

## Realtime Healthcare with Localised Reports

Prof. Mr Mohan Raj Ramasamy<sup>1</sup>, N Ajithesh<sup>2</sup>, Yash Verma<sup>3</sup>, Aditya Sharma<sup>4</sup>, Garvit Nigam<sup>5</sup>

<sup>1</sup>Professor, Department of Computer Science & Engineering, SRM Institute of Science and Technology, Delhi  
<sup>2,3,4,5</sup>Research Scholar, SRM Institute of Science and Technology, Delhi

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**Abstract:** As the population of smartphone users grows, it becomes the need of the hour to introduce Realtime Healthcare in this tech-based lifestyle. Our project can revolutionize healthcare within time quality delivery of health facilities which can save a person's time in this fast pace world. The traditional healthcare system imposes problems such as the physical presence of the patient, doctor's availability, a huge volume of paperwork, unavailability of hospital and doctor's information and no emergency situation procedure. Our team conducted a survey to get people insight about issues they face. It resulted in an application with facilities ranging from basic necessities such as information about doctor's specialty, timings to advanced features such appointment booking. Its feasibility being discussed, the patient and doctor can be actively in contact with each other through Realtime communication. Reduction in paperwork can help doctor attend more appointments and can easily trace the medical history of their patients such as previous test reports and prescription. Selection for Doctor according to user choice such as Doctor by specialty, by location, by rating etc. can be easily done. The user can immediately contact the nearest hospital with an emergency button in case of emergency through a localised feature (GPS+ GSM) which provides Realtime relief to a patient. The application was surveyed and able to deliver various health benefits to people and is found to be a potential transformation in healthcare.

**Keywords**— Digital Healthcare, G P S, GSM, Smartphone.

### 1. INTRODUCTION

Health is an important aspect of human life. The System offers improved communication and manages the data among doctors, patients, and hospital staff efficiently by achieving localization. It provides transparency to the users and also helps in reducing all the manual paperwork. It handles all the related data in a secure way by adopting user-friendly interface and quick data processing and transmission. It also helps to diagnose illness by alerting the patient the nearest hospital at the time of an emergency situation. This approach can be incorporated by hospitals to provide quick access to healthcare services. The building block is based on a client-server architecture where the server is deployed on a fixed geographical location and server applications are distributed via different online application markets.

The system is using GPS and GSM technology for communication between Server and Client.

Services provided by system are:

- Emergency alarm on critical medical conditions or accidents.
- Digital medical prescription.
- Alarm for medicine consumption.
- Realtime medical reports by both patient and doctor.
- Health services such as scheduling appointment and booking an ambulance.
- Localisation via nearest hospitals and pharmacies.

### 1.1 Purpose

Accessing healthcare is one of the defining issues of our time. To provide a unified system to address different issues regarding healthcare from the ease of their smartphones within a single application. Today, about 90 percent smartphone market is captivated by android so its most accessible platform to launch the application in order to reach out to maximum number of populations intended. As medical care has advanced and treatments have increased, healthcare costs have also increased considerably. The purpose of health insurance is to take care of your finances in case of any health-related issue. A set of 10 categories of services health insurance plans must be covered under the affordable care act. These include most of the doctors' services, drug coverage for prescriptions, services related to pregnancy and childbirth, in-patient and out-patient hospital care, healthcare services regarding the improvement of the mental state of people and more. Some plans even go beyond these and try to cover more and more services. We can improve the value for the patients which is the quotient when health outcomes are divided by cost of delivering outcomes. Costs which are for the patient care cycles. Doctors on the other hand have to take a oath and swear to they will apply dietetic measures for the benefits of the sickness, according to there ability and their judgment. The oath is the

fundamental guidelines western medical practice and that we have to focus on the health of the patient.

## 1.2. History

Health is a major concern among all the people. The health sector is maintained and organized by both private and government organizations to provide free and right to healthcare services. Many healthcare-related programs, seminars, and other field-oriented health camps are conducted and maintained but they provide basic solutions and remedies, analysis of symptoms and other details such as checking your BMI, BPI etc. Many medical apps that basically focus on these aspects ignore handling during emergency situations and live consultant services. Technological revolutions have now made it possible to recreate a healthcare system that is able to be ported and handle situations. We have learned that our health is highly dependent on the conditions regarding our society and environment in which we live and work. Air pollution, chemical exposure, poor quality food, and poverty influence our health more than our genetic makeup. Despite their large influence, these factors are ignored while making the medical policies and schemes to some extent. In the United States of America, only four percent of all healthcare expenditures are devoted to prevention, while a whopping 70 percent is devoted to treating chronic disease. This has led to the establishment of a sick care system that is now accounting for 18 percent of the total economy. Outside of the military, healthcare is the largest part of the GDP.

