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Patient Deck

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***Abstract*— Major drawback of conventional medical system is that patient has to visit physically the doctor for the assistance. This becomes an issue when the doctor is far away from the patient's reach because it takes much effort to visit such doctor. Therefore to save all the unnecessary efforts there will be a website named as PATIENTDECK which will bridge the gap between doctor and patient and also help them to reach out to the required doctor and get proper consultations with the help of chat and video call. If there is a medical emergency, where patient has to wait, then that specific patient's problem can be solved through this platform. Also, that patient will get online surveillance. Features of this website are that patient can start an instant consultation within seconds or start a video consultation at the scheduled time. Shield privacy that means all the data related to the consultations are fully private and safe. Patient will get notified of their prescribed medicine from time to time. A Patient will get a valid digital prescription. Labs can upload the reports of patient so that patient and doctor both can access it from anywhere. If a patient needs to go through more treatments then he/she can also get offline appointment to visit that specific doctor. The functionality is also provided for measuring the heartbeat and temperature of the patient while patient interacts with the doctor.**

***Keywords*— Doctor, Patient, Appointment, Schedules, Consultation.**

I. INTRODUCTION

PatientDeck is one of the components of eHealth. Versatile health innovations are a demonstrated medium of doctor–patient communication and have contributed to noteworthy change within the patients' health results. Specialist interview through portable health apps is helpful for the doctors and their patients because it spares time and cash of both. This approach has been found to overcome broad health framework obstructions, such as health proficient deficiencies, dependence on untrained and/or casual suppliers, fetched of benefit, transportation, and need of sources of solid data. In India, the prevailing mode of healthcare financing is out of stash use, and the lion's share of healthcare is conveyed by the private segment.

Hence, PatientDeck, as a proven medium of healthcare conveyance, has colossal potential within the nation. With urbanisation, the request for Health-related administrations within the nation is likely to extend as well. To our information, there has been exceptionally small distributed work within the space of mHealth applications as of now working within the nation with the arrangement of specialist meeting online/offline. With this foundation, the current inquire about is being defined to outline the health apps working in India with the office of either online specialist interview or offline specialist arrangement booking.

II. RESEARCH METHODOLOGY

The research paper includes an amalgamation of qualitative and quantitative approaches. Firstly, availability of online health portals is studied. Three portals are selected, and the content is studied in detail. The selection of the portal is based on the traffic received on these websites. Further, a survey is conducted to find out the usefulness of the online health portals. The purpose is also to identify barriers in accessing these online portals. A well-structured questionnaire is given to the respondents. The sample size for the same was 100. The findings are summed up in pie charts.

A. Study of online health portal

There are online healthcare portals in India which provide much needed guidance on health issues, to provide support services to the information seekers. Some of these include 'Arogya', 'Only My Health', 'Practo', 'Healthy India', 'Med India', 'BabyCenter', 'Vhealth', etc. These portals answer health and fitness related queries, create discussion forums, identify suitable medicines, provide connectivity with medical practitioners besides giving basic information on healthcare. Based on the online traffic estimate tool, Practo, 1mg and MedIndia were one of the top ranked healthcare portals available in India.

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1. PRACTO

As the website puts it, "We are a Bridge and Practo is that little bridge that helps the patients cross the river." Practo is an Indian based healthcare portal which acts as a bridge between health seekers and medical experts. Its services are available in 15 countries, almost 50 million appointments with the doctors are booked in a year and has around two lakh healthcare providers. It not just provides basic health information but also provides an opportunity to interact with the doctors and even book appointments. The portal has over 30, 000 doctors. One can even contact pharmacies and order medicines and health products just with a click. It also provides services like full body health checkups. Moreover, the portal has a blog through which it shares informative articles on health-related content. It has different sections for patients, doctors, clinics and hospitals. To make it more convenient for the users, Practo services are also available on its mobile app. Also, there is a review column for its users to share their experiences. Practo is also available on social media platforms like Facebook and Twitter making it more accessible.[1]

2. 1MG

According to the portal, "1mg provides accurate, authoritative & trustworthy information on medicines and helps people use their medicines effectively and safely." 1 mg is an online platform which is accessible for healthcare necessities. It provides home delivery of health products including all types of medicines, vitamins and nutrition supplements at affordable prices to over thousand cities across India. It has the facility to consult with qualified health professionals and chat for free. Users can book lab tests online and even get the reports online. It also has its mobile app which increases its accessibility. Further, it even tries to overcome the language barrier in India by publishing health-based articles in Hindi. According to the portal, the owners are working hard to make this information available in multiple languages. It serves the diverse interests of users by offering products and services related to allopathic, homeopathic and ayurvedic. Thus, it has revolutionized the lives of consumers and caregivers.[2]

3. MEDINDIA

Medindia is an online healthcare platform assisting the audience to reach healthcare professionals and executives worldwide. 'Networking for health' is its mission statement.

