On the movie page, after the user enters their location, they can see all the cinemas that are close by and choose a session time on the right hand side.



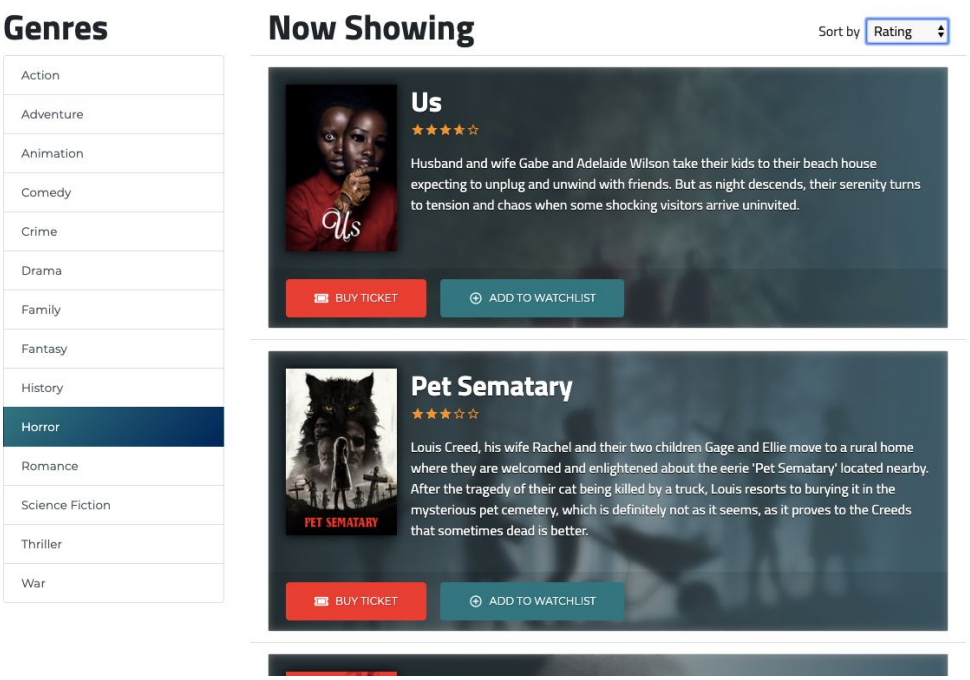
The login page where users must login to use the watchlist feature.



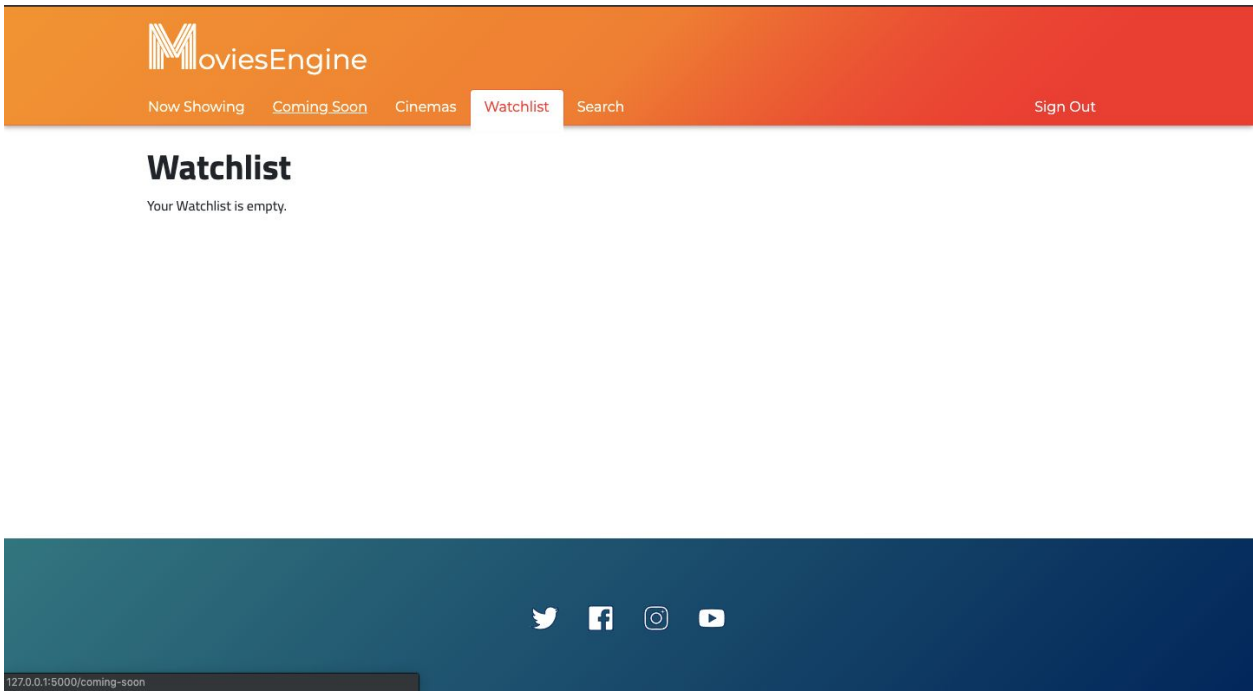
If the user doesn't have an account on the site, they can register on this page.



The user can select their preferred genres after registering onto the system.



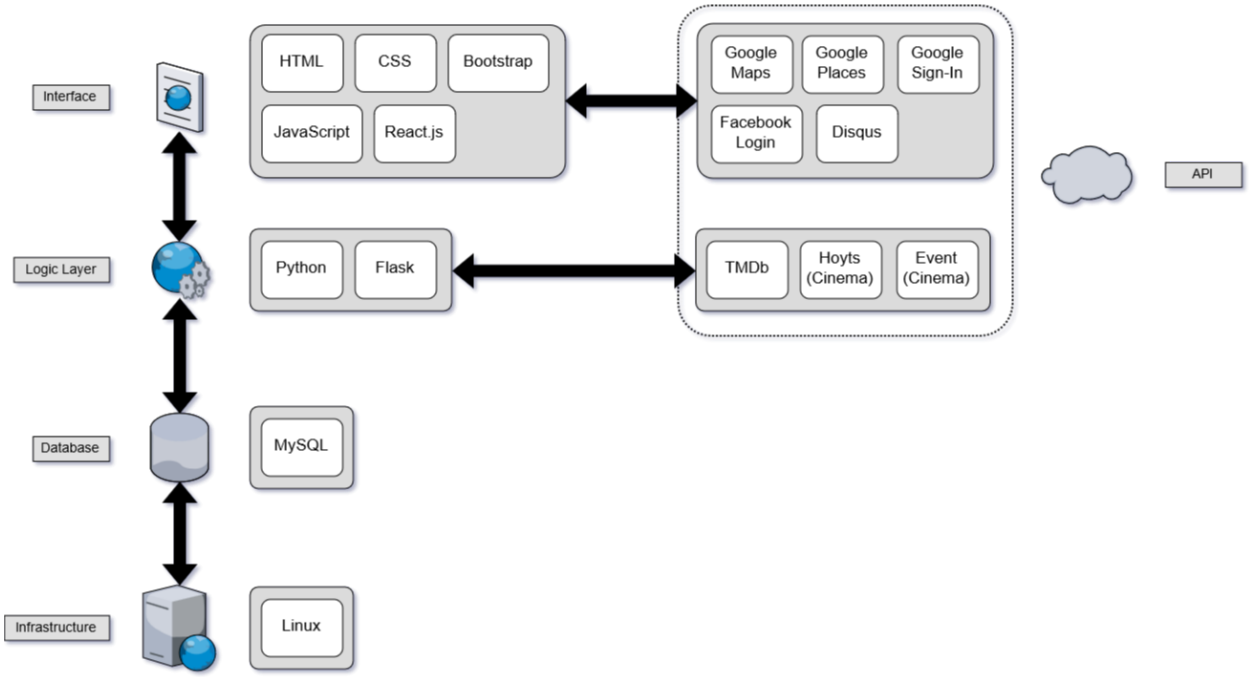
The user can filter their movies by genre.



