VITALS MONITORING SYSTEM

Domain: Healthcare

Location: US

Project description:

Allows care teams to monitor vital health information and manage their patients in any Site-of-Care, including their home, by incorporating advanced medical devices with a highly intuitive and functional telemedicine application. This helps achieve great patient outcomes, reducing physician's office visits, while decreasing the cost and increasing efficiency.

Requirements:

To build a platform to enable customers to monitor their health vitals at home and seek medical advice/consultation in case these vitals deviate beyond standard values.

A system should connect with various diagnostic kits like blood pressure monitors, thermometers, blood glucose meters, etc. and log these values automatically into a central online system. These reports should be made available to a panel of healthcare professionals who can prescribe medicines or exercise/diet advice online.

All the patient medical records need to be secure and adhere to stringent HIPAA compliance.

Solution proposed:

The core part of the solution was the embedded control mechanism that transmitted the readings from the diagnostic kits to the online system.

The web system consisted of 2 parts:

1. Data collection through APIs.
   Vitals recorded on the diagnostic kits transmits data to the online server using APIs.
2. Master admin access
   Provides the webmaster a comprehensive dashboard to manage and configure the various parameters in the system including patients, diagnostic reports, organizations, medical care providers, payment transactions,

Master Admin access:

1. Dashboard
   a. View a complete list of patients
   b. View following details of selected patient:
      i. Vitals log from diagnostic devices
      ii. Appointment log with HCPs
      iii. Configure email and mobile alerts for each result or critical result or on skipping a result.
      iv. View medical history of patients including current diseases and medications.
      v. View history of services availed.
      vi. Generate reports for specific period/time and choose vitals to be displayed in the report.
2. User roles
   Define the various roles like patient, HCP, Super admin, Organization Admin, etc.
   a. Manage organizations
      i. Add/Edit/Delete hospitals/clinics that register to the system.
      ii. Provide admin access with roles
   b. Manage HCPs
      i. Add/Edit/Delete Medical Healthcare professionals in the system.
      ii. Assign HCPs under organizations.
   c. Manage patient permissions
      Define the vitals stats that they can/cannot view
   d. Manage devices (serial nos, etc.)
      Add/Edit/Delete the various diagnostic devices with their serial number and MAC id.

e. Manage patients
   Add/Edit/Delete patient profiles into the system
f. Manage monitoring centers.
   Add/Edit/Delete monitoring centers
g. Assign HCP and patients under monitoring centers.
h. Manage vitals testing for patients
   Define the type of tests for specific patients with timings for tests.
i. Vitals Report management
   Generate reports based on various filters like patient name, time period, dates, parameters to include in report, and type of report format (PDF, Email, etc.)
j. Manage services offered to patients
   i. Define the type of services provided by HCPs that patients can avail
   ii. Define the cost of the service.
k. Accounts
   i. View transaction history for services opted by patients
   ii. View transactions for HCP billing
l. Manage exercise
   i. Set up types of exercises
   ii. Add video links for specific exercises
   iii. Assign specific exercises to patients.
m. Manage mobile app data
   Add/Edit/Delete the mobile app installations done by patients and HCPs

Organization admin access (for hospitals/clinics)
Has restricted access to just the patients and other modules that are related to the organization.

