

Python-based Telemedicine Prescription Record App

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ABSTRACT

Telemedicine is an emerging field in the healthcare sector. Bloom in its growth, was marked amid the COVID-19 pandemic. Audio and video conferencing with doctors or specialists are the most common telemedicine applications. Through these means, diagnosing and treatment are effective up to a level. But many miss out on prescriptions. Prescription is one of the vital components to be checked. Noting down the medicines is not just enough. A proper prescription is always safer and recommended by many. Thus, the concept of electronic prescription was born. Yet, it came along with security issues since the data were stored in the cloud. Maintaining a prescription record electronically is sophisticated process. As a solution to all such issues, the 'python-based telemedicine prescription record app' is proposed. It ensures an error-free, safe, and convenient system to generate prescriptions and store their details. And, as the name suggests, this application is developed using the python programming language in Kivy, Pycharm.

Keywords: Kivy, Prescription App, Prescription Record, Python, Telemedicine.

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INTRODUCTION

There exists a variety of application which is currently being used for generating electronic prescriptions. Seldom are the ones whose base code is python and it's so because python-based apps is also an emerging aspect. Django, Tkinter and Kivy are few powerful and effective platforms that support app development using python. Python is comparatively a user-friendly language and comes with ample of packages that are needed for app development. Thus, python was chosen as the framework for this particular project. Electronic prescription is quite common and finds majority of application in telemedicine field. There are apps that not only prescribe but also report on the same, but they depend on some requirements and aren't particularly 100% secured. Since such apps apply more in the doctor's end, it needs to be ensured that the doctor is comfortable with it too. This project is very similar to an electronic prescription app but it provides fully safe and secure environment for data storage. Also, it enables the user to keep up to date record of the prescriptions. Telemedicine is the new trend, and though it's all about online consultation and treatment, this application isn't restricted only to it. Its use cases can be extended to offline healthcare scenarios too.

METHODOLOGY

Electronic Prescription Apps

E-prescribing or electronic prescribing is a tech that enables medical practitioners to write, store and send prescriptions to the particular patient and pharmacist through electronic means. It is anytime better and preferable over manual prescription. Implementing and using this tech via an application is what is called an electronic prescription app. E-prescribing is cost-effective, user-friendly, and efficient but, its setbacks are security, wrong dosage, wrong patient, etc. Block chain-based e-prescription apps have provided a safer environment for data storage. But then its fully functioning and compatible working model is not yet developed. Most of the apps are connected to the cloud server from where the receptionist, pharmacist, doctor, and patient can access related or required information. Few advanced versions come with reminders but, the more complex features in-app, the more the chances of error occurrence. Providing additional features has shifted the primary focus of the app- which is to generate and store the prescription. It looks more like an electronic health record than a prescription app. Figure 1 depicts the same. These apps save the time and energy of the user and also come at

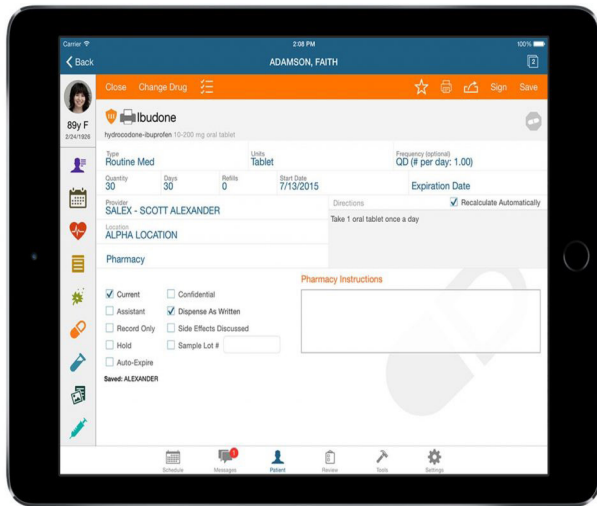


Figure 1: Example of existing e-prescription app

the cheapest expense. E-prescription is a permanent solution to misinterpretation of doctor's handwriting, maintenance of prescription records and such hassles. Whilst drawbacks such as poor knowledge of app use, mixing up of prescription records, security risks, etc., can't be overlooked either. Yet another issue faced by the user is that the textbox provided for entering medicine names doesn't support multi-lines. Due to this, the pharmacist often finds it difficult to find out the cropped out medicine name. Since these vital parameters are vulnerable to higher threats in the telemedicine field, we have provided a better and safer solution. This python-based telemedicine prescription record app provides utmost security and doesn't require much complicated system knowledge to use it.