## 2. SURVEY

For the development of the Realtime system and to get the insight of the requirements for the application we conducted a survey of 20+ multiple choice type questions regarding the features which we are going to include in our application the responses from the survey guide us to the real time requirement's which a user wants example the emergency button and text to speech ,medicine reminders the survey was conducted in the age group 15-95 .The survey form are circulated through mails and WhatsApp groups which includes specially doctors ,patients and normal peoples.

### 2.1 Questions

- FULL NAME
- EMAIL ID
- ARE YOU A RETIRED DOCTOR OR A STAFF?
- DO YOU USE SMARTPHONE?
- WHAT TYPE OF SMARTPHONE DO YOU USE?
- ANY OTHER ISSUES OTHER THAN MENTIONED?

Age Group

157 responses

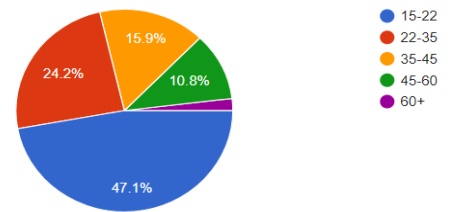


Fig 1. Statistics belonging to age of different groups.

## 3. SURVEY ANALYSIS

Online medical services have its roots prior the emergence of technological revolutions. It is observed on previous researchers that the satisfaction rate from various patients diagnosed using online services ranges from 1-20 percent, however, the accuracy of the solution provided by the doctor's ranges from 68-99 percent thereby resulting in an understanding that patient's interaction during the process is found to be problematic and below satisfactory as a result of deep research and analysis. The effect of Online medical services over patients depends on geographical coverage, availability, and knowledge of the system. Around 71.7 percent increase is observed when an easier user-friendly system is adopted. Most of the pre-existing online services and application focus on live consultation with less or no location transparency, unavailability of doctors or hospitals, fixed times and no inter-communication availability. IoT being a major contributor in providing resources and knowledge to medical services and the system requires proper web scraping of information so that the accuracy of the solution is approved and 90 percent or fewer errors are analyzed. The security of such Online medical services can be easily compromised. Previous findings include a security and privacy breach of 40 percent of individuals registered on a service network. Inhibiting such compromises requires proper analysis and strong implementation of secure networking database.

What type of smartphone do you use?

152 responses

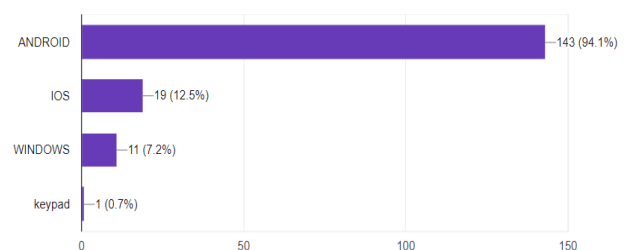


Fig 2. Statistics belonging to devices of different groups.

Maintaining and contributing to a database that contains a large number of medical solutions, problems and medicinal values show a nine percent decline in average patient consumption resulting in prolonged side effects of unavailability of the proper database. Constant updates to the database result in 2.1 percent average increase in consumption per year. Static pages are on a constant decline due to its invariability. Infrequent updates on static pages result in an average decline of 1,000 users per 10,000 users (ten percent reduction) in the usage of online medical services when compared to Dynamic pages that interact with respect to the user. This shows a prominent increase in the user database. Initial analysis of average live consultation on previous medical services involves a lack of constant knowledge transmission due to hardware restrictions and compatibility issues. United States, UAE, Germany, Japan, and theUK are countries that provide constant knowledge transmission irrespective of hardware and compatibility restrictions under medical fields and healthcare sector. India, China, Singapore and Malaysia and neighboring countries do not use intermittent online knowledge transmission and patients of such countries prefer a constant offline update on their health. It is observed that over 50 percent of the people are able to sufficiently convert from offline services to online services due to its global availability. American Medical Association (AMA) supports this thesis on their latest research paper. European and German Medical Association (EMA & GMA) on the contrary prefer scientific and technological revolutions to increase the health sector significantly. Sequential analysis of technologies used under Online medical services should follow standard medical practices. Elsevier compiled a series of non medical practices that all Online Medical Services should comply. Patient comfort and knowledge transmission rate is observed to be 23 percent on average of 24,000 people subscribed to a medical service. In order to increase such decline in rate, there is a standard of practice which considers the user-friendly approach to problem identification and solution delivery to both patients and doctors of their respective services. Global usage of license to Standard Indian Medical Practices should comply. Due to unavailability of resource storage, there is a constant decline of two percent of the reduction in Online medical service usage. Thereby resulting in a constant disadvantage of symptom identification and data analysis. An updated database is maintained that gets constantly recognized and updated with respect to newly identified problems and its solutions determined with their satisfactory rate. Indian Council of Medical Research has recently approved of such medical practices that are following the law and order of Indian Medical Governance System.

