

# PrEazy : A Road Map from Traditional Prescription System To Digital Prescription System

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## ABSTRACT

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Fake Prescriptions have emerged lately becoming hazardous for people's lives; bringing their lives at stake. Drugs like Schedule-H cannot be bought without a doctor's consent and thus cases of such drugs being bought with the help of fake prescriptions have become very common today. Sometimes pharmacists find it hard to identify the medicine names from handwritten descriptions and it may eventually lead to misinterpretation of the prescribed medicine name. We provide a solution to this problem. PrEazy is an android application that provides secured and digital prescriptions such that it reduces the use of fake prescriptions. Also, it is a Paperless Technology making it Environment-Friendly. This application is digital prescription software which transmits communication between doctor, patient and pharmacist.

**Keywords:** Fake Prescriptions, Paperless Technology, Mobile Application, Digital Prescriptions, New Generation System

## I. INTRODUCTION

Prescriptions earlier were written on a paper, which is followed by most of the doctors today because of its ease in use. This Traditional Prescription System which needs to be upgraded as per a modern technology with time. In this traditional method, as stated in the Jini-Based Solution [1], the doctor checking the patient writes a prescription of medicines needed by the patient to cure themselves, this prescription has a unique registration number of the doctor which prove their genuine identity with medical council of India, it is the duty of every doctor to mention their registration number in all their

prescription. For availing the facilities of doctor, a person needs to visit the clinic and needs to wait in a queue for his/her turn to come which may take a lot of time. Either they need to book an appointment by calling the doctor which makes it necessary for a person to have the doctor's number (which may be difficult to find if not available on the internet). After checking the patient and writing a prescription, it is signed by the doctor and then given to the patient then they can take it to any pharmacy of their choice. The pharmacist then dispenses the medicines conforming to the prescription.

The main disadvantage of this current prescription system is that it uses a lot of paper, leading to wastage of paper at a large rate. Also, this system increases the possibility of people making fake prescriptions and acquiring drugs with the help of it. This makes it insecure as it is hard to find which prescription is true and which is a fake prescription. With the traditional prescription system, it becomes necessary for the pharmacist to verify the doctor's registration number (which is a unique number for each doctor). Even after verifying the registration number, the chances of fake prescriptions are not much reduced. In fact, there is a possibility that an already existing prescription written by the doctor is edited by a person and then given to the pharmacy. In such cases it becomes very difficult to identify the true handwriting of the doctor.

Sometimes even pharmacists may make mistakes by giving wrong drugs/medicines to the patient. This happens due to misunderstanding doctor's handwriting. One such incident has been originated in the state of Assam a few years back. A girl from Assam suffering from convulsions was given DAONIL (anti-diabetic medicine to control blood sugar levels in type II diabetic patients) [6] instead of DUODIL (tablet for Cephalalgia, ear pain, Joint pain etc....) [5] which were prescribed by the doctor. This happened due to illegibility in understanding the doctor's handwriting. [7] Thus it becomes very much necessary to advance the current system and make it more secure and environment friendly.

The main need of advancing the current traditional prescription system to digital prescription system is to make advancements in technology and reduces the benefit the people gain by making fake prescriptions, and there will be no need to regularly verify whether the doctor is authorized or not. A digital prescription system will also prevent the wastage of papers. Regularly evolving technology has become a part of people's life today [2]. Undoubtedly, many

software/applications have been made to bring technological advancements in the current, existing system further leading to growth and development of nations. But unfortunately, due to many reasons these applications have failed to make our system better, the main reason being their high hardware cost, or it is difficult to use the application. And this is the reason why various such applications even after being launched in the market, are not used by most of the people and could not make a change in the current system.

Thus, to make our world a better place to live in with Technology, we provide a solution: PrEazy i.e. Prescriptions made Easy by digitizing them. PrEazy is an application where doctors, patients as well as pharmacies get a common platform to read and write prescriptions. The doctor will write a prescription for the patient approaching him in the application itself. This prescription will be encrypted for security purpose and converted into a QR Code. This QR Code will be scanned by the pharmacist then he/she will be able to read the prescription and give medicines accordingly.

## I. LITERATURE REVIEW

As stated in the earlier part of this paper, there is an important need of advancing our current and traditional prescription system to something new and something better. The problems of bad handwriting and chances of fake prescriptions in the current prescription system have been there for years, making them the major disadvantages of using the traditional prescription system. The prescription system have evolved over years, but undoubtedly, even this traditional prescription system has been upgraded to what it is today where, the unique identification numbers are present on the top of each prescription which identifies and validates a doctor, ensuring that that the prescription is from an

authorized source. The current prescription system gives an opportunity to a forger to forge a prescription and misuse it to obtain illegal drugs.

