SOFTWARE ARCHITECTURE

DEVELOPMENT

Heading

*Subheading/motto*

**Team Members**

Asd,asd,asd,asd,

**Mentor**

## Prof. Christoph Hahn

***ACKNOWLEDGMENT***

We are ever grateful to our mentor – ***Prof. Christoph Hahn*** for his guidance and encouragement.

This project is a result of your continuous motivation and support throughout the module of ***Software Architecture Development***.

Table of Contents

[Prof. Christoph Hahn 1](#_Toc481979855)

[OVERVIEW 1](#_Toc481979856)

[STAGES STAGE 1- PERSONAS 3](#_Toc481979857)

[Introduction to Personas 3](#_Toc481979858)

[PERSONA 1 4](#_Toc481979859)

[PERSONA 2 6](#_Toc481979860)

[PERSONA 3 8](#_Toc481979861)

[STAGE 2- INTERVIEWS 10](#_Toc481979862)

[USER INTERVIEW TRANSCRIPT 1 10](#_Toc481979863)

[USER INTERVIEW TRANSCRIPT 2 14](#_Toc481979864)

[USER INTERVIEW TRANSCRIPT 3 18](#_Toc481979865)

[Justification for User Interview Questions 21](#_Toc481979866)

[STAGE 3- USER STORIES 40](#_Toc481979867)

[OUR USER STORIES 40](#_Toc481979868)

[USER STORY 1 40](#_Toc481979869)

[USER STORY 2 41](#_Toc481979870)

[USER STORY 3 42](#_Toc481979871)

[USER STORY 4 43](#_Toc481979872)

[STAGE 4 – STORY MAPPING 44](#_Toc481979873)

# OVERVIEW

‘CampusSports Manager’ aims at making life easier for students, faculty and the general public who are interested in using the HealthClub facilties on campus.

Majority of tasks nowadays are shifted to tablets, laptops and smartphones. Our concept revolved around the idea to build an application that would be optimized for use on any mainstream device but will primarily be hosted on the web. We want to build an application that would make it easier for people to explore and use the facilities in the health club, keep track of their progress and courses in the club and even find and meet friends with similar interests.

Using current Software Architecture Development Practises we could build our application from scratch. We adopted AGILE Methodologies such as the Kanban Board and Paper-Prototyping, using this we reached the final view of our project bu going through stages such as – Personal Interviews, Persona development, Customer Expereince(Journey Map), Story Mapping etc.

We adopted **Software Architecture Development Practices** that helped us to build our application from scratch. We took in practice the **Agile Methodologies** like the Kanban Board and the Paper-Prototyping Approach. We reached the final view of our project by going through pre-determined stages – Personal interviews, Personas, Customer Experience(Journey Map), Story Mapping etc. These stages are described in detail below.

Introduction to *CampusSport Manager*

assssssssa

as

a

as

as

as

as

a

sa

s

as

as

a

s

a

# STAGE 1- PERSONAS

## Introduction to Personas

Based on intensive qualitative and quantitative user research, we derived Personas from several Interviews from current users of varying expertise levels, potential users, parents, current Health club Administrators and faculty. We built our analysis by collecting data about the individual such as:

* Basic information such as age, profession, character, marital status etc.
* Background
* Motivation
* Physical Activity History
* Interested Activities
* Challenges
* Goals and Preferences

The data collected during this phase helped us to identify various target user groups and in developing our stories further. To be more precise and thorough we included a statistics such as the various Devices Owned abd Used by the Users to give us a better Idea of the users affinity to using technology.

## PERSONA 1

### Robert Finch:

### A Brief Overview

Robert T. Finch, born in Tenesse, USA is an American who moved to Heidelberg, Germany in 2016. He is 25 and is working as Developer with a software company near Heidelberg. he has joined the CampusSports to use the Court and Swimming facilities. He is an avid footballer, and has been playing the sports for 10 years. He would love an application that could help him manage his Health Club profile and book the courts available for football.

