



Human Computer Interaction

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1. Introduction

HCI(Human-computer-intraction) is the interaction between the user and the computer This course provides knowledge about system design, design evaluation, and how complex systems can be designed. HCI was born in 1980 with personal computers and today HCI has been used in more fields. HCI is the design that helps users interact with the product from the meanings of buttons and icons, interaction design is like designing a drawing on paper, in addition to the designs that help the user's eyes HCI This is an important step for users to understand the product quickly is the product suitable for each country, this is called ethics.

The project required the creation of a blueprint for a sport product for skiers that required Axure to design a design that would allow skiers to track and view their skiing (eg. : statistics and route taken) and the product must provide relevant content about nearby restaurants and cafes in the ski resort.And proof of quantity is required. user participation so that people have a feeling of wanting to use the product or not to use it to evaluate the quality of the product. To create a user-friendly design, the product's audience must be defined.

During the design process, I created 3 functions: Locate, History, Start Skiing

- Determines where you are currently standing and includes a map display showing the location of the ski mountain and navigation to nearby restaurants and cafes, searchable names of nearby restaurants and cafes there, it will then display information about the view of the bar and the menu of the restaurant, coffee, on top there is a clickable map icon to show you the cafe or restaurant of your choice
- History displays information during the week where you skated and displays parameters with a bar chart measuring how many km/h you slide, you can click on each column to see the route, calories burned , mountain name, time (date, time), temperature when skiing shows parameters of skiing activity
- Ski Strat is displayed when user starts skiing, press play icon and skier will see ski distance, ski time, calories

Link: SKI APP:

<https://qhelvf.axshare.com>

<https://qhelvf.axshare.com/#g=14>

2. Background

2.1 HCI research

Adams, Anne; Lunt, Peter; and Cairns, Paul. Human-Computer Interaction Research Methodologies, chapter A Qualitative Approaches to HCI Research, Cambridge University Press, pp. 138-157. (2008). Having stated that, science is highly reliant on quantification, yet in HCI, quantification is difficult to accomplish or experiment with, as is ethical research through experiments. The privacy of researchers cannot be curtailed. Consider the growth of mobile devices; the user interface makes design increasingly challenging if not thoroughly explored. There are now interactions between technology and life as a result of the dispersion of social networks and computer technologies, which has loosened the link between technology and the HCI platform. Yet, because it is difficult to identify and quantify factors, the authors are unsure where to perform the research. They recognize that focusing on the job is no longer an option for designing effective systems due to the current necessity to comprehend the user's perception, experience, and emotions while looking at the product and the user's use. How will people react when they use it? As a result, HCI research is more qualitative than quantitative.

HCI design is a comprehensive process that necessitates careful balance of human emotions and appropriate functionalities for users. Four actions are required for successful HCI design: identifying requirements, generating an alternative design, producing an interactive version of the design, and validating the design. Three user adoption principles: Iterative design, user-centered design, and performance measurement

Design method

The framework of HCI is Activity Theory, which gives logic and tools for analysis and interface design.

User-centered design may make designers' jobs simpler since they can easily grasp what users require.

User interface design principles: this concept states that icons and functionalities should be designed such that the user understands what they are. For example, if the trash can icon is presented, the user will understand that this is a delete button.

The value-sensitive design investigates investor knowledge of technology usage, conducts a qualitative and quantitative user survey, and conducts a technical examination of technology use design and execution.

Job analysis is an important aspect of user requirements analysis design in order to build solutions that meet the needs of the users and save developers time.

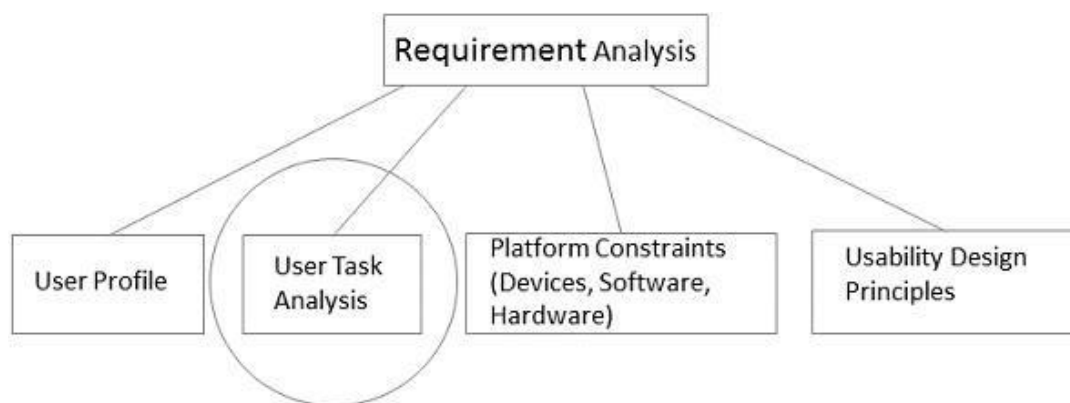


Fig 1: Task Analysis(Source:

https://www.tutorialspoint.com/human_computer_interface/design_process_and_task_analysis.htm)

2.2 Alpine Skiing Tracking Method

- In Rapid peer review and publication
- Authors: Jiashuo Qi,Dongguang Li, Cong Zhang,Yu Wang
- Date of Publication: 12 April 2022
- Electronic ISSN: 2169-3536

In this article, they mentioned the study of tracking skiers using UAV optical sensors to calculate and analyze and study the difficulty of targeting.

They wanted to display information about the skier's acceleration, speed, trajectory, incline, angular velocity and video image of the skier, which is important for improving skiing skills and performance, complex motion altimeter and drop

Alpine Skiing Data Acquisition and Analysis System

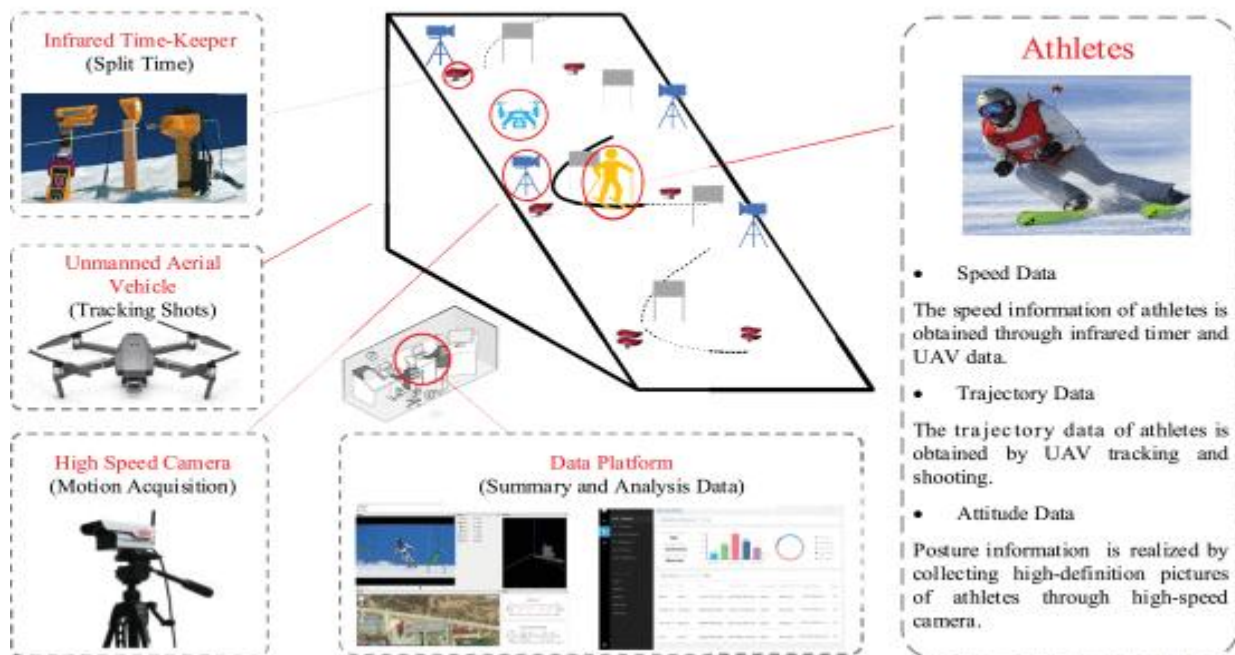


Fig 2: Alpine Skiing Data Acquisition and Analysis System.

(Source: <https://ieeexplore.ieee.org/abstract/document/9755966>)

In my product, I use the functions to measure how many km/h missed and how many calories burned while skiing, showing how many kilometers a day skied and which day skied more.

2.3 Location around

- CHI '08: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems April 2008 Pages 1157–1166 <https://doi.org/10.1145/1357054.1357237>

- Authors: Victoria Bellotti, Bo Begole, Ed H. Chi, Nicolas Ducheneaut, Ji Fang, Ellen Isaacs, Tracy King, Mark W. Newman, Kurt Patriage, Bob Price, Paul Rasmussen, Michael Roberts, Dianel J Schiano, Alan Walendowski

This article describes Magitti, a context-aware mobile recommender system. Magitti is unique in that it infers user activity from context and patterns of user behavior and produces suggestions for content matching without the user having to perform a query. Comprehensive field investigations of leisure time behaviors in an urban context (Tokyo) inspired the concept, developed its specifics, and gave data detailing normal behavior patterns. The fieldwork, user interface, system components and functionality, and assessment of the Magitti prototype are all described in the study.

