Applied Computer Science

SRH Campus Sport

Part 2

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Contents

GitHub Repository (SAD Part 1): https://github.com/bg-shishir/CampusSports

GitHub Repository (ACS – Part 2): https://github.com/bg-shishir/FitnessClub-Manager
(With complete code and Angular File Structure)

INTRODUCTION

'CampusSports Manager' aims at making life easier for students, faculty and the general public who are interested in using the Health Club facilities 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 Practices 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 but going through stages such as – Personal Interviews, Persona development, Customer Experience (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.

- **FACILITIES**

The User has an option to generally browse thorugh the currently available facilities in the Health Club.

List of all Events and Courses and Sports

User here will be able to see all events that's happening, User can also see various courses that's being offered by the health club and user and take part in various sports activities

Kids events, programs

This tab shows user with various kids' events and programs in which kids can participate

➢ EXPLORE

In this option user can explore the various activities, events, trainers and timing of all the things. This part is in depth details of all above-mentioned things.

Courses

User here can see detail of all the courses that are being offered by the health club and can participate.

Events

In this section user can see list of events they have offer. User can then contact them.

Sports

This section will show various courts and their respective timings also it shows what type of games are being

➢ Find Buddy

In this section user will be able to find a person of same likeness and various level of expertise in Sport activities. User can use various filter to filter out the result. If user doesn't find any one of same interest then he/she can write about the sports buddy they looking for and post that as add in find buddy section

Find using parameters

User here has option to filter out there interest

Contact option

user here has option to contact with their sports buddy

Place an Advertisement or become a buddy

User here can post his interest and put advertise

➢ MEMBERSHIP

User here will be able to see the details of his account. He/she will be able to see kind of and numbers of activities they are registered in. Furthermore user will have calendar option where he/she will be able to see in detail activities.

Fees paid/ to be paid, type of member

User here will have option to check fees he had paid and fees he have to be paid and also type of membership he has

➢

Offers

User here can see the various offers

➢ ABOUT US

Hours

The opening and closing hours of the gym on the weekdays and the weekends

Contact

The contact info and the email id of the SRH CampusSport

Services

List of all the services provided by the SRH CampusSport

TECHNOLOGY USED

- The application is developed using NodeJS,
- Git is used for code management and the code is pushed on to Github to keep a record of all the commits from the project members and to manage the code at one place.
- ProjectLibre was used for Project Management, Kanban Boards & Firebase Deploy for deploying the application on cloud.

PROJECT MANAGEMENT

The Project of building Campus sports web application started with the module Software Architecture Development as the project was approved and concept was discussed in a brainstorming session with keeping the existing campus sport of SRH and comparing it with the Mannheim Campus sport website. We were quick in finding what needs to be done and hence we started documenting the functionality and hence the target state was easy to recognized.

Project Milestones:

The project Milestones are recorded as mentioned below with the help of ProjectLibre the project was executed per this.

Name	Duration	Start	Finish	Predecessors
Project Start	2 days	**6/19/17 8:00 AM**	**6/20/17 5:00 PM**	
Project Approval	1 day	6/19/17 8:00 AM	6/19/17 5:00 PM	
Concept - paper creation	1 day	6/20/17 8:00 AM	6/20/17 5:00 PM	2
Requirement Gathering	5 days	**6/19/17 8:00 AM**	**6/23/17 5:00 PM**	
Software requirement anal	2 days	6/19/17 8:00 AM	6/20/17 5:00 PM	
Business Plan	2 days	6/21/17 8:00 AM	6/22/17 5:00 PM	5
Project Kick off	1 day	6/23/17 8:00 AM	6/23/17 5:00 PM	6
Navigation Plan	12 days	**6/19/17 8:00 AM**	**7/4/17 5:00 PM**	
Functionality definition	5 days	6/26/17 8:00 AM	6/30/17 5:00 PM	7
Prototyping	12 days	**6/19/17 8:00 AM**	**7/4/17 5:00 PM**	
Low Fidility Prototype	5 days	6/19/17 8:00 AM	6/23/17 5:00 PM	
High Fidility Prototype	7 days	6/26/17 8:00 AM	7/4/17 5:00 PM	11
Programming	28 days	**7/5/17 8:00 AM**	**8/11/17 5:00 PM**	
Convert Modules to kanbar	2 days	7/5/17 8:00 AM	7/6/17 5:00 PM	12
Analysis Review	2 days	7/7/17 8:00 AM	7/10/17 5:00 PM	14
Functionality definition	2 days	7/11/17 8:00 AM	7/12/17 5:00 PM	15
Clean coding	20 days	7/13/17 8:00 AM	8/9/17 5:00 PM	16
Quality review	2 days	8/10/17 8:00 AM	8/11/17 5:00 PM	17
Testing	23 days	**7/14/17 8:00 AM**	**8/15/17 5:00 PM**	
Functionality Test	1 day	8/10/17 8:00 AM	8/10/17 5:00 PM	17
Unit Test	20 days	7/14/17 8:00 AM	8/10/17 5:00 PM	16
User Interface Test	1 day	8/11/17 8:00 AM	8/11/17 5:00 PM	21
Compatibility Test	1 day	8/14/17 8:00 AM	8/14/17 5:00 PM	22
Final Test	1 day	8/15/17 8:00 AM	8/15/17 5:00 PM	23
Final Review	1 day	8/16/17 8:00 AM	8/16/17 5:00 PM	24
Product Release	1 day	8/17/17 8:00 AM	8/17/17 5:00 PM	25

Gantt Chart:

The Gantt chart was also created to track the flow of the project and as it is mentioned in the graph , the unit test was done in parallel with the clean coding as the module was selected from Kanban , Was completed to code and tested as it is coded. By this approach , time and efforts were effective used and hence , we could take many more functionality than the other teams in the class.

Project Start	2 days	**6/19/17 8:00 AM**	**6/20/17 5:00 PM**	
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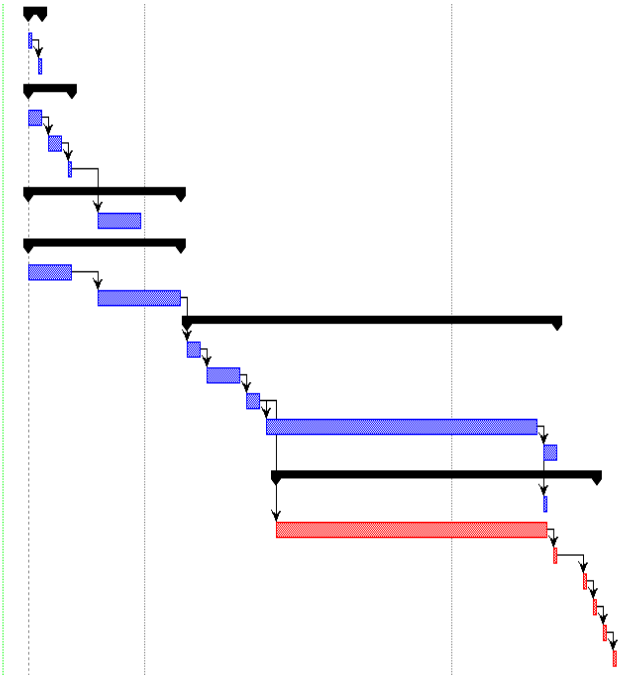
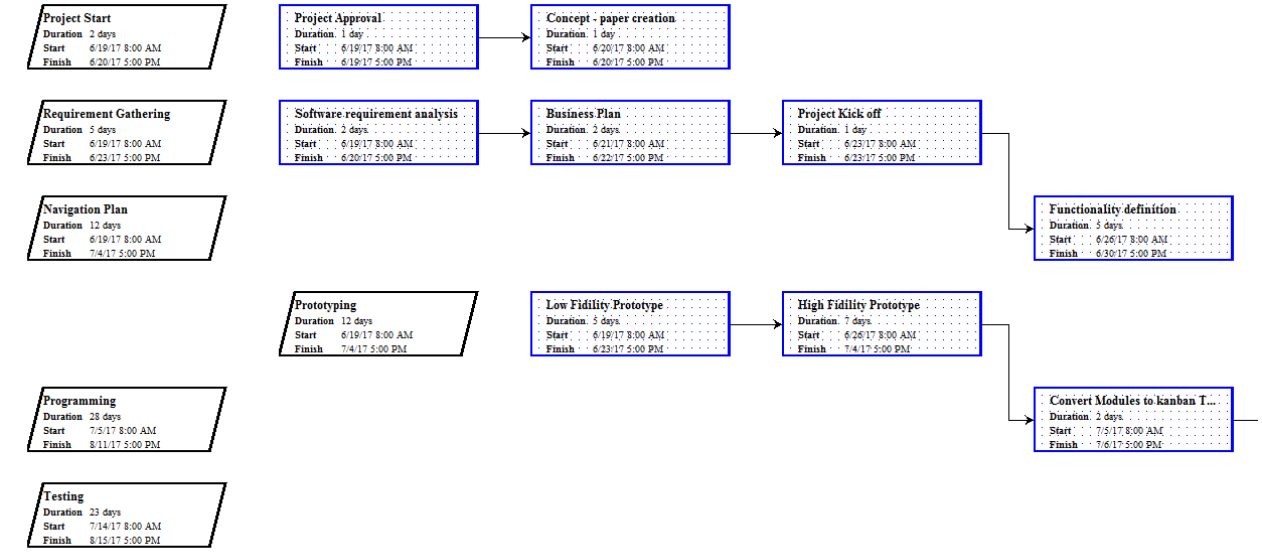


