School of Electronic Engineering
and Computer Science

Interim Report

Programme of study:
Software engineering for business

Project Title:
SmartManage

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Queen Mary
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Abstract

At the end of last year Wuhan Municipal Health Commission, China reported a cluster of cases of pneumonia in Wuhan, Hubei Province. A novel coronavirus was eventually identified. On the 11th of March 2020 the WHO mad and assessment that COVID-19 can be characterized as a pandemic. In the months and come COVID-19 drastically affected millions of people forcing them to work and study from home.

This radical change increased the workload for families, workers and employee and made planning and time management lot more difficult and complicated to achieve.

SmartManage is an Web application empower users to take control of their schedule and manage their activity The application allows the users to add specific and detailed information about their events, using such information SmartManage makes suggestion and recommendation. For example, if you set up a meeting outside and is going to rain that day the application will notify in advance.

A research survey identified that potential users are in favour. With the vast majority will be happy to switch to an agenda that provides suggestion and recommendation about the best way of managing their days.

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Chapter 1: **Introduction**

1.1 Background

People have always struggled with time management, however, as time went by the issue is become more and more diffused. If we take as an example a family with a young child, this issue is even more present, if we take a look at two decades ago, in a family the mother would be expected to be in charge for childcare and housework. However, in recent times with both parents working, childcare and housework became a major issue and with the recent advent of the Covid-19, now more then ever families will have to manage and plan their day carefully to accommodate all the activity. (Daniela Del Boca, Mariacristina Rossi, Paola Profeta, Noemi Oggero, 2020).

The research undertaken by Daniela del Boca and her team (Daniela Del Boca, Mariacristina Rossi, Paola Profeta, Noemi Oggero, 2020) has shown that with the during the current Covid-19 the workload on families has drastically increased especially on women. This is due to the fact that with the school switching to remote learning the parents will also have to make time for childcare while working from home.

This is only one of the fields where Covid-19 had a deep effect, business and students are also having several issue copings with the different deep changed that affected them.

1.2 Problem Statement

It is clear that in the current situation workers, students and people in general, are looking for a way to improve their time managing due to the increased added during Covid-19. Some are looking for a new way to manage their time and others are looking for some help to do so. More businesses are also relying on applications like Google Calendar and Outlook to manage events and staff communication. (Slintel, 2020)

During this period virtual conferencing app such as Zoom and Microsoft Teams became incredibly popular, given the fact that the vast majority of the work is now done remotely from home and not always the same application is used. Therefore, the user needs a way to track where the meeting is taking place.

1.3 Aim

This project aims to build a Web application to help users who are struggling to manage their daily activity with their current tools or are new to the field. The are several calendar and activity management application on the market, the most popular of which are Google calendar and Microsoft Outlook that combined hold the majority of the market share, especially in a business context. However, those applications do not provide any feedback or provide advice about how to manage their activity, it is just a static tool that record information.

SmartManage aim to provide all the tools the user will need to plan and manage at best their daily activities and meeting.

SmartManage aim to provide regular feedback analysing the different details given by the users when creating a new event. SmartManage will be able to make suggestions on cancelling or changing the location of a specific event in case of unfavourable external condition. For example, if an event is set

to take place outside and the weather is unfavourable the app will notify the user in advance so that it can be changed.

SmartManage aim to combine different tools such as memos and OPC (Optical Character Recognition) to help the user to quickly take notes and link them to an event, saving a lot of time.

SmartManage aim to provide a quick recap of the daily activity when the user accesses the application, so that the user will immediately know what the schedule for the day is.

SmartManage aim to provide an easy to use tool to allow the users to track on which platform the meeting or event is taking place and allows the user to add more specific information in base at the platform used.

SmartManage aim to provide all the general functionality that other management applications have, like setting alarms for events this will keep the application useful even if the situation suddenly changed and new aims are required.

SmartManage aim to combine different tools/application to provide a more complete management experience to the user without having to leave the app.

1.4 Objectives

- Identify the major time management issues related to the Covid-19 pandemic.
- Develop a Web application for users to manage their daily activity in the best way possible.
- Provide the user with a simple application to manage their daily activity easily
- Constant contact with end-users to make sure that the end product still meets the requirements
- Identify patterns in activity management to be able to provide the user with better advice and solutions

1.5 Report Structure

Chapter 2: Lecture review of the resources used to research the problem to be solved and martial consulted to identify a solution.
Chapter 3: The provisional result of the survey conducted, data collection, user requirement, risk management and ethics issues.

Chapter 2: **Literature Review**

2.1 Workload

Time management is the process of planning and applying constant control on the time spent on a specific activity to increase productivity, efficiency and effectiveness. Time management can also be seen as a collection of skills that include organization, prioritization, planning and more. (Guide, 2020)

Time Management has never been easy, even in a stable situation. Time Management issues can be dated to way before the recent Covid-19 pandemic that changed the lives of millions of people increasing their workload, especially on double-income families that because of the school changing to remote learning will also have to be in charge for childcare while working from home.

University students are the category that struggles the most with time management in general. A report produced in May 2013 by Which? Magazine (Darian, 2013) shows that in average a university student in the United Kingdom is expected to study an average of 30 hours per week when factoring both scheduled learning and private learning. This figure sometimes rises to 40 hours per week in specific subjects like Architecture, Building and Planning and medical-related subjects and falls to 24 hours for students studying Mass Communications and Documentation. The report also shows that the average of hours a student is expected to study kept rising jumping from 26 hours in 2006 to 30 hours in 2013 and seen the continues growth over the analysed years we can predict that the number kept growing.