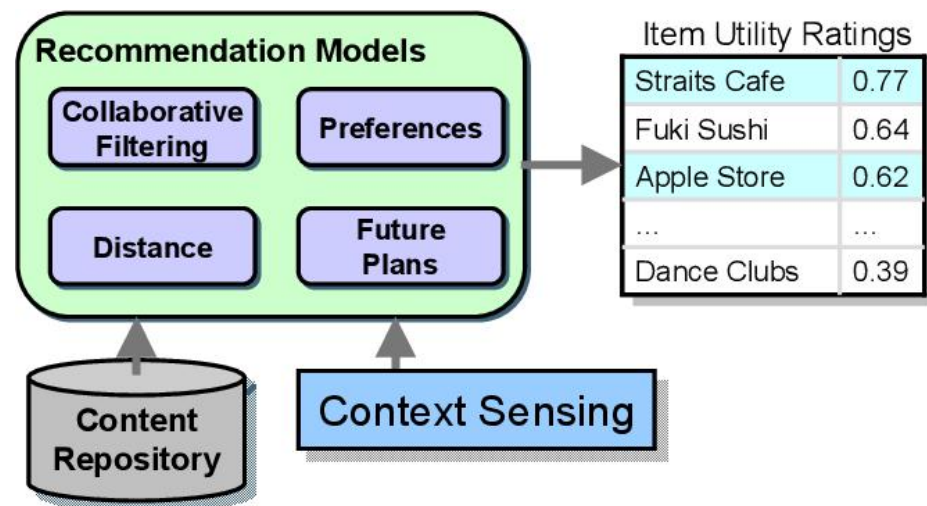


Fig 3 :Surroundnavigati on system

(Source:<https://d3i71xaburhd42.cloudfront.net/1d1fe7384b674009e295f1c23ac8da34eb90a054/6-Figure5-1.png>)

I use this idea to design according to the topic. I use Magitti model to visualize the design, according to which I design the current position standing and around there will be more restaurants and nearby cafe

3. Design Process

3.1 Conceptual Design

3.1.1 Site Map

- Here is a map of the steps when using the SKI app: first enter the ski icon then you will come to a screen with a start button, then log in and it will show successful login click on ok , will come to the main screen of the app, will show three buttons: locate, history, start skiing
- In Locate will display a map of the user's location and nearby coffee or restaurant locations just click on the icon and it will display the navigation and typing page of the restaurant or coffee you want to go to . There is a search button above so that users can go to the information page of the restaurant or cafe just selected there will display the image of the shop and the menu of the restaurant, if you want to go there, you can click on the map icon will be navigated there
- In the history section, a column chart will appear showing how many kilometers the user has skied, users just need to click on each column chart to see eg: the user wants to see on

the 2nd day the user has skied. how many km snow and what mountain to ski, time, temperature when skiing, how many calories burned

- In the last part is to start skiing: when you want to start skiing, it will display the play button for you to start skiing and it will automatically record parameters: skiing time, distance data, data average speed, calorie count

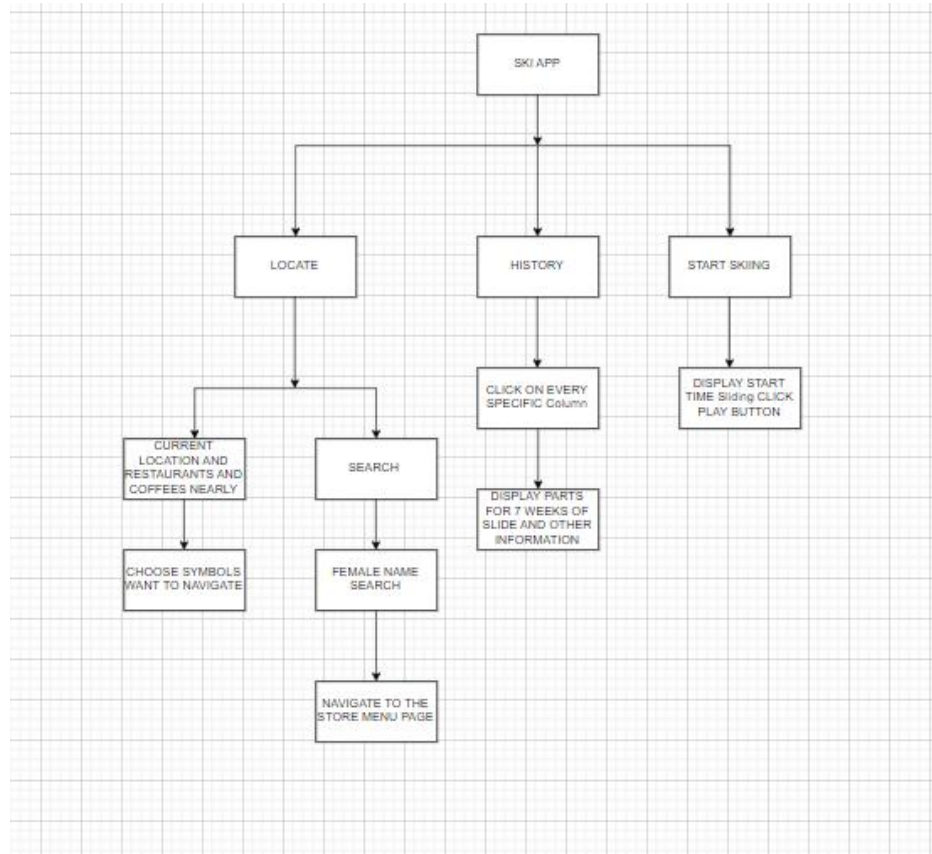


Fig 4: Site Map

3.1.2 Use case

In the user section, there will be additional login and logout functions and the rest of the functions are guided on the site map section.

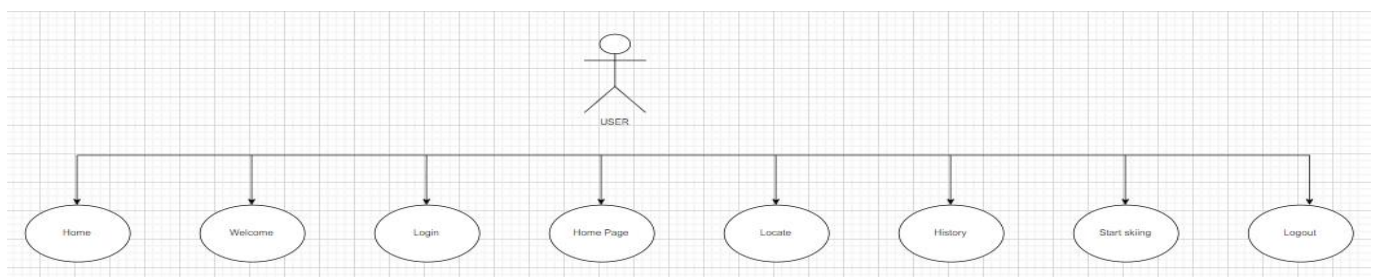


Fig 5: Use case

3.1.3 Conceptual Model

This process when the user has just used the phone. When they open the phone the first thing they will touch the phone screen and when the phone is unlocked they will choose the type of interaction they want eg: they want to ski can click on the type of interaction SKI APP will continue. follow will display according to use case

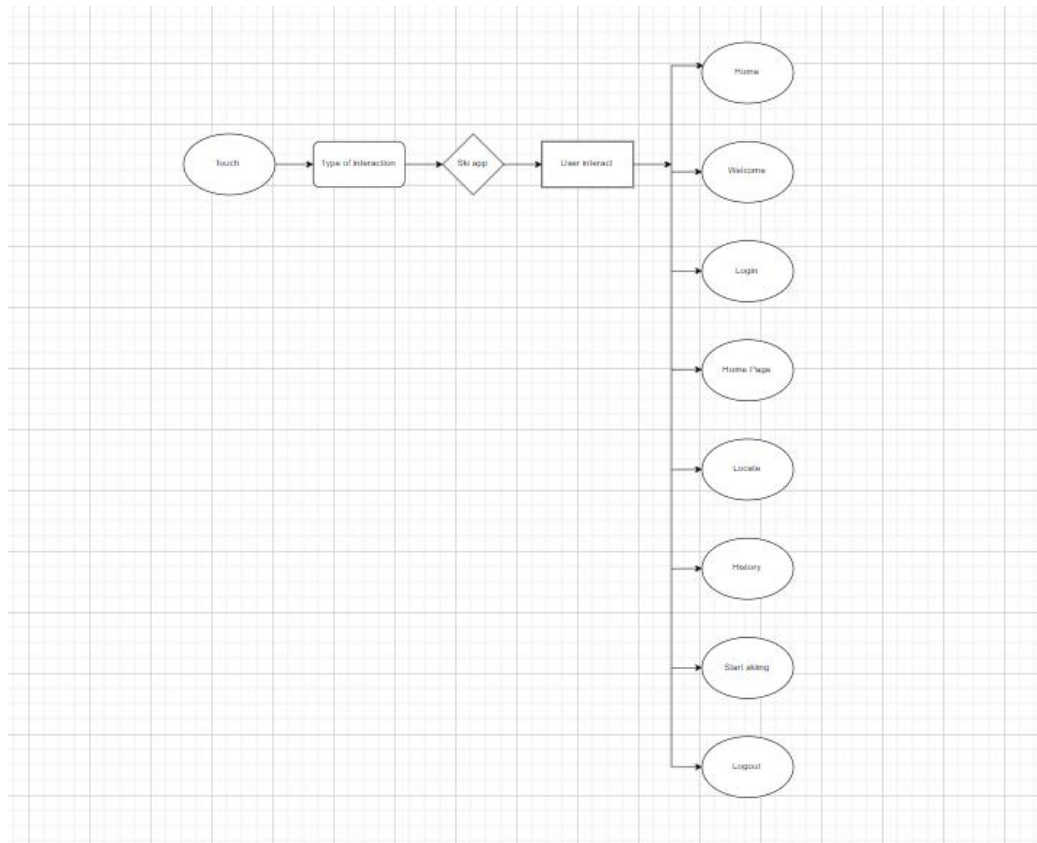


Fig 6: Conceptual Model

During the process of working on the project, I had a hard time coming up with an idea of how to design it in accordance with the identification of nearby restaurants and cafes, so I came up with the idea that I would give them to them. shows directions from where you are to where you need to go, such as a cafe or restaurant. The search part was hard to handle at first I had trouble when it didn't show up when I searched for information and after 2 days I was able to fix it and it searched successfully as I wanted.