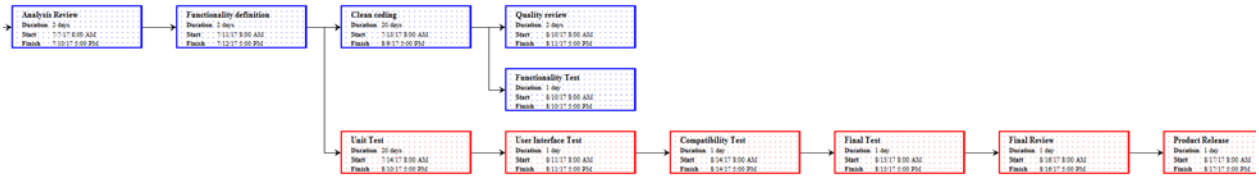
Network Analysis :

The project Network analysis was the main part of project management as efforts was made to reduce the number of critical path in the deadlines in completing the project.

We tried to implement Modern Kanban approach with traditional waterfall approach where the number of parallel processing was significantly reduced and

with better feedback from the design team to the testing team as development phase went in hand in hand with the unit testing.

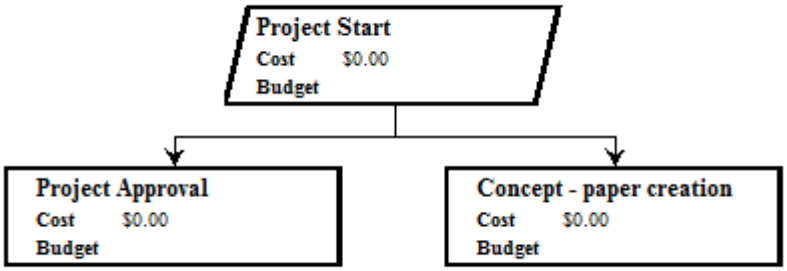




After the Network Analysis, we created a work breakdown structure, the cost is not included, if it was a client project, the cost would be included as per the hourly basis of the development.

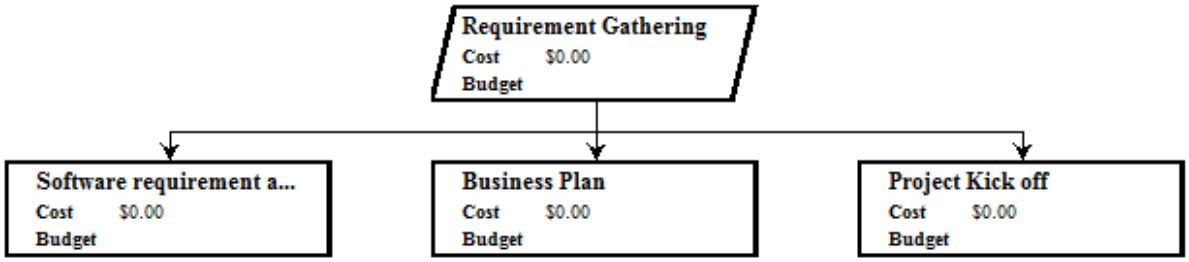
Project Start :

The first module we would like to start is the project start itself, as the project is initiated, it consist of Project approval which we had as a discussion in the Software architecture development , as the project was approved the paper concept was created.



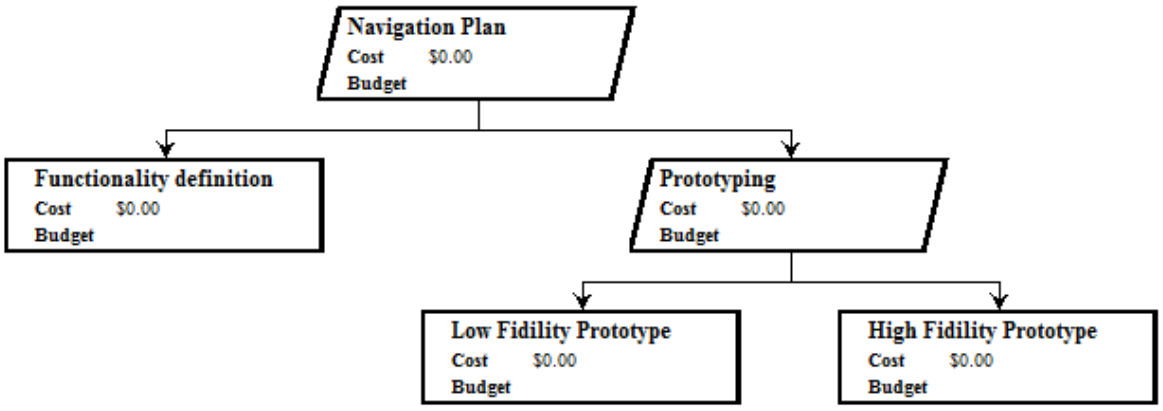
Requirement Gathering :

This phase consists of a business plan as we were first intended to do this web application for the SRH Heidelberg campus sport as we found the current application with few issues. This forced us to do the software requirement analysis and the project was kicked off.



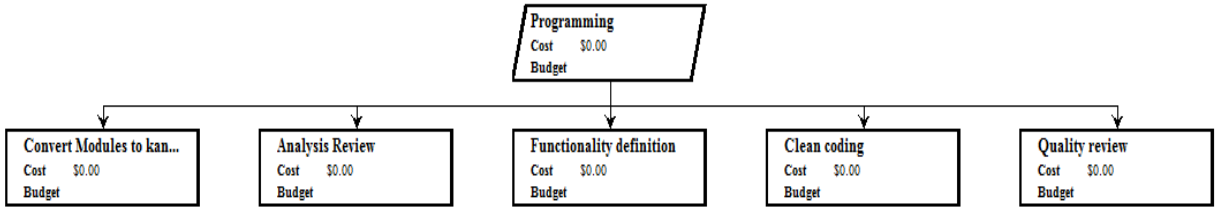
Navigation Plan :

It consists of 2 separate submodules which is functionality definition and prototyping.
Functionality definition was on paper made internal understanding document which details about all the functionality in the web application. Prototyping has been divided into Low fidelity and high fidelity. The prototype phase was in detail in the previous document which was provided.



