

# DIGITIZATION IN MEDICAL CONSULTANCY

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**Abstract:** Patient visits a different health center/clinic for second opinion or for other treatment reasons; because there is no system to save and share their previous health related information with the healthcare specialist, the patient has to repeat many tests and might even have to wait for long time to get the results. Therefore, the availability of test results and others previous medical records to doctors, in the case of emergencies would save time, cost, and lives of patients. In another scenario, the availability of common medicines is scarce in many places of world. Pharmacies are severely overcrowded and service is more often of less quality than required. We often see queues that run a mile long, at government hospitals that are filled with people waiting to get their required medication. Medical shops, dispensaries and pharmacies are mostly closed at midnight and holidays, so during emergency situations, immediate access to supplies may prove to be a major difficulty, and at times, even impossible. Hence, we can build an “Automated Medical Machine” (AMM), machine stores essential and frequently used drugs with other medical supplies. It is also connected online to a doctor, on call. The doctor “consults” and “prescribes” the medicines, which is “acquired” and “dropped” to user, like money is dropped from ATM (Automated Teller Machine).

**Keywords -** QR code, Medical ATM, Medic

## I. INTRODUCTION

Medical Services are the backbone of the system of a country. In developing nations there is huge problem of availability of the medical supplies and services in the rural areas. This adversely affects the health of individuals of the nation and even increases the death rate of the country. We are trying to bridge the gap between the patient, doctor and services provided. We will make a Medical ATM that will be setup in rural areas and the far-out places in urban areas which will dispense medicines. Unlike the pharmacy stores this ATM will be available in service 24 Hours. Also, there will be an application supporting the storage of the medical records of the patients and keeping the medical prescription of the patient provided by the doctor in a secure fashion.

There is problem of availability of Medicines in rural areas and semi-urban areas at late night, as there are no 24 hours Pharmacy shops. There are some Pharmacy shops that have a monopoly which sells the only costly medicines in spite of their cheaper version available (Generic medicines). Also, there are some Pharmacists that provide prescription-based

drugs/medicines, without a prescription to the patient, that may result adversely. Another problem is in the regular medical consultancy process, the patient goes to a doctor and gets check-up then the doctor gives a written prescription which gets lost or damaged. If any patient is suffering from chronic diseases and consults to a doctor and then relocates to another place then he/she has to gather all the medical history of him/her while consulting to a doctor this becomes a complicated job to keep the records safe for years.

We are trying to make the whole Doctor-Patient relationship digital. In which all the medical history of the patient will be stored online or on cloud. Which will require a good security protocol. Therefore, for security concerns we will be using certain algorithms like Homomorphic, Ocomota, Algal, etc. There exists one more problem that a patient faces, when there is no doctor available and patient is having severe pain or other symptoms and if they want temporary cure for their pain, they just have to enter their symptoms and the system will automatically display the disease and medicines for emergency case according to the symptoms, until the doctor is not available.

## II. METHODOLOGY

This section includes the detailed description about all the modules present in our application named ‘MEDIC’ and all the security measures we are planning to provide so as to maintain confidentiality, authenticity and overcome the problem of loss and stealing of data. It has in total of 5 modules i.e., Doctor, Patient, Receptionist, Pharmacist and an Emergency module. Each module can be accessed only by the credentials provided to them and they can’t access the module other than their own.

### 2.1 Study about the Doctor’s Module:

Doctor’s registration is a very important step for the application and therefore before registration we need to verify the doctor’s license as the genuineness is a major concern. After the successful verification doctor can register themselves. It will have the option to send prescription provided by him directly to the receptionist which will be forwarded to the patient. Doctor can request the appointment list from the receptionist and can alter the timing in case of emergency and if there are any changes in time it will directly send message to patient regarding changes in appointment. Doctor can request patient for accessing their medical history. Doctor can alter symptoms and disease of the patient in the database. Application will show nearby medical atm and pharmacy.

## 2.2 Study about the Patient's Module:

The application will display nearby available doctors based on the requirements of the patient. Patient can provide access of his/her medical history to the doctor. Patient can self-diagnose disease according to the symptoms he/she has by just entering it into the medic app for temporary relief, until the doctor is available. If patient is out of cash, medic's fashion. It will show nearby medical atm and pharmacy. They can obtain prescription-based drugs from the atm by scanning the QR code. Patient can contact receptionist and fix his/her appointment.

## 2.3 Study about the Receptionist's Module:

Receptionist is the manager of the doctor's clinic or hospital so all the management work is done by the receptionist. Only receptionist has an option to register a new patient and generate a unique patient id for patient. Receptionist can check the medical visit of already registered patient using current patient option in receptionist module. It will send the QR code that contains prescription data. Receptionist can arrange appointment for the doctor. It has the option to accept payments through visitor payment portals. The application will maintain the database of all the patients who were consulted by the doctor.

## 2.4 Study about the Pharmacist's Module:

Pharmacist dispense prescription medicines to the patients. In the pharmacist module of medic app there is a QR code scanner that will scan and produce a list of medicines that are prescribed by the doctor. Accordingly, the pharmacist will dispense the medicines and the quantity dispensed will be stored in the database of Pharmacist. The app will alert the pharmacist when a medicine is out of stock or is in low quantity. This will make the job easier and quicker as the process of maintaining the database is now automatic.

## 2.5 Study about the Emergency Module:

Emergency module does not have login everyone can access it in case of emergency. It will have the option through which it will call emergency services and share its location automatically.

## 2.6 Security Measures undertaken:

As patient's medical history will be stored in online database it needs to be highly secured. Database security concerns use of a broad range of information security controls to protect databases against compromises of their confidentiality, integrity and availability. Therefore, for security concerns we will be using certain algorithms like Homomorphic, Ocomota, Algamal, etc. Homomorphic encryption is a form of encryption that allows computation on ciphertexts, generating an encrypted result which, when decrypted, matches the result of the operations as if they had been performed on the plaintext. Homomorphic encryption can be used for secure outsourced computation, for example secure cloud computing services, and securely chaining together different services without exposing sensitive data.

## III. FUTURE SCOPE

The crucial part of our project is the availability of medicines 24\*7 even in rural areas. That is possible with the help of medical atm. It is a machine similar to our bank atm machine which will dispense medicines instead of cash. It will have a QR code scanner that will scan the QR code on the prescription given by the receptionist. Accordingly, it will dispense medicines. It can also dispense common medicines without a prescription. It maintains the database of the available stock of medicines. It will automatically contact supplier in case of shortage of stock. In case of theft or inappropriate action it will alert nearby police station.

## IV. CONCLUSION

Here we have changed the typical process of medical consultancy by introducing a mobile application and have provided better health care support and medicine availability to the people by the Medical ATM. Now people living in rural and semi-urban areas will be provided medicines 24/7. Also, in the places where ATM can't be installed, we will tie up with local pharmacies to provide medicines easily by the use of QR Code scanning. We are providing interface in which patient's medical history will be kept securely.

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