

Digital Health-Care System for Smart IPD Booking

Ajinkya Yelne¹ and Archana Raut²

¹PG-Student Computer science and Engineering, G H Raison College of Engineering, Nagpur, Maharashtra
Email: ajinkya.yelne.cs@ghrce.raisoni.net

²Assistant Professor Computer science and Engineering, G H Raison College of Engineering Nagpur, Maharashtra
Email: archana.raut@raisoni.net

Abstract—Success of health sector in a MedTech industry giving online consultation from doctors, lab tests and delivery of pharma products through smart phones has all on our finger tips. Moreover, we have also some applications which provide information about the treatments, lifestyles, surgeries, OPD appointment booking etc. There are certain barriers between doctors, patient and hospital here we are to provide a solution on IPD booking system to those barriers, to give a digital platform for hospital booking. To provide information about treatments and healthcare facilities in all classes of society by way of patient education. Which will reduce the cost of hospitalization to the patient and reduce the operational cost of Hospital.

Index Terms— IPD booking, Digital health care, Smart IPD booking, Healthcare, Online-Consultation, App-Development.

I. INTRODUCTION

By the year 2022, the smartphone has given a solution to the health care sector a new light of hope by providing delivery of online medicine, consultation, and lab tests. The major part of health care in IPD i.e., In-Patient Department. IPD is a part where the patients having critical medical conditions are admitted for proper precarious care and attention. Our main objective is to provide a digital health care platform for IPD booking to remove barriers between patients, doctors, ambulance drivers, and hospitals. Which will reduce the cost of hospitalization to the patient and reduce the operational cost of the Hospital. We are using the mobile apps as a platform as smart for easy access for our solution to every class of society.

II. LITERATURE REVIEW

Development of Online Hospital Booking Portal for Patient Appointment [1]. The author's design has a clear vision to deliver a digital platform web- grounded that will give druggies to bespeak movables for treatment with croakers and reduce the hedge between them. Hence an effective result is offered by this design where druggies can see colorful booking places available and elect the preferable date and time [1]. In this system, druggies can also cancel their booking anytime. The system has to be fed by the croaker regularly with his diurnal earnings and at the month's end a report is automatically generated by the system of the total quantum earned [1].

The Effective Online Medical Appointment System [2]. This is a web-grounded operation that overcomes the issue of managing and reserving movables according to the stoner's choices or demands. Then the stoner can elect good croakers by referring the earlier details and reviews. Hence this design offers an effective result where druggies can view colorful booking places available and elect the favored date and time.

The Aspects of Digitalization of Healthcare in India (2020) [3]. From the following paper author has explained a clear and effective delivery for the services to their consumers and citizens of the nation and appreciates in a true sense of India's digitalization. Query and challenges in Digitalization are also well explained. This huge digital healthcare sector is continuously developing, growing up, and working on making healthcare worldwide a wider sector [3].

Similar kind of applications are discussed in research "Doctor Consultation through the Mobile Applications in India, Challenges, and the Way Forward" [7]. It's the check of mHealth operations where the author plant 22 operations were are planted to be furnishing online croaker discussion and/ or croaker appointment booking and other allied services [7]. mHealth apps furnishing croaker discussion are gaining fashion ability in India, and they've enormous implicit in the country. The government should make enabling the programs to grease and vulgarize mHealth apps [7].

In WHO Digital Health Guidelines a corner for global health [8]. The directions provide nine recommendations on the select digital health interventions that includes the use of a mobile phone or device [8]. It also provides information on performance considerations, quality, and certainty of extant substantiation, factors related to adequacy and feasibility of the intervention, and gaps in the substantiation that can inform unborn exploration. Given the vital part, digital health plays an important role in supportive to health care systems [8].

III. METHODOLOGY

To build a Mobile application we have to go with the standard mobile app development process which is divided in following 6 steps with the figure 1.

1. **Strategy and Problem Definition**
This is the first step of mobile app development in which we have to be very clear about our objective of app building. Also, we have to identify the user for our application, research the competition and select the platform for application.
2. **Analysis and Planning**
Identify the requirement, define team structure and prepare the product roadmap this is the second step of app development.
3. **UI/UX Design**
To create seamless and effortless user experience with a polished designing also we have to make the information architecture & workflows, wireframes, Style guide, mockups and prototype which is a very important process of app development. In this stage we get to know about our applications functionality and design.
4. **App Development**
Develop Backend, API and Mobile app Following agile development process. It contains the coding part of application and backend server database.
5. **Testing**
Our product should be validated and tested thoroughly with the series of testing criteria. We have to test our product in the following types user experience, functional, performance, security and device & platform testing.
6. **Deployment & Support**
Launching of app on the platforms with support for future revisions.