The watchlist will display nothing if the user has not added any movie to their watchlist. Watchlists are different for every user.

4. Software Architecture

4.0. Software Architecture Diagram



Our software Architecture consists of 5 layers namely, the infrastructure layer, the database layer, the logic layer, API layer and finally the user interface layer. Each layer serves its own purpose and role in the application.

4.1. Infrastructure

The infrastructure layer shows the server platform that will run the software, it is basically the operating system that our system will be run on whether it is Windows, Linux, Mac OS or similar. The system we are building is deployable on popular operating systems such as Windows, Linux or MacOS.

4.2. Database

The database layer shows the different databases our application will access to generate its information the most important database being the cinema databases.

Our database will store user information, which includes username, email, password, their genre preferences and watchlist.
The database also stores information of now showing movies and upcoming movies fetched from TMDb API. The movies are updated daily for users to find the newest movies showing in cinemas.

4.3. Logic

The logic layer is the processing layer of the application and is made up of mainly Python it's can be thought of as the main function of the software application. It processes requests and forms from the users.
It also handles which information the users can see, and send the information by fetching data from the database through a connector, and then send the data to the front end in the form of JSON.

4.4. External Data Source (APIs)

To minimise development time while maintaining a high-quality web application, we incorporate various APIs in different functions of our app.
For logging on, on top of creating an account on our server, we also allow users to log in via Facebook or Google account. Facebook/Google account with the same email will be treated as the same user.
To access a large database of movies, we use The Movie Db (TMDb) API. The API provides a poster URL, summary, rating, popularity measurement for every movie. TMDb also has a search function, which allows users to search for a movie by title or alternative titles.
Meanwhile, Hoyts and Event API provides a solution for searching for which cinemas are showing a chosen movie and the session times plus ticket price. Furthermore, Google Maps API will show the location of the cinemas on the map so users can easily locate the cinema.
Each movie has reviews on them. We use the Disqus API to manage the review threads. Users can upvote or downvote reviews so the useful reviews are more visible.

4.5. User Interface

The basic user interface comprises of HTML and CSS, while most of the CSS is from Bootstrap. The combination provides an aesthetic user interface.
We also use Javascript-React framework to make to the web page more interactive (i.e. render components based on user input). It is also used to fetch data from and send data to the backend of our system.

4.6. Supported Platforms and Requirements

To provide maximal utility to consumers the system should support a wide range of platforms. For this reason, we have chosen to implement a web-based application. By doing so, the system is accessible to users on any platform with a standards-compliant web-browser.

Supported platforms include, but are not limited to, the following:

- Windows
- Linux
- MacOS
- Android

Supported, standards-compliant web-browsers are:

- Microsoft Edge
- Google Chrome
- Mozilla Firefox
- Safari
- Opera

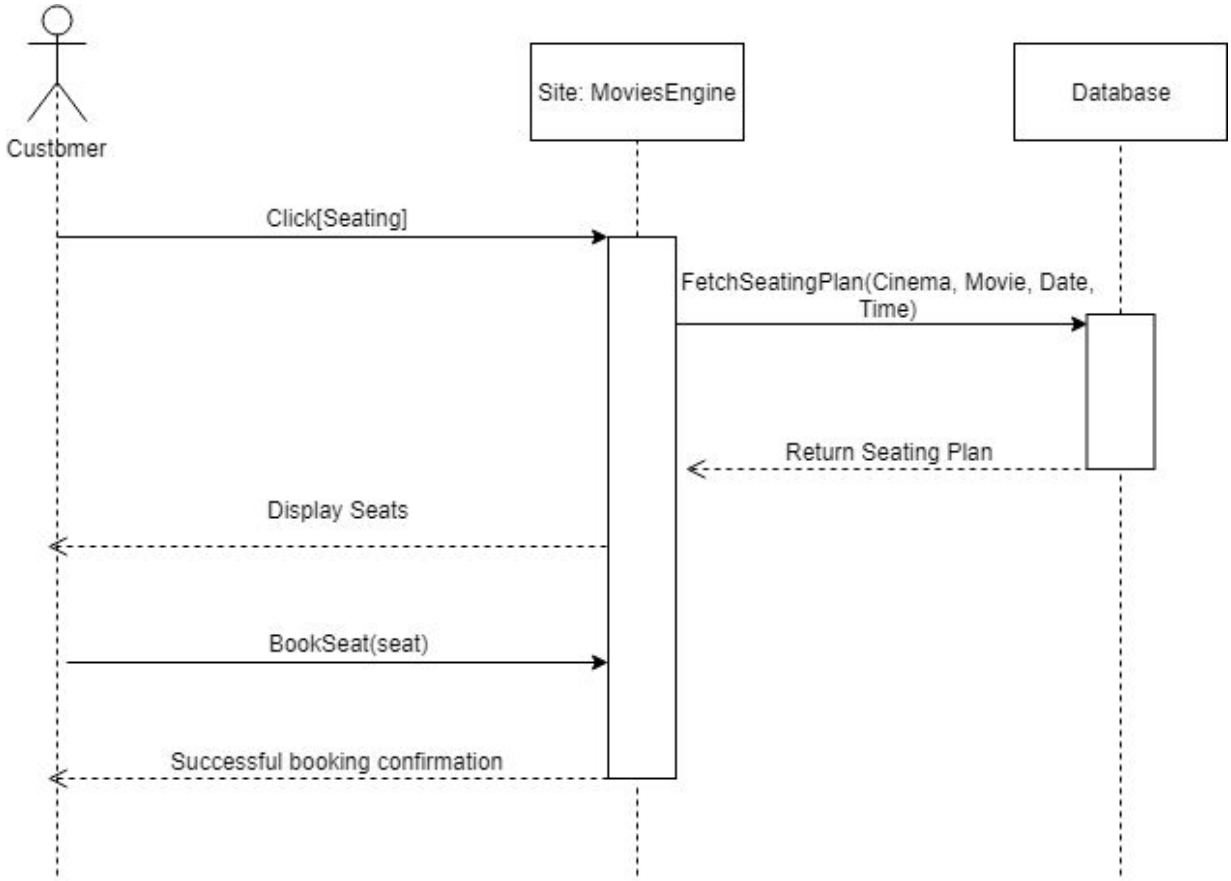
4.7. Benefits of Chosen Architecture

The chosen architecture provides an efficient development experience, allowing the application to be created in a short period of time, as well as ensuring a high-quality system which is accessible by a large consumer audience.

The use of existing APIs enables the quick creation of a minimal, viable product (MVP). This allows consumers to use the system as soon as possible which in turn allows for the collection of user feedback. By collecting user feedback bugs can be found and fixed earlier, feature suggestions can be obtained, and further development can be focussed on user satisfaction.

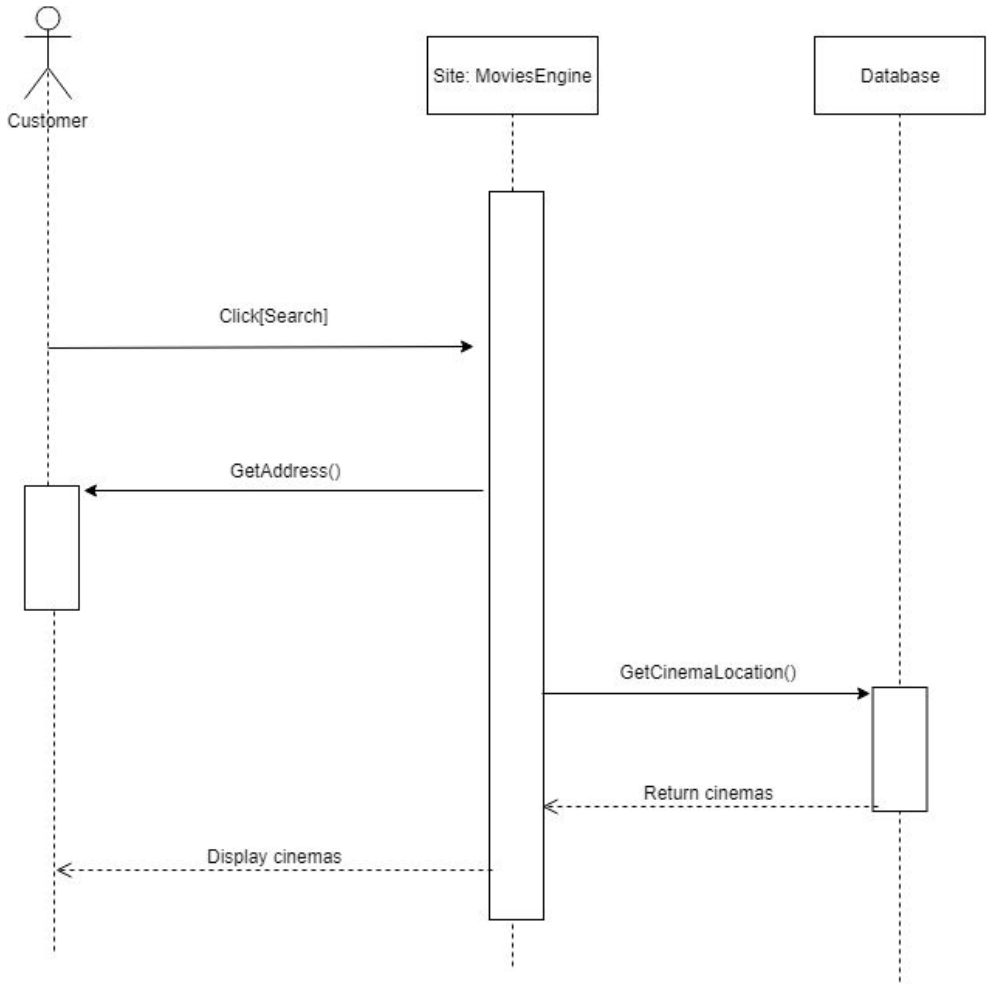
By creating a web-based application, the system is able to be accessed by as large of a consumer-base as possible. Any consumer with access to a web-browser is able to access the system, minimising platform-specific development overhead and maximising the accessibility of the system.