3.2 Five Dimension of Interaction Design

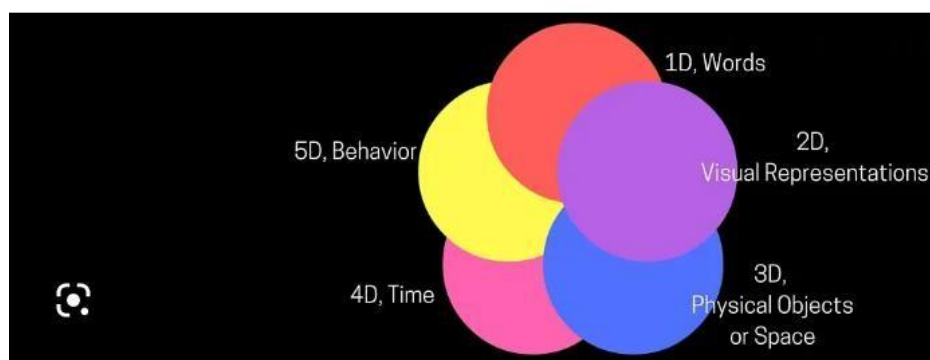


Fig 7: Five Dimension of Interaction Design

1D Words:

Words have a profound effect on us they convey important meanings and can alter our feelings. As a result, the language should be employed in a voice that the user is acquainted with.

An intonation that matches the user's preferences and is utilized consistently throughout the product.

2D Visual Representations:

Refers to graphs that display outcomes; it is also inferior to words; its visuals are results, and they may be utilized to understand what consumers desire and what can be accomplished for them. 4 icon 2D depiction of icons using foreground/background colors, borders, and visual hierarchy.

3D Physical Objects or Space :

The surrounding elements are designed so that consumers grasp the meaning of each of our functions, such as the trash can icon, which indicates delete.

4D Time :

How long will it take for consumers to monitor the status of the interaction and comprehend the functionality we create?

5D Behaviour : It's similar to what the blueprints do.

- In the process of designing the blueprint, I didn't know how to name the app and wanted to be easy to understand and able to meet their requirements, so I set it as SKI APP, which was both simple and easy for them to understand. easy to find it on the phone screen. Inside the background color I used white as the main color, the map image is green, in the map section I tried to add a border to show the way to the user and display a small table to show the map. evaluating this will make it easier for them to achieve results. In the design I use the map icon most of the time like in the information and menu of the restaurant or cafe I use the map icon with a red image so they can understand that it is the location from where they are. go to where they want to go, the search part just need the user to click on the letters I added will find the restaurants and click eg: they search and press the letter "a" it will show two parameters suggest Aux Folies , Au Petit Fer a Cheval , if they want to choose Au Petit Fer a Cheval it will navigate to the Au Petit Fer a Cheval information page and also a map to get there . I have tried to keep things as simple as possible so that the users can understand what I want to convey to them, so they will understand it in no time. behavior in design i just want the user to be able to go where they want to go by directing them

4. Prototype

4.1 Design low-fidelity prototype

- I using Axure

4.1.0: Home it's the navigation button inside the app

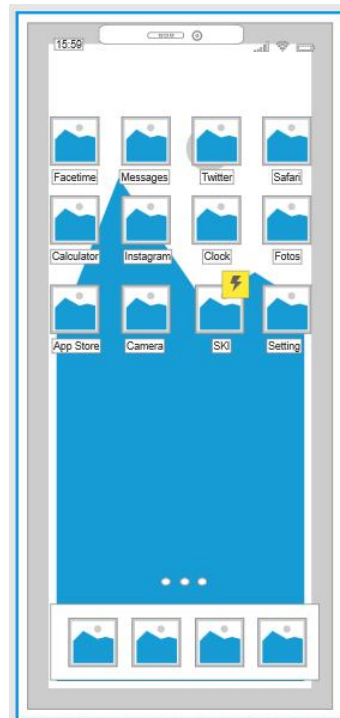


Fig 8:Home

4.1.1 Welcome in the screen there is a start button the user can click to be able to enter the login section in the app

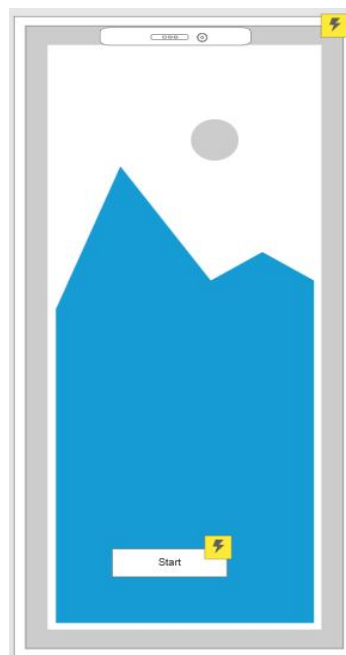


Fig 9: Welcome

4.1.2 Login :this is the login page when you enter the correct information it will display a message that you have successfully logged in and move to the next page

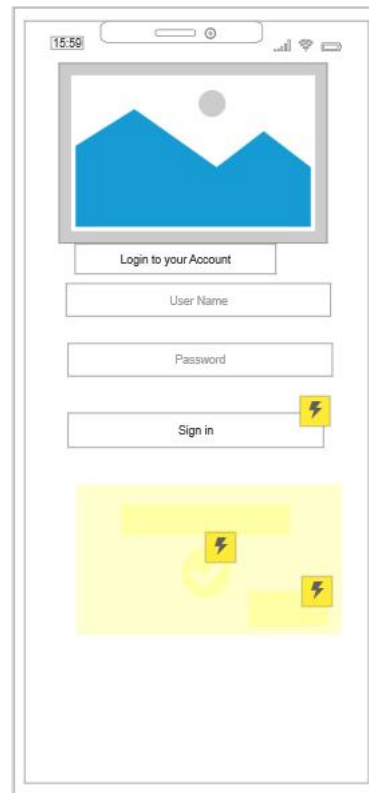


Fig 10: Login

4.1.3 Home Page : this is the home page of the app that includes ski pictures and functions with three buttons: locate, history, start skiing users just need to click if they want.

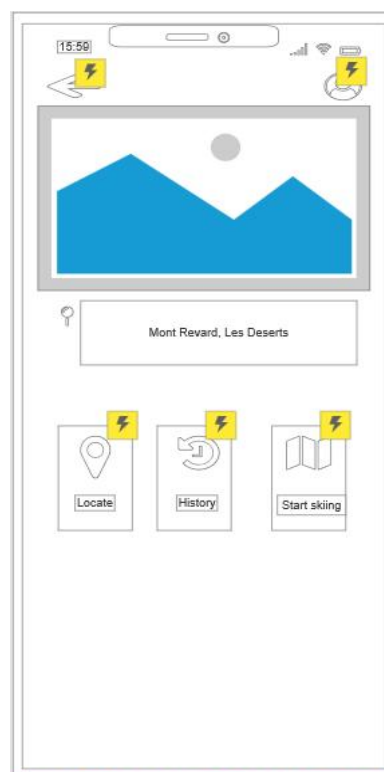


Fig 11: Home Page

4.1.4 Locate : if you want to navigate on locate button it will show your current location and restaurants and cafes near you. You can click on the restaurant icons, it will be a fork and a spoon, and the cafe will be a cup icon for hot coffee.

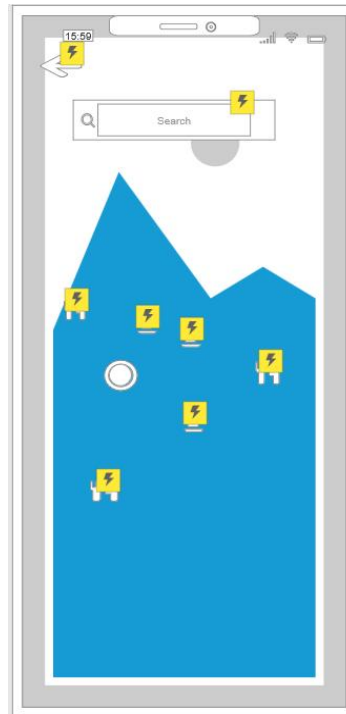
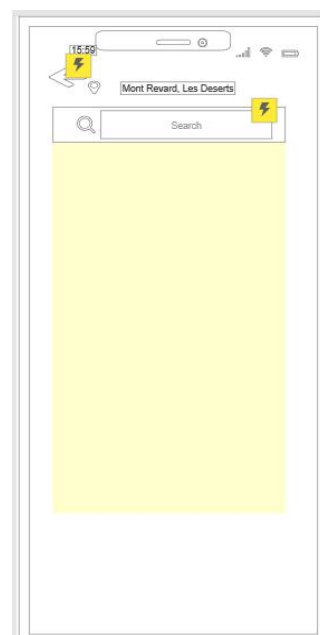


Fig 12: Locate

4.1.5 Search : There is also a search button on the top of the map when clicking on it will link to the search page as said on the site map eg: you want to go to a cafe called Aux Folies , you just need to click on the letter "a" " it will suggest you a name Aux Folies you just click on the selected name it will navigate you to the information page of the cafe you have chosen



Fig

13 : Search

4.1.6 Aux Folies: In the information board of the Aux Folies , there is a red map icon, it will guide you to that shop and display customer reviews for more peace of mind.



Fig 14 : Aux Folies

4.1.7 Aux Folies Inf: The information board about the shop is named Aux Folies when you selected it in the search

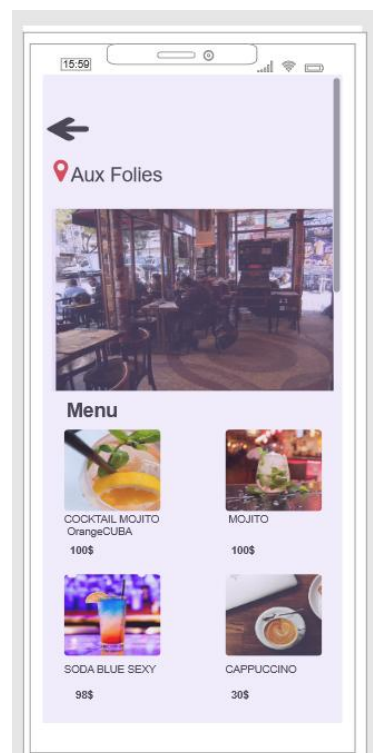


Fig 15 : Aux FoliesInf

- 4.1.8 Cafe de Flore: In the information board of the Cafe de Flore , there is a red map icon, it will guide you to that shop and display customer reviews for more peace of mind.