University student does not have only to worry about their study. A research was undertaken by Rutger Education and Employment Research Centre (Daniel Douglas, Paul Attewell, 2015) also found that 62.3% of the undergraduate students were part-time employed during their term, at the time the data was collected in 2015. Moreover, an article on the daily newspaper The Guardian (Gil, 2014) also found in the same year one in seven students work full-time while they study.

Students are only a fraction of the have to face a huge amount of workload, families are also a category that was heavily affected by it. (Daniela Del Boca, Mariacristina Rossi, Paola Profeta, Noemi Oggero, 2020)

2.2 Management and market research

To adapt to the new challenges millions of people turned to the technology to provide a solution. The effect of Covid-19 can be seen on multiple management, scheduling and video conferencing apps. One of the applications that profited the most from the ongoing pandemic is the video conferencing app Zoom, which daily pick meeting participants jump from around 10 million in December 2019 to more than 200+ million participants in March 2020 and the latest figures show that the app reached more than 300+ million in April this year. (IQBAL, 2020)

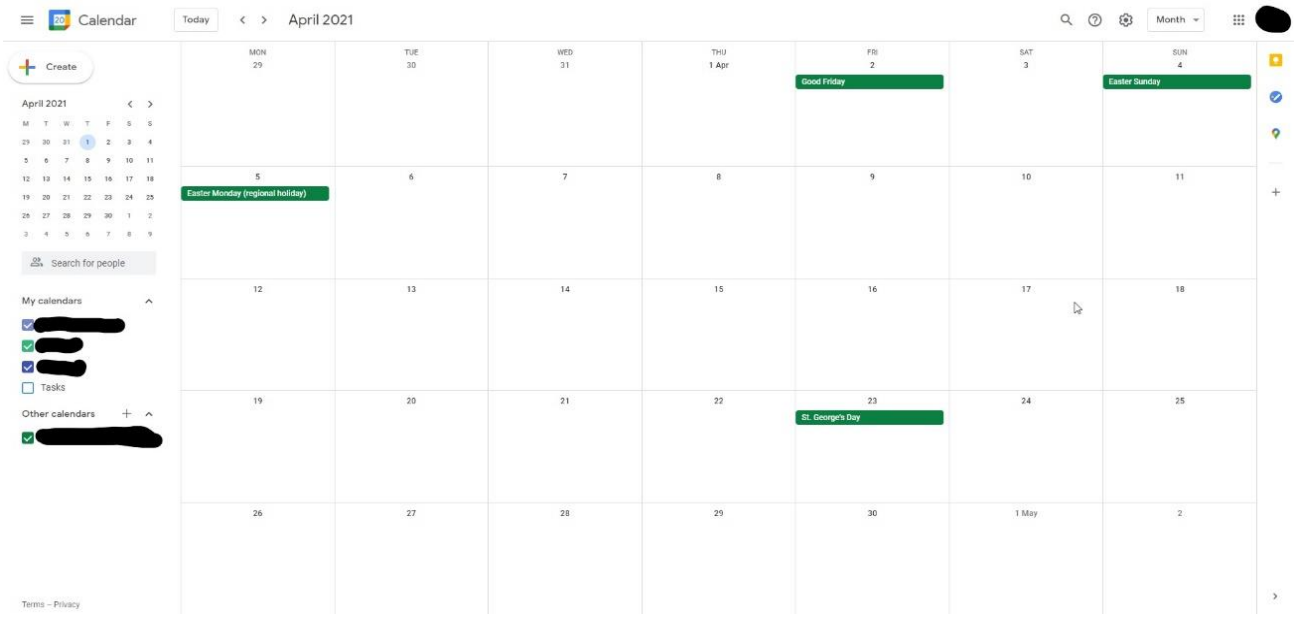
One of the major applications in the field of management and planning is Google Calendar. The app reached a milestone when it achieved 500 million installations in mid-2018 and reached more than a million installation this year. (Store, 2020)

Something that all the application on the market have in common is that they are stand-alone application that does not provide all the tools that a user will require to plan and manage their days.

2.2 Existing application review

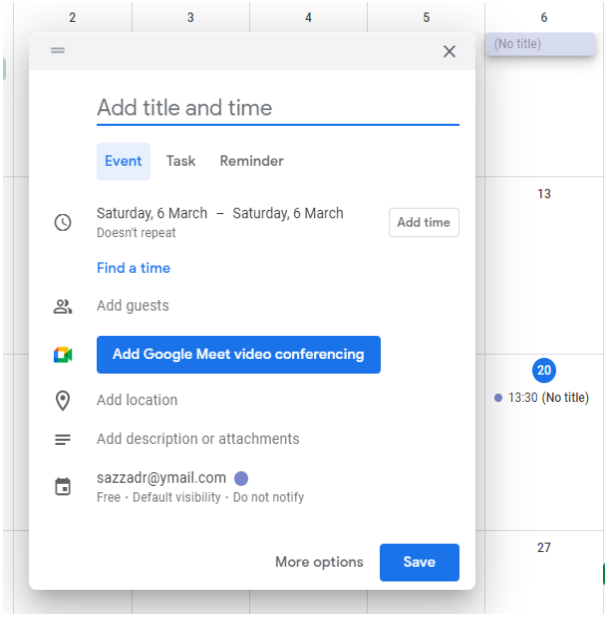
At present, there is an abundance of mobile applications to manage vent that provides a calendar UI. However, the situation is completely different for the browser environment, the two most famous are Google calendar and Outlook Calendar provided by Microsoft.

2.2.1 Google Calendar



Google calendar is a web application and a mobile application is available for both Android and iOS. Google calendar provides a clean and clear user interface to tack activity and event and shows them clearly to the user.

The implementation of pop-up tabs and Ajax request makes the application incredibly responsive and provides fluid navigation that makes the user more comfortable to use the application instead of an application that maybe need to reload at each action. The use of these features makes the navigation flow continues and uninterrupted.