6. Sequence Diagrams



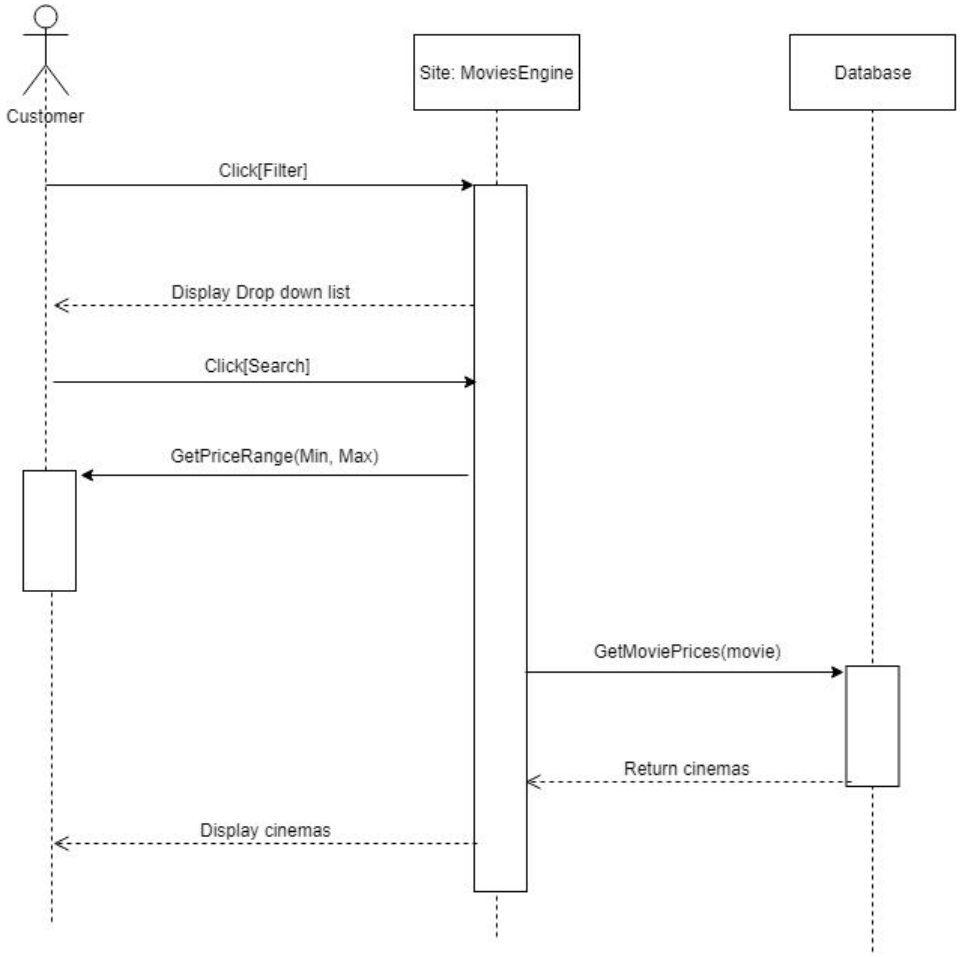
Booking a seat at a cinema

This diagram shows the process of booking a seat when the user has chosen a movie and has decided to buy a ticket.



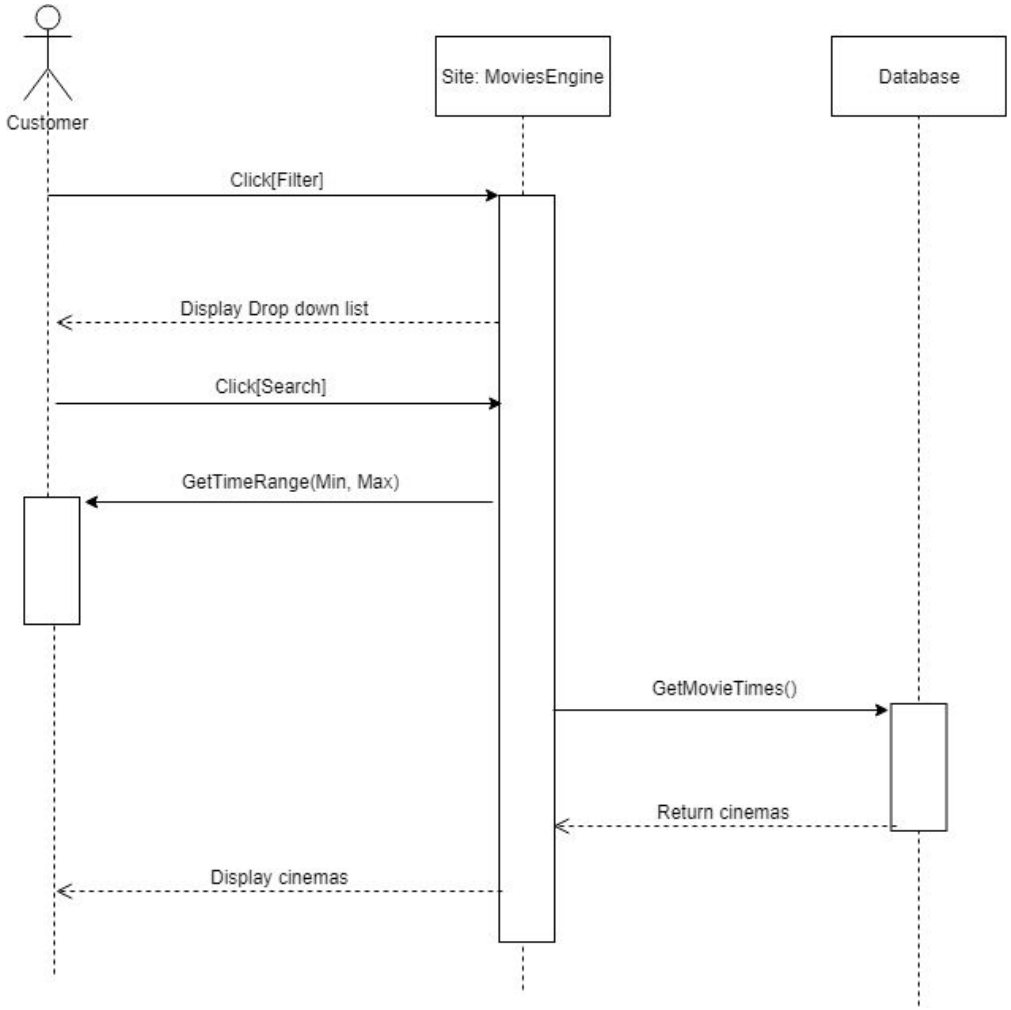
Show cinemas closest to the user's location

This diagram shows how the user selects a cinema by searching based on their current address.



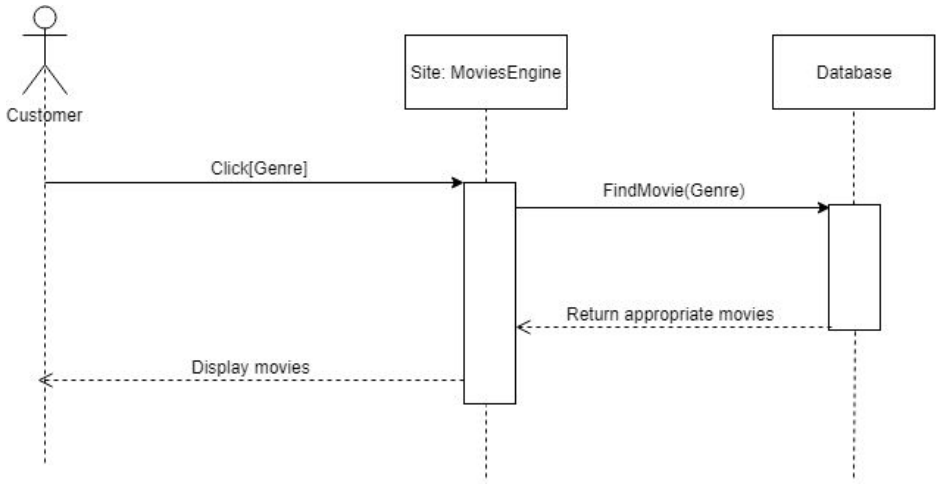
Search cinema by price

This diagram shows the process of finding a cinema by filtering with a minimum and maximum price on tickets.



