MyMedicine

ECS506U Software Engineering Group Project

Problem/Domain Analysis Report

Contents

1. Introduction

The introduction is well written especially the need for the application and how the application solves the said problem

Domain analysis in this document is conducted for a mobile application that helps to manage medication consumption process by sending reminder notifications. This application is specifically targeted for elderly people, but their doctors and family members are expected to make use of the app as well. This document describes the information that has been gathered through conducting research and analysing domain about how elderly population deals with taking medication. The information below will be used in the process of mobile application development in order to solve the problem of taking drugs for the elderly.

Domain Outline and Problem

After conducting our primary research, we have discovered that a dramatically high number of older people take medications on a regular basis. A study conducted by Cambridge University has found that about half of people over 65 years old in England are taking at least five different drugs a day. For some aged individuals, the number of medications goes as high as 23 tablets every day, the long-term investigation shows.[1] Moreover, the amount of drug consumption for older generation seems to gradually increase year by year due to the invention of new types of medications and elderly population growth.

To make matters worse, according to Age UK, more than 2 million people in England over the age of 75 live alone.[2] This means that aged people have to control the process of taking the required medication by themselves, without the help of other family members. This often leads elderly people to have serious difficulties in taking their medications, mainly because of age-related memory problems.

Such a high rate of elderly people taking medications is not the case only for the United Kingdom. In the USA, an online survey revealed that 75 per cent of the participants take prescribed medications on a regular basis, with an even higher percentage for those aged 65 and older. Among older people, over 80 per cent take at least two prescription pills a day and over 50 per cent take four or more. [3]

The consequences of not taking medications as prescribed, are extremely serious and can impose a great risk on people. Not taking drugs properly can lead to unnecessary hospital admissions, new and worse illnesses and, in some cases, even passing away. It also costs the healthcare system billions of dollars every year because of hospitalisations and lost productivity of the medical staff. For example, about 5% of hospital admissions result directly from not taking medications as recommended. [4] Hence, improper drug intake for older people leads to dangerous consequences and clearly requires a solution.

Need for the application and solution proposal

The issue of taking medication on a daily basis for elderly people, especially those who live alone or suffer from poor memory, needs to be addressed. Since the outcome of skipping

drug intakes can lead to serious health complications, a system that aids older generations with proper drug management needs to be created.

Our team is developing a mobile application that will help elderly people cope with the responsibility of taking medication. The goal of the proposed software is to send reminders (notifications together with alarm sounds) before each drug intake to make sure that the person is informed every time they need to take a pill. Additionally, our software gives an opportunity to keep track of missed medications intakes. The design and development of this mobile application take into account how older people are often not as familiar with technology as the younger generations are. Hence, the design of the interface will be simplified using big fonts and icons, and the functionalities of the software won't be complex to use.

The application also gives an opportunity to doctors and family members of an elderly person to control the process of medication intake. When too many drugs intakes are skipped, medical practitioner and family receive warning messages to let them know about the situation. This way they can prevent negative health consequences by ensuring that the aged person takes his/her medications properly.

Our software helps elderly people strictly discipline themselves when it comes to taking pills, and provides a convenient system with all the needed information regarding their prescriptions schedule.

2. Customers and users

Need better descriptions of the users. I would rate it 3.5-4

Primary users:

Older Adults:

Older adults are the main users of the system. Since the application is created to facilitate elderly's lives, it will not require performing complex tasks from them. The key task for these users is to mark if the medicines were taken or not.

Typical older adult:

- Prescribed to take one or more medicine during a day.
- May have memory issues and thus require constant reminders.
- Basic computer literacy. Will need simple navigations, good visibility and transparent explanation.

Secondary users:

System Administrator:

The system administrator is the user that makes sure the system works in the way other users expect and confirms it runs effectively. He also fixes errors as they appear. It is crucial

to maintain and update the system correctly since the accuracy of the system helps to maintain health of older adults. The administrator will also add and remove medicine to the list of all medications.

Typical system administrator:

- Has a great understanding of the system.
- Very computer literate.
- Has a basic understanding of the sphere of medicine.

Family member of older adult:

This user is able to observe if treatment is going successfully for their relative and remind them to take drugs. It is done by sending an email to one of the family members if an older adult failed to mark the intake of medications 5 or more times. Moreover, this user can also add information about the medicine(name, dosage, time when it should be taken), edit or remove the medicine.