Do you wish to keep track of your medical history ?

157 responses

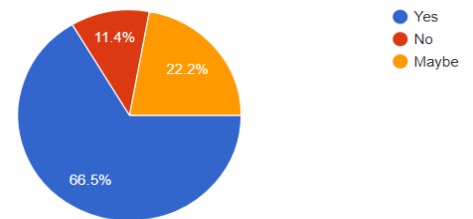


Fig 3. Statistics belonging to preferences.

#### 4. METHODOLOGY

##### 4.1 Existing System

The Existing system was not unified system comprising of all facilities at one stop. There is a high chance of misinterpretation of data and communication resulting in unprecedented errors. Increase in volume of patients leads to increase in paperwork. No location transparency and violation of user data security and privacy. The system tries to achieve direct communication between patients and doctors thereby not considering the technological aspect. It ignores handling any emergency situations and focuses on pre-existing situations. Clearly, a better and unified system was needed.

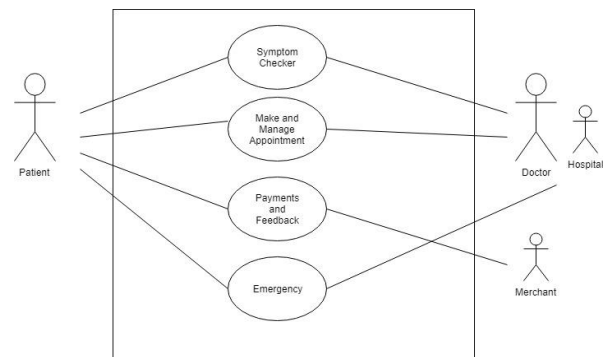


Fig 4. Use case for patient.

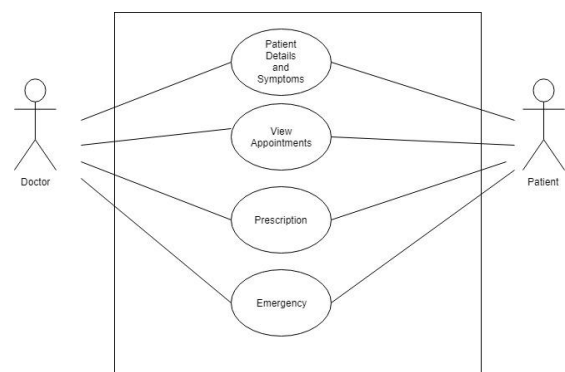


Fig 5. Use case for doctor.

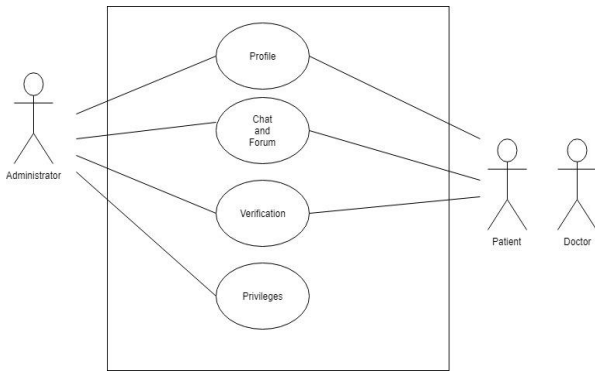


Fig 6. Use case for administrator.