Programming:

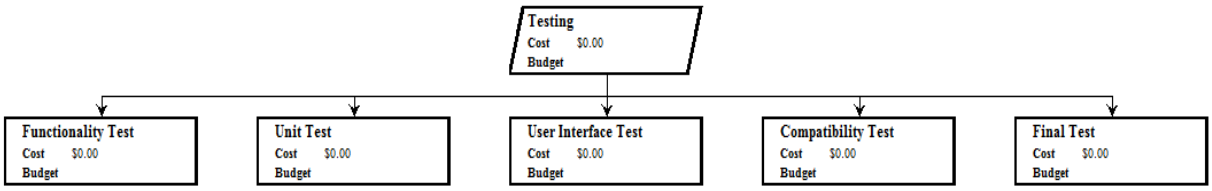
The programming phase consists of many different subphase like Coding, Quality review and Analysis review. This was the big phase in our project as much of our time spent was going through the tutorials and other functional aspects of Angular JS 2, as we went through different materials mentioned in the references provided in the reference section , we were quite able to understand and understand the concepts and implementation clean and much of our efforts were in this phase as there was a huge stack of concepts to learn and implement.



Testing:

The user Acceptance testing for prototype was provided in the previous document and we would continue speaking about the implementation testing as this document clearly explains how the testing phase was done in this project.

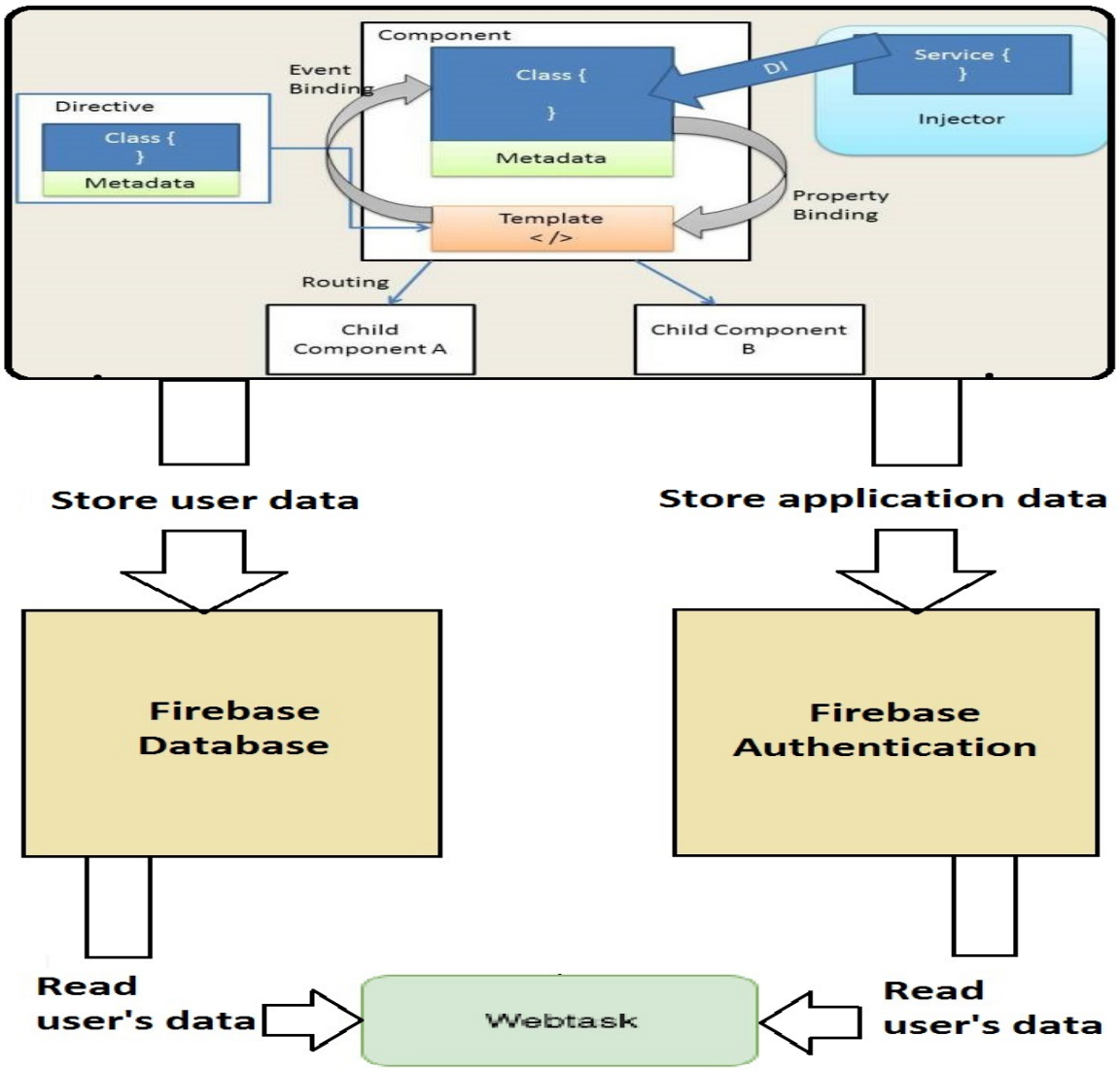
We concentrated much about the unit testing as it was done in parallel with the development phase



The testing phase is much in detail in further chapters

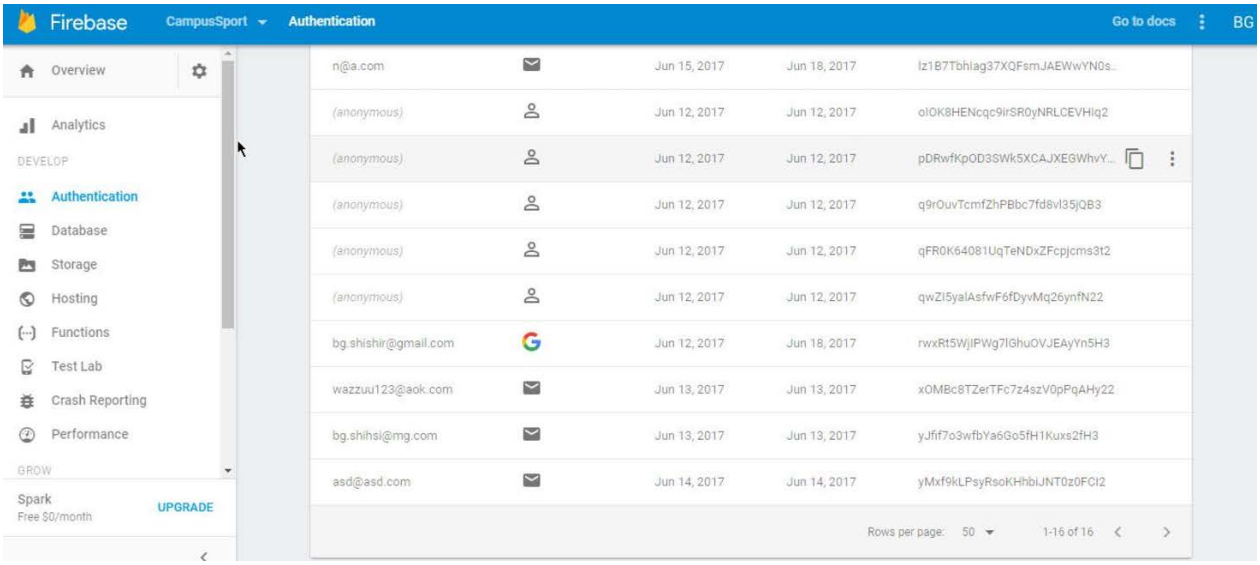
Architecture Diagram:

There was a change in Database as it was recommended by Angular 2+ to use the firebase. Previously in the PART 1 document we recorded the architecture to be in MongoDB but we decided to do in Firebase as Angular strongly supports Firebase to the fullest and there are many document pertaining to the same , most of the references are provided in the reference section.

