Ort Braude College

Software Engineering Department

Innovative supportive social media application for Android users

In Partial Fulfillment of the Requirements for

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Abstract. In our project we suggest a solution for problems like hostility in social networks, lack of caring and lack of volunteering. Our solution is based on a platform of social network, which encourages social meetings, social volunteering, new friends making, and an option of receiving help from others, all based on a positive environment with some content filtering. As an incentive, users get benefits for their positive activities which are connected to the application. Benefits are in form of points which can be redeemed to discounts and gifts on different shops and businesses. Those points are also used to achieve higher rank as users and extend the scope of bonuses in result.

Keywords: volunteer, social network, social points, content filter

1. INTRODUCTION

It is well known that social media applications (e.g. Facebook, Instagram, Twitter etc.) have become an integrated part of our lives.

Up until January 2019, 3.26 billion people use social media on mobile devices, with a growth of 297 million new users every year. [1]

From that number of users, we get a very high percentage of 76.67% (October 2019) of Android users. [2]

There is no doubt that social media is a wonderful platform of meeting new friends, staying up to date on worldwide issues and so on.

Unfortunately, not all the published data is appropriate. Some uses of those platforms might be as bad as

cyber harassing, blackmailing, lack of human contact and time wastage.

Moreover, caring for each other is an essential need for all of us. There are many ways people can help and care for others, but not many people are aware to them.

Thus, to try overcoming these problems, a new innovative application must take the role of changing our society.

1.1 Paper Organization

In section 2 we wrote about related work and motivations for developing our application. In section 2.1. we brought some facts and statistics from different resources about current specific problems in the world: Cyber bullying (section 2.1.1) and lack of caring (section 2.1.2). In section 2.2 we discussed about current solutions, implicitly or explicitly, to the problems which we discussed about in the previous sections. We focused on 3 major companies: Heroes for life (2.2.1), Facebook (2.2.2) and We heart it (2.2.3), and we counted some advantages and disadvantages of those companies, relating to our subject. In section 2.3 we wrote our conclusion of all the written above. Section 3 was dedicated to our solution to the problems we mentioned. In 3.1 we wrote a general description of our application and its features. The section after, we explained what is Firebase that we are using to make our application work on worldwide web. In 3.2 we explained how using our application will be a better social experience and in section 3.2.1 we described an algorithm in our application that filter abusive textual content. We continued to describe in sector 3.3 about how our solution helps people to find new friends, socialize and volunteer while receiving also material benefits of it. We based our position with farther information of the "social points" and bonuses in sections 3.4, 3.4.1, 3.4.2 and 3.4.3. Section 3.5 catches the main idea of our application's home page, and section 3.6 supply more information about volunteering, receiving help and meeting new people by using events mechanism. In section 4 we declared our expectation of the results, after releasing our application to the world. Section 5 was dedicated for software engineering documents: requirements (use-case, 5.1), design-5.2(class diagram 5.2.1, and primarily GUI 5.2.2) and testing plan-5.3: user registration and login, user's actions and manager actions.

2. BACKGROUND AND RELATED WORK

2.1. Current Problems

2.1.1. Cyber bullying

Cyber bullying refers to Internet bullying. It can be done by using technological devices (e.g. computer, cellphone etc.), to bully or harass another person.
Statistics have shown that cyber bullying has become a serious problem (can be seen in Figure 1) among teenagers, But not only for them.
Cyber bullying can take many forms, such as:

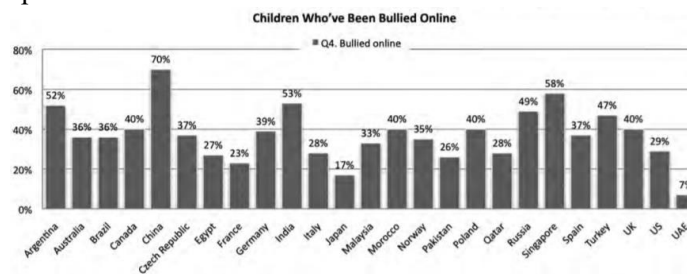- Mean and offensive messages
- Threats
- Stealing a person's account

Figure 1: Children around the world who have been bullied online, including: China- 70%, Argentina- 52%, Russia- 49%, from the "Cyber Asia and the New Media" paper, by Christine Suniti Bhat, Shih-Hua Chang, and Moira A. Ragan.[3]