Mr. Finch says:

*“As a quite resilient and self-motivated person I have a routine to help me remember my workout plan and football schedule in the gym. I am unaware of an application that will help me keep track of my courses and booking courts. Being able to use the application on my mobile is important as I only use my computer at work”*

## PERSONA 2

### Jane Doe:

### A Brief Overview

Jane Doe (name held upon request) is 23 years old and was born in Bangalore, India. She moved to Heidelberg, Germany to pursue her Master’s degree in Environmental Engineering. She completed her Bachelors in Chemical Engineering in Bangalore, India and worked for an IT firm for a year and a half. She regularly uses the health club for Cardio, Badminton and Fitness Courses. She is a foodie, a nature lover and she loves to travel.

Jane says:

*“…………………….”*

## PERSONA 3

### Alex :A Brief Overview

Alex (name held upon request) is a 55 year old Mechanical Engineer. His job is a desk job and does not involve a lot of physical activity. He was an athlete and always preferred to stay fit.

Alex says:

*“…..*

*.”*

# STAGE 2- INTERVIEWS

## USER INTERVIEW TRANSCRIPT 1

### Basic Information

Name: Robert Finch

Age: 25

Location: Heidelberg, Germany

### Background

1. **Could you please tell us about yourself?**

**Answer:** I am 25 years old and was born in Tennessee. I then started a web development company which I sold and then started working for a software company as a Developer, after working for 2 years, I moved to Heidelberg in March 2016 and have continued to work for the same company since.

### Could you please tell us briefly what you do in your free time? What are your hobbies?

**Answer:** I like to read a lot, mainly newspapers and books and I like to watch sports on TV.

### Tell us a little bit about your professional life? What kind of work do you do? Would you say you are active?

**Answer:** During my Job I general have some travelling to do around Germany. At least one flight or long distance train a month. I mostly travel to Berlin, Hamburg and Stuttgart, last week I was working in Saarbrucken. Even though there is some travelling, it is mainly a desk job.

### When did you start and how did you get interest in Working out and Football? And how often would you say you use the health club?

**Answer:** I first started playing football with my brothers at a very young age, then in high school I joined the football team when I was 15 and in my final year I was captain. During this time we had a strict workout schedule. My love for Football and fitness has continued ever since. Apart from the time I am travelling which is maybe a week in a month I use the gym facilities daily and play football as and when my friends get together and find a place to play.

### Challenges and Goals

1. **What do you think is your biggest hurdle in playing Football or Working Out?**

**Answer:** I really don’t think I have a challenge at all. Remembering which course I have for the week and what new courses are available is sometimes a problem. A way to see which courts are free and booking them is hard when you don’t live close to the health club.

### Do you have any day to day goals that need to be achieved?

**Answer:** My daily goals vary depending on the course I am doing at the club, apart from this I do weightlifting and burn around 800 Calories totally. We also play football a few days a week.

### Do you have to keep track of your activities or sports?

**Answer:** Not really, only if I do a course then I need to know the schedule, but otherwise to the gym and football I go as per my set routine.

### Are you facing any problems in achieving your goals?

**Answer:** Not particularly now, it’s just a few inconveniences like not being able to book a court or even seeing my profile and what I am involved in at the health club.

### Motivations

**1. What motivates you into achieving your day to day goals? (Incentive, fear, achievemenkjn**

**Answer:**I would say I am motivated mainly by a sense of achievement with regard to my fitness, I am quite self-motivated and love playing in team sports or helping my partners in working out.

### Technology

1. **How many smart devices do you own? (Eg. laptop, smart phones, tablets etc.)**

**Answer:** I have one smart phone and a laptop which is issued by the company. I also have one laptop for personal use and an iPad for reading and entertainment.

### How often do you use your mobile or laptop?

**Answer:** I am actually on my laptop for pretty much the entire day, at work on my companies and at home with my personal one. It may be that I don’t use the iPad at all for weeks, especially while travelling. I am not too attached to my smart phone and use it mainly for communication and sometimes go in social media.

Justification: The amount of time users spend on their devices helps us to choose a specific platform to develop the application.

### On an average, how much time do you spend surfing the internet? (Like social media, blogs etc.)

**Answer:** Well I use it more on a weekend. Usually an hour or two on a working day and about four to five hours during the weekend.

### Do you think using a website that works readily on all your platforms is more convenient than downloading individual mobile apps?