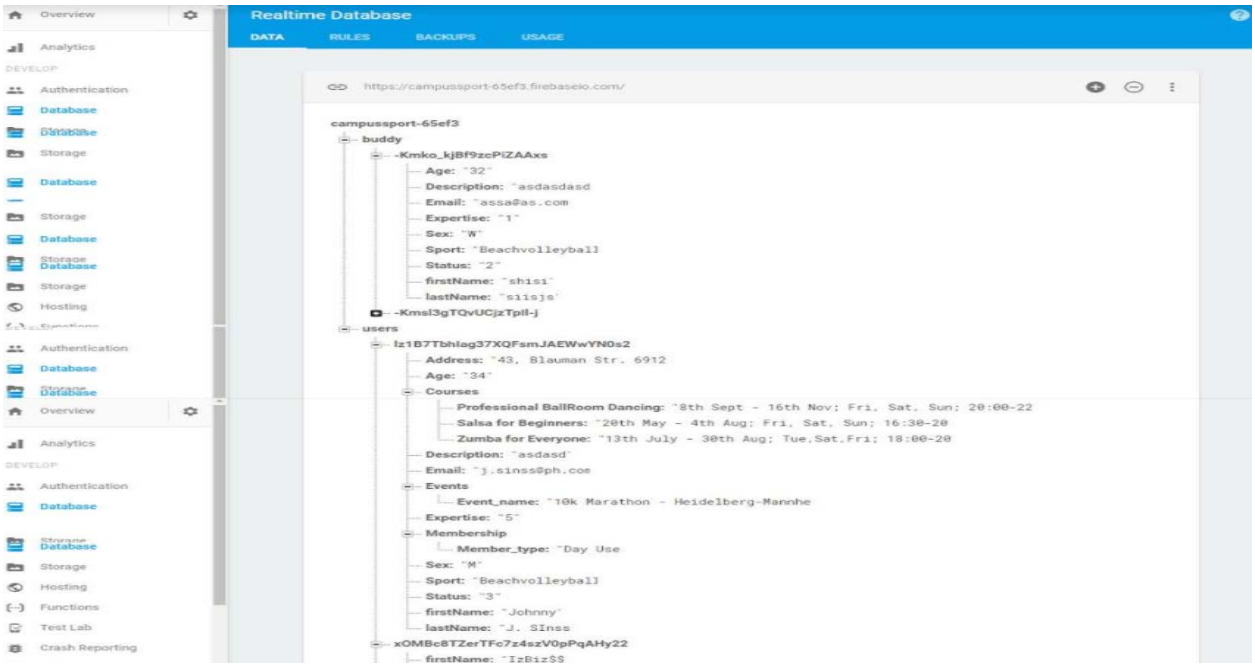

Component
Event Binding
Class { }
Metadata
DI
Service { }
Injector
Directive
Class { }
Metadata
Property Binding
Template < />
Routing
Child Component A
Child Component B
Store user data
Store application data
Firebase Database
Firebase Authentication
Read user's data
Webtask
Read user's data

FIREBASE DATABASE

Database Authentication:



Database Storage:



FUNCTIONALITY

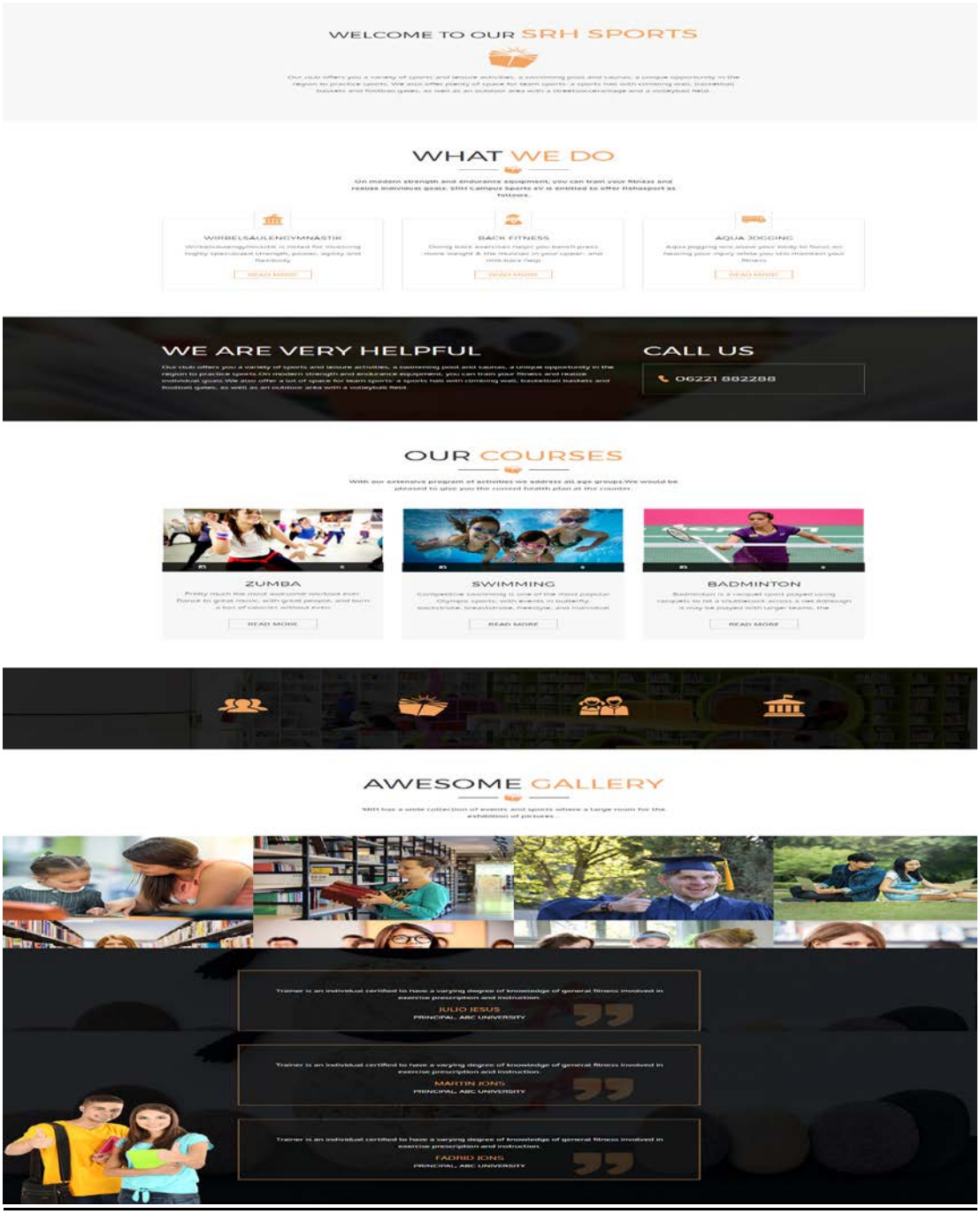
Main Header:

The main header consists of the functions that can be performed. The 'Home' button always navigates the user to the main home page. The 'Facilities' button has further options to choose from as per user's needs. He can choose from different facilities e.g. Cardio, Sauna and training for different sports. The 'Explore' button consists of courses and events taking places in Campus Sports. The 'Memberships' button consists of different memberships offered by the Campus Sports and their fee. The 'Find Buddy' consists of options for a user where he can register as a buddy, look for a buddy and contact available buddies. The 'Book' button consists of options for booking a court, registering in a course and booking a trainer. The 'About Us' consists of opening hours, services provided and contact details of Campus Sport.