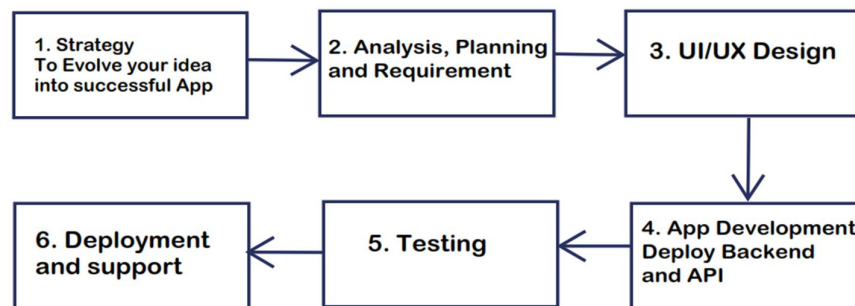


Figure 1: Mobile App Development Process

As per Mobile app development process our mobile application's users are the Patient, Doctor and Hospital. We are giving app's web login for hospital login as today every hospital has web-based application for hospital management or an ERP based system and we can easily connect with the system.

So, we have identified the users i.e., Patient, Doctor and hospital and our main objective is to give patient the mobile application to book hospital for treatment and educate patient about hospital. Our main focus is on the booking of IPD i.e., Inpatient Department of hospitals which will give patient an overview of hospital, doctors available in hospitals, facilities, services and to avoid last minute rush to hospitals. In situation of emergency the patient will have the booking done with the available beds and hospitals will be in ready with the patient's reports and direct admission is done without any paper work.

We have studied and research about the current working principle of hospitals on IPD booking of patients the flow is shown in figure 2. We are to make this process online.

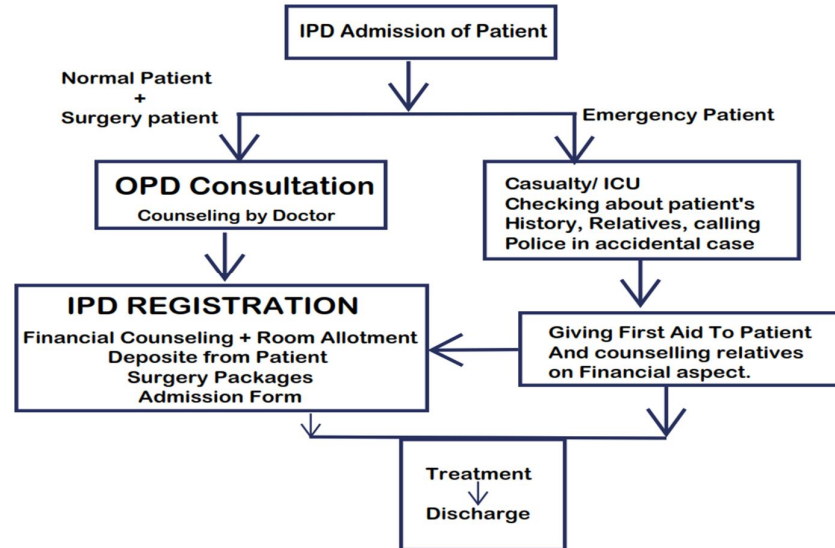


Figure 2: IPD Booking Process of Hospital

All hospital follows the above process for Inpatient department of hospital there might be some changes as per different hospital guidelines.

Drawback of IPD booking Process:

- Waiting period to get appointment for walk in patients.
- Non visibility on the services offered by Hospitals.
- Inadequate time management due to last minute patients.
- Selection and availability of rooms and clinicians for patient and relatives.
- Lack of follow-ups by doctors and medical staff.
- Non availability of personal assistance.
- Lack of clarity on treatments and approach by doctors.
- Lack of clarity on hospital tariffs.
- Patients lacking information about the Hospitals.

After analyzing this process, we have overcome above drawback in our application by giving patients a mobile platform to book appointment before he/she can see about hospitals overview, services, facilities, offers, doctors staff and many more. Patients must be able to see the available beds and book them accordingly, there will be proper follow-ups online reports patients can see his treatment details all in a single application. Also, patient will be able to schedule ambulance to hospital. Others facilities through our app is online consultation form doctors.

To build the application with above facilities we have used Flutter-Flow software which is a web-based platform to design mobile devices for Android and iOS allow viewing and interacting with Flutter prototypes in real-time on mobile devices. We will see the products prototype in the below figure 3 which have the onboarding page of app and next with login, signup and forget password pages.