2.1.2 Lack of caring

The continent decrease in caring for each other, or even our surroundings, is an issue we must deal with.
Caring may be referred in many forms, such as:

- Helping others
- Volunteering
- Saving the environment

Although volunteer work is essential for maintaining a stable and thriving society,
we face a decreasing number of people who are willing to contribute, for others and for the environment we live in. For example, the volunteering rate of 2018 in the United States was 24.9%, compared to 28.8% in 2003-2005 (Figure 2).
According to Amy Yotopoulos, from the Stanford Center On Longevity, three reasons people do not volunteer are [4]:

- They do not have much time
- Lack of information and loss of interest
- No one has asked them to

Although we probably cannot influence their time management, we are able to inform them about diverse volunteer opportunities and share all the information they need about the work they are interested in.
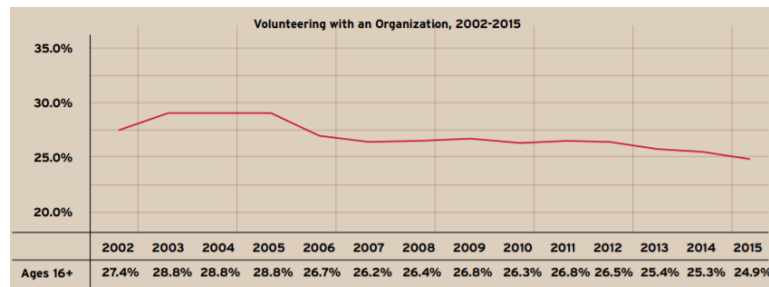
Figure 2: National adult volunteer rate in the United States (Ages 16 and Over), 2002-2015, from the University of MARYLAND, October 2018 [5]

2.2. Market Research

Currently, there are some famous organizations or applications that may suggest partial solutions for the problems which were discussed above. Let us discuss about those existing solutions and about the reasons we found them to be not completely satisfying:

2.2.1. Heroes for life

Background: Heroes for life (i.e. lokhamim le'lo gvulot in Hebrew) was founded in 2013 by three IDF officers who served together in an elite unit. Their vision is to turn Israel into a global superpower of charity in developing countries and to run humanitarian volunteer projects in four different continents of the world. For this purpose, the organization sends delegations of volunteers combined of post- army Israeli travelers to contribute in poor countries, while supplying them food and accommodation during their volunteering time.

Usually the volunteering will be in an orphanage, and will include many different subjects, the main ones being- teaching English, calculus, personal hygiene, values, music and arts, renovating, painting and more.

For the present, 4100 children were assisted, in 4 continents, during 3 years of activity.[6]

Advantages:
- A truly decent opportunity for people who want to volunteer, while travelling the world.
- The organization and its published activities raise the awareness of poor people's problems and somehow manage to achieve caring.
- People who participate the program can meet with other people in the program and make new friendships.
- Volunteers get accommodation and food supply by the organization, while staying abroad.

Disadvantages:
- The volunteering is limited for post-army Israelis and only for certain activities, mainly in poor countries.
- There is no real time help for people who need it on the daily basis.
- The benefit that the volunteers get is limited.
- There is a potential to improve the connection between the volunteers and to make it become a larger, more connected community.

2.2.2. Facebook

Background: Facebook is one of the most common social medias in the world, with approximately 1.62 billion daily active users (i.e. users who log in every day) as of September 2019. It has begun in February of 2004, as a school-based social network, by Mark Zuckerberg along with Edward Saverin.[7]
Their mission was to give people the power to build community and bring the world closer together. People use Facebook to stay connected with friends and family, to discover what is going on in the world, and to share and express what matters to them.

Advantages:
- Easy way to make new connections, as you can see people's interests and shared media.
- Publishing may help for business groups
- You can publish your thoughts, help others or ask for help.

Disadvantages:
- Does not encourage enough volunteer work.
- Might have offensive and harmful contents, especially comments and discussions.
- Does not encourage its users to participate in social meetings outdoors.

2.2.3. We Heart It

Background: We Heart It was founded in 2007 by Fabio Giolito, a native of Brazil. He started the site as a side project around the idea of "hearting" photos and saving them for sharing with friends. In December 2013, We Heart It reached 25 million monthly users. We Heart It is an image-based social network. It describes itself as "A home for your inspiration" and a place to "Organize and share the things you love." Users can collect (or "heart") their favorite images to share with friends and organize into collections.[8]
We Heart It is known for its positive community, since there are no features for commenting, users feel more comfortable posting content since it will not receive negative comments as it might on other social networks.