**Answer:** I would say that it depends on the application in question, since these days the Google Apps and Whatsapp have become unavoidable, especially when I am travelling. But on a daily basis I would like to simply use the same website as it works well on all platforms.

### If there was a web application linked to your health club, would you use it and what you expect from it?

**Answer:** I think I would use for sure, especially if it allowed to do things like keep track of my activities, or even book courts, courses and trainers online.

### Would it make your life easier if you could share your information with a trainer or nutritionist?

**Answer:** Well honestly not really, as I have my own routines and habits with my workouts and my diet and that seems to be working well for me. But at the same time it is a good feature to have.

### What do you think would help you better?

**An application that educates you on your activities and schedule and lets you use it interactively to make bookings? OR Would you like that it simply collects and displays data, such as schedules, list of events, courses? OR a combination of both?**

**Answer:** I think it will be great if I book courts for a later date, but other than that if it simply stores my profile and displays my activities I would be happy.

Justification: This will help us to decide whether the application should be information centric or feature centric

### What medium would you prefer to have the data presented to you? Would you prefer a mobile application or a web service?

**Answer:** Preferably both. But a good web service is what I would use am I am mostly on my laptop.

### One last question before we conclude. If the app could connect you with other enthusiasts and let you find partners to play sports or take courses with, would that be something you would like?

**Answer:** I think it would help if I am able to find partners online, but I would not like it to be another social media platform.

### This concludes the user interview with *Mr Robert Finch*. Thank you so much for making yourself available for this interview. We hope that with your inputs and feedback, we can develop an application that would truly help you.

## USER INTERVIEW TRANSCRIPT 2

**Basic Information**

Name: Jane Doe

Age: 23

Height: 167 cm

Weight: 64 kg Profession: Student Marital Status: Single

Location: Heidelberg, Germany

Character: Friendly, enthusiastic, determined

### Background

1. **Could you please tell us your name and a little bit about yourself?**

**Answer:**I was born Pune, India and completed by Bachelors Degreee in Chemical Engineering, after that I worked in a Pharmaceutical company for a year. I then moved to Heidelberg, Germany in 2014 to pursue my Master’s in Environmental Engineering

### Could you please tell us briefly what you do in your free time? What are your hobbies?

**Answer:**I love hiking and travelling. I also play a lot of badminton and constantly look for new fitness and yoga courses I can join. I am also a huge foodie and trying out many cuisines.

### Tell us a little bit about your professional life? What kind of work do you do?

**Answer:**As I am doing my Master’s, I don’t really travel that much. My day varies between classes, badminton, some course or the other and my room.

### When did you start and how did you get interest in your Fitness activties? And how often would you say you use the health club?

**Answer:**Well my father was a professional badminton player, so I’ve been playing

from a very young age. My mother introduced me to Yoga when I was about 17. Since then I’ve tried many different types of yoga and dance workouts. I do Yoga in my room every morning and use the health club every other day for some basic cardio. I also try to play badminton whenever I can, if I manage to find a partner.

### Challenges and Goals

1. **What do you think is the biggest challenge you face in your day to day life with regard to your condition?**

**Answer:**I think the biggest challenge I face is to find somebody to play badminton with or take some courses together. Since I am new here I don’t have many friends and the few I do have are not very interested in fitness activities.

### Do you have any day to day goals that you must complete?

**Answer:** Well apart from trying to exercise regularly not really. Just badminton for fun sometimes. I also love exploring new fitness courses that I can try out.

### So have a need to keep track of your activities or sports at the health club?

**Answer:** I would say that it would be helpful if I could.

### Are you currently facing any problems in achieving these goals?

**Answer:** I guess it’s not always easy to find a partner to play baddy with. Oh and a way to check out new courses and join them online would be cool.

### Motivations

**1. What motivates you into achieving your day to day goals? (incentive, fear, achievement)**

**Answer:** I guess I’m most afraid of getting fat later, I wouldn’t want any health issues. Plus my diet right now is not exactly great so that really motivates. So yeah Fear I would say.