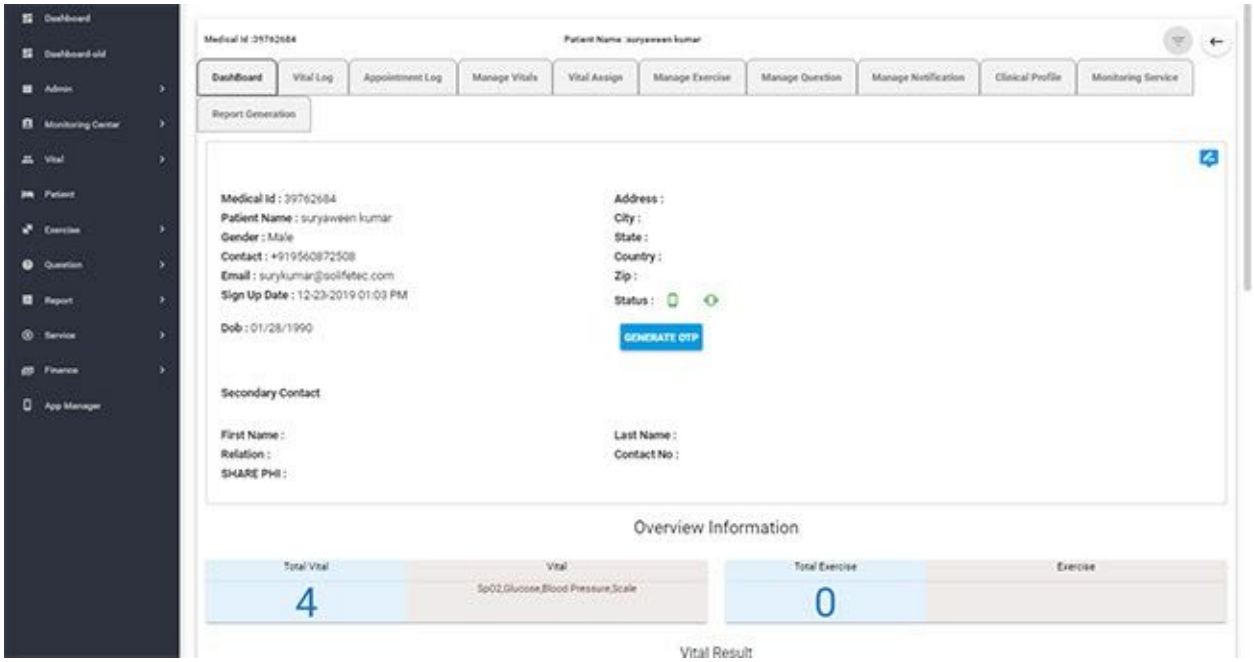
Patient management system (just for HCPs)
Have limited access to patients' data linked to them by Master admin or Organization admin.

Technologies used:

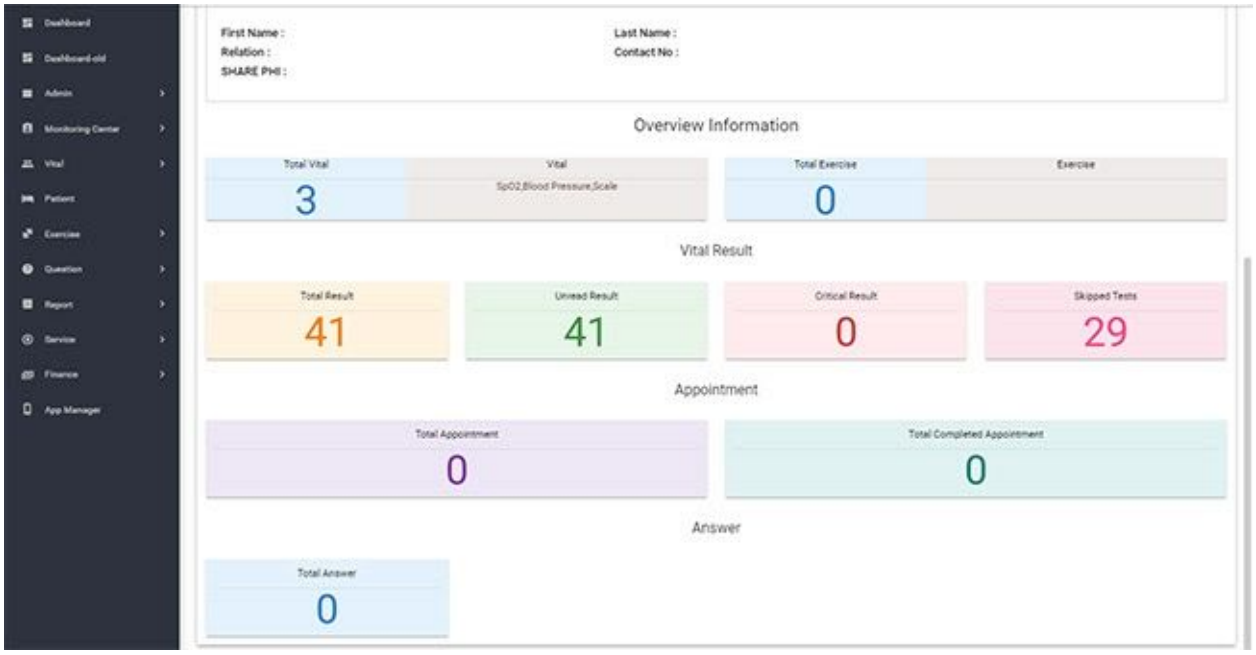
- Express JS framework. Node.js
- Socket.IO for real time data transmission between device and server
- Firebase and iOS APN integration for push notification sending
- Twillio for SMS sending
- BrainTree for payment gateway.