Medindia is one of the leading health related platforms globally with 10 million monthly page views in terms of traffic, reach, search engine ranking. The portal claims that it provides almost 40 health news items daily having over 35,000 news and research items related to health. These include articles related to diet & nutrition, yoga, lifestyle & wellness, home-made remedies and even beauty tips. There is provision to use various health tools like blood group calculator, blood pressure chart, height weight tools, body fat calculator, vitamin deficiency calculator, etc. Medindia specializes in health information, medical dictionaries, diets, drugs, dental care, cancer, men and women's health, mental health, diabetes, depression, and weight loss. The portal is also available on various social media platforms including Facebook, Twitter, Instagram, etc.[3]

B. User and Usage of online platform

In the technological driven era, people mostly use online platforms to gather content on healthcare. Through the survey conducted, it was observed that out of the 100 samples, only 9.8% people do not prefer online mediums to obtain health-based information. Others expressed that they use such platforms to gather information on health-related content. Further, it is important to note that more than 50% responses were received from people between the age group of 15 and 30 years. Around 30% respondents belong to 31 to 45 years of age group. The rest 11% respondents fall between the age bar 46 to 60 years. However, very few responses were received from people over 60 years of age.

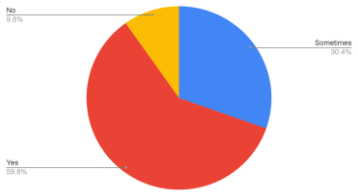

Fig 2.1: Usage of online mediums to obtain health-related information

C. Increasing Demand of online health portal

In the digital era, online health portals have reached the forefront in serving as a health information source for the users. According to the survey results, online portals are being preferred mostly because it is an accessible, convenient and cheaper medium. Also, it takes less time to gather information. Almost 50% respondents opted for all the mentioned reasons.

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The most favorite option for the respondents was the easy accessibility. For others, it was less time consuming or a cheaper medium.

Factors contributing to increase in demand:

- To consult doctors
- To book medical appointments
- To conduct online health tests
- To search for healthcare information
- To buy health products

As per the survey results, the most preferred reason to use such platforms was the need to search for healthcare information. Clearly, users consider this as a source of information which is available to them at low cost and in a lesser time. Also, almost 90% users recommend such platforms to others

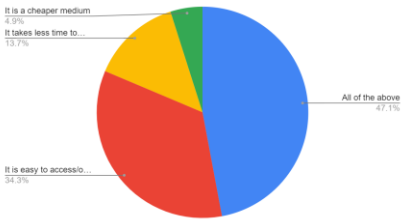

Fig 2.2: Reasons for preferring online health portals

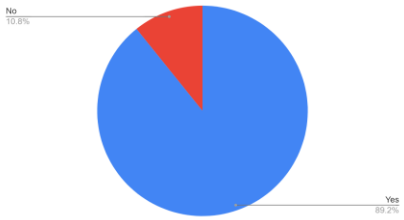

Fig 2.3: Would you recommend online health portals to others?

D. Popular Health Portal

Talking about the health portals, the survey depicts Practo (practo.com) is the most popular portal among users followed by Medindia (medindia.net) and 1mg (1mg.com). The respondents also mentioned other portals which they use. The names include PharmEasy (pharmeasy.in), Healthline (healthline.com), Medlife (medlife.com), Fortis Healthcare (fortishealthcare.com), Mayo Clinic (mayoclinic.org), WebMD (webmd.com), and National Health Portal (nhp.gov.in). Some of them even mentioned about searching google for obtaining healthcare content.

E. Off-line means are still dominant for health-related requirements

The survey depicts that 98% users consider offline means as well for the health-related requirements. This indicates that users do not entirely rely on the digital medium to fulfil their healthcare necessities.