### Technology

1. **Do you own any smart devices?**

**Answer:** I have a notebook for college work and entertainment and a smartphone.

### How often do you use your mobile or laptop?

**Answer:** My phone is always with me so I use it a lot, But I wouldn’t say I’m too tech savy. All my work is on the laptop so I’m almost the whole day.

### Approximately how much time do you spend on your mobile or on your laptop?

**Answer:** The full day in college and then at home, so around 5 hours on the laptop and 3 to 4 on my phone.

### Would you say you surf the web quite often in a day?

**Answer:** Well I’m active on Social media, generally with my laptop so about 3 hours on facebook, 9gag and other stuff.

### Would you say that using a website is convenient than downloading an app?

### Answer: Well not really, I think an app once downloaded is much faster than using a website. But for quick browsing of information or booking something, websites would be quicker as I am also on my laptop a lot.

### If there was a good web application linked to your health club, would you use it? And what would you expect from it?

**Answer:** Yes definitely. My current one just a basic blog type website. I’d like to see some sort of social media aspect as well as a way to book courts and stuff.

### Do you feel that shifting from the Facebook group to the website for discussion and updates would be helpful?

**Answer:** Not really. The group works fine, but if it was there I’m sure I would use that to find courses, meet people and stuff.

### Would it make your life easier if you could share your information with a trainer or nutritionist?

**Answer:** No. I don’t have a trainer and I would not want to share my health club with him or her.

### What do you think would help you better?

### An application that educates you on your activities and schedule and lets you use it interactively to make bookings? OR Would you like that it simply collects and displays data, such as schedules, list of events, courses? OR a combination of both?

**Answer:**I guess a combination of both would be good.

### This concludes the user interview with *Ms. Pooja Mathur.* Thank you so much for making yourself available for this interview. We hope that with your inputs and feedback, we can develop an application that would truly helps you

## USER INTERVIEW TRANSCRIPT 3

Basic Information:

Name: Indira Gowda

Age: 38

Height: 164 cm

Weight: 62 kg

Profession: Marketing Analyst

Marital Status: Married with 1 child

Location: Heidelberg, Germany

Character: Friendly, enthusiastic, determined

### Background

1. **Could you please tell us your name and a little bit about yourself? Also what are some of your hobbies?**

**Answer:** I am a 38 year old Marketing Analyst in working in a consultancy in Germany. My hobbies are running marathons and swimming. I also enjoy participating in tournaments and yoga. Other than that most of time goes in taking care of my son. After working for 2 years after my Bachelors in India, I moved to Heidelberg for work in a consultancy here.

### Tell us a little bit about your professional life? What kind of work do you do? Are you active?

**Answer:** Well I do travel around a bit, maybe a few days a month. But still it is primarily a desk job, I generally use my laptop so I even work from home often. I would not say I am active during work hours but I make it a point to walk as much as I can, I even use a standing desk.

### What made you take interest in these hobbies and activites?

**Answer:** Well I’ve been running marathons and swimming for 6 years now, I started first at home and have been addicted since. I also enjoy Zumba courses and since am ready to try anything new. I also love yoga for the peace my mind it gives me as my work life is quite stressful.

### Challenges and Goals

1. **What do you think is the biggest hurdle with respect to your activities?**

**Answer:** Well I would say it’s a lack of a proper way to get notified of new events and courses that are happening at my health club as well as in the city. Apart from that my son takes up most of time and summer is coming, so a way to find and register my kids for camps and other kids events would be great.

### Do you have any daily goals that have to be achieved?

**Answer:** Well daily I may not have too much time, but I do always run a few kilometers or swim a few laps every day.

### Do you need keep track of yours or your children’s activities in the healthclub?

### Answer: Yeah it would surely help to see the stuff my family is involved in and a schedule to keep track of everything. Also a way to rent or buy equipment online for my son would be great, that way he doesn’t have to carry too much money.

### Motivations

**1. What motivates you into achieving your day to day goals? (Incentive, fear, achievement)?**

**Answer:** Well I want my children to be active and healthy and I do want to set a good example for them. And I am not getting any younger and it’s up to us to keep healthy

### Devices Owned & Technology

1. **What are the smart devices you own?**

**Answer:** I have a laptop from work and a simple smart phone. As I’m not too tech savvy I generally rely on my husband or by sub ordinates for cyber related stuff.