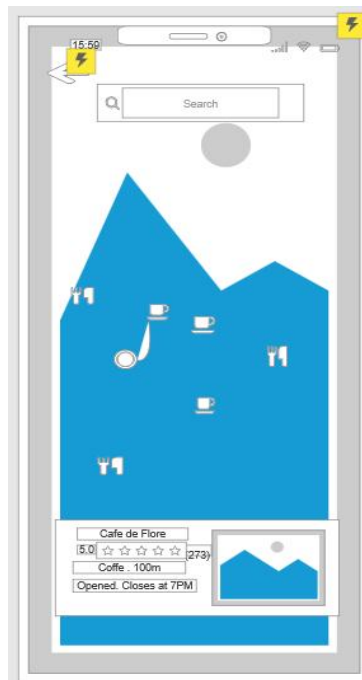


Fig 16 : Cafe de Flore

- 4.1.9 Cafe de Flore Inf :The information board about the shop is named Cafe de Flore when you selected it in the search

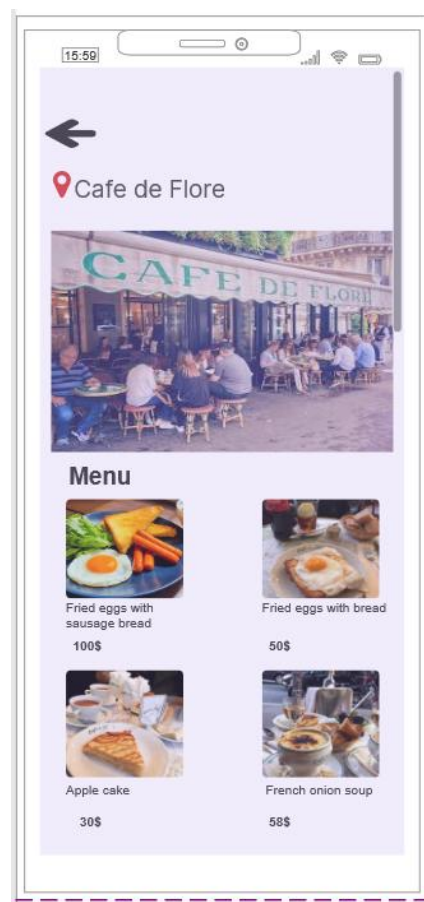


Fig 17 : Cafe de Flore Info

- 4.1.10 Au Petit Fer a Cheval : In the information board of the Au Petit Fer a Cheval, there is a red map icon, it will guide you to that shop and display customer reviews for more peace of mind.

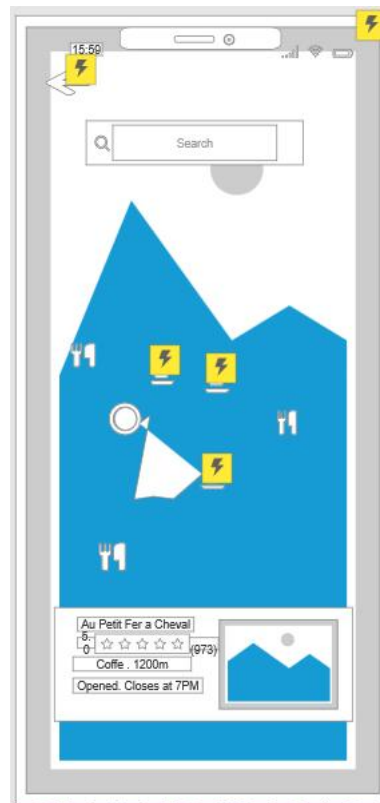


Fig 19 : Au Petit Fer a Cheval

- 4.1.11 Au Petit Fer a Cheval Inf : The information board about the shop is named Au Petit Fer a Cheval when you selected it in the search



Fig 20 : Au Petit Fer a Cheval Inf

- 4.1.12 Il Etait Un Square : In the information board of the Il Etait Un Square, there is a red map icon, it will guide you to that shop and display customer reviews for more peace of mind.

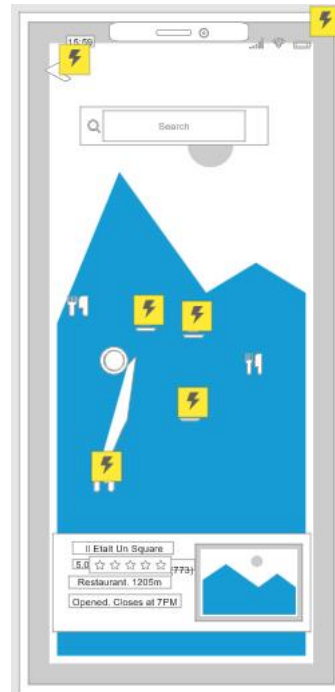


Fig 22 : Il Etait Un Square

- 4.1.13 Il Etait Un Square Inf : The information board about the shop is named Il Etait Un Square when you selected it in the search



Fig 23 : Il Etait Un Square Inf

- 4.1.14 Cavale : In the information board of the Cavale , there is a red map icon, it will guide you to that shop and display customer reviews for more peace of mind.

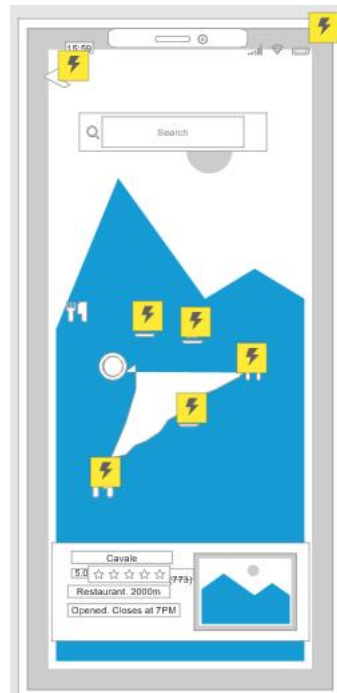


Fig 25 : Cavale

- 4.1.15 Cavale Inf : The information board about the shop is named Cavale when you selected it in the search

- 4.1.16

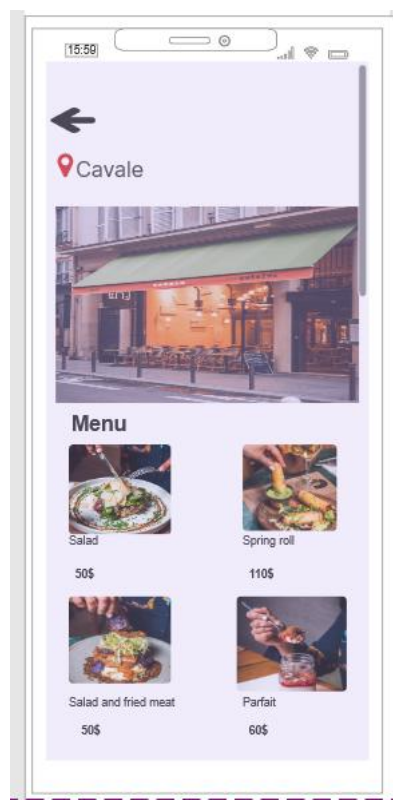


Fig 26 : Cavale Inf

- 4.1.17 Bistrot Instinct: In the information board of the Bistrot Instinct , there is a red map icon, it will guide you to that shop and display customer reviews for more peace of mind.

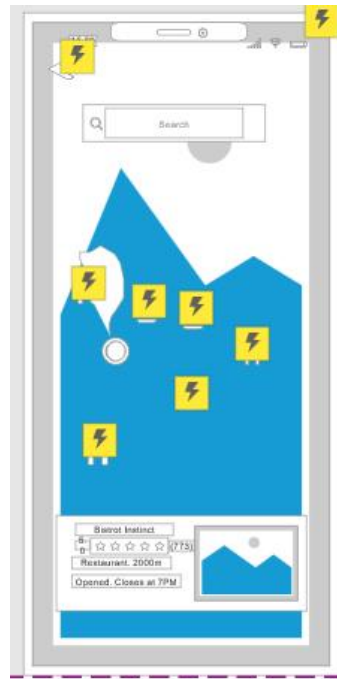


Fig 27 : Bistrot Instinct

- 4.1.18 Bistrot Instinct Inf : The information board about the shop is named Bistrot Instinct when you selected it in the search

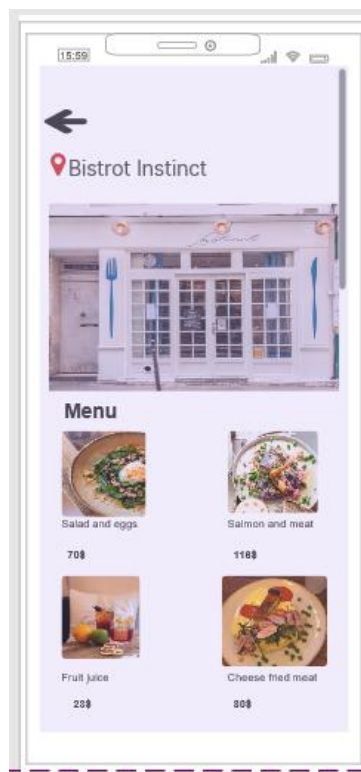


Fig 28 : Bistrot Instinct Inf

- 4.1.19 History S: Information about the day of skiing and it will record the information if you enter the column marked with "S" for the week it will display information about km, calories, mountain skied, temperature, ski time what time

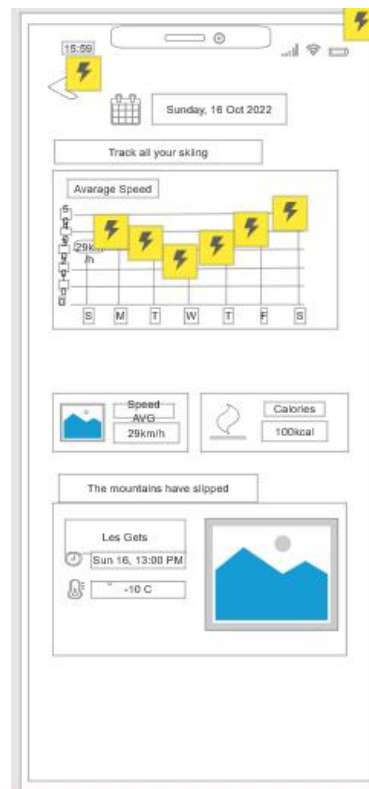


Fig 30 : History S

- 4.1.20 History M: Information about the day of skiing and it will record the information if you enter the column marked with "M" for the week it will display information about km, calories, mountain skied, temperature, ski time what time?