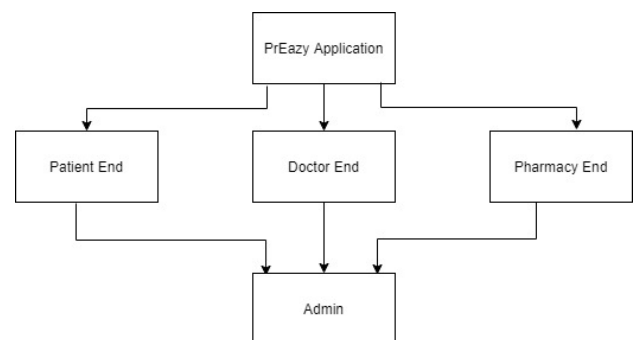
Efforts have been taken to digitize the current prescription system, advancing it with the progressing technology. Many applications and websites have been made for medication purpose. Example: Qualifacts CareLogic Software [4] patientfusion.com [9] is an online website for medication in USA. It offers searching a doctor and booking an appointment, maintaining patient history, storing health records electronically [EHR]. But most of such websites and applications have not been able to advance the existing system due to many reasons. Example: Searching for a doctor must have a list of all the certified doctors of that country which was not fulfilled in some websites. Some applications also have been made to improvise this current system. Patient medical records and appointments for doctors: dr.pad, [3] docstat are some of them to name a few. These both applications are very costly to be used daily making them inconvenient for the users. These applications are not preferred as they are not user friendly and may crash a lot sometimes while using them.

Pharmacy-end applications like 1mg have been made but they provide only delivery of medicines for which also a paper written prescription's photo/document must be inserted. This still doesn't solve the problem of misunderstanding prescription due to bad handwriting. We had conducted a survey, by which it was clear that 80% of the pharmacies are facing this issue and need a better system to overcome this problem. The doctors too are very much willing to adapt the change if any such digitalized system will be used further. To conclude, all the websites and applications that have been made for different medication issues are either for doctor or only for pharmacies. There are no centralized applications to solve difficulties for all on

a single platform. This paper proposes a solution to overcome this problem by providing an idea to build a centralized application that can be used by patients, doctors as well as pharmacies.

## II. WORKING PRINCIPLE AND IMPLEMENTATION

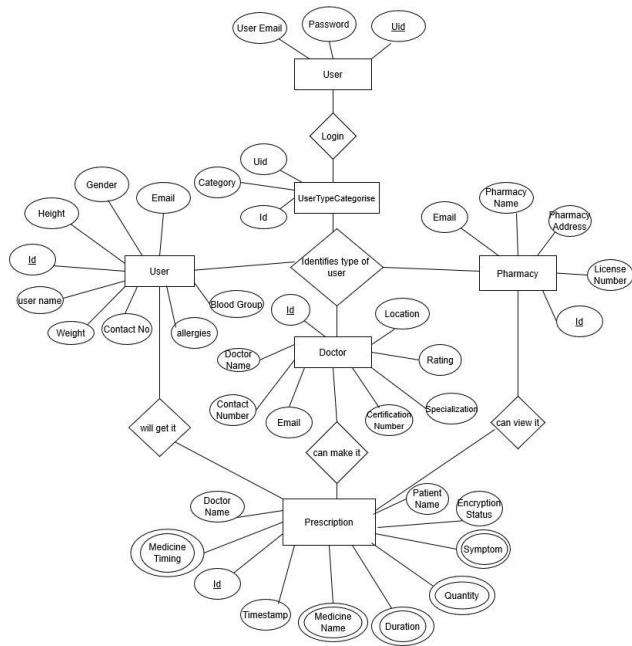
This paper states the need of switching to digital prescriptions. We propose a working for this system ahead. The application PrEazy provides a centralized platform for Patient, Doctor and Pharmacy making prescription writing and reading easier. In order to use this application must have an account to login into the application, be it patient, doctor or a pharmacist. There is not any one application providing all these three ends in a single application which makes it unique and different from other medical applications and systems.



**Figure 1.** Modules of the Application

This figure depicts the modules pertaining to the application, Patient, Doctor and Pharmacy, which are monitored by the admin end. Each module targets different users of this centralized system. The main role of patient module is to provide the facility to view its own prescriptions and book appointments for a visit to the doctor. The role of doctor module is to allow him/her to create prescriptions and view other patient's prescription as well. Pharmacy module provides medicine by scanning the encrypted prescription of the patient.

A user having this application in his/her smart phone can register as a patient, doctor or a pharmacy and can even have two accounts for example: one for patient and one for doctor or one for pharmacy and one for patient etc. Each account will need a separate email address.



