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MSc Automation and Control Engineering

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Feasibility Study Document

For the Application of Medication Reminder

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1. Introduction

Drugs (Medicines) are used to maintain health or manage chronic illnesses. However, if people forget to take these prescriptions due to many circumstances, the treatments' benefits will be reduced and lead to medication side effects. It is challenging to keep track of consuming multiple medications. About 50% of people are found, to forget to take medications, in the paper presented by Marie T. Brown, and Jennifer K. Bussell.

In today's world of sophistication, IT resources are growing at a faster rate. Because of the time saving and ease of use, it has been accepted by people worldwide. Exploiting those resources leads to assisting the patients in managing drug administration. "Reminders" are an excellent method to keep track of medications. Taking them on time can help people avoid unnecessary side effects.

The feasibility study gives a detailed frame of analysis of the given project. It determines whether a project should go ahead, be redesigned, or be completely abandoned. It also discusses the possible alternatives and resources needed for its completion.

This is a mixed-method study that is going to be conducted in three phases: First, the feasibility of the project. Second, a comprehensive study by the team, and finally, the feasibility in terms of IT systems.

2. Problem Statement

A person can get sick due to various reasons, foremost neglecting the medical conditions which might have an adverse effect on the body. For controlling chronic illnesses or treating transitory ailments, it's important to take medications. Medication adherence requires personal interaction with your healthcare provider or pharmacist. Taking them as prescribed by the doctor at the right time leads to overall long-term health and well-being. Thus, managing with medical conditions.

People tend to get so engrossed in their lives that most of the time, they forget to take the medication at the right time or ignore the medications. It is easier for some people, to remember to take medicine while it is new. They would be either more mindful of 'doing it right,' or relieved to finally be getting help and feeling better. However, as they get accustomed to feeling well and no longer had symptoms or agony to remind them to take their medications, it is easy to get sloppy. Again, this takes a toll on their health, which has its own consequences. The human nature of

forgetfulness creeps in all of our lives causing problems in different aspects of life and in this case particularly, it affects our health.

Forgetting or skipping medications can have unanticipated consequences. The outcome of not taking the medication can vary in a wide spectrum, ranging from having little or no effects to fatality, in extreme conditions of missing multiple dosages. Sometimes symptoms of the disease will return, or there will be less relief from them, if people forget to take their medicines. And for some people, the return of symptoms or pain can have a significant impact on the things they need to do. In cases of diseases which needs timely attention like arthritis or asthma and intake of antibiotics which has to be taken for a fixed course, missing the medication leads to treatment failure extending the course of medicines or possibly to re-emerge the disease in much higher intensity. Considering the anti-depressants for the same, it can lead to symptoms like anxiety, headache, mood changes and sleep problems to name a few.

3. Proposed Idea

The problem presented give rise to the idea of a reminder for the medications. A medicine reminder that helps people to take the medicines at the right time with prescribed dosages. Therefore, saving the people from the consequences such as side effects of improper intake of medicines, unusual panics for not taking the medicines at right time, etc. The proposed idea is effective for anyone who uses medicines for any kind of illness irrespective of the age group, types of medicines, or if the person suffers from an acute or a chronic disease that takes to ingest the medicines for a short amount of time or even recurringly.

The implementation of the idea can be seen in different aspects like the development of a software solution or a hardware device comprising the necessary requirements. The possibilities of software solutions include web applications such as websites or browser extensions such as medication reminders, mobile applications, and Software as a Service (SaaS). All these software solutions require a hardware device where it is executed and accesses the corresponding hardware functionalities in terms of clocks and reminders. The other aspect involves the development of hardware devices such as Medication Reminder Alarm Clocks or Watches which should be particularly engineered using electronic circuits or micro-controllers that outputs the necessary requirements to remind the user for medications.

Developing a software solution takes an upper hand when it comes to the ease of building, as hardware device requires all the skills and equipment for integration and a much more rigorous

testing process that rules out any physical issues compromising safety, while software solution requires computers and its accessories. The implementation method can be further narrowed down to mobile applications because of its accessibility and time spent by a user, which is higher than that of desktops or laptops. Thus, developing a mobile application seems to be a more sensible and reliable choice, by weighing down the pros and cons of all the other methods, from the perspectives of both user and the developer.