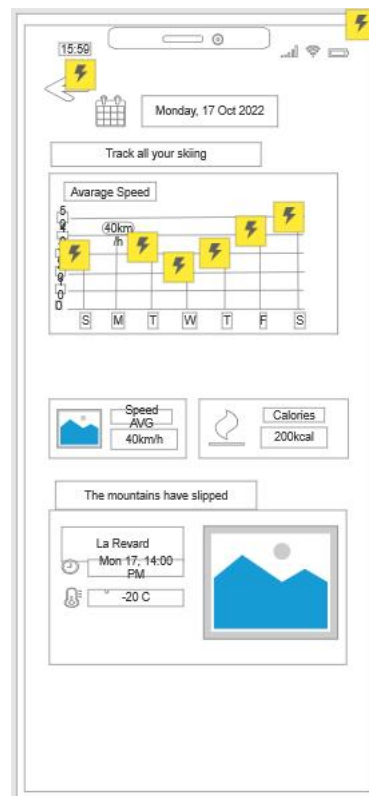


Fig 31 : History M

- 4.1.21 History T: Information about the day of skiing and it will record the information if you enter the column marked with "T" for the week it will display information about km, calories, mountain skied, temperature, ski time what time?

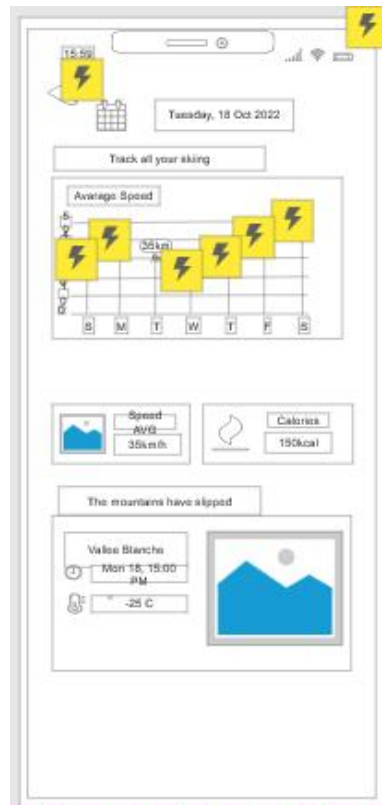


Fig 31 : History T

- 4.1.22 History : Information about the day of skiing and it will record the information if you enter the column marked with "W" for the week it will display information about km, calories, mountain skied, temperature, ski time what time?

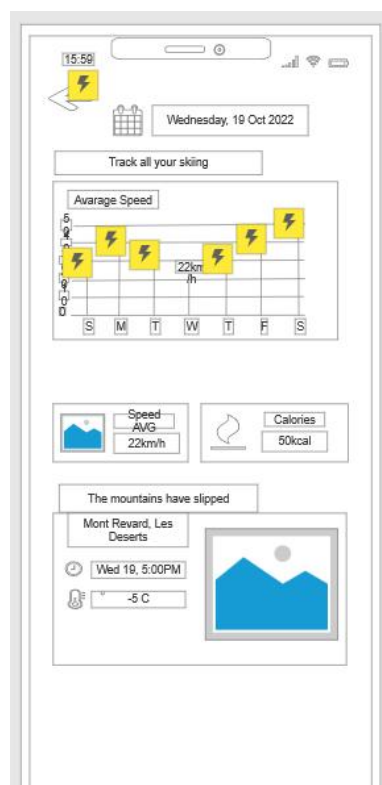


Fig 30 : History

- 4.1.23 History TH: Information about the day of skiing and it will record the information if you enter the column marked with "T" for the week it will display information about km, calories, mountain skied, temperature, ski time what time?

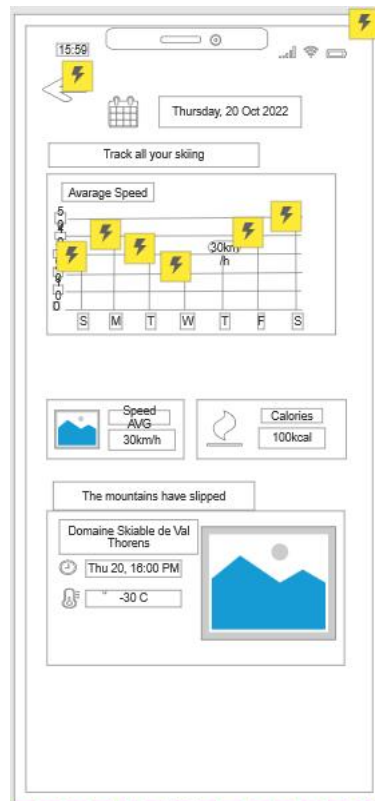


Fig 32 : History TH

- 4.1.24 History F: Information about the day of skiing and it will record the information if you enter the column marked with "F" for the week it will display information about km, calories, mountain skied, temperature, ski time what time?

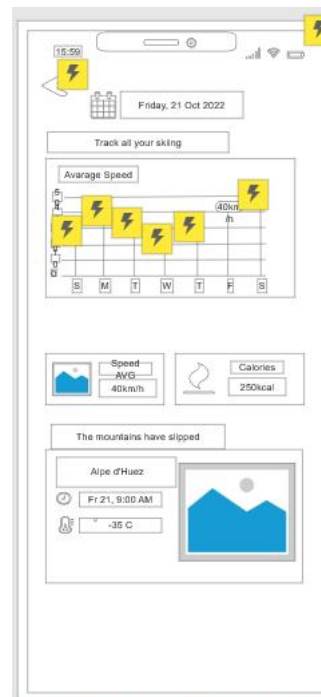


Fig 33 : History F

- 4.1.25 History SA: Information about the day of skiing and it will record the information if you enter the column marked with "S" for the week it will display information about km, calories, mountain skied, temperature, ski time what time?

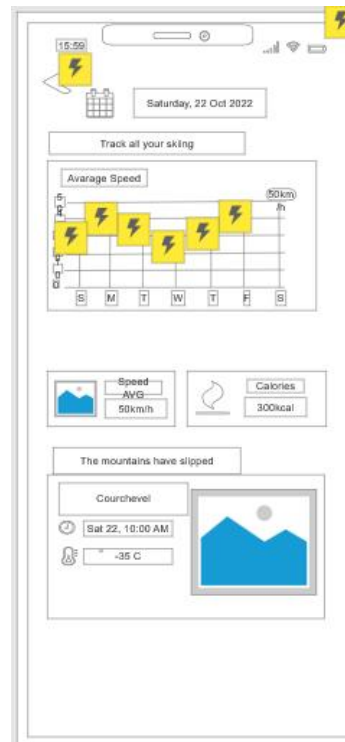


Fig 34 : History SA

- 4.1.26 Start Skiing : For this site I made it so that when skiing directly it can measure the distance, average speed, calories of the skier.

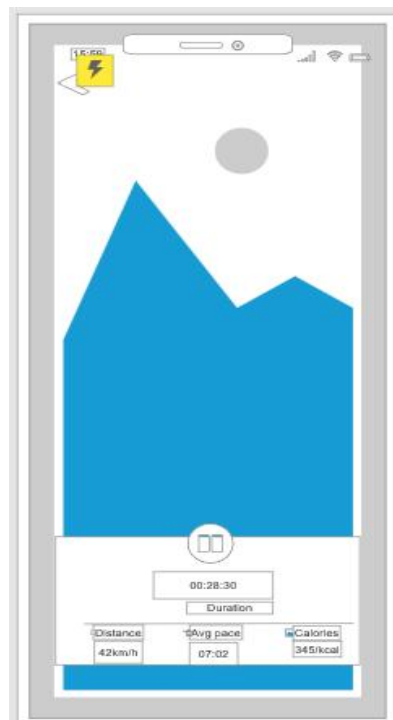


Fig 35 : Start Skiing

- 4.1.27 Log Out: In the main page on the top right side of the screen, there is a human icon for logging out. When clicking on the page below that says "Log Out" it will return to the main screen and exit the application completely

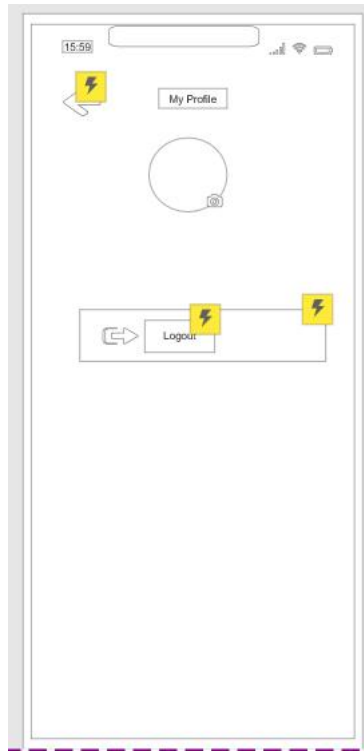


Fig 36 : Log Out

4.2 Design high-fidelity prototype

- I using Axure

4.2.0 Home: it's the navigation button inside the app



Fig 37 : Home

4.2.1 Welcome: in the screen there is a start button the user can click to be able to enter the login section in the app

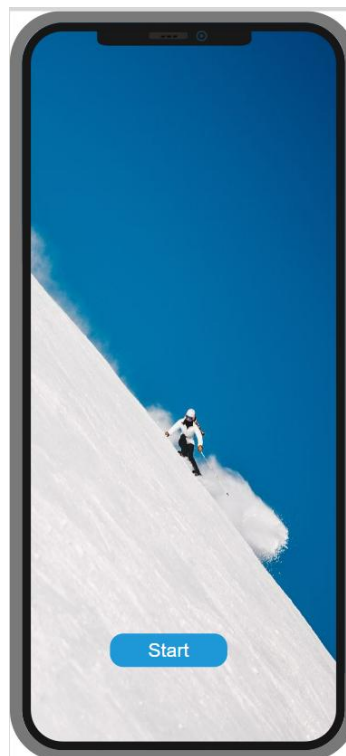


Fig 38: Welcome

4.2.2 Login: this is the login page when you enter the correct information it will display a message that you have successfully logged in and move to the next page