F. Barriers in accessing online portals

Through the survey, it was found out that around 24% users face difficulty in using such online platforms. The difficulty faced included:

- Complex process of registration
- Language barriers
- Connectivity issues
- Long waiting time for medical consultations

III. PROPOSAL

A. Design Considerations

1. The device must be android to install this app. So, the impact quality is high.
2. The efficiency of this system depends on the speed of processor. So it is not predictable.
3. As cloud is used for monitoring and handling the data, chances of data loss are low and if it occurs then it can be easily recovered by cloud.
4. As initially we are not introducing this application in the market, so we are using fake data of doctors, path labs & Hospitals for the database.

B. Experimental Setup

1. Visual Studio Code
2. MySQL workbench
3. MongoDB Atlas, MySQL Server
4. Node JS, Bootstrap, JavaScript.
5. Heart rate and temperature measurement device: This is a Heat rate and Temperature monitoring device based on ESP8266 Microcontroller which can update the measured data to the Server using Wi-Fi.

Components Used:

1. ESP8266
2. MAX30102 Pulse Oximeter Heart Rate Sensor
3. LM35 Temperature Sensor

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Esp8266: The ESP8266 Wi-Fi Module is a self-contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your Wi-Fi network. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor.

MAX30102 Pulse Oximeter Heart Rate Sensor: The MAX30102 is an integrated pulse oximetry and heart-rate monitor biosensor module. It includes internal LEDs, photodetectors, optical elements, and low-noise electronics with ambient light rejection. The MAX30102 provides a complete system solution to ease the design-in process for mobile and wearable devices.

LM35 Temperature Sensor: The LM35 series are precision integrated circuit temperature devices with an output voltage linearly- proportional to the Centigrade temperature. The low-output impedance, linear output, and precise inherent calibration of the LM35 device makes interfacing to readout or control circuitry especially easy.

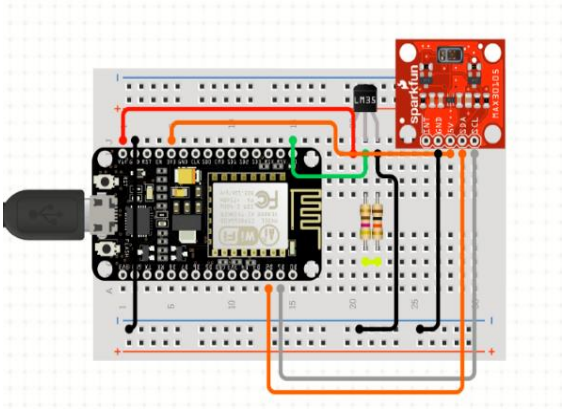

Fig 3.1: Heart rate and temperature measurement device

IV. Result And Discussion

All the chosen Health apps are giving online specialist consultation-related administrations, with the CallDoc App as it is giving offline specialist arrangement booking-related administrations. Specialist arrangement booking office is given by Practo, mfine, Lybrate, Inquire Apollo, I Online Specialist, CallDoc, Specialist INSTA, DocOnline, and India Dental World apps. Among the 22 chosen health apps working in India, Practo, mfine, DocsApp, 1mg, Netmeds, Lybrate, MediBuddy, and Medlife are found to be the eight most well known ones with over a million downloads and on normal four-plus client rating out of five.

Practo, mfine, and Lybrate offer specialist meeting through chat, sound, and video calling. Netmeds and DocsApp offer specialist discussion through both chat and sound call. 1mg offers free chat discussion, whereas MediBuddy and Medlife offer sound call discussion as it were. Practo, mfine, Netmeds, Lybrate, MediBuddy, and DocsApp charge a interview expense for specialist interview. Netmeds and mfine offer free follow-up meeting inside 7 days of an starting discussion. Practo, mfine, DocsApp, Lybrate, MediBuddy, and Medlife give a web health record upkeep facility, which 1mg and Netmeds don't offer. Considering booking specialist arrangements for offline interview, Practo, mfine, 1mg, and Lybrate as it offers this office among the eight most prevalent chosen health apps. In Lybrate, after the app has been downloaded, the app inquires for foundation points of interest of the quiet, such as sexual orientation, age, conjugal status, tallness, weight, and existing health conditions to propose a pro who ought to be counseled to address the patient's given health condition. Practo offers different enrolment plans for healthcare in which a shopper must pay a certain sum at first to get boundless online meetings, free in-clinic interview, health check-ups, and pharmaceutical markdown for a certain period of time. The mfine app gives the primary specialist interview without charge. MediBuddy tracks the GPS area of the versatile endorser to recommend adjacent specialists of different specialities accessible for arrangement booking with time and date spaces. DocsApp inquires for age, sex, indications, and health concerns some time recently proposing a master to supply the suitable care for a patient's needs. In Medlife, one can select from different masters accessible at a specific date and time for discussion. Netmeds offers specialist meeting through chat after the understanding has paid an introductory meeting charge. Different pro interviews in expansion to the interviews by a common specialist given by these apps incorporate gynecology, dermatology, urology, dentistry, gastroenterology, paediatrics, oncology, sexology, endocrinology, sustenance, physiotherapy, psychiatry, common pharmaceutical, surgery, diabetology, pulmonology, cardiology, orthopaedics, and neurology among others.