Advantages:
- Users can share and receive photos according to their topics of interest and communicate with other people in same circles of interest.
- Since there are no features for commenting, the topics stay pure and clean of bad discussions or harming comments, therefore the social network stays more positive.
- Users can find inspiration in the tips and photos that people post and get helped by that.

Disadvantages:
- The application does not encourage volunteering and helping each other enough.
- Users do not get the chance to participate in social events.

2.3. Conclusion

Nowadays, cyber bullying and harassment are big issues, caring and volunteering rates are decreasing.
There are partially existing solutions for those problems including organizations as Heroes for life and applications as Facebook, We Heart It (and more), but there is no application that takes care of solving all of those on one platform.

3. OUR SOLUTION

3.1 General Description Of The Application

Our approach is to solve the problems which we mentioned above with a social network application, called "BeSocial". The application, that will be accessed internationally by anyone who uses android mobile phone and connected to the internet. To assure it works, we are using Google's Firebase backend as a service (some more details on the next section). The application will include features which will support making new connections and sharing information with each other (e.g. posts, picture uploads, messages etc.). In addition, it will also include features which will allow the users to volunteer, get help, see upcoming social or volunteering events. The application will encourage the users to help others and participate in social events by giving them special benefits- as more they are active, the more they get.

3.1.1. Firebase as a backend service

[9] Firebase is Google's mobile platform that helps you quickly develop high-quality apps and grow your business. Firebase provides several services which help us to build our application faster, more secure and efficient. Some of its services are:

- User authentication: Firebase Authentication aims to make building secure authentication systems easy, while improving the sign-in and onboarding experience for end users. It provides an end-to-end identity solution, supporting email and password accounts, phone auth, and Google, Twitter, Facebook, and GitHub login, and more.
- Crashlytics: Firebase Crashlytics helps you track, prioritize, and fix stability issues that erode app quality, in real-time. Spend less time triaging and troubleshooting crashes and more time building app features that delight users.
- Real-time database: The Firebase Realtime Database is a cloud-hosted NoSQL database that lets you store and sync data between your users in real-time.
- Cloud storage: Cloud Storage is designed to help you quickly and easily store and serve user-generated content, such as photos and videos.

3.2. Better Social Experience

As in most social networks, our users will be able to upload and share pictures and thoughts, follow and chat with other users. Furthermore, they could be a part of groups according to their interests, getting to know other users with similar interests as theirs. While this being said, "BeSocial" will act to keep the vibes of the social network more positive, by allowing user only to like posts, no comments. We will act as much as possible for not allowing abusive content or abusive users, by removing bad posts and blocking this kind of users. Users will be able to report other users or offensive content, all for making the user's social experience cleaner and more positive

3.2.1 Content filter algorithm

As part of the user social experience, our application will combine a special algorithm for filtering abusive text content. The algorithm:

1. First, load the list of abusive words (CSV file) to a hash map(key-value), and save the length of the longest word.
2. When a user writes a text content and presses 'send':
   2.1. From the beginning of the content, move on each letter and check if there is a consecutive set of letters that is included in the abusive words hash map.
   2.2. If there are abusive words, add them to an array of bad words.
3. Check if the array of the abusive words is empty, if yes-let the user post the content, if not, pop a text dialog with options to let the user know the bad words in his input and choose whether to continue sending the content or cancel.

3.3. More Friendship Making, Volunteering And Fun Social Meetings

Our goal in "BeSocial" is to create a real supportive and friendly community. Therefore, the application will provide a convenient platform to communicate with other users by using chat, to volunteer and get help from others by creating a "Need help" events or searching for other users' events around you. Users will also be able to socialize and meet new people outside of the social network by attending fun social events, organized by event organizers of the company. In order to boost users to participate in the activities of the application, we will use the "social points" and bonuses method. Bonuses will come in form of benefits in selected companies on different categories (e.g. discounts in clothing stores, coffeeshops, movie theaters, sports and etc.). Moreover, selected high ranked users would be able to participate in high-valued events of "BeSocial", such as barbeque events, bar tours, community service volunteer events and even volunteering abroad, all for free or sometimes even getting paid while filling the role of event organizers. As part of the benefits method, users who make "positive" actions such as: connecting other users by sending a message, helping others, participating in social or volunteering events and etc., will be benefitted by receiving "social points". These points are required for level-ups of users' ranks and receiving bonuses, the higher the rank is- the better the available benefits are.

