

Requirements Document

Tuberculosis Treatment Application

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1 Introduction

Taking medicine every day can be hard for patients with tuberculosis (TB). Our goal is to help tuberculosis patients adhere to their treatment plan. The reason why this is important for tuberculosis is as follows: TB is treatable and curable, but treatment starts with a 6 month course of 4 antimicrobial drugs to be taken every day. Poor adherence could cause the disease to spread and possibly give the bacteria a resistance to the drug. Of course there are many other factors that play a role, but adherence plays a big role as it is extremely important for medicine intake to be taken according to the treatment plan.

The aim of our project is to increase treatment adherence by designing a smart-phone application for patients that gives information about tuberculosis, treatment, side-effects and gives a patient an overview of their treatment plan and reminds them when they need to take medication.

2 System overview

Our current system consists of an android and iOS smart-phone application to be used by patients and guest users, as well as a web application to be used by physicians and administrators. These applications can communicate with a server using an api. Users that do not have an account can still use the app to look up general information about tuberculosis in the form of videos in combination with quiz-like questions. Physicians use the web-app to create patient accounts and manage them, as well as keeping track of and managing their patients' treatment plans and questions that patients may ask through the app. At last, an administrator can use the web-app to update information to be displayed in the app.

3 Functional requirements

3.1 Users

- Patient: a patient is a user of the mobile app. They are supposed to receive an overview of their treatment plan, and reminders about when to take medications. Possibly a progress awarding system could be added. A patient has limited control over their account, they cannot create one nor modify the treatment plan. They should be able to choose their password and possibly their user name. Account creation is performed during a meeting with the physician.
- Guest user: the guest user is a user of the mobile app. They do not have a patient account and should only be able to access the information section as well as possibly the FAQ.
- Physician: a physician is a user of the web application. They are supposed to be able to create patients' accounts and modify/create treatment plans. They have full control over their account and can create one, choose a password, and give a preferred email address (needed for recovery). A physician can possibly create accounts for multiple patients, and they should be able to have a complete overview of all of them. They should also be able to keep track of single patients' medications progress.
- Admin: an admin is a user of the web application. They are someone appointed to modify/update the content of the application after its release. The creation process of an admin account is still TBD

3.2 Critical

- The physician can create their own account on the web application to allow them to overview and manage data of their patients as well as interact with the date.
- The admin can create their own account on the web application to add/remove features (e.g. informational videos)
- The physician can create a patient account that a patient can use to log in to the mobile app, giving them access to their personalized treatment schedule.
- The physician can input/modify a patient's treatment plan. A treatment plan is the information of what medicine should be taken at what time/date. This will also be done during account creation which is done together with the patient during an appointment.
- In the app a patient needs to be able to see their medication and the times and quantity at which a medicine needs to be taken.
- A patient needs to be able to mark a medicine as taken for a certain date. This marking should be undo-able in case of accidental marking. The patient should only be able to mark medicines as taken on the current date and a/some day(s) before in case the medicine has been taken but was not registered in the app.
- A patient should be able to receive reminder notifications if they did not register a medicine as taken at the set time.
- Both the patient and the physician need to be able to see the progress of the treatment in terms of medicine intake.
- A physician should be able to recover their account if they forgets their account details.

3.3 Important

- The mobile application should have a calendar functionality in the sense that a patient will receive a pop-up when they are notified instead of just a background notification.
- The physician should be able to recover a patient's account should the log in details go lost.
- A user of the mobile app should be able to select their language upon first use of the app. After that they should be able to change it in a settings section.

3.4 Useful

- The app should contain general information in the form of videos about the illness and medication. Given information should be accessible before logging in, so that a guest user that does not have access to the treatment plan part of the app can keep up-to-date and learn about tuberculosis.
- Each video should have a short quiz with multiple choice questions so a user can see check if they understand the information of the video correctly.
- A patient user should be able to receive awards for successfully following their treatment plan or doing the quizzes to keep them motivated. The rewards can be collectibles in the app.
- A patient user should be able to enter questions that the physician can see so they can answer them during an upcoming appointment. The patient and physician should be able to delete these questions when they are answered or no longer relevant.
- It would be preferred if there is a FAQ section that a patient can look at before asking a question to their physician.