4. Market Study

With the confirmation of the proposed idea, a comparative assessment of some existing mobile applications as well as models has been planned and executed. To discover different aspects of the idea from an application standpoint and a users' point of view, a research study has been conducted for already available medication reminder mobile applications in the google play store as part of this process. In this preliminary phase, the contents and models of almost 21 different applications were overlooked, particularly:

No	Applications
1	*Dosecast; My Therapy; TOM*
2	*Medisafe*
3	*Mediteo*
4	*Care Clinic (virtual hospital)*
5	*Take Your Pills*
6	*MedicaApp*
7	*Pill Reminder*
8	*Pills time*
9	*Medicine Reminder*
10	*Mr.Pillster*
11	*My pills*
12	*Max*
13	*My pill Reminder*
14	*MedControl*
15	*Medication Reminders*
16	*APR Alarm and pill reminder*
17	*To-do list*
18	*Medication Reminder*
19	*Cute pill*
20	*Silvers pill reminder*
21	*DrugStars*

From the above-mentioned applications, it gave the idea of users' perspective about the implementation of the idea through their reviews and ratings, for the different ways of implementation for the same idea by different developers. Also, from the developers' point of view,

it showed the aspects of different models, the sequences and workflows. By using the apps, personal preferences were also considered by evaluating the pros and cons.

The study revealed that the idea proposed for the problem has been implemented through multitude of mobile applications with different features in several application marketplaces. Thus, in order to stand out from the crowd it is inevitable to bring out a unique combination of features to the application which can be put as a selling point, in regard to financial standpoint as well. For the same purpose, the application has been further studied to its different combination of features, to come up with a distinctive set, which will be further referred in Requirements Analysis and Specification Document (RASD).

5. Development Platform

According to the survey conducted by Statista, more than 80% of smartphone users possess an Android-based Operating System. The team's preliminary focus is now on the development of the application supported by Android OS in support of the survey.

Considering the various development platforms for Android including coding-based software such as Android Studio or Visual Studio and GUI-based software like MIT App Inventor, Kodular or Thunkable, the inclination to GUI-based development frameworks was more, owing to the ease of doing without extensive coding, accessing multiple libraries, and referring a lot of repositories. Working with coding-based platforms also requires a fairly good experience in the programming languages like Java or C/C#, contributing to be another factor, to consider GUI-based software which simply allows the drag-and-drop of the components that do not need any experience in programming languages.

The MIT App Inventor platform is a web application integrated development environment provided by Google and maintained by the Massachusetts Institute of Technology. It uses a graphical user interface (GUI) which allows users to drag and drop visual objects to create an application that can run on Android devices. App Inventor is based on and informed by constructionist learning theories, which emphasize that programming can be a vehicle for engaging powerful ideas through active learning.

While considering other platforms such as Adalo, AppGyver, and Thunkable, they provided diversified features for creating an application with no-code features, but that comes with a pricing list. In the free version, features were limited, with very little support to modify the versions of applications.

6. Conclusion

The increased demand for smartphones has given a huge platform to develop and deploy various applications. With the need for personal healthcare and ease of digitalization, both sectors are getting invested sumptuously, in improvising their characteristics which has a promising future. Forgetting to take the medication leads to several adverse effects like the development of new treatable diseases and reduced treatment effectiveness. The medicine reminder applications prove to be one of the competent solutions in daily life.

According to the market research, many applications include different functionalities which makes them unique. The application named “MedRem”, which is the acronym for Medication Reminder will exploit the idea of simplicity and ease of operation to further create the same. It will be made from the users’ perspectives, considering the constraints of their day-to-day life.

“MedRem” reminds the patient of their medication administration time thereby reducing the mistakes and improving adherence. The identification of the features is further explained in the RASD.

Considering these pieces of information, the idea to develop a medication reminder application is feasible. This idea was taken to improvise the life of the people, who are taking medication currently as well in the future.

7.References

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