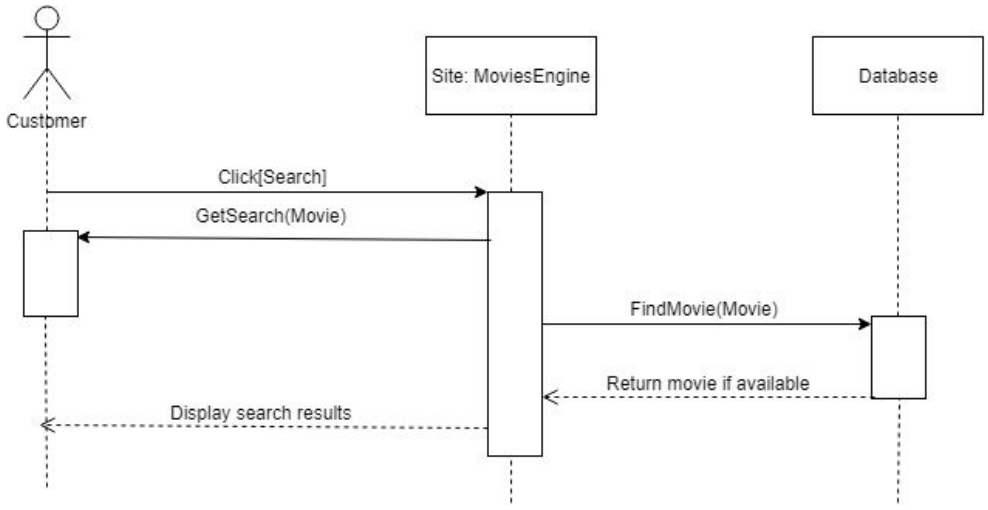
Search cinema and movie by time

This diagram shows the process of searching for a movie in a cinema based on the time it will be showing.



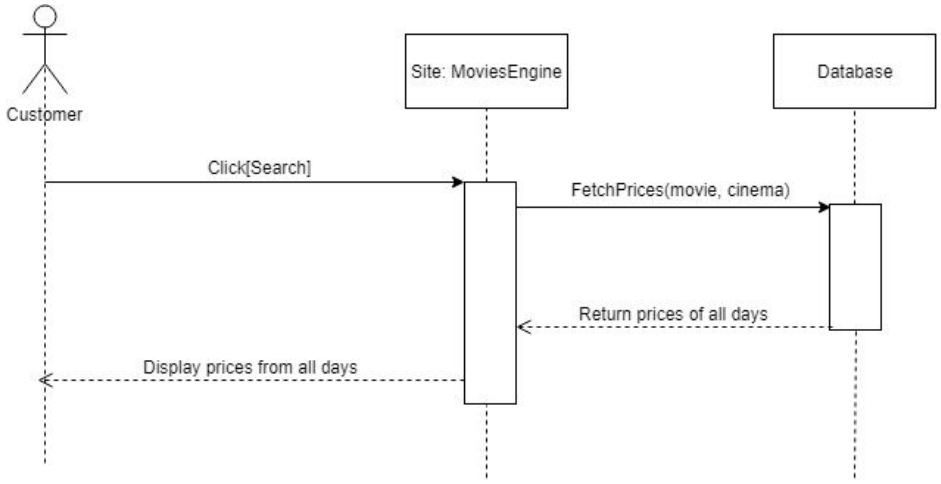
Search movies via genre

This diagram shows the process of filtering movies with a specific genre.



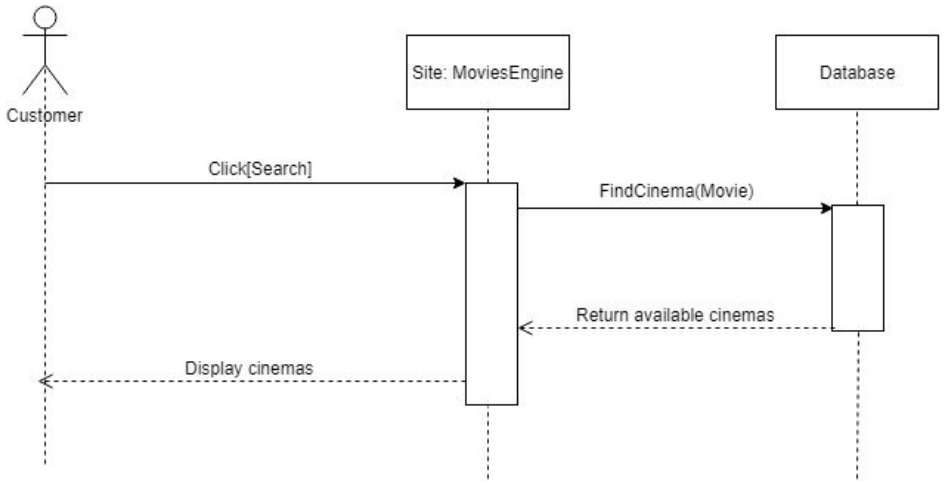
Search for a movie

This diagram shows how the user will search for a specific movie on the site.



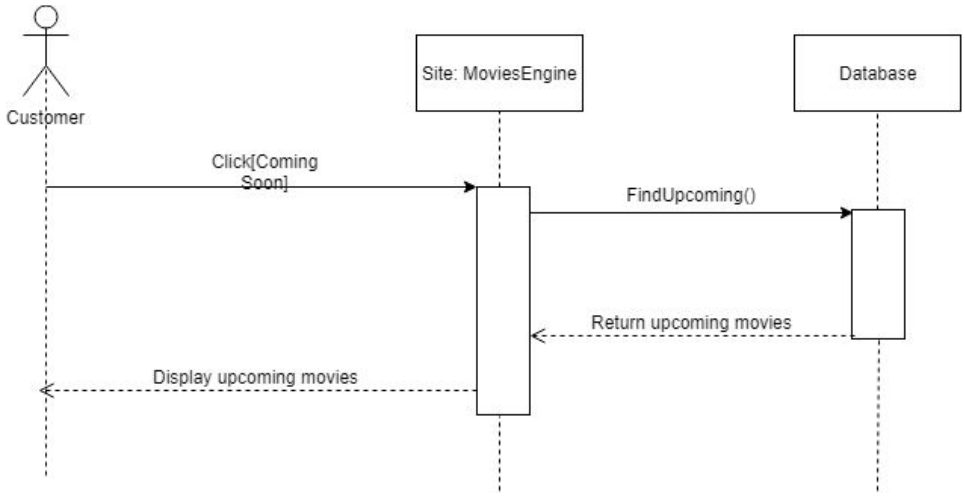
Check prices of movie tickets on different days

This diagram shows the process of checking the prices of movie tickets on different days.