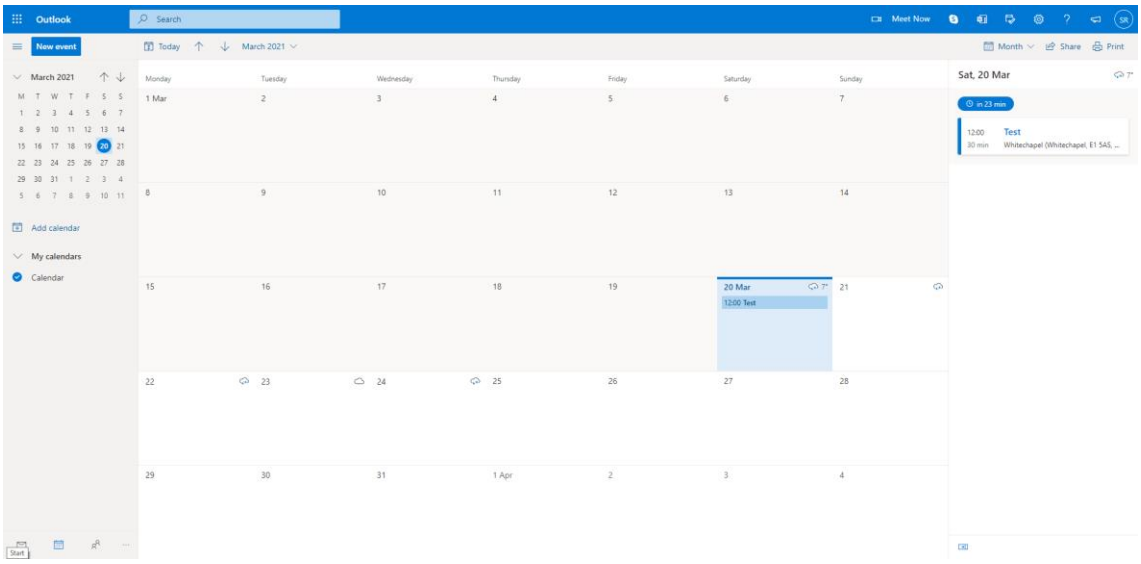
Major pros of the application are the built-in google maps for address search and the possibility to attach files in the description of events however, this functionality is not available for task and reminder.

However, the application does not provide wheatear information for the day of the event nor any health and wellbeing functionality like an activity tracker, therefore, a user to have a complete experience has to switch between web sites to get a complete experience.

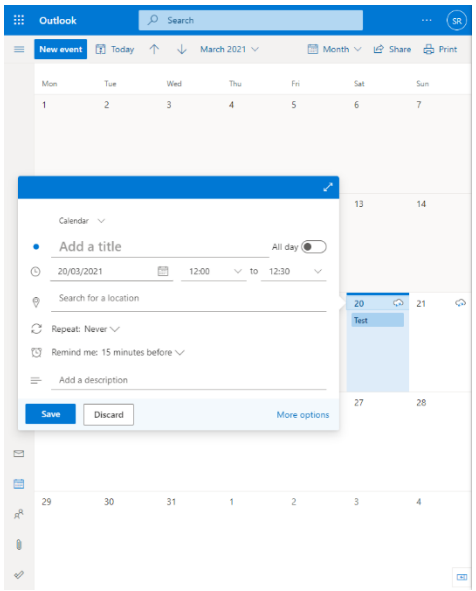
One of the major flaws of the application is the responsiveness of the navigation bar that is not programmed to resize in a more compact format when the size of the window is reduced. This leads to major navigation information to be cut our if the size of the window is not adequate.

Another design flow that in this case is less relevant with respect to the inability of the navigation bar to resize when needed, is the fact that on a small window size you need to press twice to make a search. Even if those are not major flow, they add up to a less enjoyable experience for the user.

2.2.2 Outlook calendar



Outlook calendar is an activity manager and scheduler application by Microsoft, as for Google calendar a mobile application version is available for both Android and iOS device. Overall, the design and the look of the application is very clean and functional, it does provide all the functionality you would expect from a management/calendar application, those include the ability to create events, however, in comparison to the Google calendar it does not allows user to create task or reminder but only events.



A really useful functionality that is not present in Google calendar is that close to the date on the calendar it also shows an icon that shows a prediction for the weather on the day, this is shown only for the six following days. Even if small this visual information is really useful for the user when managing activities.

The page is responsive thank to the implementation of both good Ajax request and JavaScript function. The Web application resizes the whole page content in base at the size of the window and switches to a more compact navigation bar when the size is reduced to an extreme that can no longer accommodate the full navigation bar.

The application does not allow the user to attach files to the event created, this greatly reduces the possibility for a user to create a complete and useful event reminder because in case the created event requires some documents the user will have to make a note and then spend time to locate the documents.

2.2.3 Conclusion

In conclusion, the two Web Application are similar both use a responsive decide and Ajax request to provide a fluid navigation experience. One of the more useful tools they both provide is the possibility to instantly locate the address for the event on a map, Google calendar used Google maps and Outlook calendar use Bing maps to achieve such tasks, however, there is a major difference between the two, Google calendar is able to achieve this task without the user leaving then page, on the other hand, Outlook calendar redirects the user to a separated page.

However, there are still functionalities in which they lack when it comes to providing a complete management environment and providing all the tools the user may need to manage their day as best as possible. They both lack a memo section that the user could use to taken notes that are not connected to a specific day, for example, a reminder to book an appointment with a doctor or similar tasks to which can not be attributed a date.

Chapter 3: **Analysis and Design**

3.1 Market Research Survey

A small survey was conducted to collect data about the current market status. Unfortunately, I was not able to collect enough data to make a deep analysis, however, was able to identify some critical point about the proposed app.