TELEMEDICINE AND PRESCRIPTIONS

Telemedicine refers to the implementation and usage of telecommunication technology to provide treatment and diagnosis remotely. In simpler terms, it is remote medication and, since the start of the pandemic, it has become a regular practice. While comparing this concept to proper offline consultations, we can observe several favorable factors in the former. The long patient queues, hectic doctor's schedule, the hassle to reach and wait in the hospital, etc., are now history. Through this tech, the reach of doctors to patients has multiplied. With better accessibility, patients in any corner of the world can get the best treatment. The highlight is a better quality of patient care is possible at lower prices. The most used means of telecommunication is real-time audio and video calls. There are several telemedicine-oriented apps in the market where patients can audio or video call doctors at any time, from anywhere. Most of these apps are like electronic health records or electronic medical records, and it's because they comprise telecommunicating platforms, appointment scheduling, medical purchases, pharmacy, data records and much more. All it needs is a stable connection, and thus, things are a lot easier. But, there are few aspects where telemedicine lacks. One such area is prescriptions. Although electronic

prescription and telemedicine is meant to and goes hand in hand, some perspectives have room for improvement. During face-to-face consultations, providing prescriptions is a much simpler process. Whereas, when it comes to electronic means, this process comparatively needs more attention. It's hassle-free but needs focus because the chances of error occurrence are more over here. The doctor has to type the medicine name and sometimes even the doses, which on lack of concentration, can go wrong. Also, the app must work along with the network systems to share the data with pharmacists, receptionists, and patients. The cloud server stores data and acts as an easily accessible source for the network system to transmit or receive data. Thus, the point is, there is a complex environment in the app background. This complexity adds to error occurrence, inefficient app functioning and delayed processing. The working environment should be interconnected but, in a clutter-free way. A simple and clear approach is always the best for flawless performance. Here is where this project comes into play. This app is specifically for telemedicine prescriptions and its record. Though it is similar to electronic prescription, the system is designed to support telemedicine effectively. It is also suitable for face-to-face consultations where printing of the prescription is required.

PYTHON BASED TELEMEDICINE PRESCRIPTION RECORD APPLICATION

This project is all about the telemedicine prescription generator and its record. It concentrates solely on hospital record management of prescriptions since the design provided gives better results for huge systems with ease. The functioning is really simple. The doctor has to enter the required details in the given area and has to press the print button. According to the app program, a file will be created and saved in the system memory space. All the details entered will be saved in that file. On opening that file, all the necessary information can be viewed. Since the app signifies hospital record management, all the prescriptions will be appended to a single file, thus making record maintenance much easier and sustainable. But this will make things tougher for pharmacists and patients to revisit their details. Once the prescription is ready, it will be sent to the destination. The prescription generated can be in the file format of document, PDF and excel sheet. Only one file format is supported at a time because it is not possible to implement three different types of commands in the same code location. So, the application will be available in three different versions which support the respective file format. This app will be very useful and easy to use while the doctor is on an audio or video call with the patient. During the call, the doctor can simultaneously access the app and enter the information so that the prescription instantaneously reaches the required parties. Thus, the application is called "telemedicine prescription record". The interface components are all preset. All that the doctor must do is enter the required data into the textbox. The problem with other apps is that the medicine name gets cut off in the long list of medicines. Here that is no problem since there is a multiline option that enables the doctor to write one