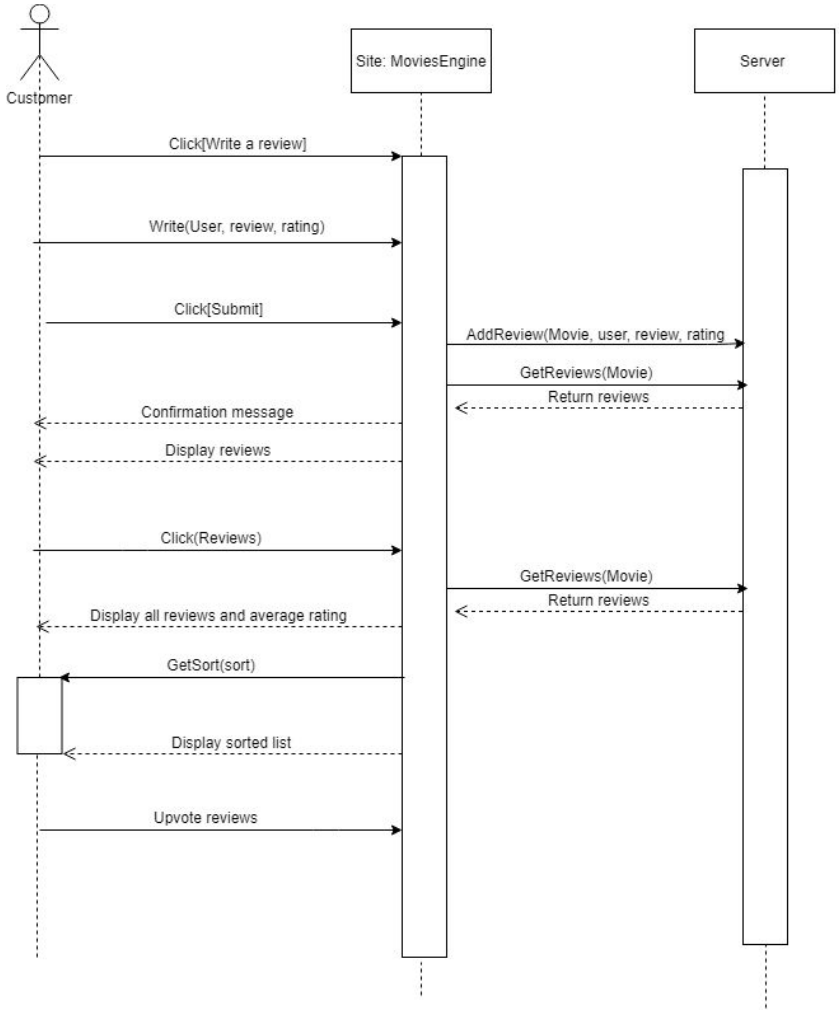
Find all cinemas showing a movie

This diagram shows the process of searching through different cinemas showing a specific movie.



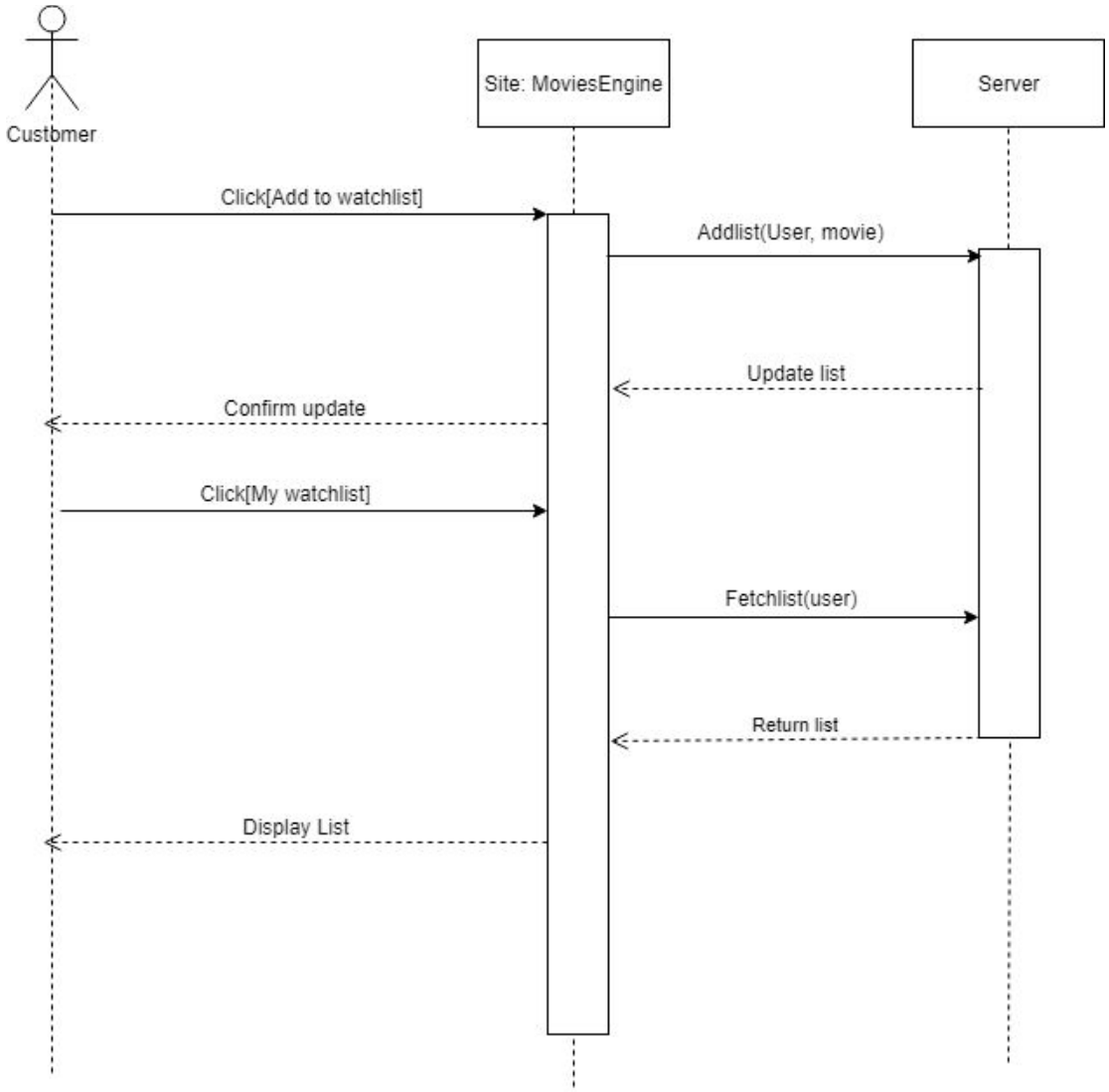
See all movies that are coming soon

This diagram shows the process of finding upcoming movies.



