

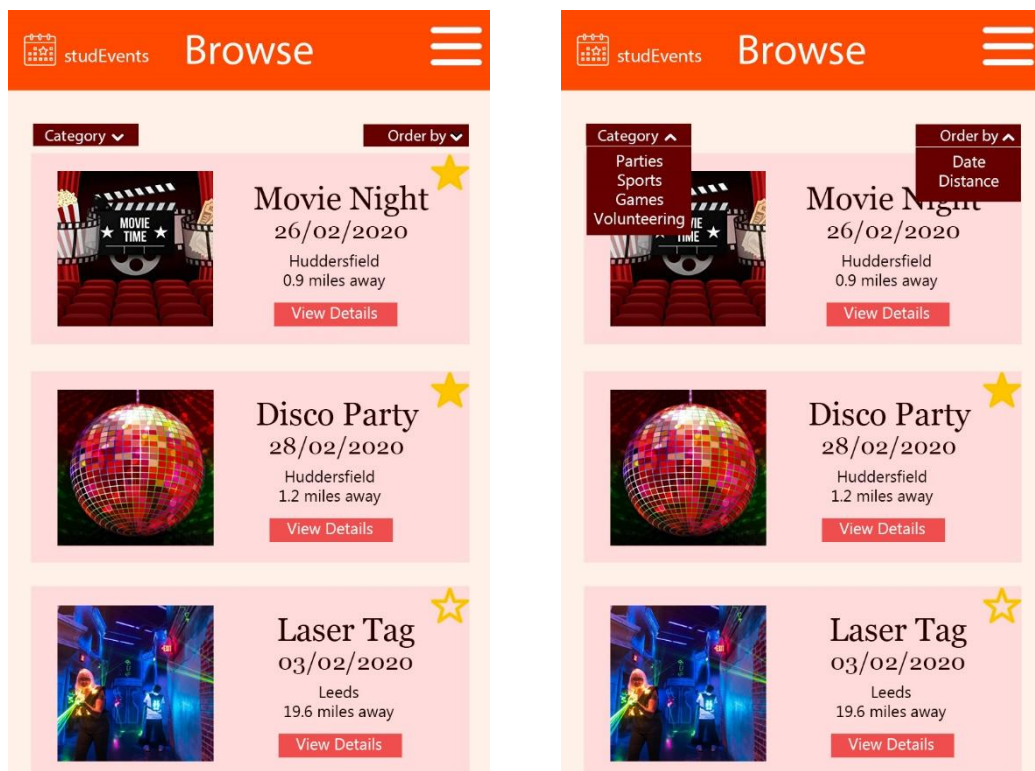
# Find events in your area. StudEvents application

## Introduction

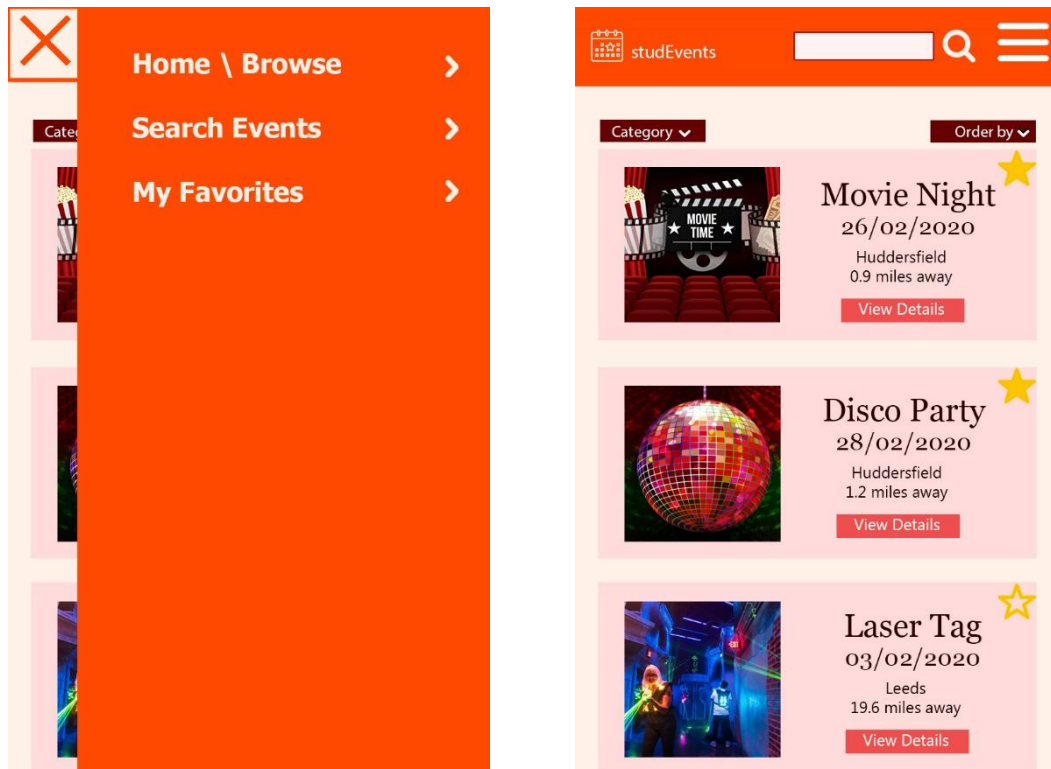
The application shows the nearby events which are organised by students for students. Its main purpose is to keep track of all events organised for students and help them socialize and make their student life experience better. Users can search, filter and view details of different events. They can search events by typing specific key words, such as, name of their city, type of event, etc. Moreover, users can order the list of events by date, distance from their current location and filter it by selecting a category(ex. parties, games). The app provides the exact location of the event, that can be viewed by the user on map, also it calculates the distance from the user's location to the event's place. Users can add a specific event to their favourite list, which they can access later and find out a live timer under each event, that shows the amount of time remaining till the start of event.