3.4. Further Information About "Social Points" And Bonuses

As explained before, the method of benefits to the users is an important key for our application to boost users helping each other, volunteering and meet. The following paragraphs explains more about this method.

3.4.1. Ranks and Points

Users can view their "social points", ranks and benefits in the "bonus area". Here is the list, in escalating order, of the ranks and the defined "social points" that user should have to receive them:

1. "Shy socializer": 0-200 points.

2. "Out of the shell socializer": 201-800 points.

3. "Academic socializer": 801-2600 points

4. "Socialized ninja turtle": 2601-6000 points.

5. "Socialosaurus": 6001 points and on.

3.4.2. Ways to receive "social points"

Users would be able to gain "social points" by being active in different ways as the following:
- Start a new conversation with other user- 2 points.
- Help people on "Help me" events- 50 points (limited to up to 3 events per day).
- Contribute in volunteering event-100 points.
- Participate in social event-50 points.

3.4.3. Redeem benefits

Once a user has reached the second social rank, he will be able to redeem benefits from the store.

Each rank comes with its unique bonuses and limitations on claiming them. The user enters the "Bonus Area", chooses the specific benefit he wants and asks to claim it.

After he chooses, he gets a serial code for the benefit, which he can go to the specific business and use his benefit.

3.5.   Home Page And Posts

The home page in our application will mainly show posts of users, according to the chosen category. A user will also be able to filter posts by choosing the option to show posts only of people who the user follows. The default case will be showing the posts of all the users, since we believe this is a good way for users to communicate with other users who they do not know yet and make new friends.

3.6.   Creating Events, Asking For Help And Volunteer

For assuring that users will have a proper platform for receiving help, meet new people- not only virtually, and volunteer in some special occasions, we use the events form.
Users can create a new public event as a "help me" event for asking for help or "social event" for meeting people. Users will be able to use filters as choosing category, choose geographical area, see their own created events. Of course, users can participate in public events by pressing 'attend' button. Participating in social events and helping others not just will spiritually and physically benefits users, but also add some "social points" to their accounts which will be translated into material benefits and higher rank in the bonus area.

4.   EXPECTED RESULTS

Aiming for achieving our goals, we expect to reach millions of people.
Our application will include features that will encourage our users to make new friendships, mingle with others, meet their friends in person and leave hatred and prejudices aside. It will also push them to be politer, help others, clean the environment and make a better society.
While doing so, we hope that our users will find joy in contributing, whenever they are rewarded or not.
Our application will host contribution events (e.g. charity work, cleaning beaches etc.) and social events (e.g. running races, barbeques etc.), as many as it will be able to.
Most importantly, our final and most eminent goal is to make a better society, for a better tomorrow.