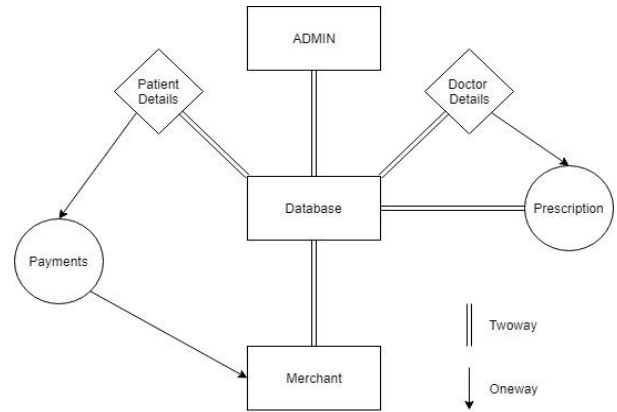


Fig 7. Data flow diagram.

## 4.2 Proposed System

All the details of patients and doctors will be uploaded at the time of creating a user ID and all the details related to patients can be easily accessible by the doctors resulting in good inter-communication between patients and doctors. The doctors and patients can create, maintain their profile individually and can have complete control over it. This provides a security to the personal details of anybody against unauthorized access. The proposed system tries to make this user-friendly by minimizing the keyboard input and providing graphical input to the system. It uses full body image and the patient interact with the sub-image of the body part which has to be treated. The gateways for the payments of the nominal prices of insurance policy payments. AS it asks you do you have any insurance policy if you say yes then it will ask what type cashless or reimbursement or if u say not then it will ask would like to have insurance with some nominal charges.

Merits of Proposed System are:

- Privacy to the patients and doctors
- reduction of time complex
- Provide effective tips to communicate with the doctor
- Emergency button
- Online prescription
- Text to speech medicine reminders
- Easy to understand graphical GUI minimizing keyboard input.
- Reduce paperwork
- Chat service for the interaction of the patient with the doctor for clarification of doubts after the appointment
- Symptoms checker for approximate diagnosis of the ailment

## 5. IMPLEMENTATION

**5.1 Profile creation and editing:** This module is used by the patients to create his/her profile for using the functionalities of the application and edit it whenever necessary in the future.

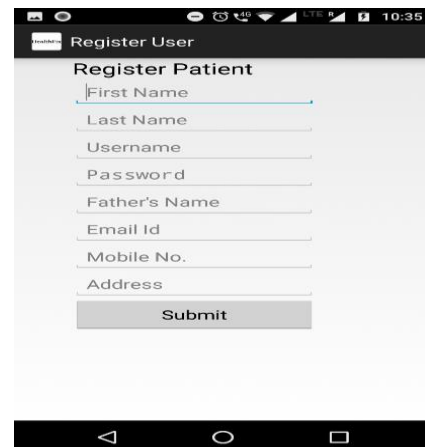


Fig 8. Registration panel.

**5.2 Appointment Booking:** From patient's panel, this module can be used to book an appointment with the doctor. For booking appointment, a patient has four different options patients can search by Hospital, doctor, locality, a specialty of the doctor. On selecting one of these options, the patient can input his preference regarding doctor, hospital, locality or specialty. After this, the patient can choose the respective doctor based on the rating of the doctor and book the payment. Patients can also rate the doctor with respect to the consultation he got from the doctor. This module uses Haversine formula for calculating the distance between the user's location and the location of a doctor (hospital). From doctor's panel, this module is used for viewing the appointments, patient's details, write prescriptions, etc.

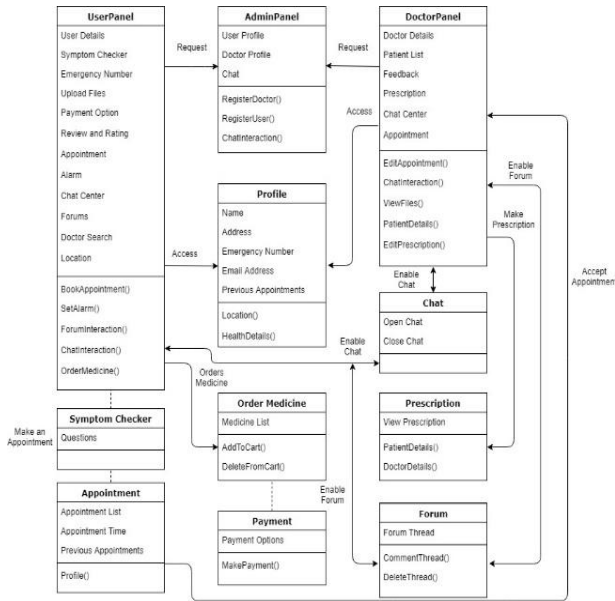


Fig 9. Class Diagram

**5.3 Reports upload:** From this module, a patient can upload his/her reports to the application from his/her android smartphone which in turn can be viewed by the doctor helping the doctor in diagnosing patient's illness.