## Wireframes models

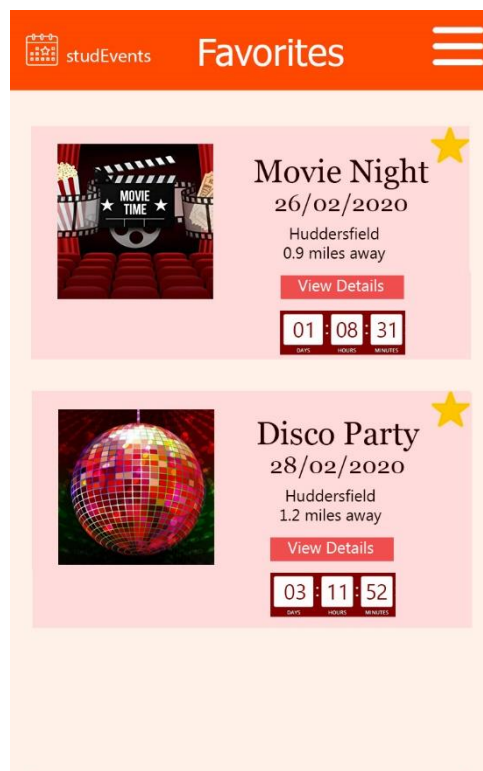
1. Home Page (Browse Page) shows the list of all events. It provides filtering features, such as, filter by category and order by date or distance. Users can access the full information about the event by taping <<View Details>> button, they can also add/remove an event from their favourite list by toggling the star-like button. Burger menu in the top-right corner provides the list of all available pages of the application.



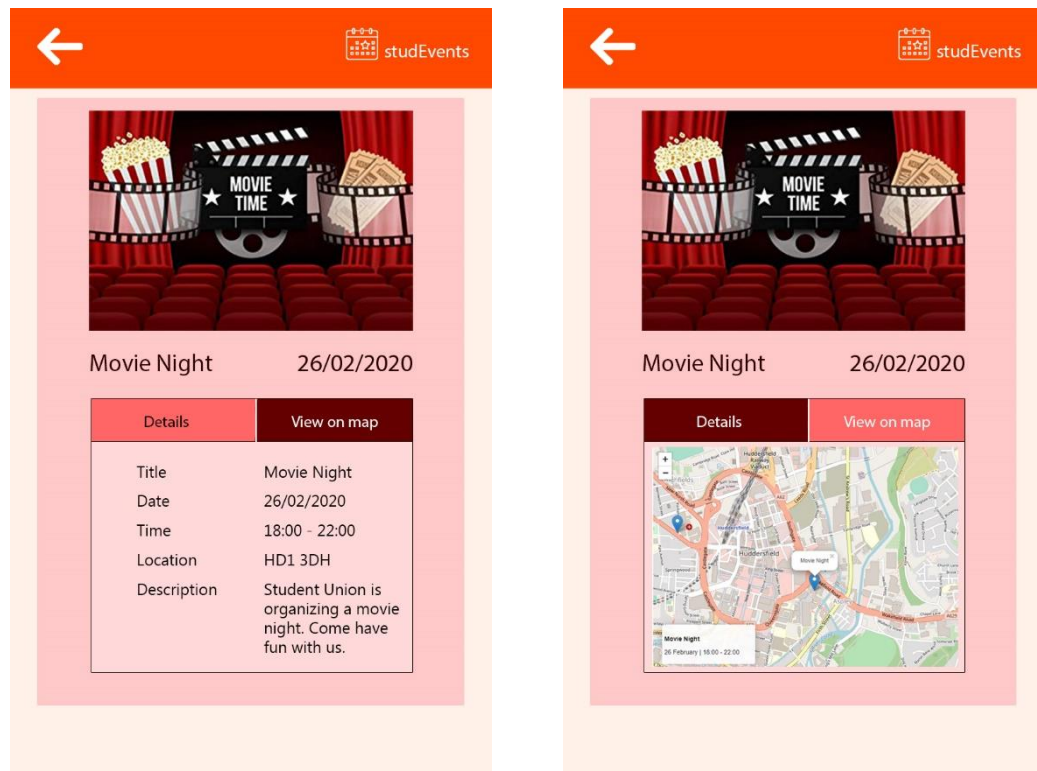
2. Search page provides a text field in the header, where users can type different key words to search in event's list.