Typical family member:

- Has an elderly relative.
- Uses email in daily life.

Doctor:

Alternatively, if a patient does not have close relatives or prefers not to involve them, after failing to mark the intake of medications 5 or more times, an email will be sent to their doctor. A doctor is able to observe if treatment is going successfully for their patient and remind them to take the required dose. Additionally, this user can also add information about the medicine(name, dosage, time when it should be taken), edit or remove the medicine.

Typical doctor:

- Has all the information about the patient and is aware of the consequences when the prescription is not followed.
- Uses email in his daily work.

3. The environment

This section is quite weak as it doesn't explain why the chosen environment is Android and doesn't consider mobile phone literacy of elder people. How do they know most elder people have mobile phones? There are claims without justification. I would rate it 2

Currently, the majority of medication reminder applications are running on iOS and Android phones, a smaller fraction of them are running on desktop. The reason for these reminders to be in the form of a mobile app is because the system is required to be accessed multiple times per day to input the data about the taken drugs. The most convenient way to do it is to access through the phone since a big number of elderly people have smartphones and

use them every day. Moreover, the research shows that the use of smartphones by elderly people will sharply increase in the next decade, expanding the audience for our product. [5]

The system we'll be developing is a mobile application for Android devices. Although, it can be easily translated into iOS to target a wider audience. The smartphone will need to have an internet connection to send emails to relatives or doctors. However, other features (marking intakes of the medicine) will not require to be connected to the internet, so the app can be used on the go.

4. Tasks and procedures currently performed

As a good habit write a small explanation paragraph straight after chapters sections don't go into lists or tables.

Mark a medicine as taken (Older adult): The user of the application is able to tick off a medicine once they have taken it for that day and time. The app will record the date and time the medicine was taken. If the user does not mark the medicine as taken 5 or more times, the shortcut will be taken and the email will be sent to a relative or a doctor.

View a medicine (Older Adult): The user can view all the medicine that they are currently prescribed to take and date and time when it should be taken. They also can view all medicine that they have taken in past and date and time when it was taken.

Add a medicine (Family member, Doctor, Administrator): Family members and doctors will be able to add the details of the medicine that older adult will need to take to the application. The information that is required to be inputted is the name of the drug, dosage of the drug and what time the drug should be taken throughout the day.

The administrator will be able to add new medicines to the database where all the medicine are stored. The name, recommended dosage and any side-effects will be entered when a new medicine is added.

Edit or remove the details of a medicine (Family member, Doctor, Administrator): The saved details of the medication can be changed or deleted accordingly. The time, the drug that needs to be taken and the dosage can be changed. The drug can also be deleted from the app if the user no longer requires them.

Receive the email (Family member, Doctor): These users will receive the email with information that their relative/patient did not take medicine for 5 or more times and can contact elderly person privately to remind to continue the treatment.

Maintain the app and fix errors (System Administrator): The system administrator is in charge of updating the application to keep up with current advancements in technology and software. They will also be responsible for fixing any errors in the application as they occur to ensure that the application is fully functional and is working as intended.

Sign up (Older Adult, Family member, Doctor): Users need to register their account in order to use the application. When signing up the system will ask the user if he/she is a family member, older adult or a doctor. In order to sign up a user will need to input his/her

username, password and email address. The user will not need to enter any unimportant information (e.g. last name, gender) because it would not influence the way an application works.

Log in (Older Adult, Family member, Doctor): Users will be able to log in to their account and view the information related to them.

5. Competing software

Medisafe [6]

Good summary of advantages and disadvantages, a table at the end might be useful for comparison

Medisafe is an award-winning software helping patients managing prescription schedules. Created by two brothers combining their entrepreneurship skills having the objective to help patients like their father suffering from long term illness manage complex medical prescription, Medisafe gained major popularity (1 000 000+ installs in google play) and is known to be a top-rated (4.6 stars in google play) medication manager. The application requires the user to create a list of medicines. At the time set, it sends reminders for the medicated listed. The user is asked to tap one of the three options: skip, snooze and take. Then depending on what user tapped appropriate records (taken or miss) is created. Medisafe gives the user free opportunity to choose the medication reminder sounds, receive medication refill reminders in order to help restock in time and customise medication design during adding medication to the list process. Extra paid features such as keeping track of measurement (weight, blood pressure, etc), writing health diary and recording medical appointments are also available.