Main Footer:

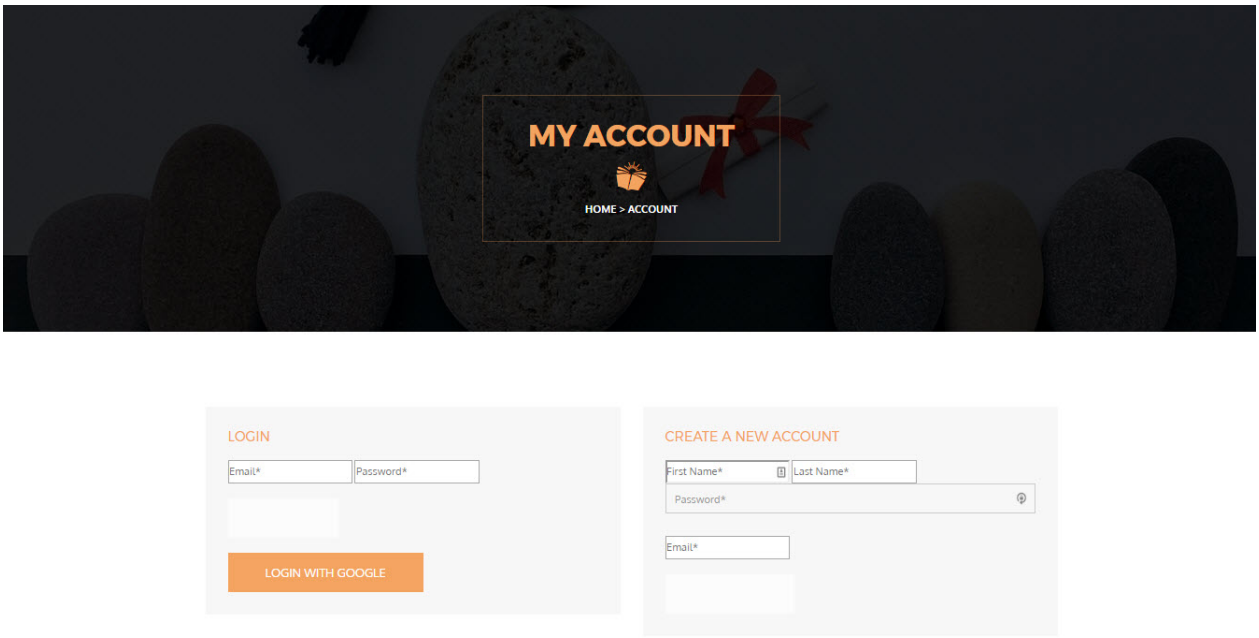
The footer consists of information about the Campus Sports, useful links to social media (e.g. Facebook & Twitter) and feeds on the Campus Sports twitter page. The contact email and address is also available on the footer of the webpage.

Main Home:


WELCOME TO OUR SRH SPORTS
WHAT WE DO
WIRBELSÄULENGYMNASTIK
BACK FITNESS
AQUA JOGGING
WE ARE VERY HELPFUL
CALL US
06221 882288
OUR COURSES
ZUMBA
SWIMMING
BADMINTON
AWESOME GALLERY
JULIO JESUS
PRINCIPAL, ABC UNIVERSITY
MARTIN JONS
PRINCIPAL, ABC UNIVERSITY
FADRID JONS
PRINCIPAL, ABC UNIVERSITY

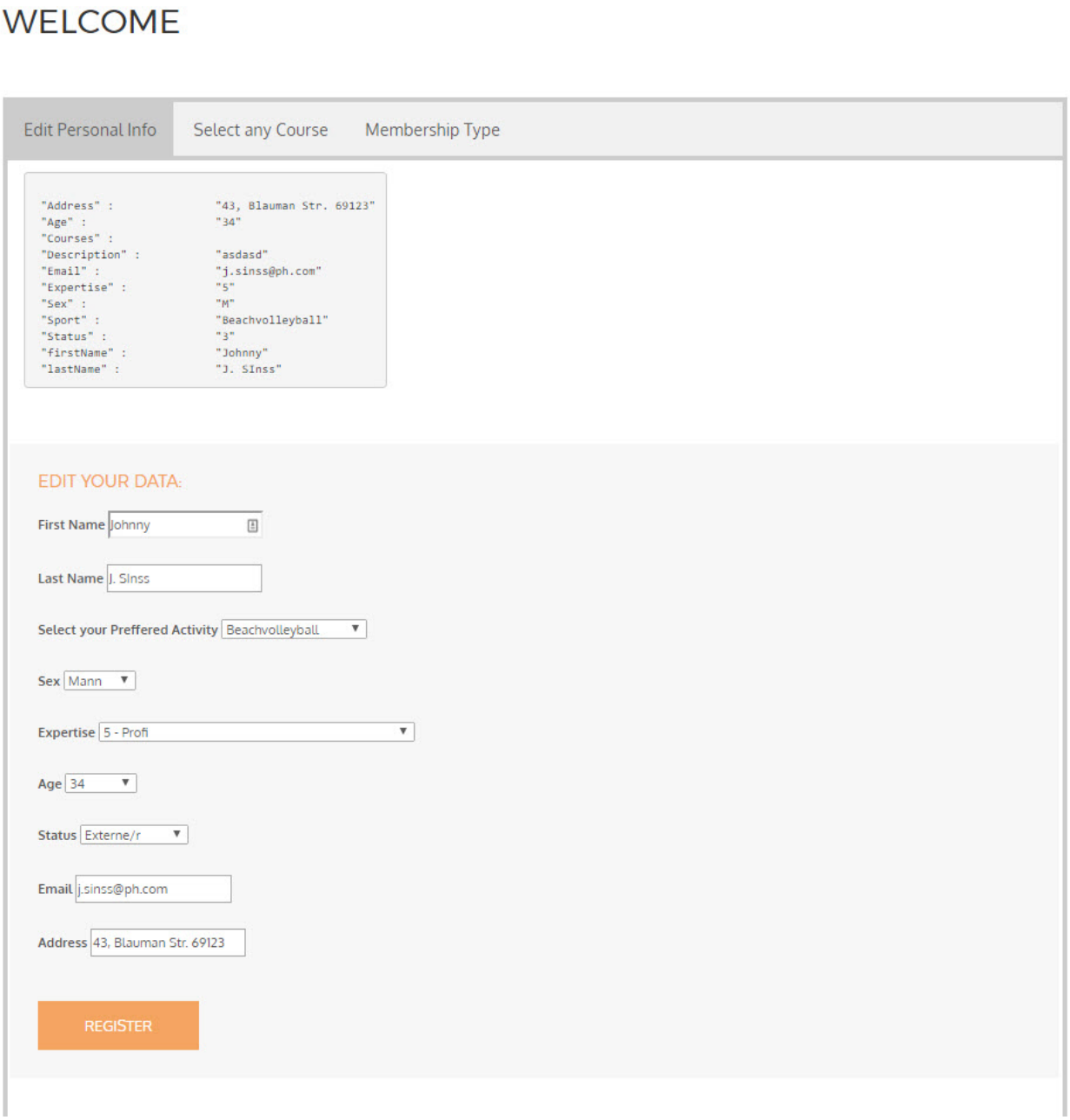
The main home page consists of an introduction to Campus Sports, what kind of services we offer for people of different age groups, the sports and fitness courses we offer, photo gallery & a shot introduction of the trainers.