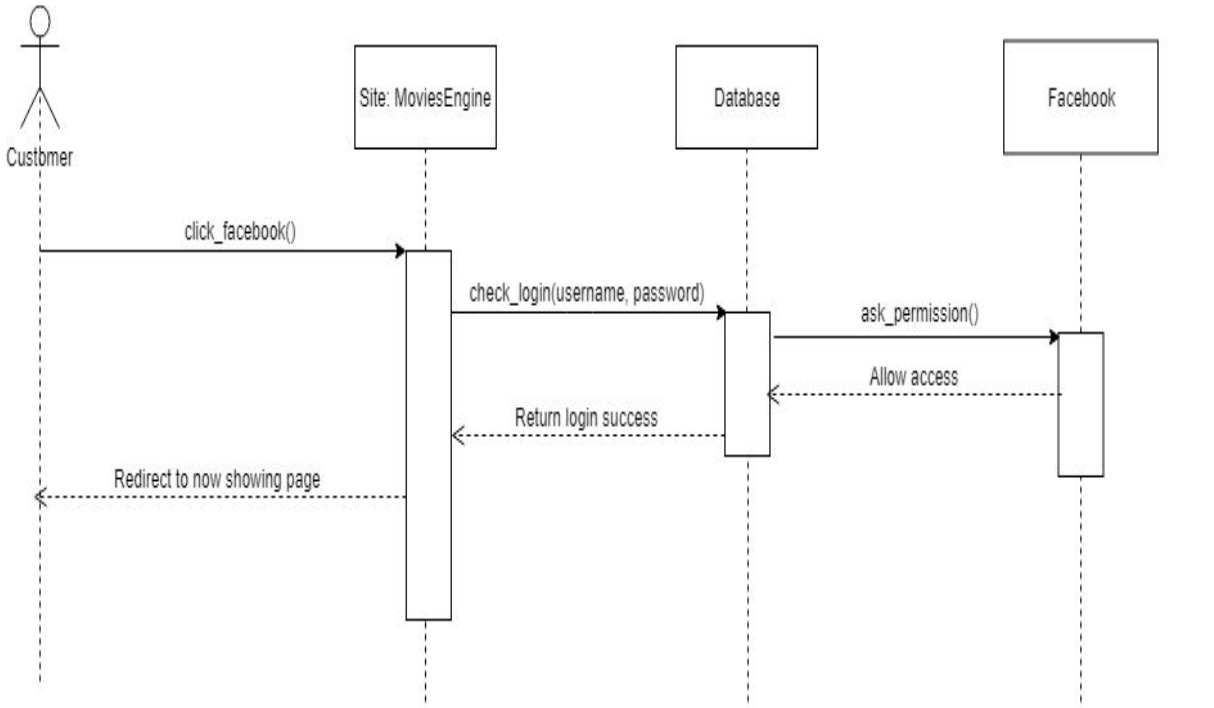
Add a review to a movie, rate a movie, see reviews and upvote reviews

This diagram shows the process of how a user writes a review, upvotes a movie, see others reviews and the average rating.



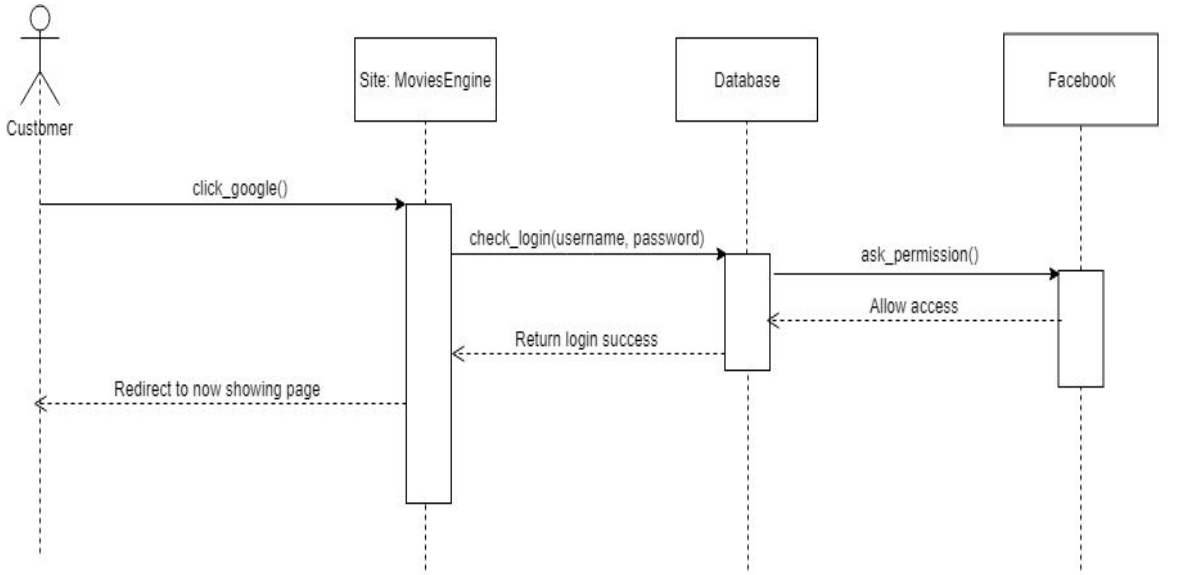
Add movies to a watch list and see a user's watch list

This diagram shows how the user is able to add a movie into their watchlist and how they are then able to see their watchlist.



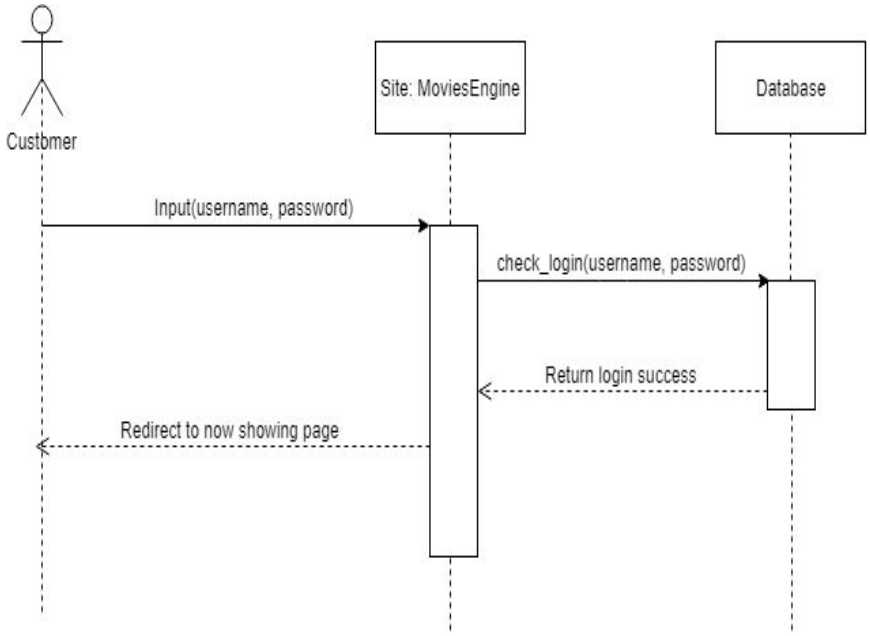
Login (Facebook)

This diagram shows the login process when the user logs in using Facebook.