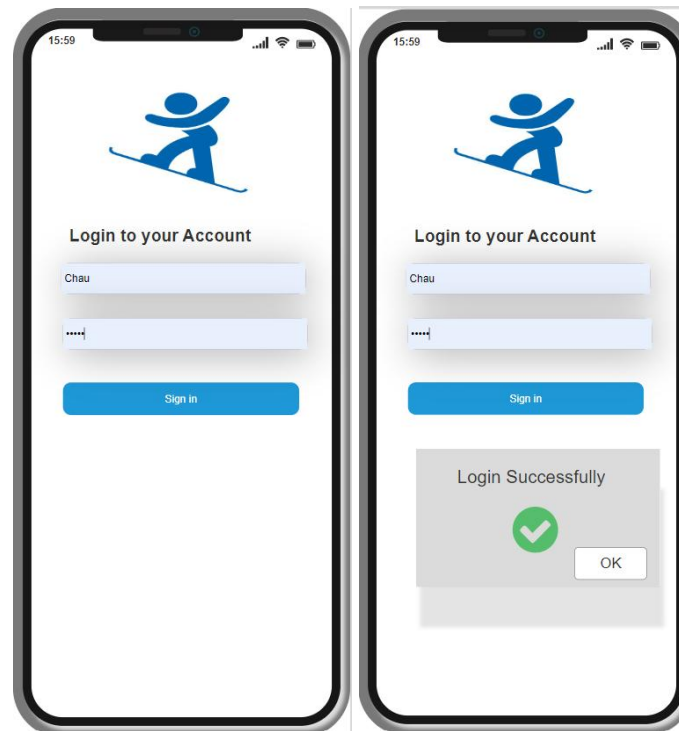


Fig 39: Login

4.2.3 Home Page: this is the home page of the app that includes ski pictures and functions with three buttons: locate, history, start skiing users just need to click if they want.

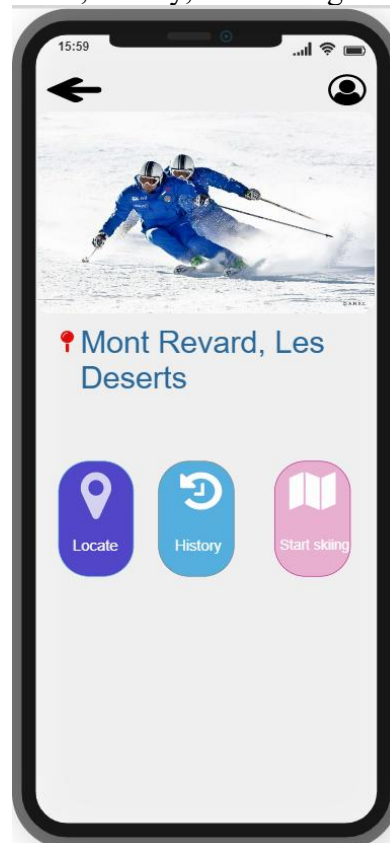


Fig 40: Home Page

4.2.4 Locate: if you want to navigate on locate button it will show your current location and restaurants and cafes near you. You can click on the restaurant icons, it will be a fork and a spoon, and the cafe will be a cup icon for hot coffee.

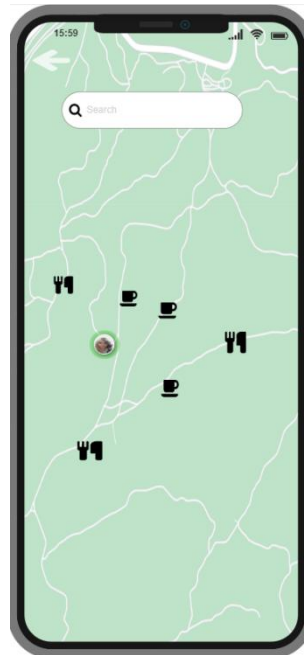


Fig 41: Locate

4.2.5 Search : There is also a search button on the top of the map when clicking on it will link to the search page as said on the site map eg: you want to go to a cafe called Aux Folies , you just need to click on the letter "a" " it will suggest you a name Aux Folies you just click on the selected name it will navigate you to the information page of the cafe you have chosen



Fig 42 : Search

4.2.6 Aux Folies: In the information board of the Aux Folies , there is a red map icon, it will guide you to that shop and display customer reviews for more peace of mind.

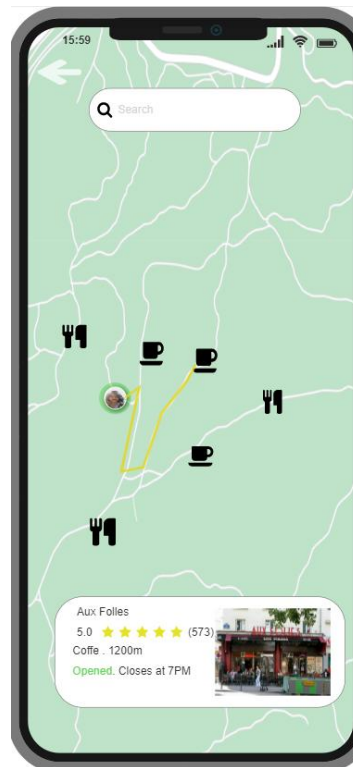


Fig 43 : Aux Folies

4.2.7 Aux Folies Inf: The information board about the shop is named Aux Folies Inf when you selected it in the search

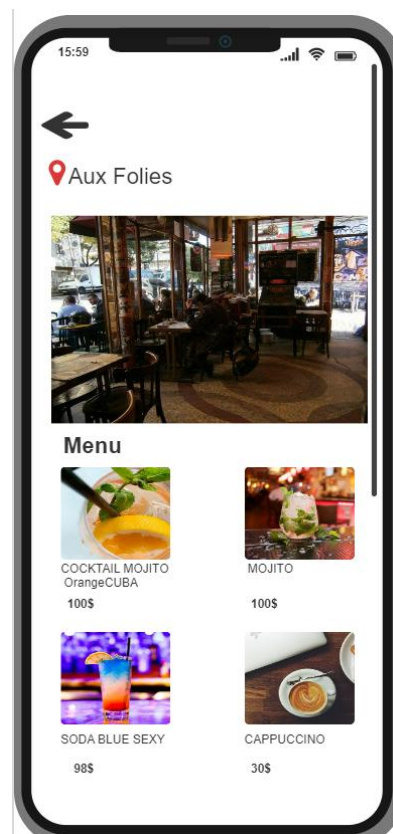


Fig 44 : Aux FoliesInf

- 4.2.8 Cafe de Flore: In the information board of the Cafe de Flore , there is a red map icon, it will guide you to that shop and display customer reviews for more peace of mind.

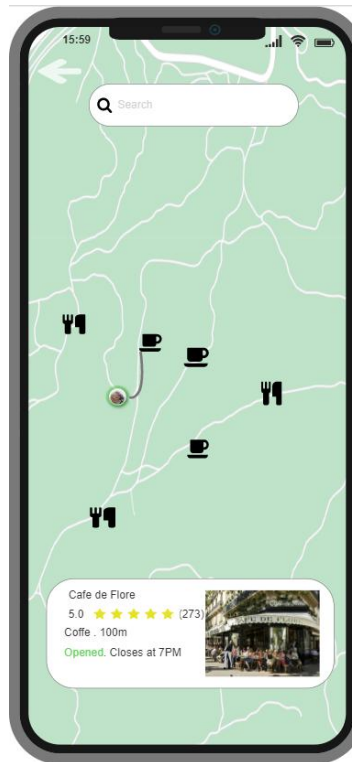


Fig 45 : Cafe de Flore

- 4.2.9 Cafe de Flore Inf: The information board about the shop is named Cafe de Flore when you selected it in the search

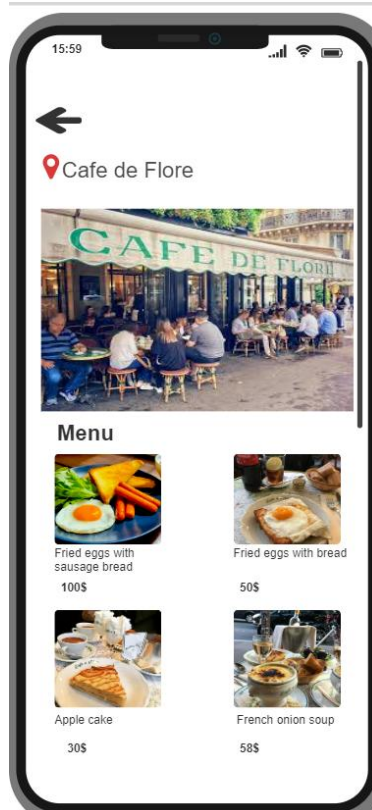


Fig 46 : Cafe de Flore Info

- 4.2.10 Au Petit Fer a Cheval: In the information board of the Au Petit Fer a Cheval , there is a red map icon, it will guide you to that shop and display customer reviews for more peace of mind

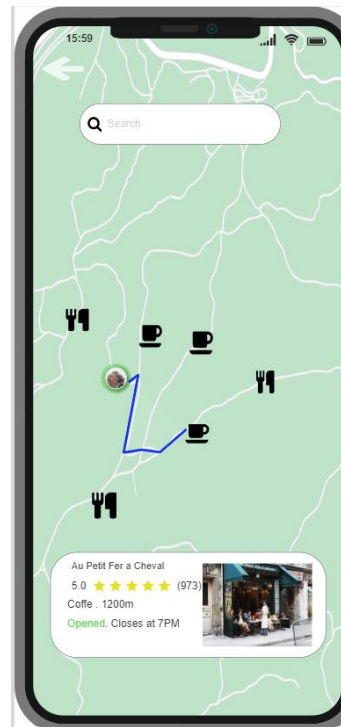


Fig 47 : Au Petit Fer a Cheval

- 4.2.11 Au Petit Fer a Cheval Inf: The information board about the shop is named Au Petit Fer a Cheval when you selected it in the search

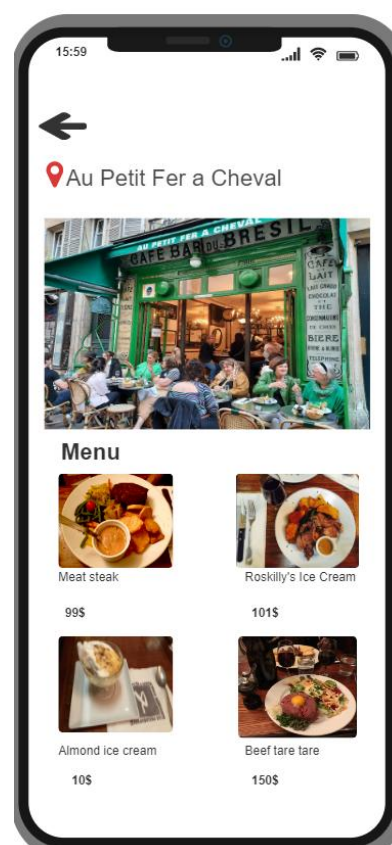


Fig 48 : Au Petit Fer a Cheval Inf

4.2.12 Il Etait Un Square: In the information board of the Il Etait Un Square , there is a red map icon, it will guide you to that shop and display customer reviews for more peace of mind.