The showed that the application has a potential high usage around a vast range of age group, especially those between the age of 10-49. However, the data could be misleading as of now because of the low number of respondents. This, even if a preliminary result, is something I expected, based on previews research I have identified that our major stakeholder will be higher education student and working people, being them at high risk of overload of work.

The survey also asked which feature they will like the most between the following:

- Auto planner: will add generic event such as exercise and rest when the user has free time.
- In-app OCR (optical character recognition)
- Personalized feedback

The overwhelming majority of the respondent has chosen the OCR.

3.2 User data and requirement

3.2.1 Functional requirements

- Users must be able to create/delete/modify new events (core)
- Users must be able to attach images or document to an event
- Users must be able to create/delete memos in the appropriate page
- Users must be able to add events on any day of the calendar
- All data related to a specific event should be deleted when the event is deleted
- Users must have access to a page to check the weather
- Users must be able to save/remove favourite location for the weather

3.2.2 Non-Functional Requirements

- The system must run on any browser
- The system must be responsive independently form the size of the screen on the device used
- The system must be available 90% of the time

3.2.3 User Data Collection

No personal information about the user will be collected. Only data essential data for the application function will be collected and stored. Such data are:

- Date
- Time
- Location
- Platform

- Specification for event
- Media

3.3 Project risk

Risk	Likelihood	Severity	Impact	Preventative / Mitigating Actions
The scope is ill-defined	Low	Medium	The final product is not as expected.	Frequent meeting and well defined and detailed scope.
Training is inadequate	High	Medium	Unfinished product	Do not aim for complex requirements that are not essential. Complex secondary requirements can be implemented on a later stage if time available.
Legal & regulatory change impacts project	Low	Medium	Product not aligned with regulation	Stay updated for any major regulatory change in the field of interest.
The user interface isn't accessible (related to 'Legal & regulatory change impacts project')	Medium	Medium	Product not aligned with regulation. Limited access to some stakeholder	Stay updated for any major regulatory change in the field of interest.
Inaccurate feedback	Medium	High	The final product does not represent the best possible version of the app because of misleading or inaccurate feedback	Build a strong and accurate questionable that the tester will have to feel when providing feedback. This will make the analysis of the result more accurate.

Homogeneous tester	Low	Medium	The product will be adequate to meet the requirement/expectation of all the stakeholder, but it will focus only on the specific category of the testing team.	When selecting the tester select tester from different age-group gender and background to ensure all the compendial user are included in the testing.
Delays in the development	High	High	Project unfinished	Define a clear and stick timetable. Define multiple small tasks instead of large ones, this allows a better management of the timetable and the project itself
Error in programming	High	High	It can result in a vast waste of time that could lead to an unfinished product.	Use of version control software like Git-hub that allows the programmer to revert the project to working version if inappropriate change were made to the code.
Ethics	High	Medium	The product can be liable for legal challenges if the legal requirements are not followed. Boycott by specific groups if ethical principles are not followed.	The project will follow the UK Ethical business regulation and general ethic standard in software development.

3.4 Milestones

- Full report: A final report for the project will be produced explaining in detail the development process, research undertaken, and results of survey and testing conducted.
- Survey: Multiple surveys will be taken during the development process. A marker explorative survey will be taken during the requirement gathering and project definition. The follow-up

survey will be taken when the major functionality will be completed to gather to decide which will be the next step.
- Backbox testing report: Individuals that were not part of the development process will be asked to perform a Blackbox testing of the application and provide detailed feedback.
- Whitebox testing report: The development team will perform a deep Whitebox testing of the whole code to reduce the number of bugs and ensure the application can complete all the primary task.

3.5 Ethics

When developing an application there are multiples ethic issues that will have to be addressed.