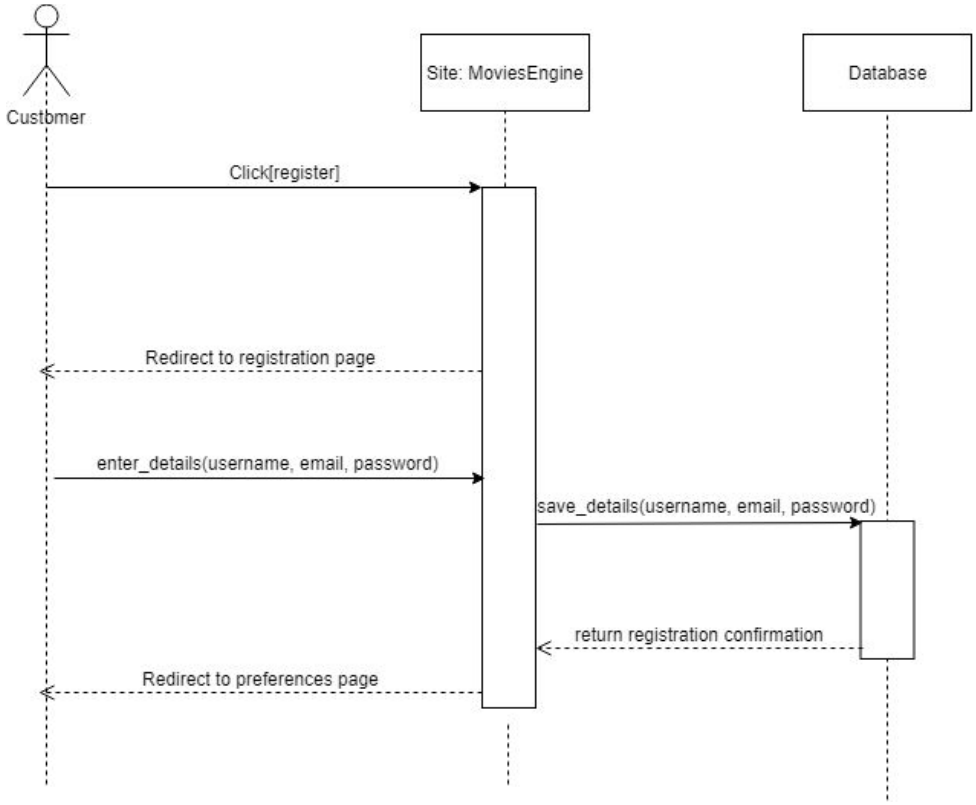
Login (Google)

This diagram shows the login process when the user logs in using Google.



Login (Not using Google or Facebook)

This diagram shows the process of logging in without the use of Google or Facebook.



Registering to the site

This diagram shows the registration process when a new user wants to sign up.

7. Summary of Achievements

Overall, our system allows users to easily navigate through the major two cinemas in Australia (Hoyts and Event cinemas) without the need to go on two different sites. This benefit allows for better efficiency as it would display the closest cinemas for a selected movie on a particular day and would also allow for the comparison of session times across various cinemas hence is overall more convenient for moviegoers. Our system also integrated many features unavailable on traditional cinema websites such as a way for users to comment and review various movies as well as a watchlist feature which allows users to save movies that they may want to later come back and purchase tickets for. It also displays movies in a much simpler and more presentable manner than other cinema websites where everything is cluttered, hence navigating our application is done with ease. Sorting and filtering movies is also a much more tedious task on the traditional cinema websites however it can be done in our system with just one click. One last major feature on our system involves searching for any Events and Hoyts cinema simultaneously across Australia and sorting them based on distance from any desired location.

8. Team Organisation and Appraisal of Work

Our team has divided the responsibilities across the members as equally as possible. Based on the deliverable at hand, each task would be assigned to a member from there. For the report deliverables we divided each requirement for each report equally between ourselves for example, someone would be responsible for the problem statement, another for the features and two people would work on the user stories. We setup google docs which enabled us to work on the assignment collaboratively, each of us could see and assist other members if any issues were to arise. As for the implementation phase a similar approach to the equal distribution of tasks was achieved through assigning members different user stories to implement ensuring that the user points were the same for all members. Communication was achieved regularly through messenger as well as weekly meetings with and without our mentor to discuss our progress and any problems we were facing.

In our opinion the project was extremely fun to do as it allowed us to be as creative and innovative as possible by giving us the flexibility to come up with whatever we felt like would be a useful system. It also taught us many valuable qualities through working collaboratively as a team in a close to real work environment. Consequently, it has given each and everyone of us a unique work-like experience as future software engineers. Although we would’ve loved to have completed all the planned features on time, the outcome of our project is nonetheless something we are all proud of. We believe that with a bit more work and completing the features which we have struggled to do, our system could really become very desirable to use by all cinemagoers.

As with any group project or assignment many issues were faced throughout the course. Some issues that our group encountered involved the inclusion of the prices of movie tickets for

comparison, as it was hard to scrape the exact prices of different tickets from the two sites. This was because prices were different for adults, pensioners, students, children etc. Another issue was regarding the incorporation of available seating for the different session times. This was similarly mainly due to the fact that scraping the seat maps was relatively difficult as each system had it implemented very differently. Finally, incorporating all cinemas in Australia was another area where we faced many problems. Firstly, identifying all cinemas in Australia would be a tedious task as there are possibly thousands all across the country. Secondly, other identified cinema chains such as Reading cinemas and Village cinemas had no APIs to assist with their integration into our system and web scraping them would've taken much more time and effort than the value they would've added to our system given that it already had the two most populous cinemas in all of Australia. Other obstacles our team faced was based on the way the project was managed. For instance, finding a suitable time for all team members to meet up, discuss and work on assignment issues was hard hence we only met a few times. Also, some group members had no experience in using javascript and css, which in turn required some time to learn and understand.

If the project were to be done differently, our group would try to start on the implementation phase much earlier to give us time to complete the features that weren't implemented on time. As our main goal is to make a convenient movie site, this would further improve on the practicality and convenience of our system. We probably would've even added extra design features which would make our application appear much more professional and inviting such as adding a carousel/slider displaying recommended and popular movies to users as soon as they open the app. Another thing we would've done differently is we would've organised more group meetings as we found them to be extremely useful and productive and it would've probably helped us complete all the unfinished features. Other minor changes in how we ended up implementing the system and how we were communicating may also be beneficial if we were to do the project again. Overall, we are satisfied with the result of our team effort and believe that we have delivered a complete and convenient system despite the issues we have faced throughout the scope of the project.