Competitive Advantages

The advantages of Medisafe is that it requires few simple and short steps to set up medicine reminders. The system only needs the name, dosage, frequency and length of treatment to be able to perform its main task which makes it relatively easy for anyone not familiar with medical environment or smartphones to fill the information about the medicines prescribed. watch for whitespace! Taking medication can be considered as a tiresome task but Medisafe made it more interesting and enjoyable by proving the option to choose the shape and colour of the medicine.
Providing synchronisation option with family members, friends or caregiver greatly contributes to the user motivation and avoid any miss out. Don't have very short paragraphs
The customised alarm sound is another smart feature that improves customer satisfaction. It enlightens the mood of the patient and makes him or her more comfortable dealing with the daily medication intakes and the illness itself through his/her favourite music.
In addition, the record of all medication intakes and misses avoid any paper notes which are hard to maintain and can get lost. The easy step of sharing progress report by only entering the recipient's email gives more freedom to the patient and avoids repeated medical visit.

Disadvantages

Although this application is a success in many levels, it also has some failures as well. Many customers complained about the notifications not appearing or appearing at the wrong time after few days of installation. The bugs issues can be reduced with more testing before releasing the new update and by keeping the application simple. Another issue subject of complaint is the amount of notification sent. There should be a small number of reminders if the user ignores the initial notification in order to not disturb the user.

MyTherapy [7] Enumarate applications to sperate from other subsections

MyTherapy is another award-winning, widely used (over 1 000 000 installs in google play) application having a rate of 4.6 starts in google play. Its main objective is the send reminder for the medication and keep track of all the medication added to the list. It has all the main features of its concurrent Medisafe except alarm personalisation and medication design setting.

Competitive Advantages

One of the most advantageous functionality of MyTherapy is that it allows the full medication data to be shared easily with whomever the user wants to. Only email address is asked for the patient to send his progress to the doctors and get a quick health check. Similar to Medisafe, the option to invite a family member or friend helps the user staying focused and lessen the chances of any dosage skip.

Disadvantages

Despite being a reliable software, MyTherapy also has few bugs when it comes to sending notification and starting alarms. It is a quite long process to add a medication in the reminder list as the system first ask to choose from the long medication list in its database then when it can't be found due to the medication list being from American pharmacology companies, the user needs to manually enter the medication.
To end, the advanced features such as record doctor appointment and diary are hard to set up and comes with no instruction or tip on how to use them. This lack of information makes these features unusable and therefore don't contribute to the application's popularity and profits.

Pill Reminder [8] Citations in paragraphs, never on titles

Just a footnote for the urls is fine no need to put them in references

Pill Reminder is known to be a top-rated (4.6 stars in google play) health, fitness and medical application having over 50 000 installations. This application is a medication reminder for kids, family and pets. Similarly to its competing software Medisafe and MyTherapy, Pill Reminder requires the user, medical team or family member to create a list of medication needed to be reminded. Records of the medication intakes and misses are saved for sharing. Notifications suggesting refill are also sent if the user chooses this option.

Competitive Advantages

Don't have a section without a text NEVER

Pill Reminder keeps records of the medicine used for the whole family. All the medication data about kids, parents, grandparents, other family members are kept in the same device allowing the easy access to the information saving time and effort on the same occasion. This software is also useful for pet owners who need help keeping track of their pet's prescription and medical report. Another advantage Pill Reminder provides is the option to choose from the application the design of the medicine or take photos of the medication in order to personalize the list.