### Would you like to have notifications and reminders for activities and events?

**Answer:** I wouldn’t like to bombarded with unnecessary notifications, so a simple way to check what’s happening and maybe an email with a list of events would be good for me.

### How much do you spend browing in a day?

**Answer:** I would say around an hour or 2 on blogs or news and videos, but I am on my laptop my whole time at work or browsing at home.

### If there was a good web application linked to your health club, would you use it? And what would you expect from it?

**Answer:** Yeah I would, especially to register for events and courses for myself and my son. I would also use it see my activities

### Do you feel that shifting from the Facebook group to the website for discussion and updates would be helpful?

**Answer:** Yeah probably, as I didn’t even know about the Facebook group, I am not very active on Social Media. But a common place that doesn’t rely on users posting events for information would be good.

### Would it help if the application could help you find people with similar interests who you could partner with?

### Answer: Yeah that would help, I think it’s a great Idea.

This concludes the user interview with *Mrs. Indira Gowda* Thank you so much for making yourself available for this interview. We hope that with your inputs and feedback, we can develop an application that would truly helps you

## Justification for User Interview Questions

The interview questions were formed to figure out the challenges the user faces and thereby come up with ideas to solve those issues with the help of an application. Based on user inputs we can also arrive at a specific conclusion that a user would be more comfortable using the application in a specific platform such as mobile application, desktop application & web application.

### Background

1. **Could you please tell us about yourself?**
2. **Could you please tell us briefly what you do in your free time? What are your hobbies?**
3. **Tell us a little bit about your professional life? What kind of work do you do? How active are you?**
4. **What made you take interest in your hobby or activity?**

**Justification:** The background of a potential user is important as it gives us as abroad picture of the use and allow us to arrive at a reasonable assumption that the application is basically useful**.**

### Challenges and Goals

1. **What do you think is the biggest challenge you face in your day to day life with regard to your activities?**

1. **Do you have any day to day goals that need to be achieved?**
2. **Are you currently facing any problems in achieving these goals?**
3. **What motivates you into achieving your day to day goals? (incentive, fear, achievement)**

**Justification:** These challenges that the user faces can be used to design application features that could potentially help the user. The motivation gives us an idea of how often the user might rely on the application

### Technology

1. **How many smart devices do you own?**

**Justification:** Gives us an idea of the different platforms we need to develop for.

### How often do you use your mobile or laptop?

**Justification:** Gives an idea on the time spent using their devices. This tells us if the users are comfortable with usage of devices and applications.

For example: If a user spends most of his time on a mobile device then to design a mobile application would be sensible.

### On an average, how much time do you spend surfing the internet?

**Justification:** Gives us an idea if the web application should include features to store data on the users computer.

### Do you think a website is more convenient than downloading mobile apps?

**Justification:** To further come to a decision whether to use a website now and develop an application later.

### If there was a good web application linked to your health club, would you use it? And what would you expect from it?

**Justification:** To learn the expectation of a particular user, translating in to further features.

### Would it make your life easier to share your information live with a trainer or nutritionist?

**Justification:** This tells us if the user is willing to share information to make his life easier and to get an idea of how many users want their trainers, if they have them, linked to their account at a health club.

### Do you feel that shifting from the Facebook group to the website for discussion and updates would be helpful?

**Justification:**will help us to decide whether the application should be information centric or feature centric. And also if the user is happy with the current means of notifications and interaction with the website

### If the app could connect you with other enthusiasts and let you find partners to play sports or take courses with, would that be something you would like?

**Justification:**Will help us to decide whether to include basic social media aspects in the application, like find a friend or a buddy.

### What do you think would help you better?

### An application that educates you on your activities and schedule and lets you use it interactively to make bookings? OR Would you like that it simply collects and displays data, such as schedules, list of events, courses? OR a combination of both?

**Justification:**Will help us to decide whether the application should be data centric or feature centric.

### What medium would you prefer to have the data presented to you? Would you prefer a mobile application or a web service?

**Justification:**This helps us decide if we should focus on mobile application or a web site.

### Do you like to have statistical data like your past 3 months progress in the form of a graph on the application?

**Justification:** This helps us to decide whether the app should have a feature to show statistical data

### We also interviewed experts on this particular medical field to corroborate our justification and also to gain a perspective from a medical expert’s point of view.