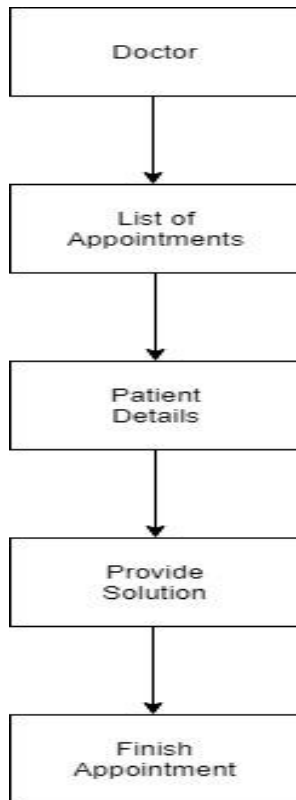


Fig 10. Appointment flowchart.

**5.4 Setting Talkback Reminders:** This module is used by the patient to set a reminder for taking medicine on time which will be very helpful for old and forgetful people.

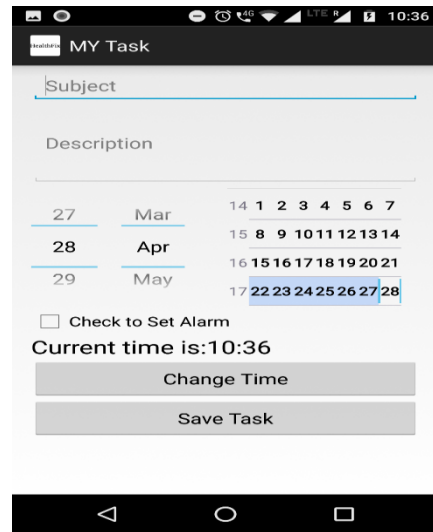


Fig 11. Reminder panel.

**5.5 Chat:** This module is used by the patient to communicate with the doctor after the consultation visit if he/she had any query regarding the condition.

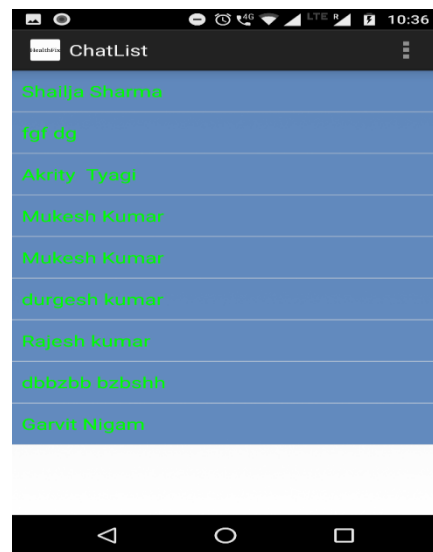


Fig 12. Chat panel.

**5.6 Emergency Alert:** This module can be used by the patient to send an emergency alert to the users' location to three nearby hospitals so that they can send an ambulance to the location. Like the appointment module, this module also uses the Haversine formula for the calculation of the distance from patient's location to hospital's location.

**5.7 Symptom Checker:** Application also has an in-built symptom checker in which a patient can input his/her symptoms according to which the application suggests the disease he/she is suffering from according to which the patient can consult the suitable doctor using the application by making an appointment

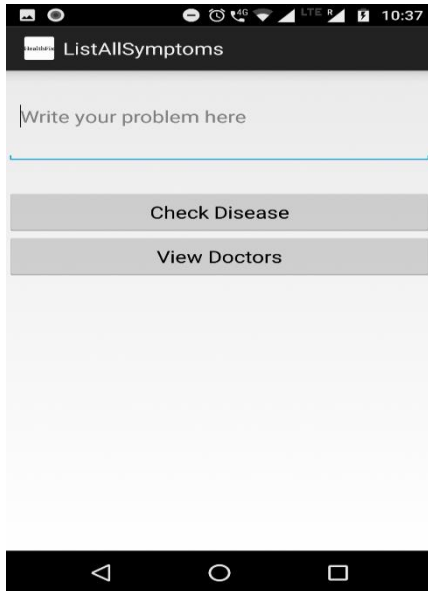


Fig 13. Search Panel.



Fig 14. Symptom Checker.

**5.8 Order Medicine:** This functionality enables the patient to get the prescribed medicine from the comfort of his/her home using Webmd.com.