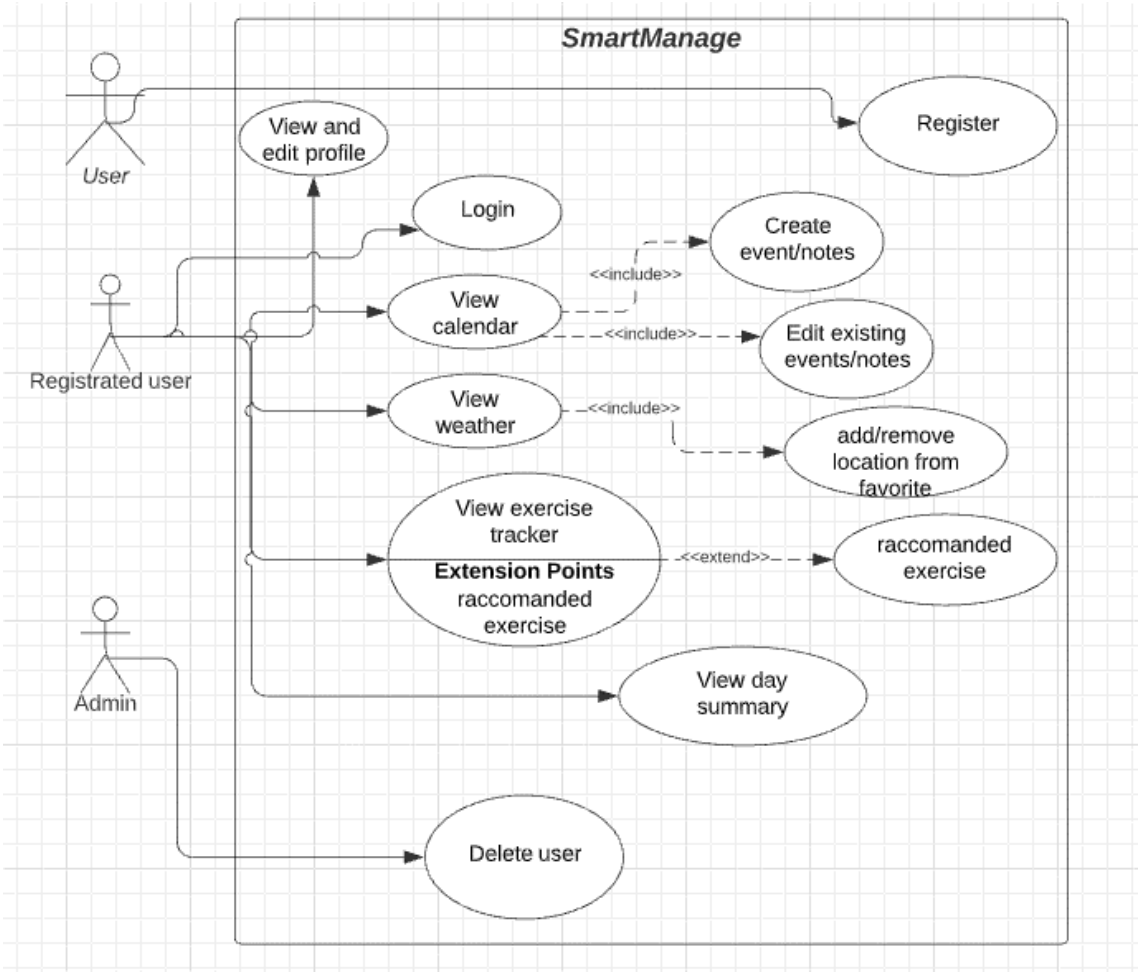
- Personal data management: Application and business manage thousands of persons private data every day, privacy is currently one of the hottest topics in the technology field, with the recent Facebook-Cambridge Analytic (Forrest, 2019) data scandal more and more people are concerned about how their data with Apple making personal data management and privacy one of their strings selling point. (Apple, 2020) SmartManage will not collect personal information about the user as specified in the data collection paragraph. Specific data about the events will be collected and will be stored only on the device.
- Data collection for advertisement and consent: The majority of the free app available on the market collect user information to provide aims advertisement to each user to pay for the maintenance of the service. SmartManage will not provide any advertisement based on user data. If any data will have to be collected with future updated the user will be asked to give consent. If consent is not given the user will not have access to functionality that require the collection of private information.
- Time usage: Lot of app makes it complicated for the user to achieve their goal quickly or use presentation tactics to increase the time the user spends on an application. The most popular of this tactic is endless scrolling that is widely used in the industry, the most visible example of this can be found in social media application like Facebook and Instagram. SmarthManage will provide users will an easy to use layout and navigation with shortcuts for the popular function to allow the users to achieve their goals in the lowest time possible.

Out of those specific issues, there are a lot of less known and uncommon ethics malpractice to prevent those to be integrated into SmartManage the development will follow the UK Ethical business regulation and general ethic standard in software development.

3.6 Design

3.6.1 Use cases

SmartManage will have multiple functionality and interaction. Below are some of the essential use cases that will help the user to achieve their goal.



The above is a simplified version to have a look at the functionality and interaction that the application will deliver.

3.6.2 Software development life circle – Iterative SDLC Model

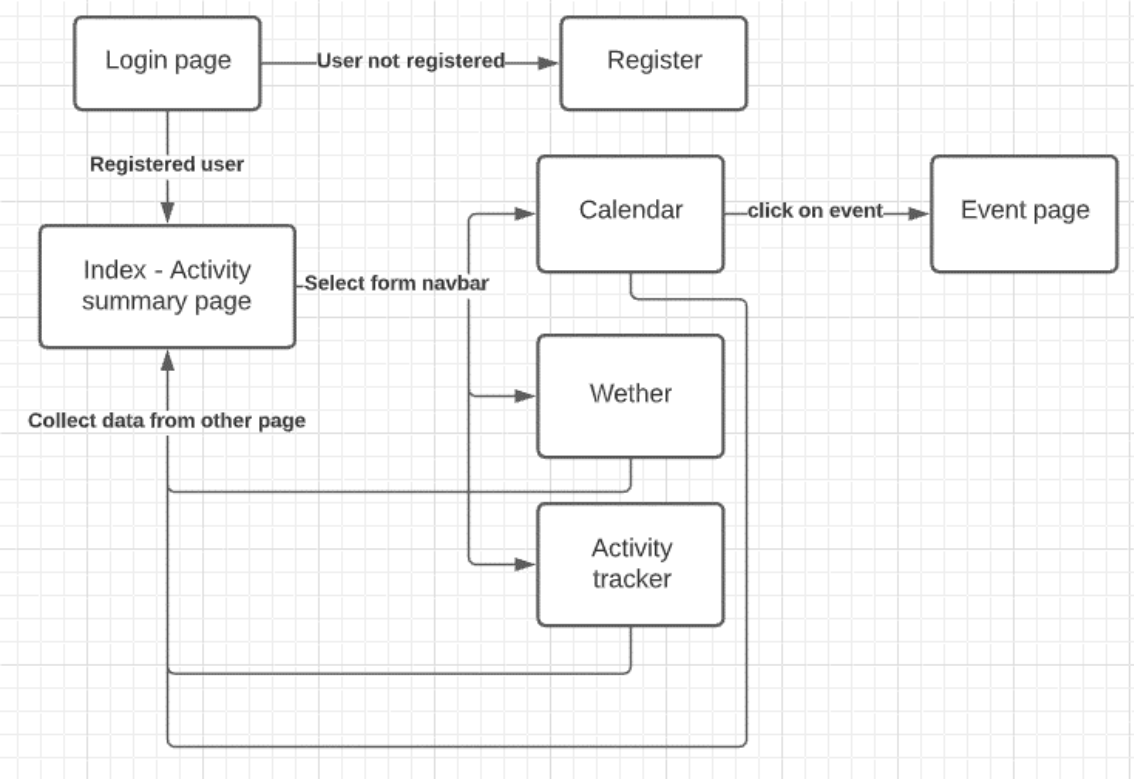
The Web Application will be developed using the Django web framework, which will include the use of Python for backend and HTML, CSS and JavaScript for the frontend, the database for the project will be managed in the backend with Python. We decided to use the Django web framework because of the useful tools it provides to make the coding part smoother and easier, for example, the whole authentication process will be handled by `django.contrib.auth`.