To conclude, among the chosen mHealth apps giving specialist interview administrations online/offline and working in India, Practo, mfine, DocsApp, 1mg, Netmeds, Lybrate, MediBuddy, and Medlife are found to be the eight most prevalent ones with over a million downloads and on normal four-plus client rating out of five.

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The government ought to make empowering arrangements to encourage and promote mHealth applications within the nation.

A. Figures and Tables

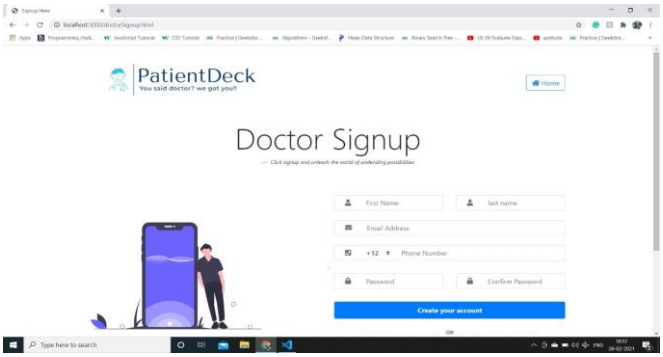

Fig 4.1: Doctor Sign up page

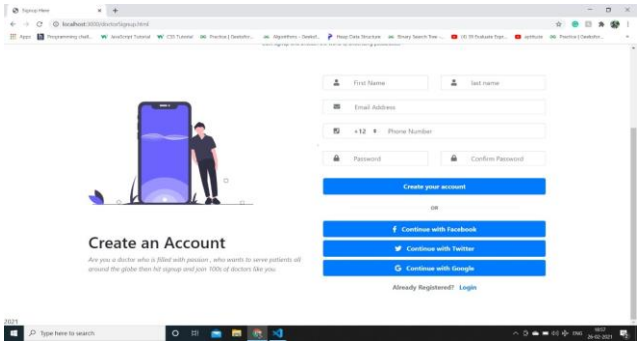

Fig 4.2: Patient Sign up page

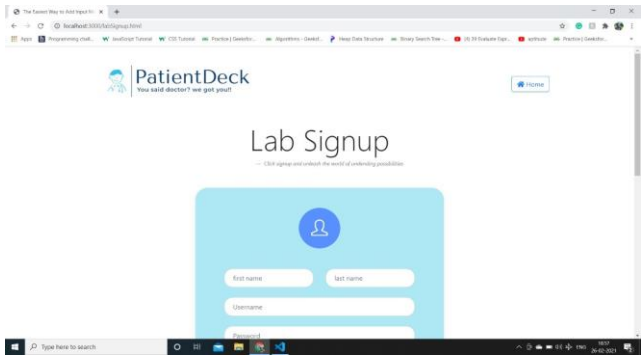

Fig 4.3: Lab Assistant Sign up page

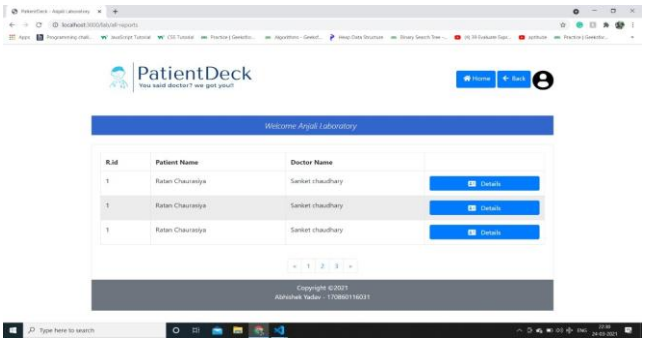

Fig 4.4: Patient appointed to doctors page

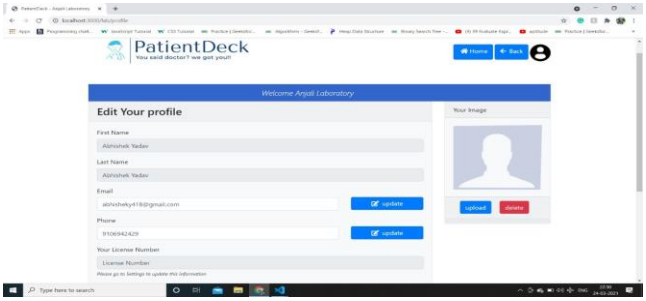

Fig 4.5: Edit profile page

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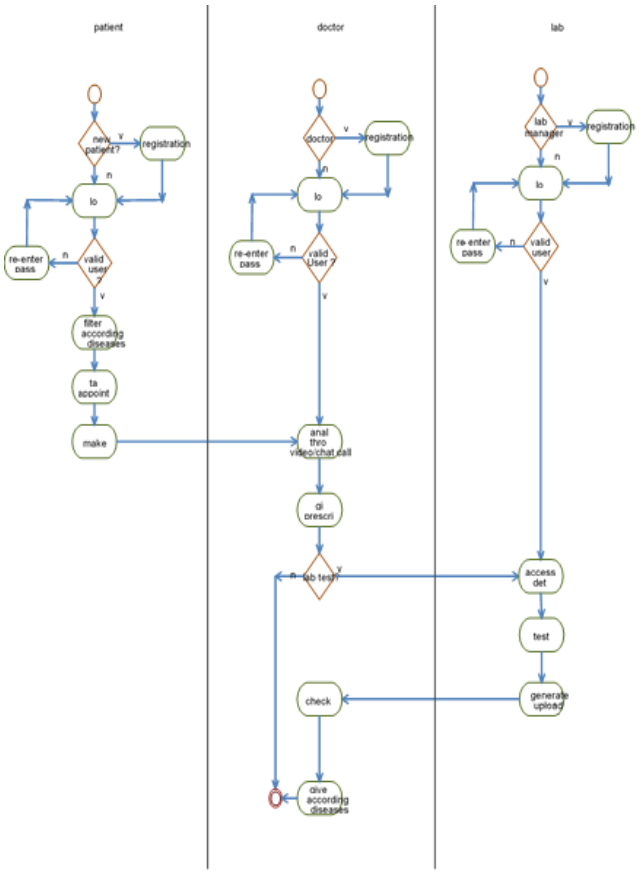

Fig 4.6: Activity Diagram of whole system

When 1st time the patient reaches to the online portal of patientDeck he or she will be asked to register and after that the patient can login to the portal and can access to all the possible facilities that are being provided by the online health portal. The same way the doctor and lab assistant can register them self on the portal for treating patient and and acing many other facilities. Once the patient login into the portal he or she gets login to the health portal and search for the doctor according to the diseases he is suffering from and is the patient need any lab test to be done if needed then the patient can get appointment and can directly see the reports on the portal and at last payment can be done online through credit, debit, or upi payment.

V. CONCLUSION

A health application is the organization of educate, resources and people that gives health care workplaces to meet the health necessities of the people. There are different applications accessible within the showcase like Thyrocare, E-wireless, Practo and numerous more. All these applications are successful as it is for specific health related issues. Practo application is valuable fair to get the subtle elements of specialists in user's territory and take online arrangement. Subsequently to overcome all the disadvantages of the existing frameworks we have presented and actualized an internet health care application with the assistance of cloud computing concepts which is able viably give different data related to preventive measures and tips that thought to be taken to maintain a strategic distance from different infectious illnesses, give distinctive way labs, online booking of doctor's arrangement, keep track of user's health checkups reports. In this way our proposed framework will be valuable in anticipating parts of frenzied work such as:

1. Finding the nearest pathology labs and hospitals.
2. Getting Proper Information about Health-related issues.
3. Access to reports
4. checking temperature and heart rate through IOT devices.

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