# STAGE 3- USER STORIES

## OUR USER STORIES

Our User Stories is spanned on four elaborations that highlights our application features. Our features include – range of facilities, costs of membership, renting equipment, booking a court and finding a sports partner. Each user story is broken down into sections that lead to an ultimate goal of helping users to overcome the challenges they face. The challenges being the following mentioned below.

* + User wishes to check out the range of facilities available for swimming & sauna as well as the costs of membership.
  + User wants to join a course in the health club and needs to check out some summer camp events for his son.
  + User wants to rent badminton equipment and book a court for practice.
  + User wants to find a squash partner to play with and check on his account information in the health club.

The below user Stories will give a detailed view on our approach to the application functionalities.

## USER STORY 1

“User wishes to check out the range of facilities available for swimming & sauna as well as the costs of membership.”

### User story decomposition 1

Swimming the best workout for the human body and sauna makes the immune system stronger. The main issue is to find what kind of courses for swimming are available, availability of sauna and how much does the membership costs.

### Functionality

The website will provide the information for facilities available for swimming, sauna and other kinds of aerobic sports in the simplest possible way. The users can navigate to their desired sport activities with just a few clicks. In addition to that, the users can also see the sports event happening in the fitness studio and at other sports facilities. In the membership button, users can see the offers, services provided and information about the contact person.

### Story Elaboration 1

Users want to have an idea about the facilities available for the aerobic sports like swimming & sauna as well as how much does it cost to become a member of the club.

**Start situation** – User needs information

**Action** – User checks for available facilities.

**Outcome** – User is able to decide which kind of membership he/she wants as he/she has seen the available facilities.

**Ultimate goal** – Keeps the decision making easy for the user by providing him the correct information.

## USER STORY 2

“The user wants to join a course in the health club and needs to check out some summer cam events for his son.”

### User Story decomposition 2

Staying healthy is an essential part of life. The user wants to join a course in the health club and also wants his son to get involved in the health activities. Therefore, he wishes check out some summer camp events for his son.

### Functionality

The website will provide a wide range courses available in the health club for the user to choose. Also, it will provide health related activities for children. User can also look for courses like summer camp for his son.

### Story Elaboration 2

**Start Situation** – User wants to join a course in the health club as well as a summer camp event for his son.

**Action** – User checks for available courses for himself and his son.

**Outcome** – User is able to join a course and also he is able to look a summer camp activity for his son.

**Ultimate Goal** – Provides the user with ease and freedom to chose for a course for himself and his son.

## USER STORY 3

“The user want to book a badminton court and rent badminton equipment”

### User Story Decomposition 3

Badminton is one of the best indoor racquet sports. The requirement here is to provide the user with the badminton court and equipment.

### Functionality

The website provides an interactive platform to book a court for badminton. It shows the availability of the court with the duration of time that a single user can book court for. It also provides a platform to book equipment for the sports.

### User Story Elaboration 3

**Start Situation** – User wants to book badminton court and rent equipment.

**Action** – User check for the availability and books the court and equipment.

**Outcome** – Gives the user a simple to use court booking system and renting equipment.

**Ultimate Goal** – With this particular feature user has now more freedom to choose a day and time for booking court as he has weekly/monthly view of the booking chart.

## USER STORY 4

“The user wants a partner for squash to play against and also wants to know how good he is by checking his account information in the health club.”

### User Story decomposition 4

The user simply wants to play squash against someone but he also wants to know how good is the other person in squash. He can check by looking into his profile in the health club.

### Functionality

The website provides a platform for users to find other users to play against and compete with each other. Also, they check the profiles of their opponent to see how good he is in that sport.

### Story Elaboration 4

Every user has a profile in the health club. In that profile, the experience level of the user is stated about the sports he is into. Any user can look for a partner to play against.