5. SOFTWARE ENGINEERING DOCUMENTS

5.1. Requirements

Figure 3 Use case diagram
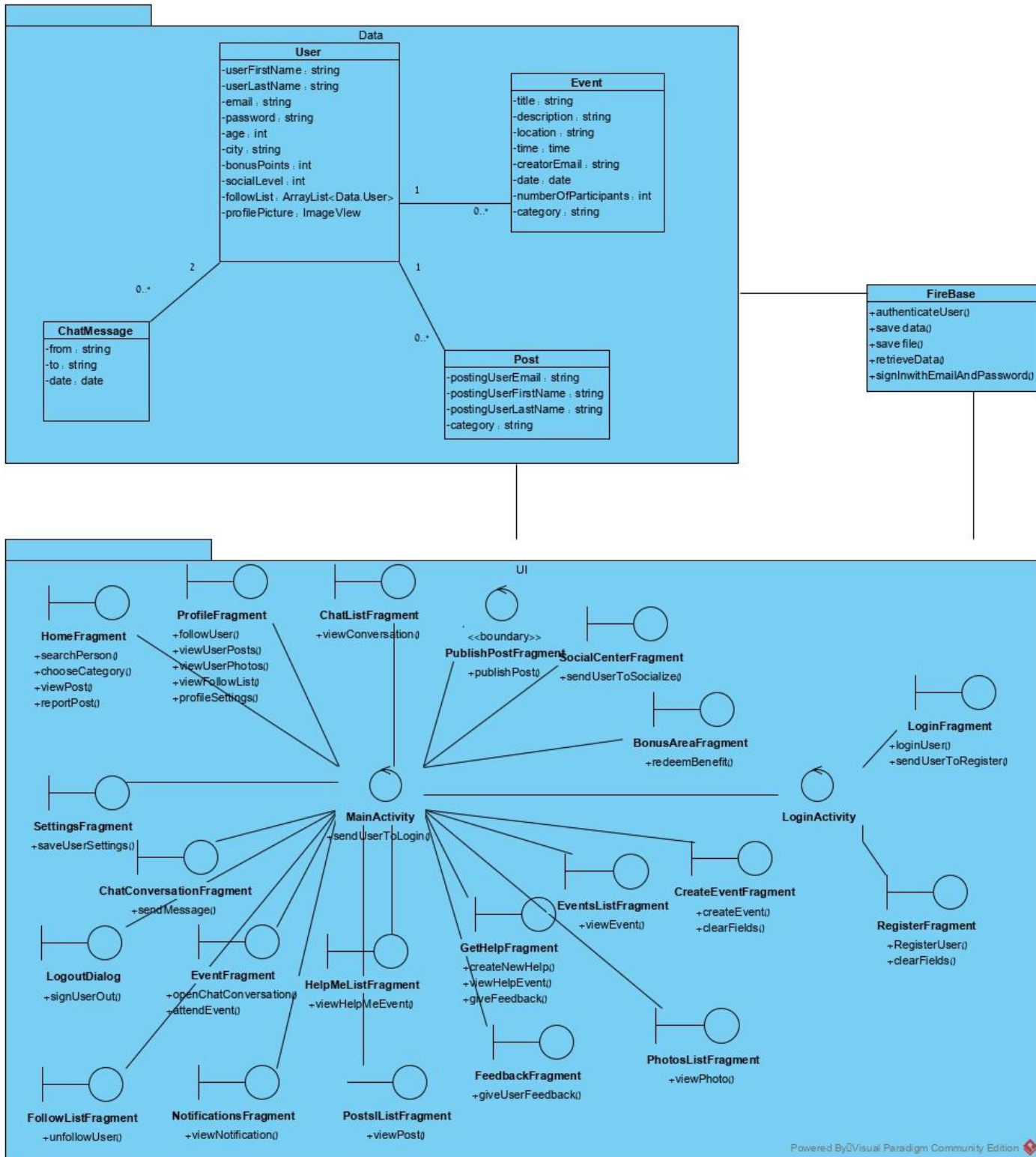
5.2. Design

5.2.1. Class diagram

Figure 4: Class diagram

5.2.2. Graphical User Interface (GUI)

In this section, we will introduce the first design of the User Interface (UI).
As part of a good and informative UI, we tried to create an informative environment, simple and convenient to handle. It is essential to give the best experience while using the app and we will continue to do so as the development will proceed.
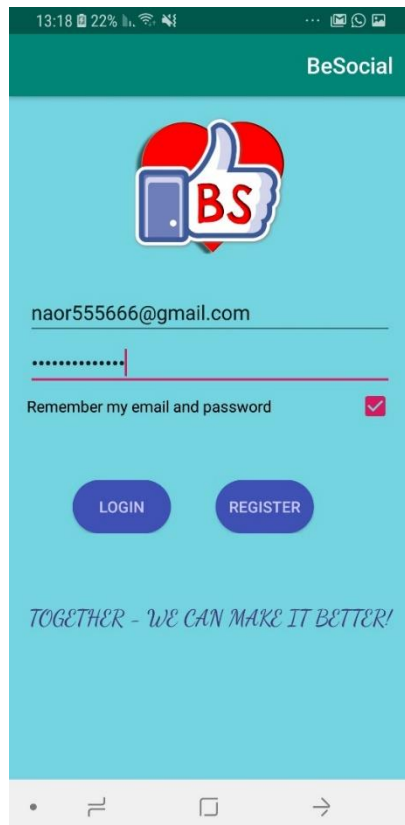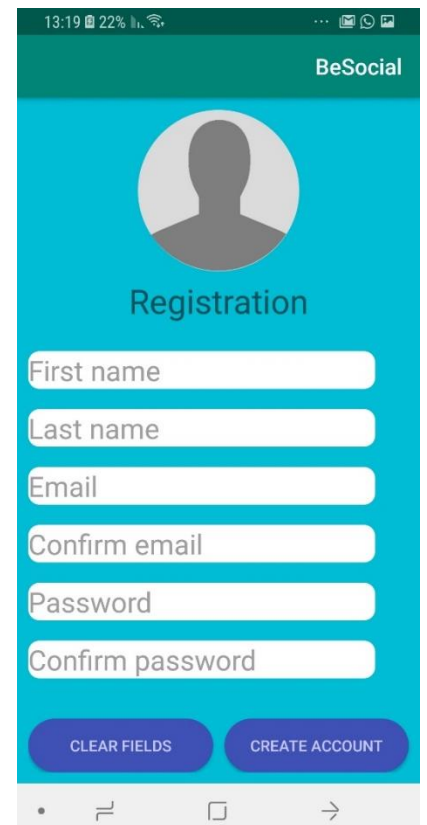