3. Favorites page show the list of events which were selected by the user. It also displays a live timer that shows the time countdown to the start of each event. The user still can remove a specific event by toggling star-like button.



4. Details page shows full information about the selected event. Users can view the location of event on map. The back arrow in the top-left corner is an accessibility feature which returns user to the events list.



## Analysis of tools, techniques and approaches

### **Functionality.**

To cover the functionality presented in the wireframes mock-ups, the app is going to use the following tools, libraries and frameworks: Bootstrap CSS framework, Leaflet JavaScript library, use of AJAX.

Bootstrap framework contains a big collection of reusable bits of code written in HTML, CSS and JavaScript. It enables front-end developers to quickly build fully responsive websites. The biggest advantages of Bootstrap are responsive grid system, responsive images, customizability. Bootstrap makes creating grid for the application very easy, as it has its own grid system predefined. What is more, the grid created with Bootstrap is responsive, which means the content is going to change accordingly to the user device's screen size. To make the images responsive, it is enough to add a simple class *img-responsive* to the images tags inside the HTML file. Bootstrap has a giant collection of predefined classes, this makes the CSS file huge, which can negatively affect the performance of the application. But Bootstrap allows developers to solve this drawback by customizing which functionality is going to be included in application. StudEvents is a small application, it doesn't require all of the Bootstrap features, that is why by customizing and ticking off the useless features, the Bootstrap CSS file will become lighter, thus increasing the loading speed and overall performance.

Leaflet open-source JavaScript library allows us to easily implement mobile-friendly interactive maps to the application. The JS file is very light, but it has all the important mapping features, which make this library suitable to use for studEvents application development. This library makes implementing the mapping features to the application very easy. The map can also be restyled to make it look unique. One of the most important things about this library, is the performance it shows while working on mobile devices. The scroll and zooming feels as smooth as native apps.

AJAX is an acronym that stands for Asynchronous JavaScript and XML. AJAX is a new technique for creating better, faster, and more interactive web applications. AJAX main function is to dynamically update content on page without reloading the page itself. It requires a web server for communication. AJAX is transmitting information to and from the server using asynchronous requests, without page refresh. StudEvents app is going to use AJAX for displaying information from the server on the web page. First, it is going to list all the events on Browse/Home page. Second, when the user selects to order the list by date, AJAX is going to make request to server and receive the updated results. Same process will happen when user selects a category of events or searches for a specific event by typing in search bar. Besides showing and updating the content, AJAX is going to help StudEvents to store the list of events that were selected by user as “favourites” on server.

### ***Optimization.***

In order to optimize and improve the performance of the application, studEvents app is going to use the following techniques: use of SVG images and use of service workers for caching.

SVG (Scalable Vector Images) are defined in text XML files, rather than using pixel grid, SVG uses shapes, numbers and coordinates to render graphics in the browser, which makes it perfect in terms of scalability, responsiveness and performance. Even though SVG image is much lighter than JPG, JPEG, PNG or other images formats, it doesn't lose quality when it is rescaled. Also, the use of SVG icons will greatly increase the overall loading speed of the application.

A service worker is essentially a JavaScript file that runs separately from the main browser thread, intercepting network requests, caching or retrieving resources from the cache, and delivering push messages.

Service workers enable applications to control network requests, cache those requests to improve performance, and provide offline access to cached content. Caching resources will make content load faster under most network conditions. We can use this technique to serve resources from the cache when the users are offline, allowing them to use the application without internet connection.

### ***Maintainability.***

To improve the code maintainability, the application will be using the following approaches: CSS pre-processor SASS, NodeJS module bundling.

SASS (Syntactically Awesome Stylesheets) is a CSS pre-processor that lets you use variables, mathematical operations, mixins, loops, functions, imports, and other interesting functionalities that make writing CSS much more powerful and easy to maintain. SASS extends standard CSS abilities by introducing the benefits of a basic programming language. Later SASS will compile the code and generate CSS output a browser can understand. SASS eliminates the need of repeating a piece of code every time by introducing variables. For example, if the main colours of application are assigned to variables, it is easy to change the whole colour scheme of the app by editing variable values. Variables and other SASS features, such as, mixins, loops and functions make the writing of CSS code less time consuming, and much easier to maintain.

While using many JavaScript/CSS libraries in web application development, problems with dependencies may appear. NodeJS module bundling creates a clear dependency path, making the code splitting easier.

### ***Type of application.***

StudEvents is going to be delivered as a PWA (Progressive Web App). PWA is built using standard web technologies – HTML, CSS, JavaScript. It runs on a mobile device as a fullscreen website while the browser bars and button are not visible. PWA can access device functionality, such as GPS and camera API. GPS data is going to be used by studEvents to identify user's location. Moreover, PWA can use browser's service workers and caching to store app data, so it can be accessed offline.

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