SCREENS:

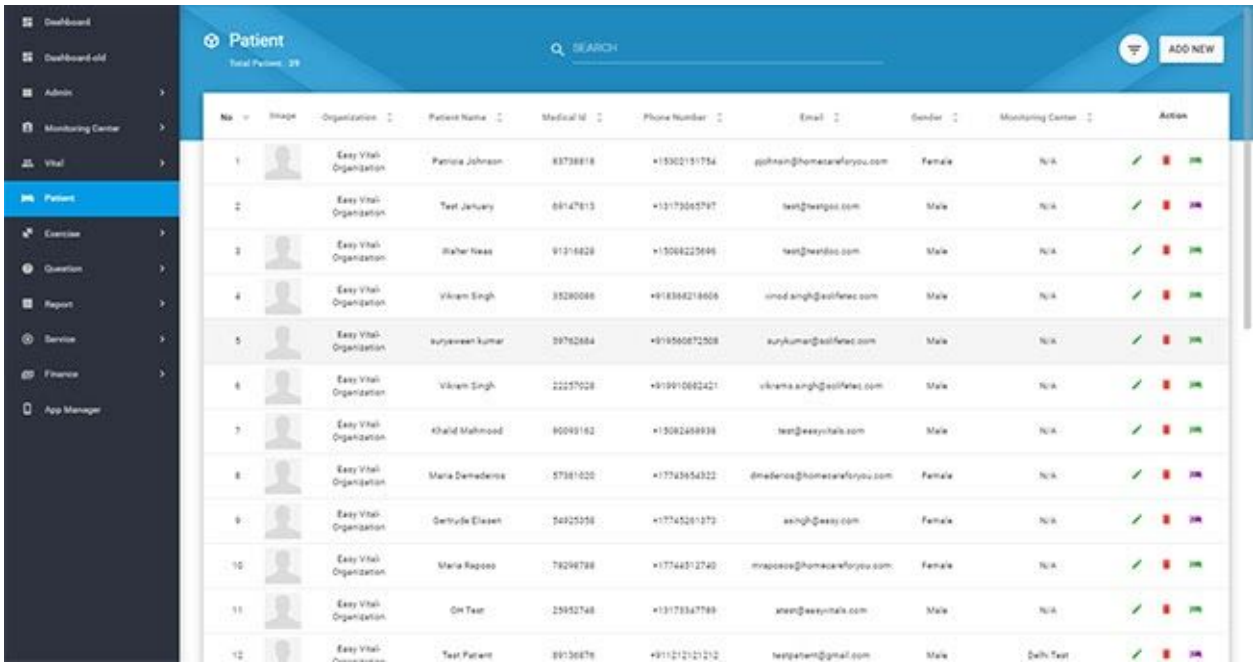
1. Dashboard



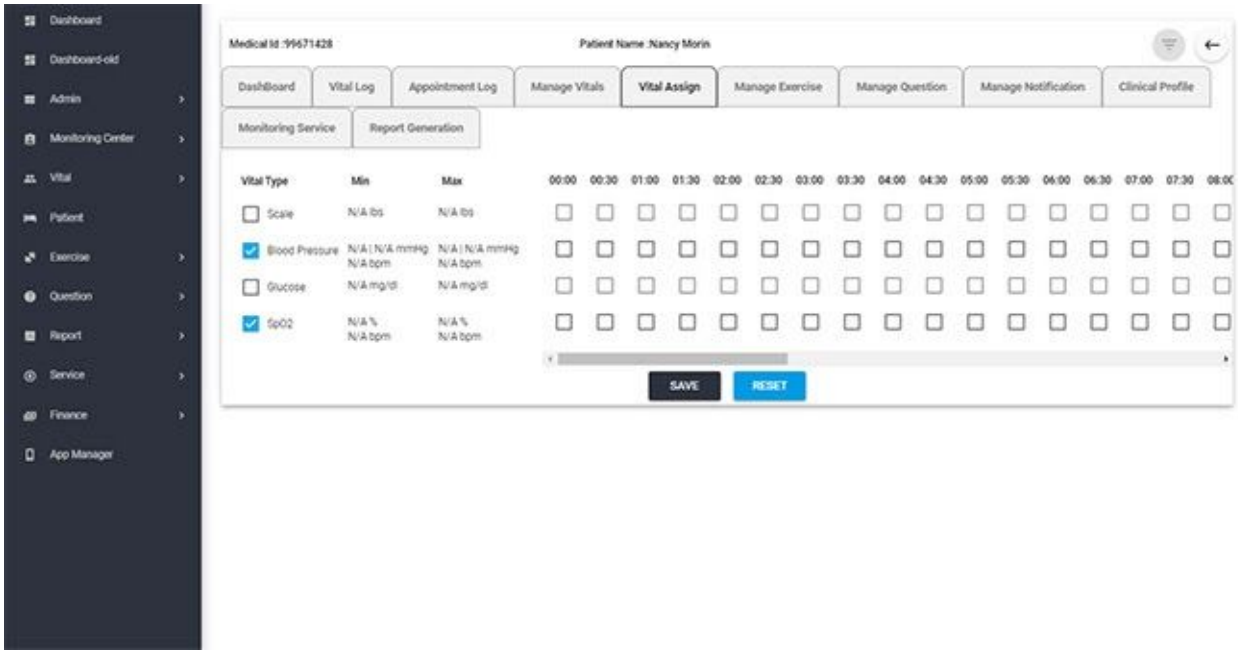