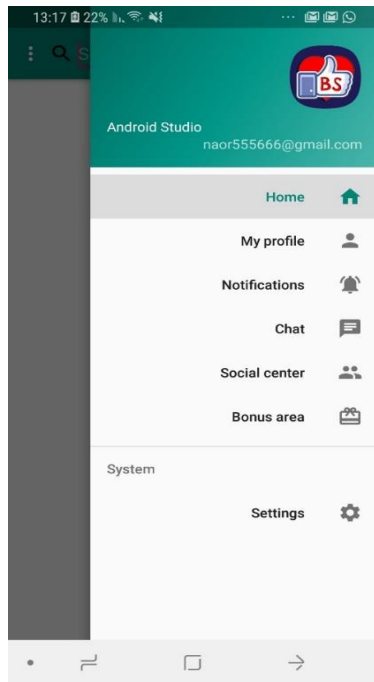*Figure 6: Login page*

Figure 5: Registration form
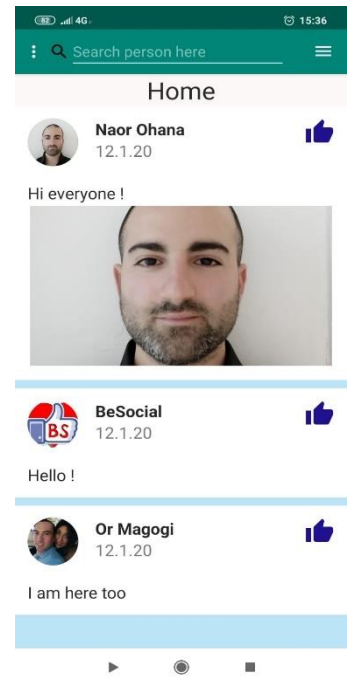
Figure 7: Application's navigation drawer
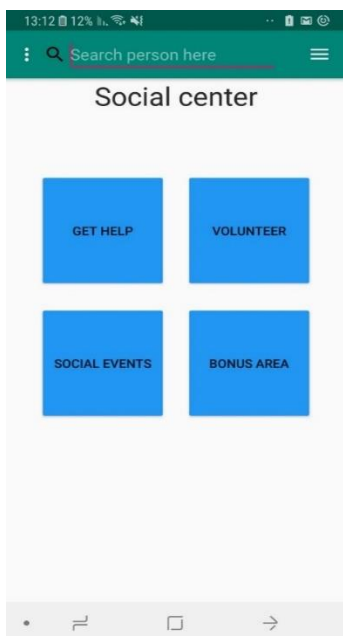