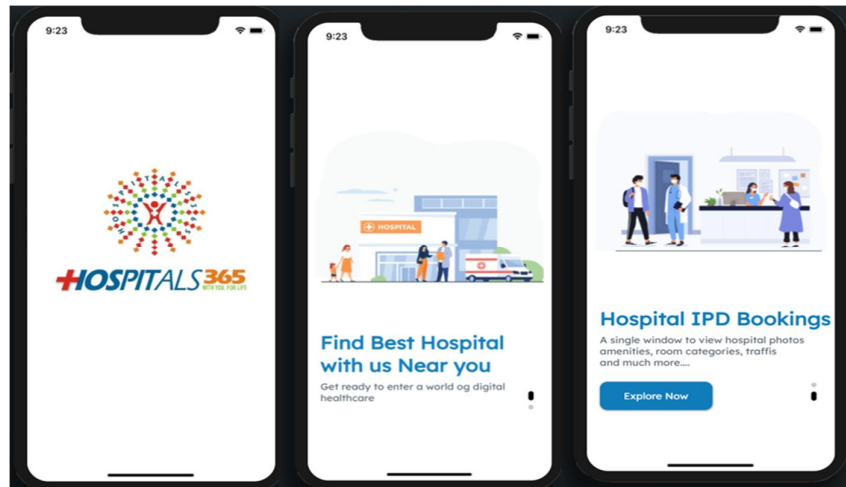


Figure 3: Onboarding page

As shown in figure 4 the patient signup by entering email and password for the first time then it will be redirected to home page of patient module is shown in figure 5 which has the options to book hospital, surgical packages, book ambulance, and online consultation, My booking, account, special services like personal assistant, physiotherapy, health checkup camps and best offers.

Doctor Login module has a login and signup page which has the email and password for login and if doctor didn't have the login information, he/she has to signup first and complete profile then after verification the email and password is mailed to registered mail ID as shown in figure 6 and 7. After successfully login we give doctor's home page where he/she is able to see Hospital admitted patients refer by doctors their treatments, reports, chat with treating doctor and total expenses after discharge. Other options for doctors are refer a patient to hospital treatment, call us, health checkup camps, community chat with doctor, notifications for online consultation and History.

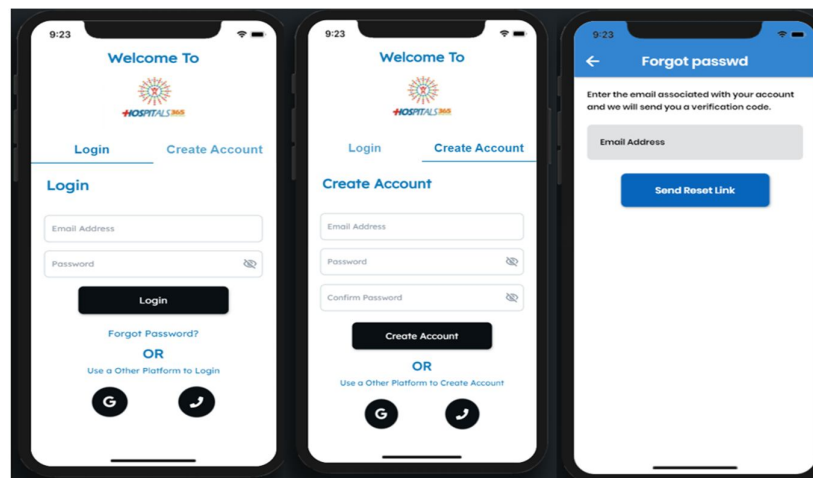


Figure 4: Patient login and signup

Further we have the hospital app with web login, firstly hospital has to sign up with us then username and password is given after verification after login by hospital it is directed to dashboard where they get the notification of new appointment where hospital admin will confirm the patients bed booking and verify him. Later after admission of patient his profile will be display under active patient here hospital will upload all the reports and treatment details so that referring doctor and patients relative can get update about treatment given to patient. Finally, when the patient is discharging his profile will be directed under discharged patient and all treatment and billing detail will be displayed there which is shown in figure 9.