The SDLC model that we will be using is an iterative model. We choose the iterative models because it allows vast flexibility in the development process, it allows to start the development without a fully finalized user requirement, this will allow the implementation or requirement that with the time required for the development risen in the priority list. Therefore, during the development we will prioritize the development of the main feature in each sector for example the add/remove/edit functionality in the calendar sector then we will move to the main feature of a different sector when the main functionalities are developed and tested, we will run a survey to check if something changed in the priority list for the non-essential feature, if nothing changed, we would follow with the established order for the secondary functionality.

Although the iterative model provides multiple pros it will also require a more constant and updated timeline at each step this will make the management of the project more complicated, therefore, the project roadmap will be updated at the completion of each main task. However, we will be able to make sure that the final product meets the majority of the user's requirements at the end of the development and testing process.

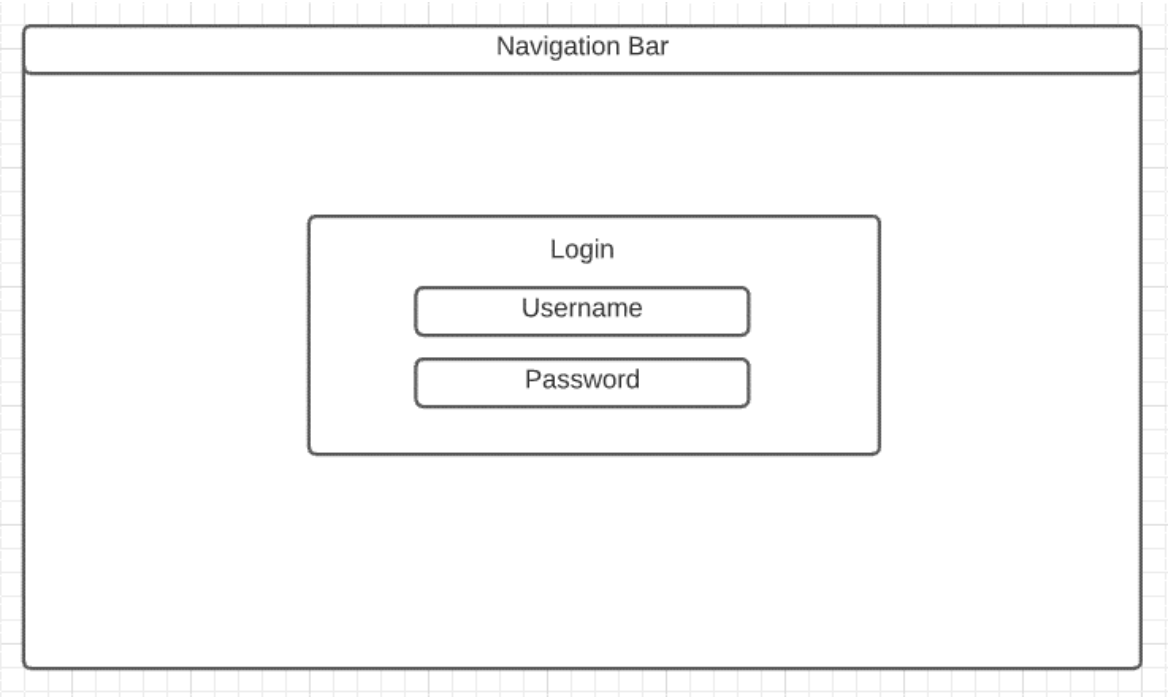
3.6.3 Web application structure

The structure of the website will be sample to allow even users without experience with similar application to be able to use all the tools that the application provides. Below is the pages structure, functionality and information on the page are not included in the diagram.



3.6.4 Pages layout

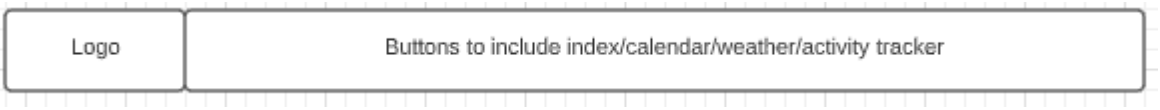
When the user first visits the website will be asked to log in.