User Login:



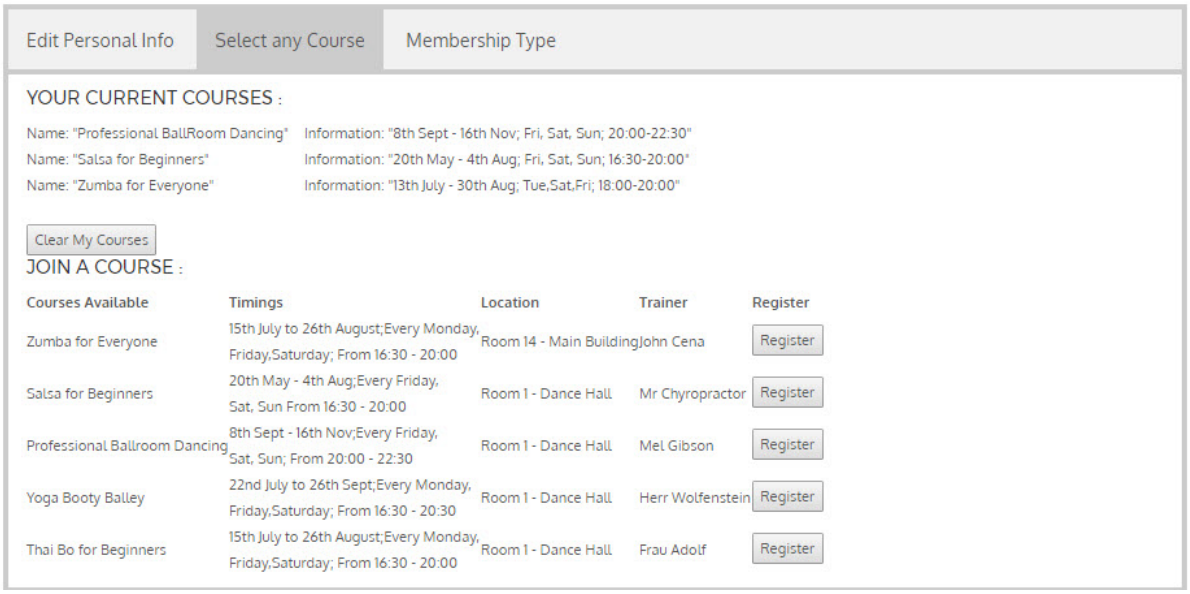
The user login page consists of two parts depending upon if the user is already registered in the system or he/she is a new user.
If the user is already registered, he can simply login with his credentials (email & password).
If the he/she is a new user, he/she must register first to login.

User Registration:



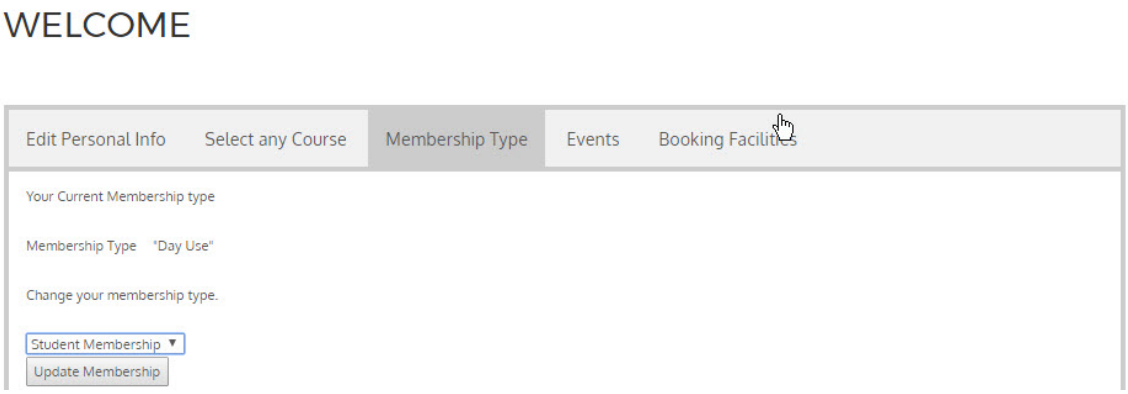
When the user wants to register, he must enter his personal data e.g. Name, age, weight, address etc. After that, he is navigated to the course selection page.

User Logged in:



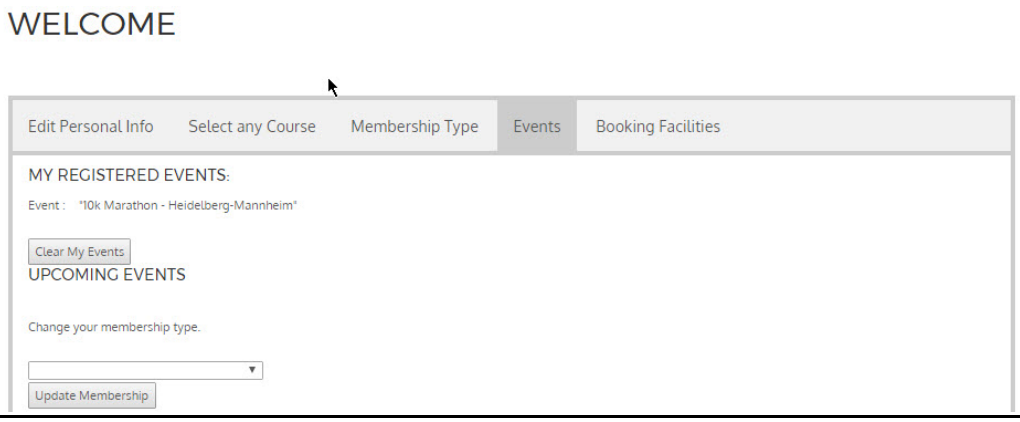
In the course selection page, the user can select and register for the courses. The information about the courses i.e. name, timings, location and trainer are shown in this page. Once registered, the courses will show under the 'Your Current Courses'.

Membership Type:



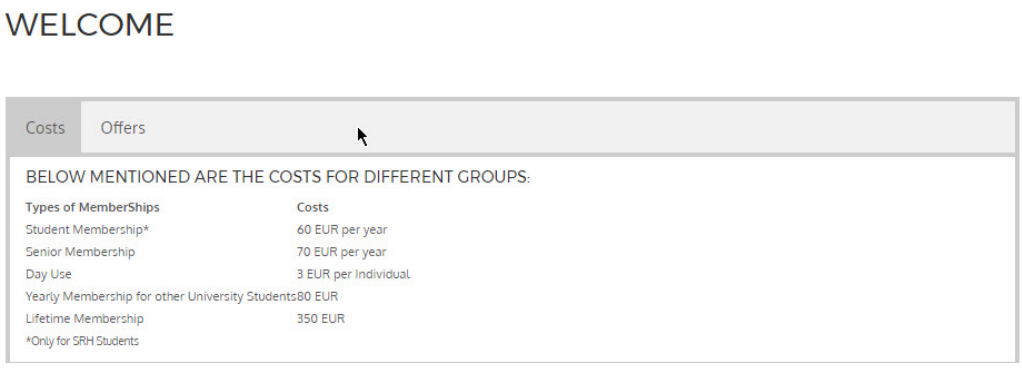
The user can the type of membership he/she wants which also depends on the status of the user i.e. the is a student, a faculty member or alumni.

Events Registration:



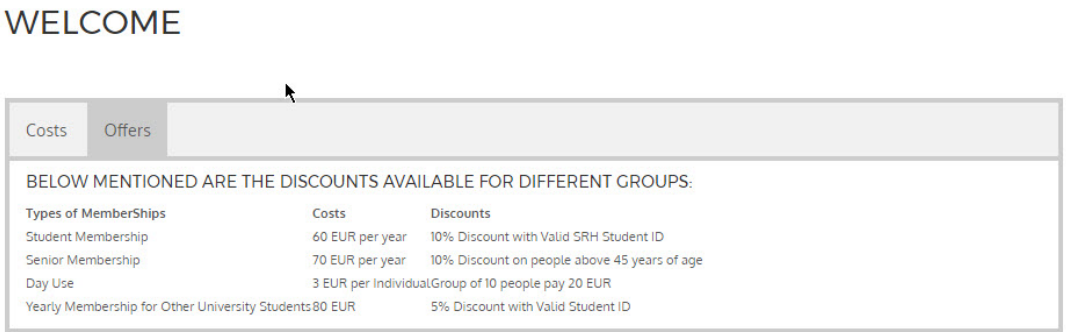
In the events page, the user can register for the events e.g. SRH Marathon or other events happening in Campus Sports. He can also update his/her membership.