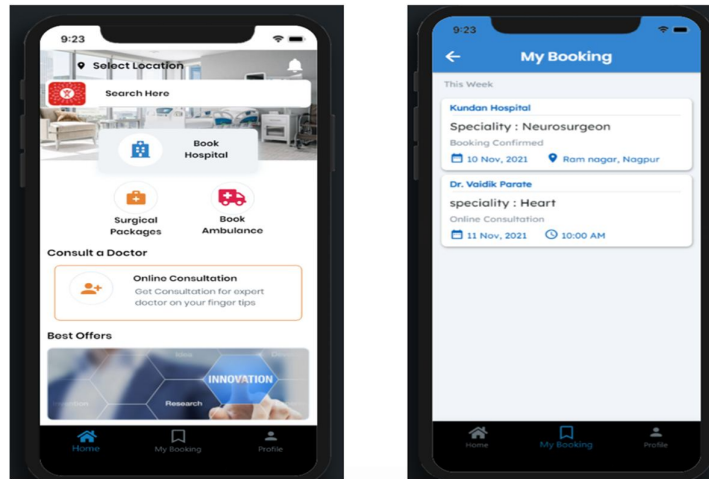


Figure 5: Patient module home page

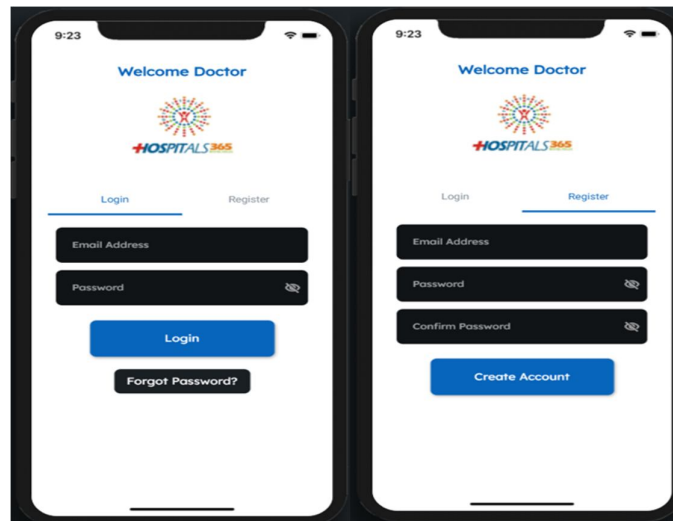


Figure 6: Doctor module login signup

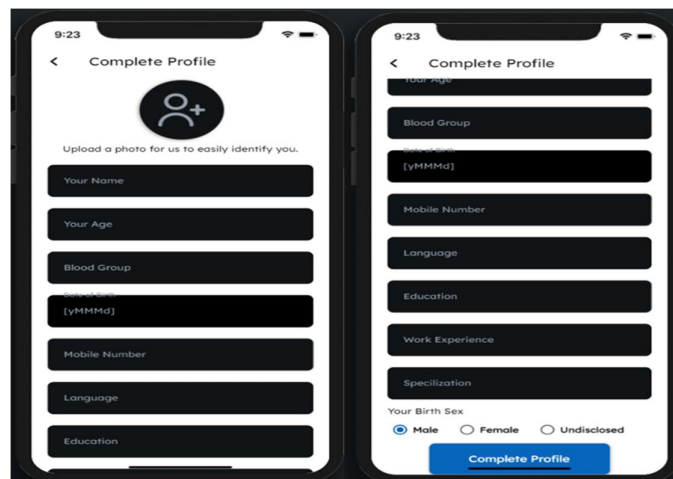


Figure 7: Doctor Module Complete Profile

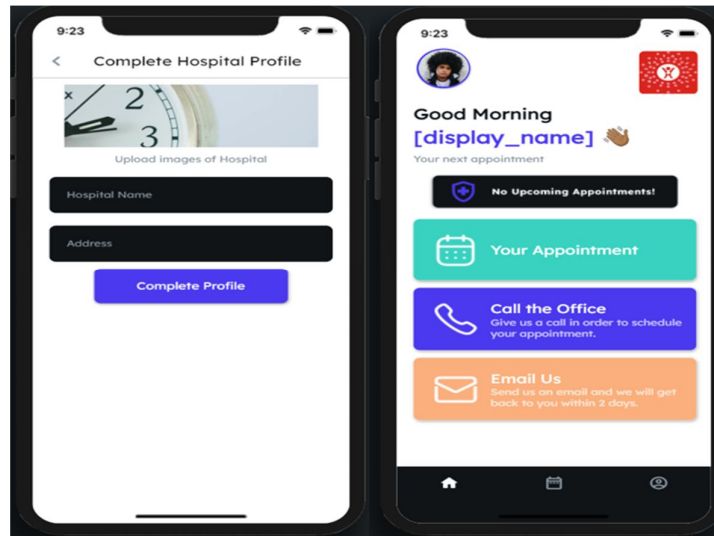


Figure 8: Dashboard of hospital web panel

IV. RESULT

Our Mobile application has a concept of Hospital IPD booking to patient providing affordable trustworthy healthcare solution with the use of digital technology. Trying to minimize complications and frictions in current healthcare delivery system. Providing correct information about various hospitals, referring needy patients and educating patients. Connecting patients from remote and rural areas to proper and latest treatment methods through our platform. Availability of all categories of health services to everyone. Helping Hospitals to upgrade and create more infrastructure and bring new technologies.

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