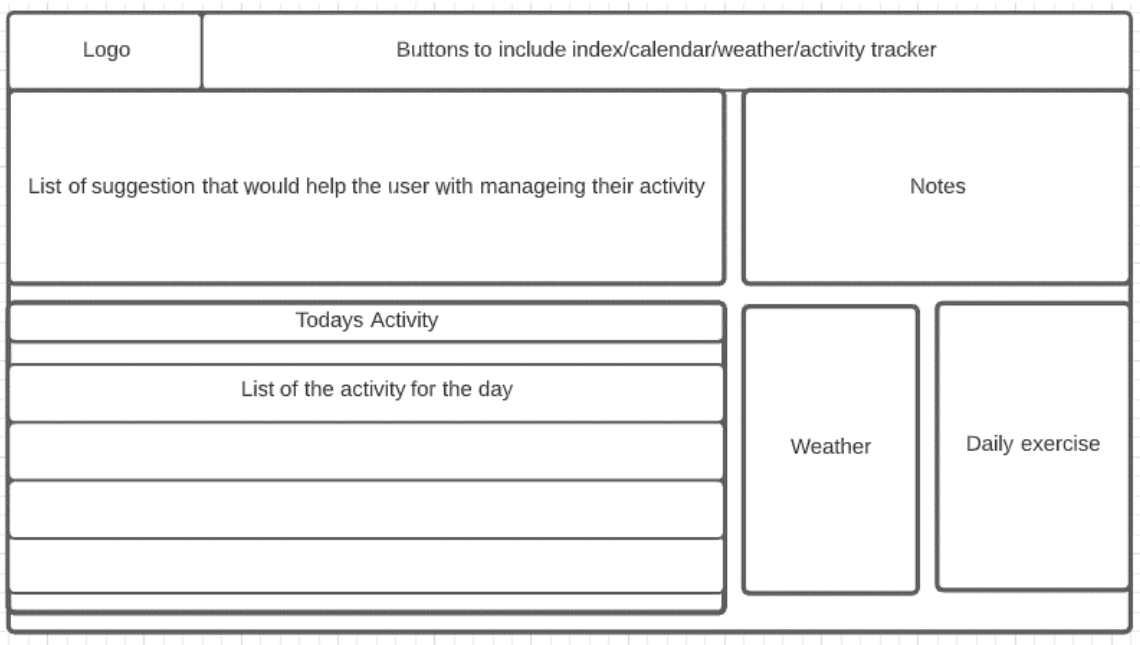
The navigation bar will how the user the name of the application and a button to register.

If the user press on register he will be redirected to a simple form that will collect information required for the registration.

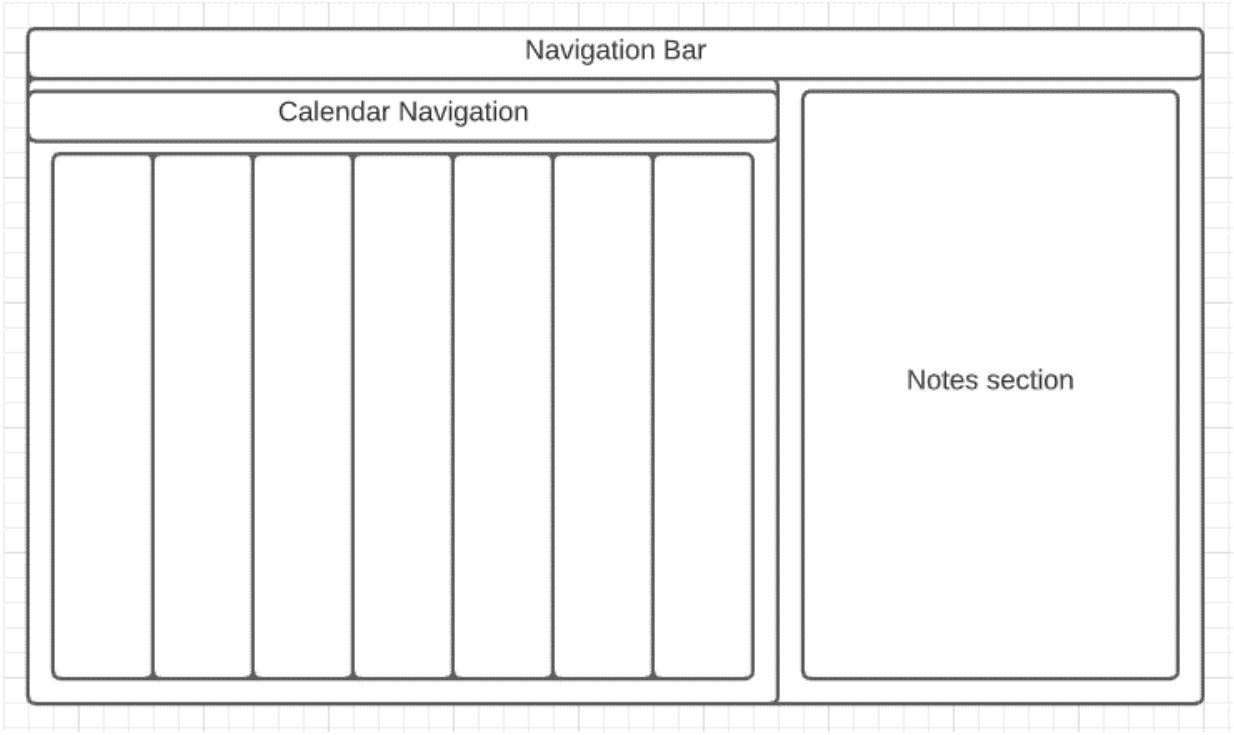
If the user completes the login correctly, he will be redirected to an index page that will collect different information from the different pages and return them to the user in a compact format. The navigation bar will also change and include buttons to navigate between pages. From this point on the information in the navigation bar will be constant and will be available to the user on all pages.