Membership Costs:



In the membership page, the user can view the types of memberships available and their costs.

Membership Offers:



In the membership offers page, the user can view the available memberships, their costs and also if there are any discounts available for a membership.

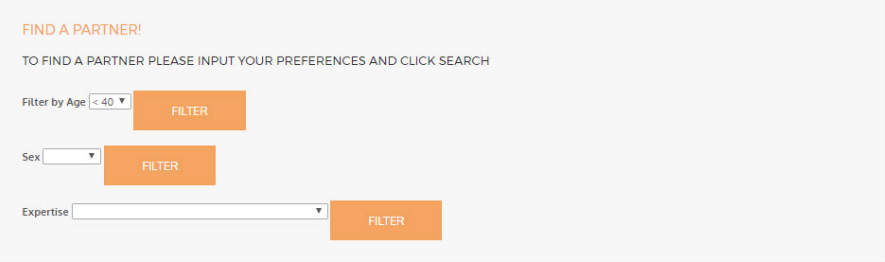
About Us:

In the 'About Us' page, the user can view the opening timings of the campus sports.

Contact Us:

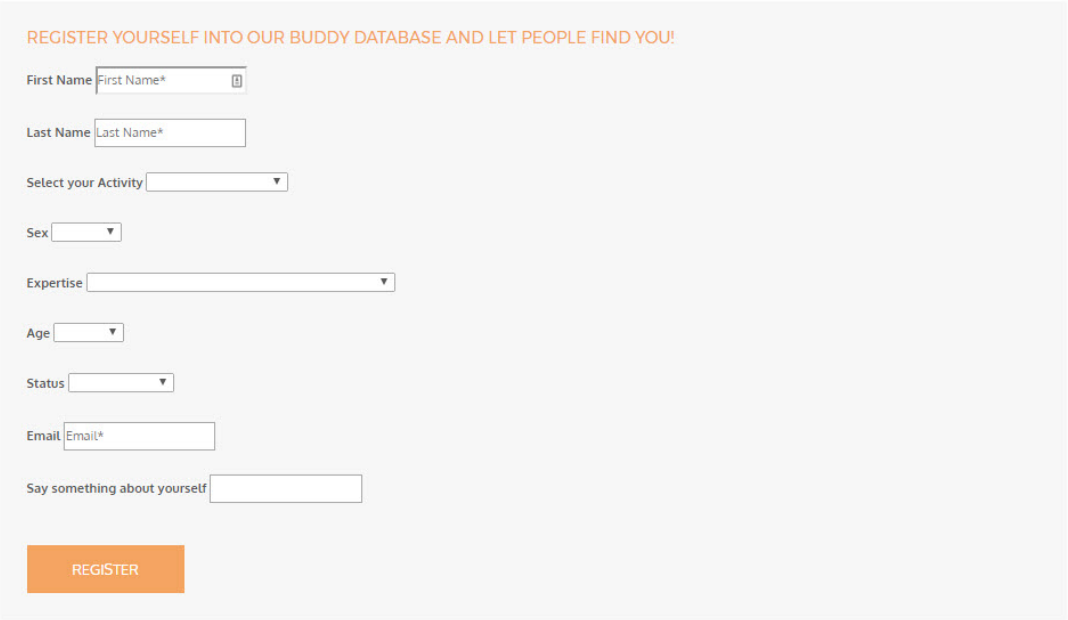
In the ‘Contact Us’ page, the user can view the address of Campus Sports and also he can write his query to the staff if they are not available on the phone or outside their office timings.

Find Buddy:



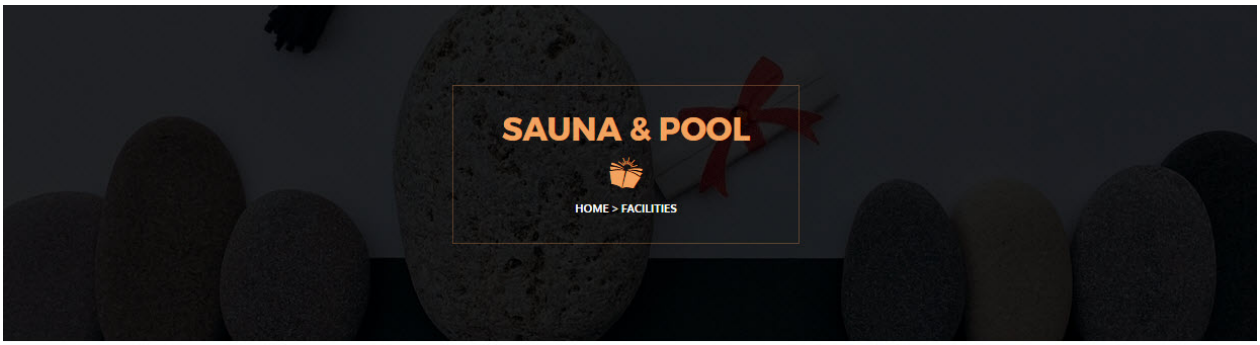
In this section a user can search a registered member. User does this by entering data as per his/her preference’s and then a list is provided. After that the user can see through list and contact another Buddy.

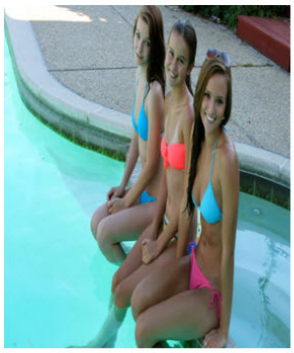
Register as a Buddy:



This page is to register yourself into our database to become a registered buddy member. User is asked to enter basic information like his biography, type of activities he/she does in sports club and the level of expertise he/she has. Once this information is saved in the database that specific information is used when other members will be looking for buddy as per to their interest.

Sauna & Pool:





Name : Sauna & Pool

Trainer : Sophie

Experience : 6 Years

Reviews : ★★★★★

Social Media :

Start your day feeling refreshed or mark the end of the day with a swim in the 25-meter pool at the wellness and fitness facilities located in the building complex. This is where you can enjoy some active relaxation or simply relax and unwind.

OTHER FACILITIES

This page provides information about one of the sports club facility namely Sauna and the swimming Pool. It includes the information about the Specific trainer assigned to help you learn swimming.

USER TESTING

TASK	NAVIGATION	REMARKS*	USER TESTING COMPLETED?
Samantha wants to check the schedule for yoga booty ballet	Home-Login-My courses	✪✪✪✪	✓
Raj wants to enroll for the football event	Home-Login-My events	✪✪✪✪✪	✓
Cameron and his friends wants to book a court for football practice	Home-login-Book	✪✪✪	✓
Kiara wants to find a gym buddy who can play badminton with her.	Home-Find Buddy-Find	✪✪✪✪	✓
Natasha could not find anybody on the buddy list and wants to enroll herself as buddy	Home-Login-Find Buddy-Register	✪✪✪✪	✓
Tanja wants to update the details in her user profile	Home-Login-Edit Info	✪✪✪✪✪	✓
Ahsan wants to know the events scheduled for the weekend	Home-Login-events	✪✪✪✪	✓
Fatima wants to enroll her kids for the summer courses	Home-Sign Up-Login-My Courses	✪✪✪✪	✓
Nicole wants to play table tennis with someone of the same expertise	Home-Find Buddy-Find	✪✪✪✪✪	✓
Esana wants to show her friends all the facilities offered by the SRH CampusSport	Home-Facilities-courses	✪✪✪✪✪	✓
Ronald who's already a member, wants to change his membership type	Home-Login-Membership	✪✪✪✪	✓
Mark wants to register himself	Home-Sign up	✪✪✪✪	✓

✪-Bad
✪✪-Average
✪✪✪-Good
✪✪✪✪-Very good
✪✪✪✪✪-Excellent

Unit testing was done Using this simple table shown above. The tasks was provided to the users with specific tasks and the remarks was recorded as shown previously.

