Senior Design Project

SurePa

Project Specification Report

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Content

1 Introduction

Forgetfulness is a crucial problem when it starts to occur often in daily lives. Forgetting something is good for your health and helps you to learn and remember new and crucial things [1]. However, forgetting things like taking medicines, drinking water, walking, and any other daily routines complicates and adversely affects the lives of those particular people.

Forgetfulness targets elders primarily. Occasional lapses in short-term memory are a normal part of the aging process, such as forgetting which medicine to take and their daily doses. So, many older adults need new ways to remember to take their medicines [2].

People with certain diseases, for instance, tumors, blood clots, and thyroid also suffer from forgetting in their daily lives.[3]. While having a disease, daily routines like not forgetting to take medicines, drinking water becomes more important than usual.

In the search for finding a solution to these problems, we came up with SurePa. It is an application for offering solutions to forgetfulness problems targeting primarily older adults and also other people. Such solutions aim to ease the life of these patients by providing intuitive ways for remembering and tracking their medication use. SurePa consists of convenient tools for anyone who carries a mobile phone, aiming to help its users undergo a smooth recovery process.

This report consists of a brief description of the project, its related constraints, professional and ethical issues, functional and non-functional requirements.

1.1 Description

SurePa is a scheduling service for people who take medicines and forget to take and which medicine to take. The service will send notifications to the patients when it is time

to take the medicines and show them the pillbox's image. It will remind them how to take medicine (swallowed, chewed, etc.). In the case of not being able to find the correct pillbox, SurePa will help patients find the correct pillbox by using an image identifier; in that case, they will use their phone's camera, and a green square will highlight the corresponding pillbox. The application also allows the creation of a caregiver account that could be linked to the patient's account. If the patient has a caregiver responsible for his/her treatment and monitors his progress, the caregiver will be notified whether the patient took the medicines. Patients and caregivers will see how much medicine should be left in the box by using the application. According to the tracking of the number of the remaining medicines, they will get notified to buy a new one when they are close to running out of medicine. The application has extra features that will positively affect their health, such as water drinking and physical activity reminders. We will support the retention of extra health data to facilitate the follow-up of the patient's blood sugar, blood pressure, and weight changes.

1.2 Constraints

1.2.1 Implementation Constraints

- Github and Git will be used mostly for version control and keeping a code base for implementing processes.
- The UI of the application should be simple enough for all kinds of users.
- Since SurePa will be used via different mobile devices using a variety of operating systems such as IOS and Android the implementation language should support developing native apps. In this case, React Native framework will be used as it allows to work in a single codebase.

1.2.2 Financial Constraints

- Publishing an application in Google Play Store requires a one-time payment of $25 USD and App Store costs $99 USD yearly.
- The website will be used for advertising purposes and it will cost $5 USD per month.
- Cloud services are free to use.

1.2.3 Ethical Constraints

- Information that is collected will not be shared by any third party.
- The terms of service and privacy should be accepted by the user before the usage of the application.

1.2.4 Maintenance Constraints

- As the application grows, feedback from users should be taken into account to make the application more usable for users.

1.2.5 Time Constraints

- Implementation of the application should come to an end before the CSFair-2022.

1.2.6 Environmental Constraints

- Mobile devices only need charging which is not harmful to the environment.

1.2.7 Accessibility Constraints

- The application will be available in English and Turkish.
- Since there will be two available languages, people who do not know English or Turkish will not be able to use the app well.
- The application will be free for all users via the Play Store and Apple Store.

1.3 Professional and Ethical Issues

- SurePa will follow the rules of the ACM Code of Ethics and Professional Conduct [4] and IEEE Code of Ethics [5].
- This is a group project, communication is the key term so keeping it professional is crucial.
- Writing emails and having meetings is also important to communicate with other non-group members such as innovation experts and supervisors. Our emails will conform to the rules of IEEE Writing Effective Emails.[6]
- Privacy is another ethical and professional issue since the application will require health and private data. However, private data will be encrypted.
- All of the used IDE's, applications, and other external tools will be licensed.
- Depending on our privacy terms, all of the data will be kept safe and will not be shared with any other third party.
- SurePa will be an open-source project to support technological development.
- Explicit content will not be allowed for the welfare of the users.

2 Requirements

2.1 Functional Requirements

2.1.1 Registration Mode Functionalities

- Users will be able to register to the applications as a caregiver or patient.
- Users will be able to renew his/her password if they forgot it.

2.1.2 User Functionalities

2.1.2.1 Caregiver Functionalities

- Caregivers will be able to edit patients' account settings if the patient lets them edit.
- Caregivers will be able to receive notification in case the patient did not provide the information that she/he had taken the medicine.

2.1.2.2 Patient Functionalities

- Users can add a caregiver to notify them automatically. Caregivers can be anyone who can care for the patient or elder. While adding contact users can tag them such as “Nurse”, “Child”, or “Neighbor”.
- Patients could monitor their daily workout routine.
- Patients will get notified to walk.
- Patients will get notified when it’s time to take medicine.
- Patients will be able to find the correct pillbox by using their phone’s camera.

2.1.2.3 Common Functionalities

- The patient and caregiver will be able to see his/her medication schedule.
- The patient or his caregiver will be able to input the patient’s physical measurements like weight, height.
- The patient or caregiver will be able to save the patient's blood pressure, blood sugar, and discomfort.

- Patients and caregivers will be able to see a detailed tracking system of the patient's physical measurements and blood test results.
- Patients and caregivers will be able to monitor patients' statistics of taking medicines in time.
- Patients and caregivers will get notified when the patient is close to running out of medicine to buy a new one.

2.2 Non-Functional Requirements

2.2.1 Reliability

Whether the medicine is taken by the patient should be accurate. Taking medicines multiple times or forgetting to take them could cause serious health problems.

2.2.2 Usability

The application appeals to a wide range of audiences and not everyone has to have a good understanding of technology. Therefore, interfaces should be easy and understandable to use.

2.2.3 Accessibility

The program should support the use of everyone such as blind, low vision, photosensitive, limited movement, and a combination of these because all of them can be our users. W3C [7] rules will be considered for accessibility issues and the application will support voiced notifications and will use simple color palettes for sensitive people.

The program must be suitable for different operating systems and different smartphones because of the variety of phones used by the users.

2.2.4 Efficiency

Since SurePa will be used by elders and most of them are using old devices, the efficiency of our application is important. Hence, image processing will be used in the application, cloud computing services must be fast enough.

2.2.5 Scalability

Since our user base is people who take medicines, the project should be scalable to handle lots of users. The server and database should be able to process a large amount of data.

2.2.6 Security and Privacy

The private information of the user such as contact, health, or medical history will be sent and stored encrypted. Also, sensitive information such as passwords and emails will be secured.

3 References

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