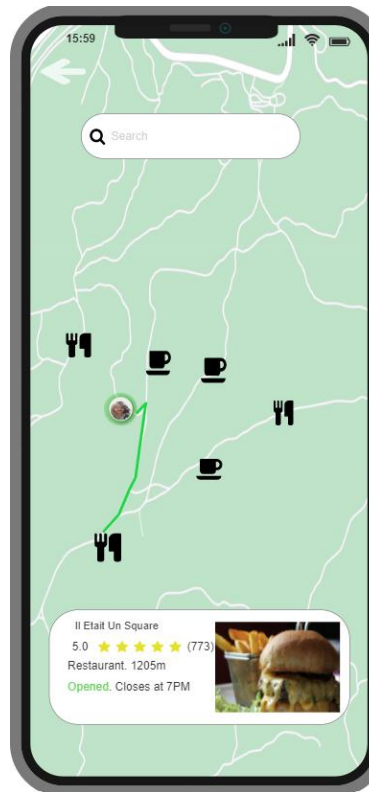


Fig 49 : Il Etait Un Square

4.2.13 Il Etait Un Square Inf: The information board about the shop is named Il Etait Un Square when you selected it in the search

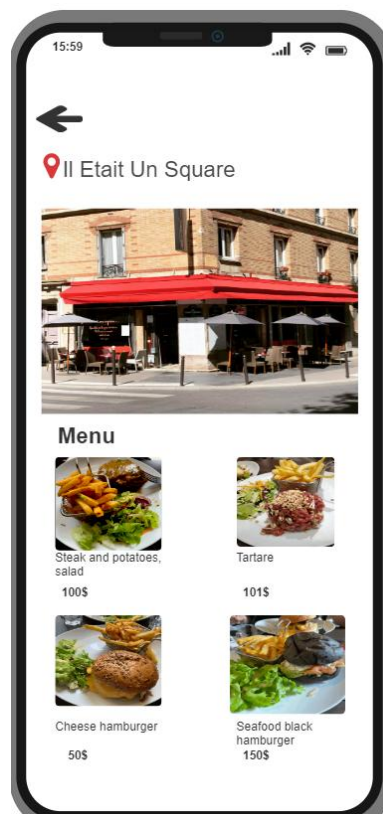


Fig 50 : Il Etait Un Square Inf

4.2.14 Cavale: In the information board of the Cavale , there is a red map icon, it will guide you to that shop and display customer reviews for more peace of mind.

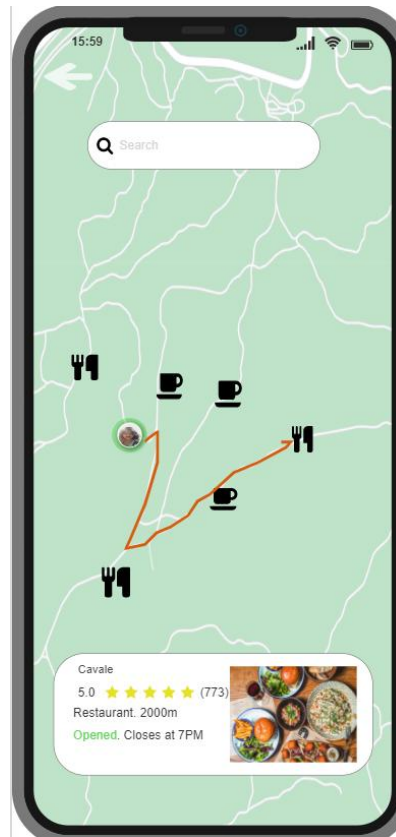


Fig 51 : Cavale

4.2.15 Cavale Inf: The information board about the shop is named Cavale when you selected it in the search

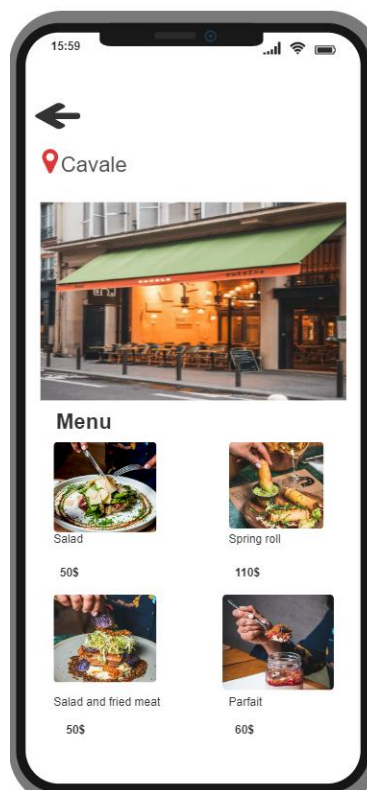


Fig 52 : Cavale Inf

- 4.2.16 Bistrot Instinct: In the information board of the Bistrot Instinct , there is a red map icon, it will guide you to that shop and display customer reviews for more peace of mind.

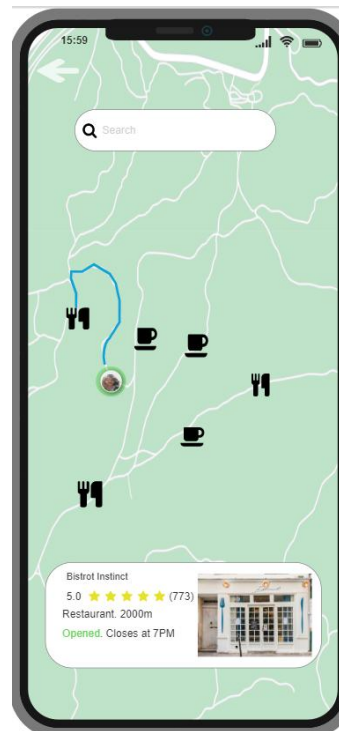


Fig 53 : Bistrot Instinct

- 4.2.17 Bistrot Instinct Inf: The information board about the shop is named Bistrot Instinct when you selected it in the search

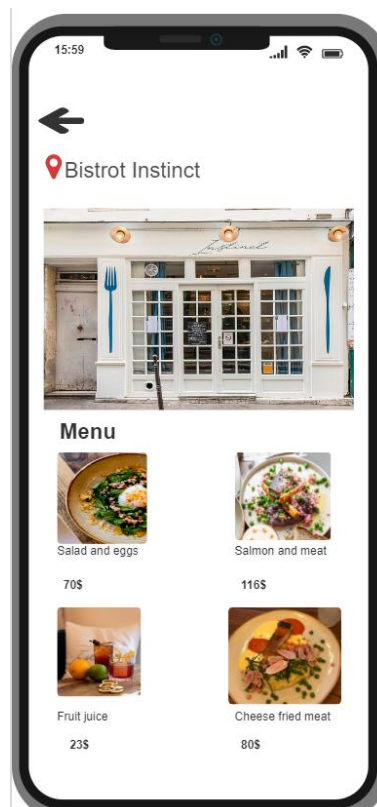


Fig 54 : Bistrot Instinct Inf

- 4.2.18 History S: Information about the day of skiing and it will record the information if you enter the column marked with "S" for the week it will display information about km, calories, mountain skied, temperature, ski time what time?

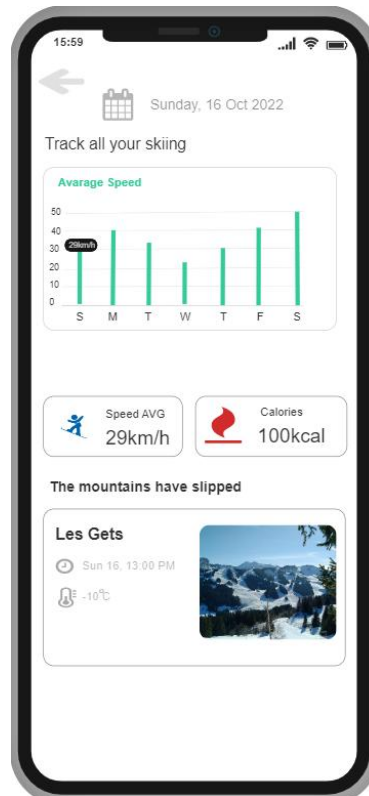


Fig 55 : History S

- 4.2.19 History M: Information about the day of skiing and it will record the information if you enter the column marked with "M" for the week it will display information about km, calories, mountain skied, temperature, ski time what time?

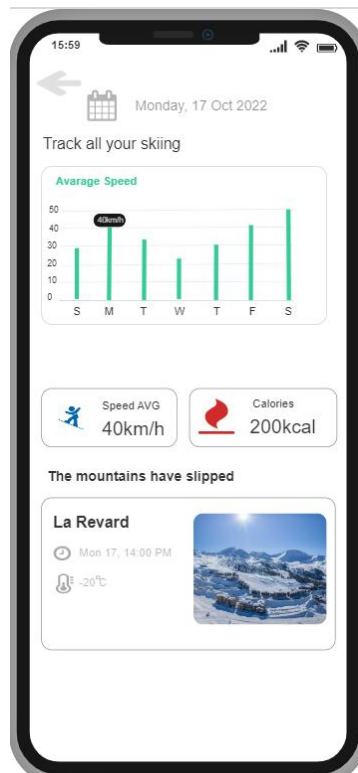


Fig 56 : History M

- 4.2.20 History T: Information about the day of skiing and it will record the information if you enter the column marked with "T" for the week it will display information about km, calories, mountain skied, temperature, ski time what time?