Figure 8: Home page
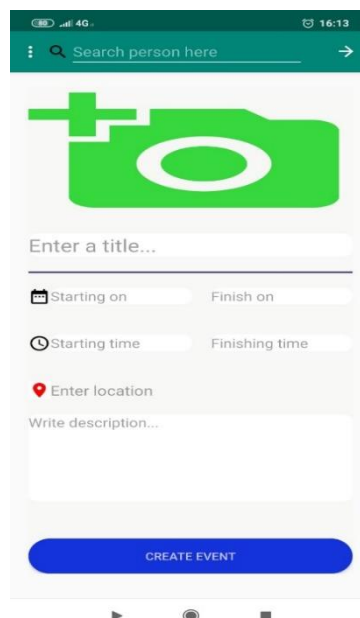

Figure 11: Social center
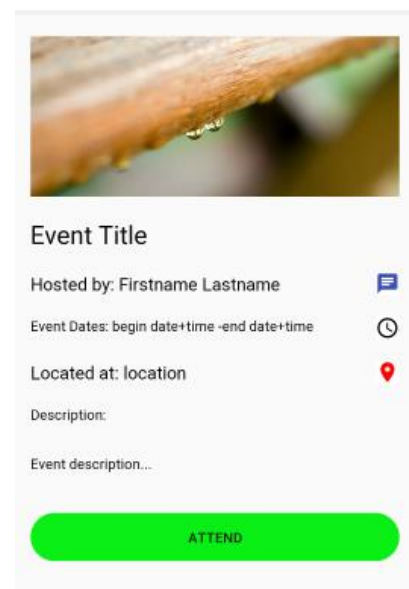

Figure 10: Create event form

Figure 9: Event page

5.3.   Testing Plan

We will perform a series of testing cases, covering a variety of common scenarios of using the application.
The testing plans will ensure the reliability of our system and will prevent uncomfortable situations.

5.3.1   Registration and login testing

Test name	Description	Expected results	Actual results	Comments
False registration	Choose "Register" option, enter not valid details and press "Register".	We get a toast, saying the details we entered are not valid.		
Complete registration	Choose "Register" option, enter appropriate details and press "Register".	A feedback is given, a new user is registered in the DB and we are back to login page		
False user login	Try to perform a login with an unregistered user.	We get a toast, saying the username or password are wrong.		
Successful user login	Enter registered username and password and press "login".	The user's home page is shown on the screen.		
Successful manager login	Enter manager's username and password and press "login".	Home page is shown, with app manage operations		

5.3.2 User actions testing

Open "My profile" fragment using menu	Press "My Profile" on menu.	Profile fragment is shown on screen		
Open "Home" fragment using menu	Press "Home" on menu.	Homepage fragment is shown on screen		
Open "Chat" fragment using menu	Press "Chat" on menu.	Chat fragment is shown on screen		
Open "Social Center" fragment using menu	Press "Social Center" on menu.	Social center fragment is shown on screen		
Open "Bonus Area" fragment using menu	Press "Bonus Area on menu.	Bonus area fragment is shown on screen		
Open "Settings" fragment using menu	Press "Settings" on menu.	Settings fragment is shown on screen		
False change in user settings	Enter settings, press"Edit", change fields and choose "No" on save dialog.	All previous details are in the fields.		
Successful change in user settings	Enter settings, press"Edit", change fields and choose "Yes" on save dialog.	All new details are in the fields.		
Choose category	On home, press a category from the list.	All new posts belong the chosen category.		
Enter a user's profile	On home,choose a post, press it's user's profile picture.	The user's profile page is shown on screen.		

Follow user	On a user's profile, press "Follow" button.	The user's posts are shown on home, the button appears as "Unfollow"		
Unfollow user	On a user's profile, press "Unfollow" button.	The user's posts are not shown on home, the button appears as "Follow"		
Post category help	Post a new help event in one of the categories.	The new event is shown in the category's help event list.		
Attend help	Press "Attend" on event's page.	A notification is sent to inform the user that someone is helping him.		
Close event	Give feedback on the user that helped you, fill details and press "send"	The event is closed, a feedback and bonus points are sent to the helper.		
Bonus level up	Get enough points to level up in bonus area.	The user is informed he has reached a new bonus level.		
Redeem benefits	Choose a benefit from the bonus store, press "Redeem"	The user gets the code for the benefit, the limit is updated.		
Report user	Press "report" button on a user, fill details and send the report.	A report is sent to managers.		
False logout	Press "Logout" on menu, then press "No" in the dialog.	The user stays logged in, the last page is shown on screen.		
Successful logout	Press "Logout" on menu, then press "Yes" in the dialog.	The user is no longer logged in, login page is shown on screen.		
Blocked user	Perform login to a blocked user.	An error message occurs and the user is not logged in.		

5.3.3   Manager actions testing

Successful manager login	Enter registered username and password and press "login".	The manager's home page is shown on the screen.		
Block user	Enter user's profile, press "Block user" button. Write a letter and press Yes to confirm.	The user is blocked and cannot login anymore, he gets a letter.		
Remove post	Press "Remove post" button near a user's post.	The post is no longer available to others.		
New social event	Press "Add new social event", enter details and press "Post".	A new event is created and shown in the category list.		
New benefit	Enter new benefit details in "Bonus Area"	A new benefit is shown in the benefits list.		

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