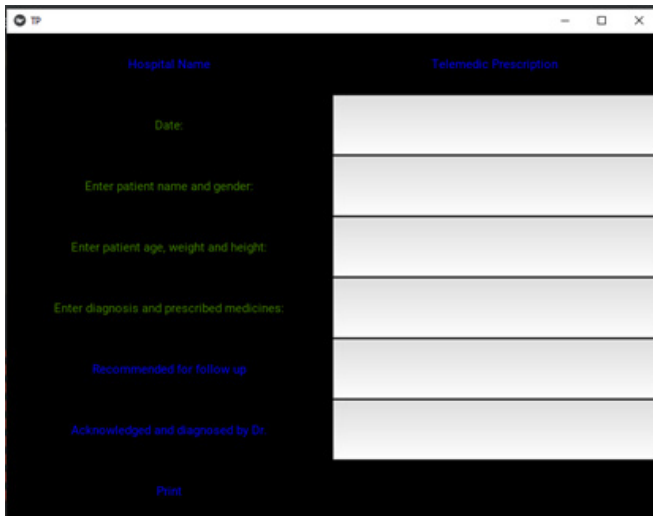


Figure 2: Telemedicine Prescription Record App User Interface

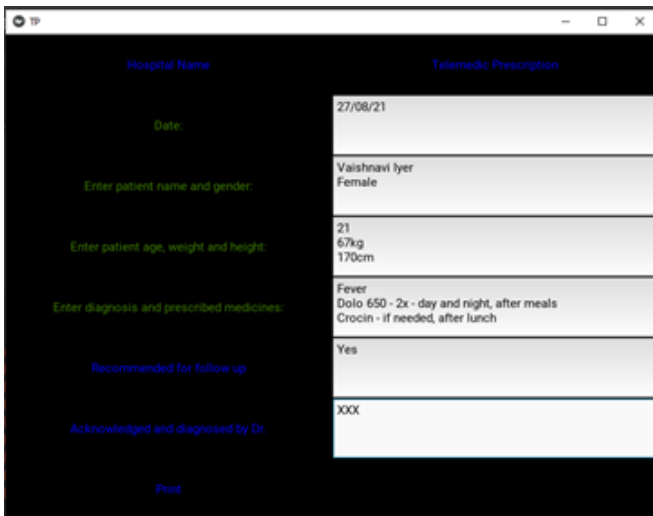


Figure 3: Entering details in the app

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Date: 27/08/21
Patient name and gender: Vaishnavi Iyer
Female
Patient age, weight and height: 21
67kg
170cm
Diagnosis and prescribed medicine: Fever
Dolo 650 - 2x - day and night, after meals
Crocin - if needed, after lunch
Recommended for follow up: Yes
Acknowledged and diagnosed by Dr. XXX
Get Well Soon
```

Figure 4: Prescription record as document format (doc)

after the other, thus making it convenient for the pharmacist. No third party will have access to the prescription because it is stored or recorded in the system memory, which means there is no way of reaching for it except via system access itself. This feature enables the information to be in a 100 per cent secure environment.

Using Pycharm software enables easy incorporation of buttons, text boxes and labels. The various layout options enhance the appearance and arrangement of GUI components.

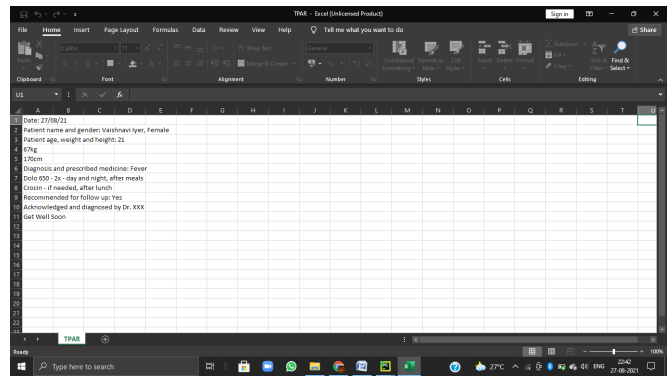


Figure 5: Prescription record in excel sheet format (xls)

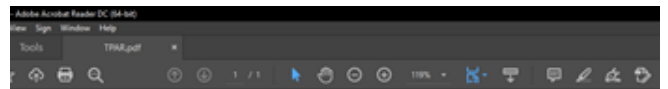


Figure 6: Prescription record in PDF format (pdf)

Kivy made it possible for the code to be executed and develop as an app. The various widgets and OOPS oriented Python programming language gave it an advanced and uncomplicated workspace. The background actions are vivid, simple and systematic. The availability of supportive models enables the developer to work in a less complex atmosphere.

RESULTS

The output of this app is as follows:

Figures 2 to 6 depicts the app interface and outputs obtained from the app. From these, you will be able to infer the working and result yielding processes of this “Python-based telemedicine prescription record” application.

CONCLUSION

The proposed and implemented system aims to provide a safe and secure environment for a huge database. Multiline data entry, multiple file-formats of the record and easy accessibility are a few of its features. Many problems such as paper waste, illegible doctor’s handwriting and maintenance of prescription files are avoided with the help of this app. The highlight is that the data is reserved in a 100% secure environment and vast data storage is possible without much hassle. This application will be beneficial for many hospitals all over the world. Further improvements or advancements will bring out the best of this

app, which comes under the telemedicine prescription record category.

PROS

This app comes along with the following benefits.

- Simple usage instructions.
- Compatible with Windows, Mac OS and Android platforms.
- Hassle-free and complex-free background actions.
- 100% safe and secure data.
- It can be preset to produce a document, excel sheet or PDF file format of prescription, as per the user's choice.
- Supports and implements multiline textbox for text input.
- Quick and efficient output.
- Accessing or searching particular data is not tedious.

CONS

Nothing comes perfect, and thus, there is always room for improvement. It needs an advanced networking system to support rechecking of prescriptions. It takes up more memory space for data storage while considering hospitals. It is possible to store the data in devices such as pen drives, etc. But hospital record's transfer will be a huge, additional process. Another aspect that needs improvement is the app interface appearance. Though the focus must be concentrated on efficient functioning, looking a bit more attractive is always a plus. Figure 2 represents the app interface, which explains the above-made point.

SCOPE

There are three concepts to consider over here – Telemedicine, Health Apps and Python framework. Considering the present conditions and growth of science and technology, one can infer that all the above aspects have a bright future. Upcoming technology will further improve the existing concepts and

help in the innovation of new ones. The increase of python applications for healthcare technology and being a health freak are the currently blooming trends. Everyone began realizing the importance of health, betterment of tech used in healthcare and associated factors ever since the pandemic emerged. Availability of different kinds of treatment adds further challenge and excitement to the process. Regardless of what lies ahead, one thing is for sure, medicine and technology going hand-in-hand will be a huge success. Development in these aspects eases the overall process and makes the world a better place to live.

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