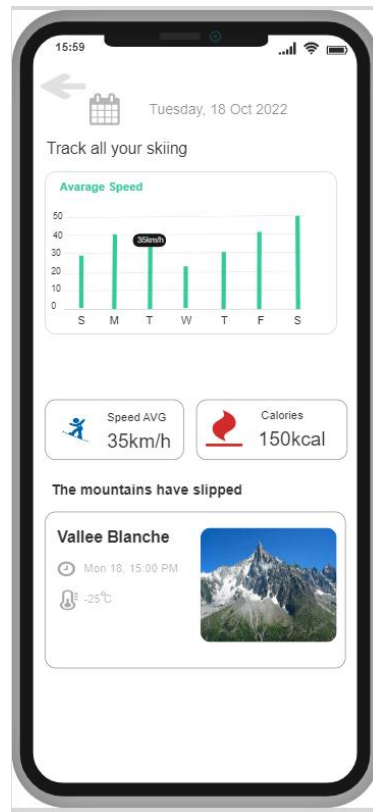


Fig 57 : History T

- 4.2.21 History : Information about the day of skiing and it will record the information if you enter the column marked with "W" for the week it will display information about km, calories, mountain skied, temperature, ski time what time?

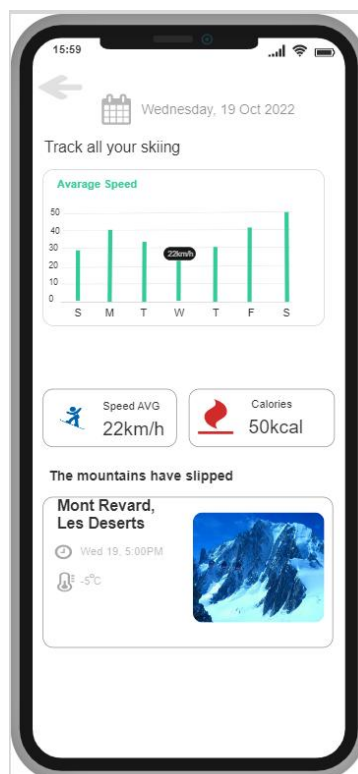


Fig 57 : History

- 4.2.22 History TH: Information about the day of skiing and it will record the information if you enter the column marked with "TH" for the week it will display information about km, calories, mountain skied, temperature, ski time what time?

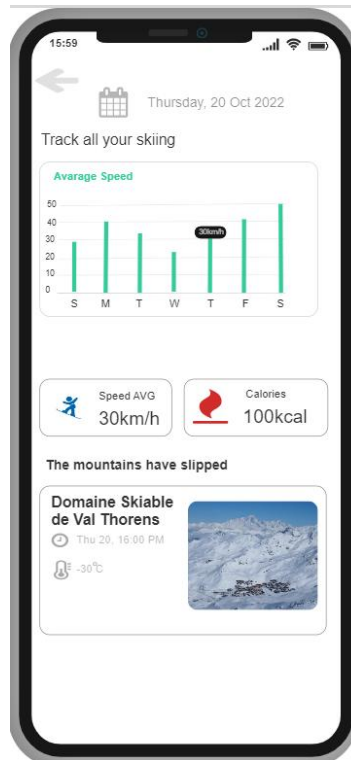


Fig 58 : History TH

- 4.2.23 History F: Information about the day of skiing and it will record the information if you enter the column marked with "F" for the week it will display information about km, calories, mountain skied, temperature, ski time what time?

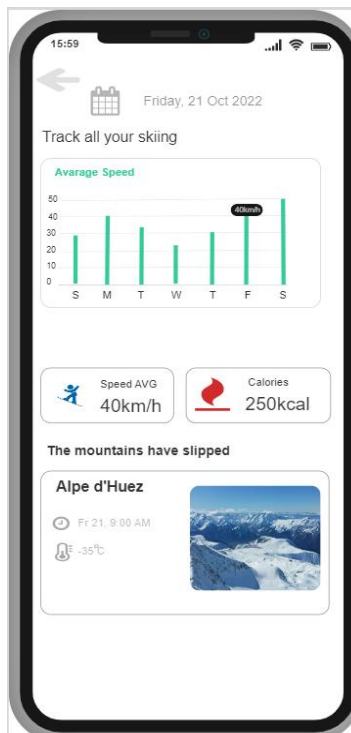


Fig 59 : History F

- 4.2.24 History SA: Information about the day of skiing and it will record the information if you enter the column marked with "SA" for the week it will display information about km, calories, mountain skied, temperature, ski time what time?

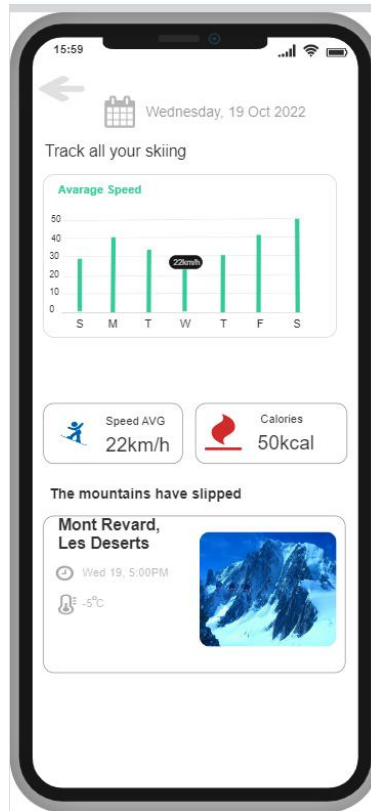


Fig 60 : History SA

- 4.2.25 Start Skiing : For this site I made it so that when skiing directly it can measure the distance, average speed, calories of the skier.



Fig 61 : Start Skiing

4.2.26 Log Out: In the main page on the top right side of the screen, there is a human icon for logging out. When clicking on the page below that says "Log Out" it will return to the main screen and exit the application completely

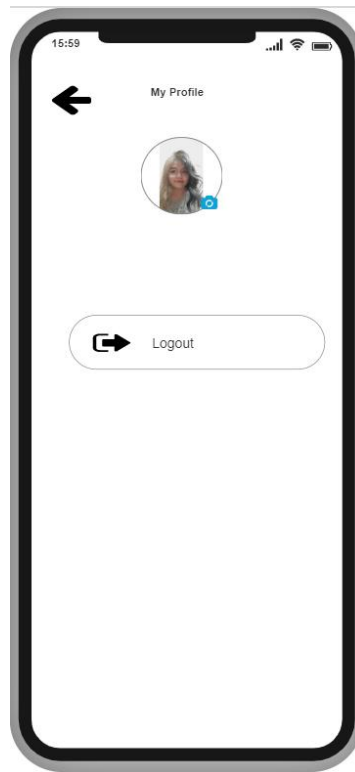


Fig 62 : Log Out

5. Research Study

1. Do you find the design convenient?



5 câu trả lời

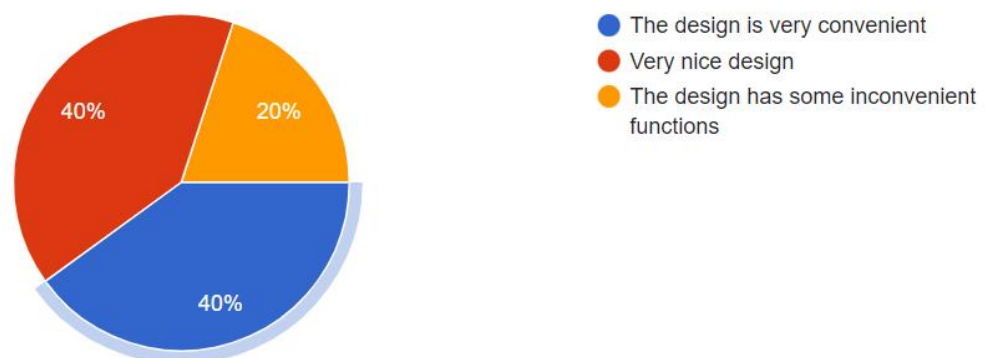


Fig 63 : User survey

2.How do you feel about the navigation function



5 câu trả lời

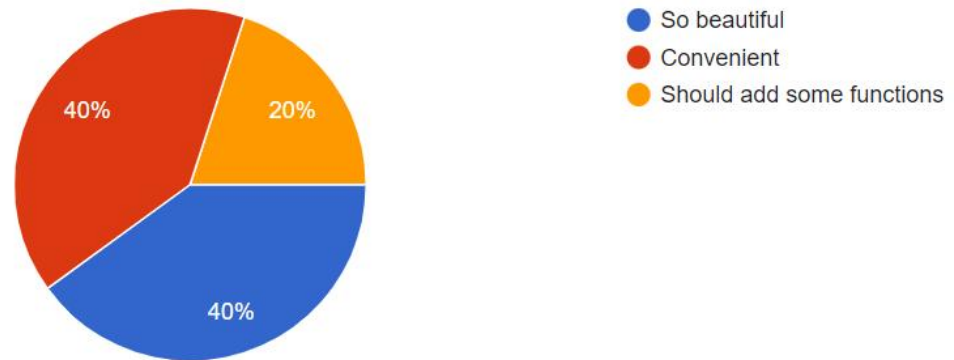


Fig 64 : User survey

3. What functionality do you feel should be added?

5 câu trả lời

| |
|---|
| no |
| temporary functions |
| In addition, places near the hotel to be able to rest |
| The design is great but adding the runway would be even better |
| It's annoying to have to click many times in the search section |

Fig 65 : User survey

Most people say that the drawing seems to be better, but besides that it needs some functions and there is one feature that makes the user uncomfortable, I will try to improve the imperfections.

6. Conclusion

In the request list I have tried to complete the requested functions. This is quite an interesting course for me for the first time without needing to code to still run some interesting features, I also had a bit of trouble completing the course because Axure software is not popular, so finding documents is a bit difficult, but it's okay when I search, I have done all the features required by the topic. Overall the requirements I have fully completed, but the topic is very interesting I want to add some more functions for more complete user experience but I don't have enough time I spent too much time on designing enough The requirements of the topic, if I have time in the future, I want to add a few restaurants or cafes and add the function of ordering and paying online: this will be more convenient without having to open another app, drawing. add ice skating rink for more variety

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