**Figure 2.** ER diagram for the application

The user wanting to use the application will first have to login into the application using his/her email and password or needs to create an account by signing up first for those who do not have an account. The signup fields for each type of user are different. The patient will have to input fields like email, gender, username, blood group, email address, contact number, height, weight etc., which are mandatory to be filled. Whereas some fields like the Allergy field is optional. For a doctor to sign up in the application and create an account, his certification number along with his name, Email address, username, email, contact number is essential. The pharmacy needs to enter its address, license number, name and email to create an account.

The doctor can write the prescription in the application which is in a digital format ensuring that the no user will face difficulty to read illegible handwriting. One may think that how may this avoid the problem of fake prescriptions? The solution to this problem is Encryption! The prescription created by the doctor is encrypted using a highly secured AES Algorithm. AES algorithm uses a symmetric key which can be 128-,192- or 256-bit keys and encrypts blocks of 128-bit data. AES has replaced the Triple-DES algorithm, which is known for its speed, by providing six times faster speed. [8].

The prescription after being encrypted is converted into a QR Code which makes the patient unable to make changes in the prescription. A main advantage of this prescription being converted to QR Code is that this QR Code can only be scanned by the scanner that the application provides which is available only at the Pharmacy end. The patient requiring the medicines needs to show this encrypted QR Code at the pharmacy where it gets decrypted by the scanner and can then be read by the pharmacy. The patient now can also read the prescription from the application once it has been scanned at any pharmacy. Every prescription has its validity, which lets the prescription be available for the defined period given by doctor, and then it cannot be used again; this ensures that a patient needs to consult a doctor for the next dosage. This system eliminates the chances of patients consuming medicines according to their knowledge which is risky for their health.

The patient can view his prescriptions in the form of QR Code before being scanned or in the form of text after it has been scanned. They also have the facility to send request to any doctor from the list for booking an appointment. By having prescription in the application becomes an advantage for the patient of not losing it unless they have their account as a hand-written or printed prescription on a piece of paper increases the chances of misplacing them.

This elimination however proves to be effective for the doctors as well, since it will increase their income. PrEazy helps the doctor to view all the prescriptions that have been created by him/her. The doctors also have the right to check any patient's history including the medicines prescribed to them so far. This becomes helpful for the doctors to create new prescriptions keeping in mind their patient's record of medicines and health so far. Booking appointments directly without having their patients to wait in line for hours or answering their calls to confirm appointments is another additional feature that PrEazy provides. Doctors can know their performance by the ratings and feedbacks that they get from the patients and improve accordingly.

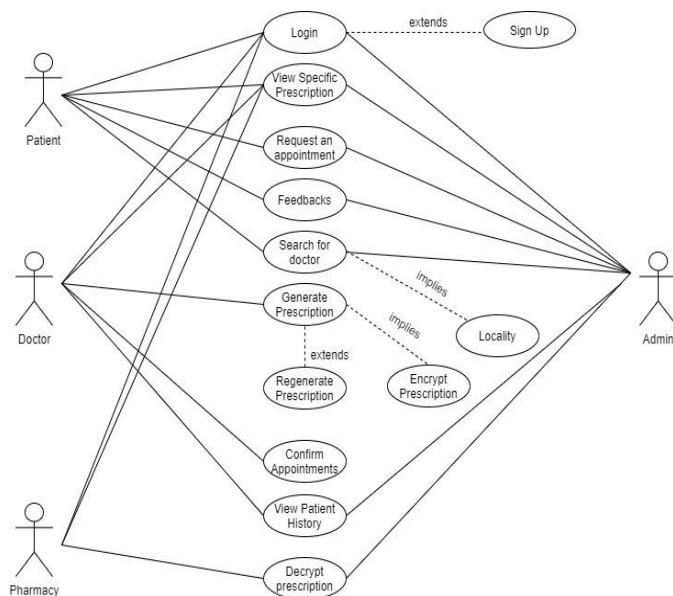


Figure 3. Use Case of the application

PrEazy at first will be limited to only some specific registered and verified doctors and would not be of much use to the doctors of rural areas. It will also not be an effective change for 20% of the people who do not have smart phones and also for old aged people who will find it difficult adjusting with the technology, but all the new changes and evolutions in the system takes some time to adjust with and use it on a day-to-day basis.

### III. CONCLUSION AND FUTURE SCOPE

PrEazy, with time, can further be advanced to make a better application. It can be merged with the e-pharmacies where from creating prescriptions to receiving medicines by the patients will be done by the application. This will be more beneficial by the e-Pharmacies as prescriptions will be sent directly from the application instead of pictures of the prescription thereby increasing the security of the prescription and decreasing the chances of them being counterfeit. It can also be integrated with applications which maintain the Inventory in pharmacies (such as Samarth) and make PrEazy an all-round application to be used by all.

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