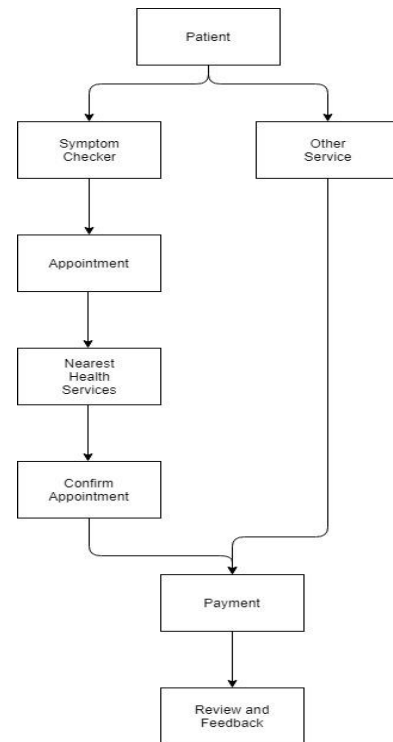


Fig 15. Symptom Checker flowchart.

**5.9 Forum:** Doctors have the privilege to create the forums using which the patient can be in touch with the doctor and other patients which provide a healthy and cheerful environment where people interact socially with people having same problems.

## 6. RESULTS AND DISCUSSION

We have been able to survey, analyze and deploy a Realtime healthcare which is very user-friendly and efficient in communication and reporting. The development has met all the objectives that were delineated as the advantages of the proposed system. By deploying the application on mobile phones, we have been able to bring the Localized reports in the palm of every individual. This can be deployed in the cloud by integrating different hospitals and linking their servers through the cloud. Though sufficient security measures have been adopted still there could be a scope to increase the security parameters. With respect to the feedback of the users, further improvements can be incorporated into the system to make it more users friendly.

## 7. FUTURE SCOPE

- The project can be scaled to cover another platform like IOS and windows operating system, web application, etc.

- Advanced encryption techniques like AES, 3DS, Blowfish, post-quantum computer encryption, etc. can be used to encrypt data.
- More advanced APIs like Google APIs can be used for distance calculations that provide more accuracy.
- Emergency alert can be restricted to users with premium paid accounts that will also help to counter with false alarms.
- Dedicated servers can be deployed for different functionalities when the visitor count crosses the threshold value

Heesun Kim Dept. of Multimedia Engineering, Andong National University, South Korea.

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## REFERENCES

- [1] "Location-based services: back to the Future," in IEEE Pervasive Computing, vol. 7, issue 2, pp. 85-89, April-June 2008 by P. Bellavista, A. Kupper, and S. Helal.
- [2] "Text classification and Naïve Bayes" by James Madison and Alexander Hamilton. In SNLP on October 28, 2011.
- [3] A Gsm & Gps Based System For Automatic Accident Notification And Severity Estimation" in IJIRAE by Venkatesh.Alwarsamy Dept. of Electronics and Telecommunication Engineering BIST (Bharath Bharath Institute University of Science, Chennai, & Technology).
- [4] "A Study on the Effects of Online Appointment Systems on Patients and Hospitals" in IJAER by

- [5] "Online Medical System" in IRJET by Aishwarya Nandagawali<sup>1</sup>, Komal Sute, Prof. Dinesh Gawande in DBACER, Nagpur, Maharashtra, India e-ISSN: 2395 - 0056 Volume: 04 Issue: 03 | Mar -2017
- [6] "Review On Android Based SoS Emergency Alert Button" in IJRSE by Rajani T. Thakare, Prof. M.R. Shahade of JDIET in e-ISSN: 2394-8299 Volume: 1 Special Issue: 1
- [7] Amit M. Farkade, Sneha R. Kaware. "The AndroidA Widely Growing Mobile Operating System With its Mobile based Applications". International Journal of Computer Science and Mobile Applications", Vol.3 Issue. 1, pg. 39-45, January 2015.
- [8] Moncrieff s., Venkatesh s. west G., A Framework for the design of privacy-preserving pervasive healthcare, multimedia, and expo, 2009. ICME 2009.
- [9] T. Suzuki and Y. Nakauchi: Intelligent Medicine Case for Dosing Monitoring: Design and Implementation, SICE Journal of Control, Measurement, and System Integration, Vol.4, No.2, pp.163171, 2011.
- [10] Prof. D. V. Chandran, SayaliAdarkar, Apurva Joshi, Preeti Kajbaje :*"Digital Medicine: An android based application for health care system"*, International Research Journal of Engineering and Technology (JET) , April 2017