Disadvantages

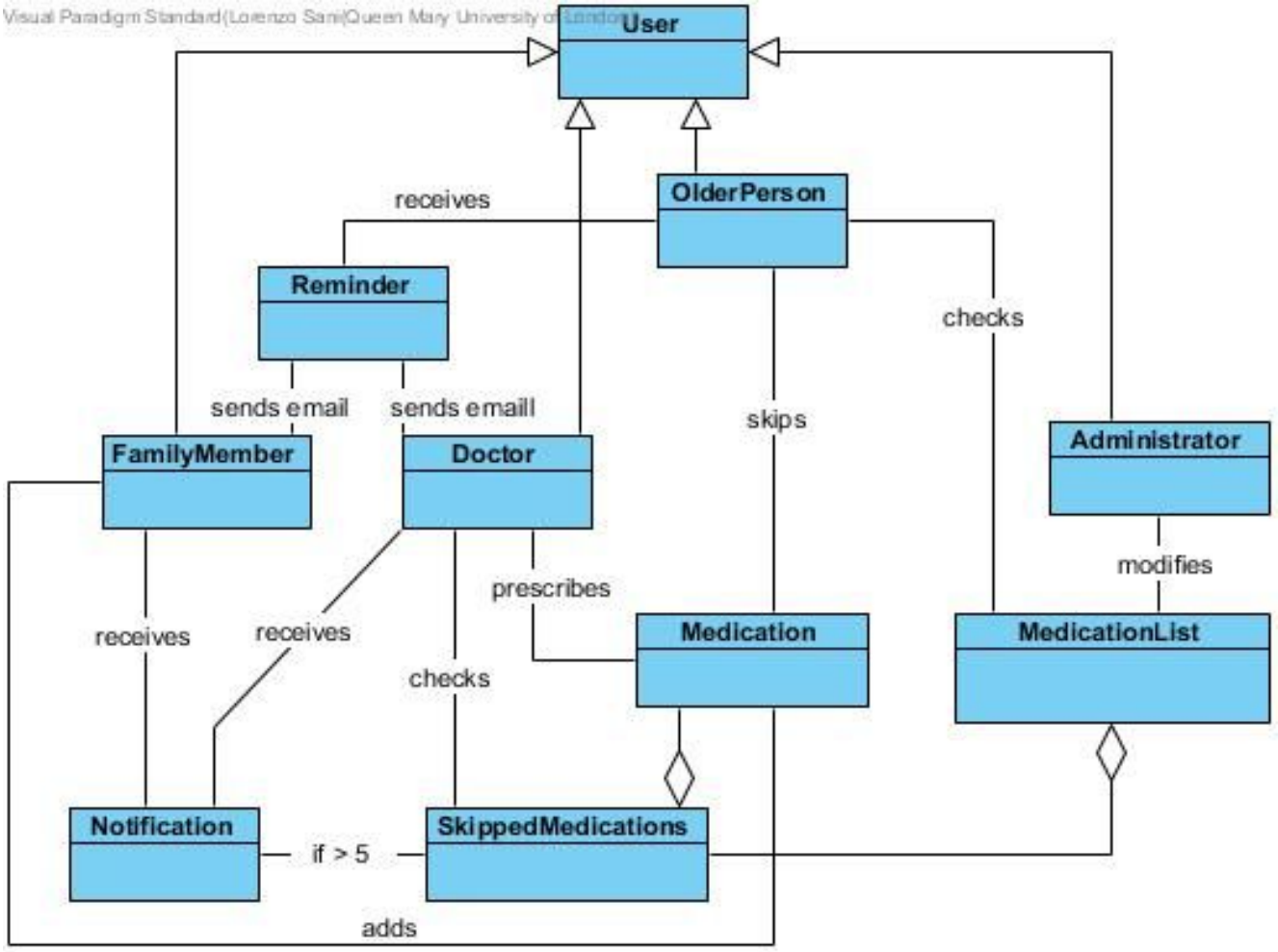
Similarly to its competitors, pill reminder showed some failure in alarm functionality. Many complaints have been made about the alarm and notification not appearing at the appropriate time or in some case not appearing at all. Moreover, the input of medication is complicated and time-consuming with over 20 information boxes to fill about the medicine. The information asked is challenging for the user not familiar with medical field. The features such as recording appointment and writing diary require long exploration to be set up and don't have any user instruction to facilitate the task.
In addition, the overall design of the interface is not user-friendly, text colour and font are unappealing. Few pages don't have "Back" option and require going to the home page in order to continue exploring the application.

Make sure whitespace is consistent

In conclusion, functionalities such as recording medication history, allowing the user to send a progress report to doctors and relatives, giving the opportunity to add a friend or a family member and allowing the user to personalise the application can help improve user satisfaction. However, the basic functionalities such as alarm and notification have been a problem for most of the similar software. It suggests more time, testing, attention is needed for this implementation.

6. Domain Model

Not too bad



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