TEST PLAN:

There are certain requirements that must be met and deliverables that should be gained in the end of this project. The test plan represents the first and most critical step in the path that leads to meeting those requirements and concluding with the aimed outcomes. The test plan for the SRH CampusSport system could be summed up into three major objectives: reliability, security, and usability. The software must be able to do the requested function and perform in the predictable way. It must provide the correct functionality to the authorized user.
The test plan is to document the approach to be used in testing, find bugs and blemishes in the system before its final release to the public. The plan will test the performance of the site by simulating real life conditions that might happen after the site deployment.

It is critical to perform a test plan in order to cover the most aspects of the system. The website will be tested to ensure that it operates in different platforms with minimal impact. A compatibility testing, functional and non-functional testing will be held. The integration of strategy, architecture, content, design and functionality of the system will be tested as well, to evaluate the site's compliance with its specified requirements.

Test Risks and Week Points:

The word “risk” could be summed up in any negative or unwanted result in the future and the chance of a risk becoming an outcome depends on how influential the risk is on the project.

All projects have various risks that could be powerful enough to endanger the objective of the development scheme. Those risks vary from one project to another depending on several aspects. Conversely, the test plan should focus on how to prevent such threats.

There are several potential risks concerning the compatibility of the SRH CampusSport project that might/might not appear during testing. The following are some of the predicted risks:
Website might change in its behavior after any kind of changes done in the system’s environment.
Webpages might not be displayed properly on old versions of web browsers.
Website might not work properly on some operating systems.

According to ISQTB1, 100% testing is impossible. For instance 90% of the system's aspects will be tested and the 10% are left untested. The 10% might cause sudden ruins when some changes happen to some objects in the environment. However, performing tests on as many possible aspects will prevent such risks. The testing process will continue even after the deployment of the website. SRH CampusSport will keep up with the latest updates and versions of computing objects to ensure the compatibility of the website.
The International Software Testing Qualifications Board (ISTQB) is a software testing qualification certification organization that operates internationally.

Prepare Environment

The first stage of the database-testing plan is to decide which software versions to be used and what platforms to be running on.

Run Required Test

The second stage is running the database tests to verify its suitability to the planned task.

Check Test Results

The third stage is checking whether all the features of a software application are working correctly.

Perform Validation

The forth stage is checking whether the entered data is valid or not with respect to data type. This is intended to provide guarantees for system accuracy, and consistency for different kinds of user input.

Report the findings

The fifth and final stage is reporting the findings and giving feedback to the respective stakeholders.

COMPATABILITY TESTING

The compatibility testing will be the first type of testing that will be performed once the system is launched. It is a non-functional testing that will confirm the compatibility of SRH CampusSports system with various other objects in the computing environment; objects such as: operating systems, web browsers, hardware platforms and…etc.

Compatibility to different web-browsers

A web page can look drastically different as displayed in different browsers and since there are more than 40 web browsers, it is difficult to cover them all in testing. Therefore, SRH CampusSport system will be tested on the most popular ones only.

According to W3Schools' 2, 70.4% of the web users use Chrome while 17.5% use Firefox, 5.8% use Internet Explorer and 3.7% use Safari - April, 2016. The following table signifies the test plan for different web browsers.

W3Schools is a web developer information website, providing information relating to HTML, CSS, JavaScript, PHP, SQL, Bootstrap, and jQuery.

Browsers to be tested	Test Description
Chrome compatibility	Since Chrome is automatically updated, the testing will be performed on the newest version only.
Chrome version 59.0.3071	This version of Chrome works on all windows and Mac platforms. Therefore, it could be testing using any of them.
Firefox compatibility	By default, Firefox is set to automatically update itself. Therefore, testing will be performed on the latest version only.
Firefox version 53.0.3	This version of Firefox works on most windows, Mac and GNU/Linux platforms. Therefore, it could be testing using any of them.
Internet Explorer compatibility	Each product has updates and version releases. Different versions might differ in the way they display the web site. Therefore, testing will be performed on the latest four versions of Internet Explorer.
IE version 11	This version only works with Windows 8.1 and Windows 7 OS. Thus, testing will be performed on one of those Operating systems version.
IE version 10	This version works on Windows 7 and above OSs. Thus, testing will be performed on one of those Operating systems version.
IE version 9	This version works on Windows Vista and above OSs. Thus, testing will be performed on one of those Operating systems version.
IE version 8	This version works on Windows XP and above OSs. Thus, testing will be performed on one of those Operating systems version.
Safari compatibility	Safari browser releases a new version or update quite often. Therefore, testing will be performed on the three latest versions only.
Safari 9.1	This version was released in march 2016 and works on OS X v10.9 and OS X v10.10. Thus, testing will be performed on this Operating systems version.
Safari 6.2.8	This version was released in August 2015 and works on OS X v10.8. Thus, testing will be performed on this Operating systems version.
Safari 6.1.6	This version was released in August 2014 and works on OS X v10.7. Thus, testing will be performed on this Operating systems version.

Table 1: Compatibility to different web browsers

FUNCTIONAL TESTING:

Functional testing or called black box testing shall describe what the website usually does. This testing will ensure that the SRH CampusSport is functioning as users are expecting it to.

It will be performed on both client and trainer's sides. The following tables describe the functional test plan for each service in each page of the website.

Login/Registration Test Plan

Items to be Tested	Description
First Name	Testing First Name/ Last Name can be done by: Leaving one of / both name fields empty Inserting special characters. Adding numbers/symbols instead of letters.
Last Name	
User Name	Testing User Name can be done by: Inserting special characters. Leaving the field blank. Inserting an already taken username.
Password	Testing User Name can be done by: Displaying Password input in bullets. Accepting combination of letters, numbers and symbols. Maximum and minimum length of input. Leaving the password Field blank.
Email	Testing Email can be done by: Entering Email address without @ symbol. Missing dot in the email address. Entering already used email address.
Gender	Testing Gender radio-button can be done by: Not selecting any button. Selecting more than one button.

User Profile Test Result

Items to be Tested	Description	Result
Name	Error message should appear if "Name" field is left blank, special characters, number, symbols are inserted	
Profile Picture	Error message should appear if file size is larger than accepted or different file type	
Address	Error message should appear if "Address" field is left empty or if Number is inserted in the city and state fields.	
Sports	Error message should appear if "Sport" field is left blank, or if none of the sports are selected.	
Certified /Non-Certified	Any of the radio buttons for Yes/No should be selected and if certified the details about the certification such as, Certifying Authority, Institute and ...etc. should be inserted.	
Trainers Experience details	Error message should appear if "Experience details" field is left blank.	

6. Evaluation

To ensure user acceptance, questionnaire forms were required to be filled up by the intended users of the system. These questionnaire attempt to assess the usability of the SRH CampusSport website and to verify that the system truly delivers its business required functions. See Appendix for more information about the form.

WHAT WAS PLANNED

- A login system with email and password. (Firebase)
- Sign up functionality and a small tour that shows a brief description of the application and collects user data for profile.
- Social login system. (Facebook and Google)
- Event list where all the logged in user would see all the current events.
- Membership page where members will have an option to become a member. Outside member can view the type and cost, offers pertaining to the membership
- Courses web page describes the courses list and log in members can enrol for the courses directly from the web application
- Facilities tab describes the Gym Facility which is available
- Logged in user can edit his personal information.

WHAT WAS ACHIEVED

All the features that were planned were achieved. There is scope for improvement in terms of data presentation, validation and the UI

CONCLUSION

The application was developed keeping the users in mind, this is a user driven application. The Application was developed based on the Kanban approach. The final application ratio to its prototype does not differ much and was developed solely keeping the user and UX in mind.

In conclusion, the App is fully functional with the main features with scope for improvements.

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