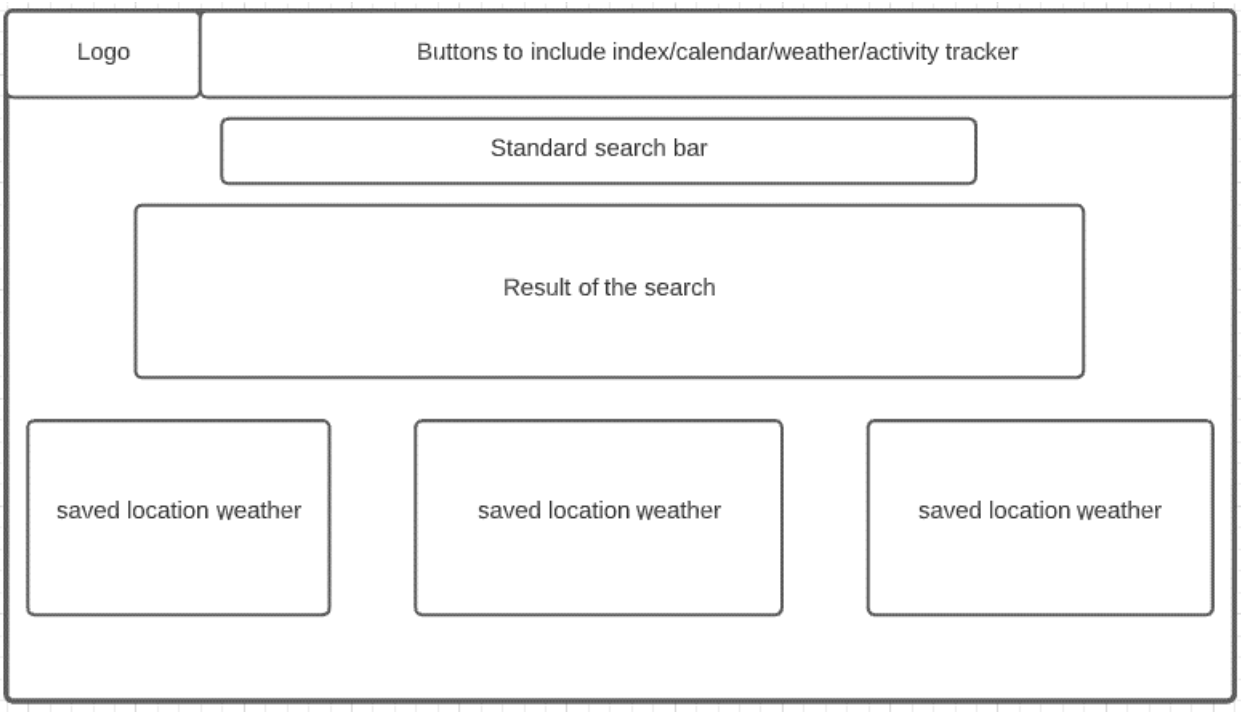
Index page



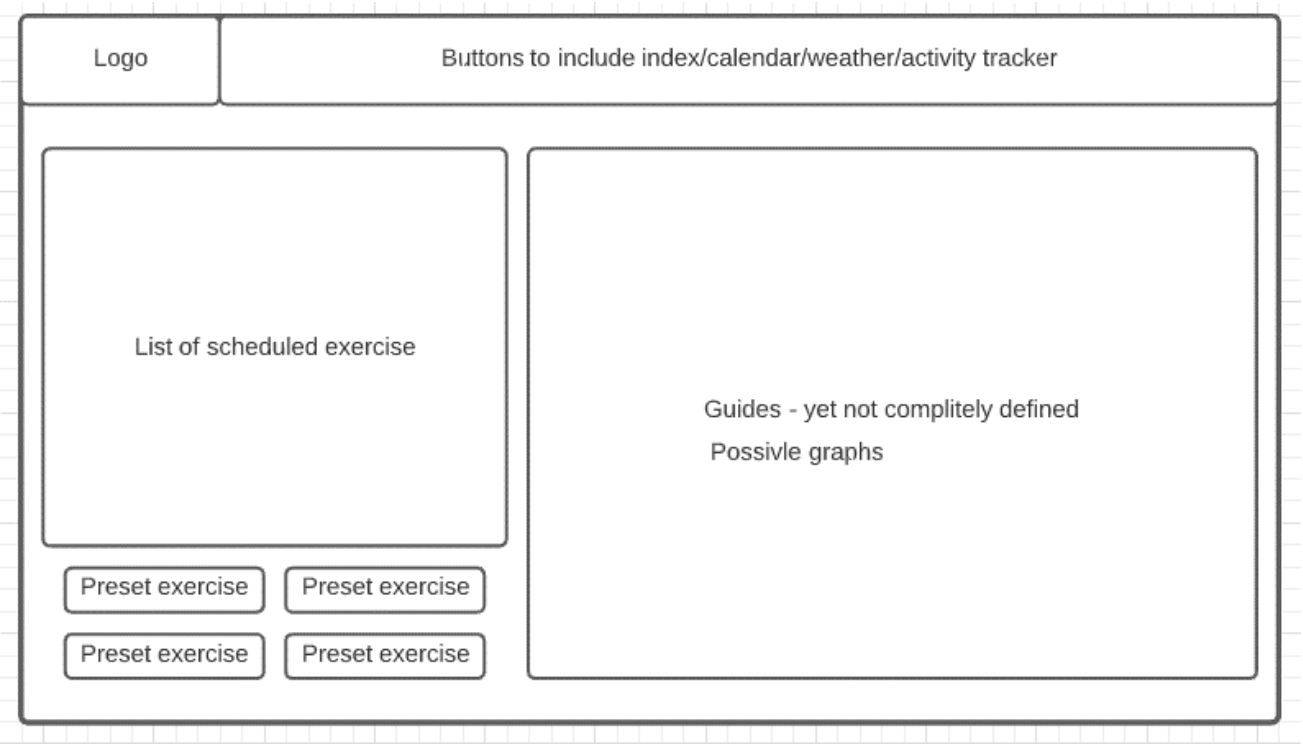
Calendar page



Weather page



Activity tracker page



When the screen size is reduced the content will resize appropriately, side to side element will be moved in a column format. Only the navigation bar will switch to a drop-down menu.

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Store, G. P. (2020). *Google Play Store*. Retrieved from Google Play Store: https://play.google.com/store/apps/details?id=com.google.android.calendar&hl=en&gl=US