4 Non-functional requirements

4.1 Security

- The application should be secured against the most common attack methods (SQL Injection, Cross site scripting...)
- The application should not treat any patient's personal information

4.2 Availability

The application should be available for

- Android
- iOS
- Browser (only for physicians and administrators)

4.3 Usability

- A patient user should be able to receive reminder notifications even when the phone is not connected to the internet.
- The app should be lightweight, because of the nature of the app this will be an easy task and should allow the app to be usable on all devices with a smooth experience e.g. no noticeable load times.

4.4 Scalability

- The app should be able to accommodate for new medicines.
- The customer should be able to update the information section without help from the programmers.

4.5 User Friendliness

- The app should be intuitive and easy to use as the target audience includes tuberculosis patients of all ages and levels of competence of using a smart phone, as well as illiterate patients. To keep the app intuitive we want to keep the design of the app in line with native user interface conventions and have it use icons as well as text where possible. The app should give appropriate feedback when the user interacts with it to provide a sense of interaction.
- The web application does not need to be extremely user friendly, since it will be used by physician that do not share the medical illiteracy of the patients, and because it will not be used for very complicated tasks. However, sufficient documentation regarding the usage of each functionality will be released.

4.6 Responsiveness

4.7 Adaptability

5 Won't do

- Development of apps aside from Android and iOS.
- Releasing continuous large updates ourselves after official release. This is in the sense that we want the app to be stand-alone, allowing easy feature updates by the physician/admin.

6 Customer meetings

Date	Discussed
28/02/2018	<ul style="list-style-type: none">• The customer stated that they want the app to have a log in system with a user's personal calendar and list of medication.• Accounts cannot contain too much personal information due to privacy concerns.• The physician needs to be able to manage the user accounts.• The app needs to have informational videos about tuberculosis that are also accessible to guest users.• At the end of the project the app should be maintainable by the customer. (Updating information)• The app needs to have notifications that remind a user about their medicine intake in case they forgot to take it in time.• The app needs to support English, Dutch, German, and Romanian.• The target audience may be illiterate and/or medically illiterate, so usage of icons and intuitive design is important.• A reward system to keep a user motivated to continue the treatment is nice to have.
13/03/2018	<ul style="list-style-type: none">• The first prototype design of the app was discussed: The informational videos will be split into categories and the calendar will get generic pill icons on a day to indicate that there is medication that still needs to be taken that day.• For now it is assumed that the same type of medicine cannot be taken at multiple distinct times a day.• Account creation will be done during an appointment with the physician so the physician can configure the treatment plan and discuss it with the patient.• The customer wants a questions section that contains frequently asked questions tuberculosis patients ask to physicians and a way for the patient to submit a question to the physician that a physician can look into for an upcoming appointment.• Due to file size informational videos will not directly be stored in the app but uploaded to youtube by the customer. The videos will then be embedded in the app.
22/03/2018	<ul style="list-style-type: none">• The client wants the video questions to be multiple choice. The answers need to be shown to the user after they confirm their selected answers.
17/04/2018	No new requirements

Date	Discussed
09/05/2018	<ul style="list-style-type: none"> Medication times will be stored as an interval to be able to implement multiple reminders without hard coding the time for subsequent reminders.
12/06/2018	<ul style="list-style-type: none"> It has been decided that the app will hold some general information about each medicine. The information will be provided by the customer. Medication alarms should now wake up a phone and show on top of the lock screen due to privacy concerns.

7 Change log

Date	Contributor(s)	Section(s)	Description
27/02/2018	Giacomo Casoni, Julius van Dijk	All	First version of the requirements document...
27/02/2018	Marco Lu	1,2,4	Added extra paragraphs to introduction, some won't do's and functional reqs.
27/02/2018	Sten Sipma	Titlepage, 4, 7	Added the title page with all the necessary information (client name, TA's group members etc.). Added a format for the meeting- and change log. Added some general points for the non-functional requirements.
12/03/2018	Marco Lu	All	Added additional info that was not provided, fixed some poor wording
27/03/2018	Niek de Vries	All	Added the summary of customer meetings and went over the document to add new information or change existing information that was outdated
14/06/2018	Niek de Vries	All	Added system overview section, updated customer meetings section, and made general edits to document