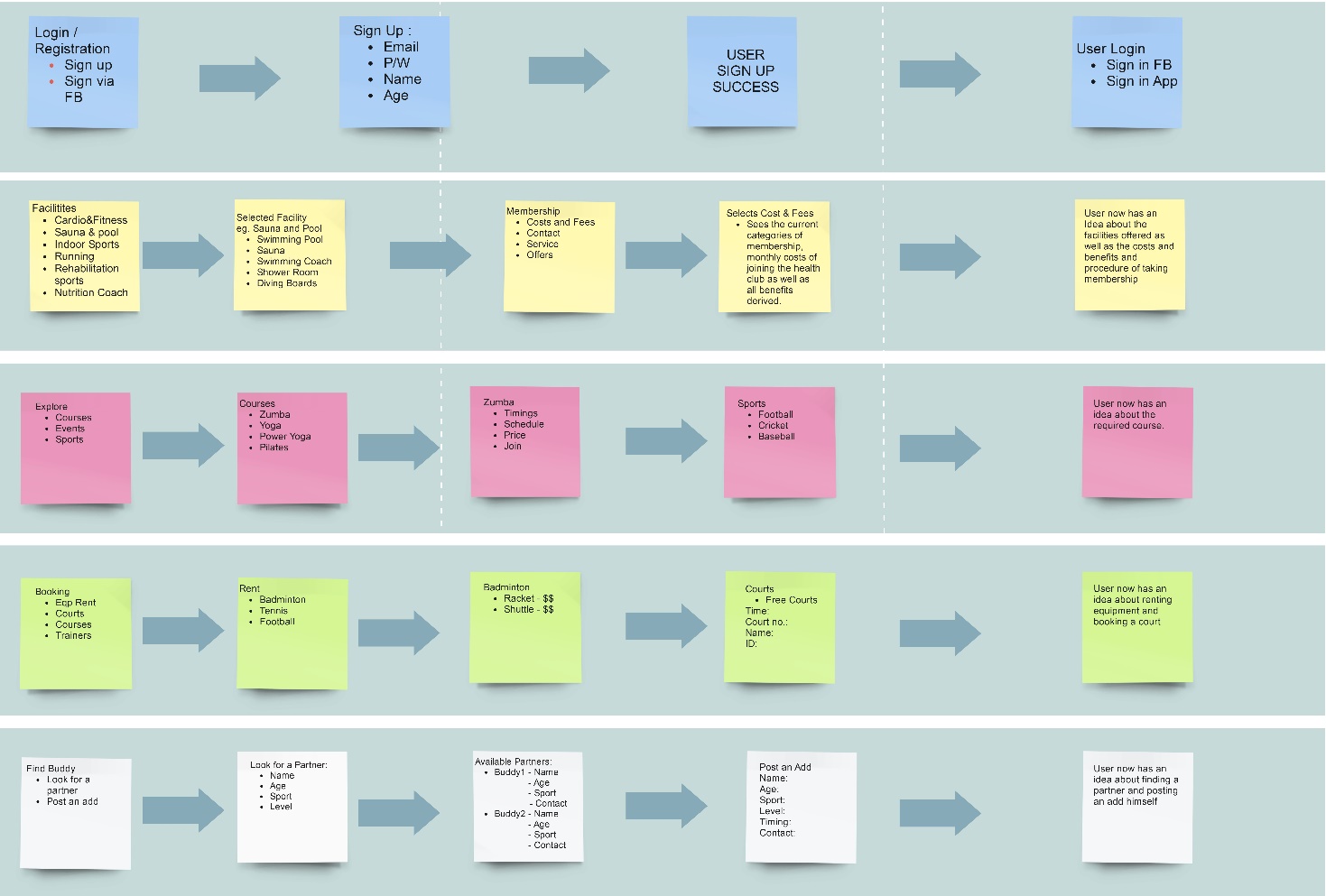
**Start Situation** - User looks for a partner to play squash with.

**Action** - User looks for experience level of his partner.

**Outcome** - User is able to choose his partner for squash according his experience level.

**Ultimate Goal** – With this feature, user has the opportunity to play against any other user. Also, he gets to see an overview of the profile of his partner and has an idea about what is the level of the other user in this particular sport.

# STAGE 4 – STORY MAPPING



### Story Mapping gives an overview on how a user navigate through the application. We have described five characters going about the application features and the possible scenarios they face.