2. Dashboard - stats



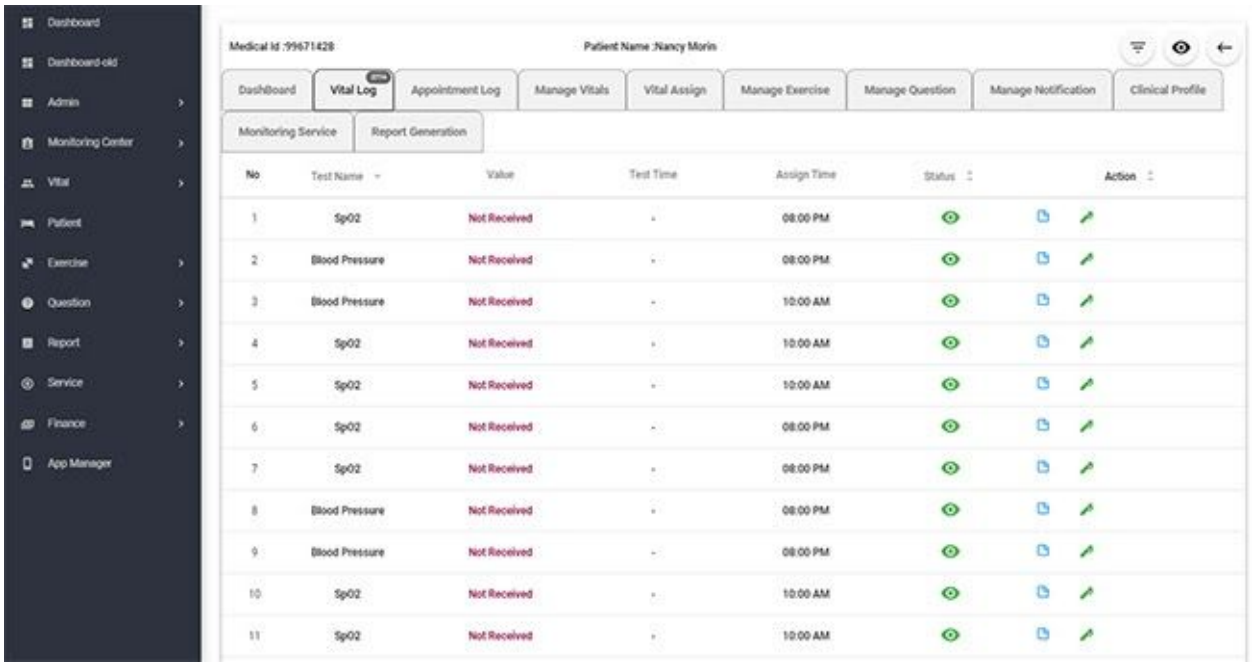
3. Patient summary



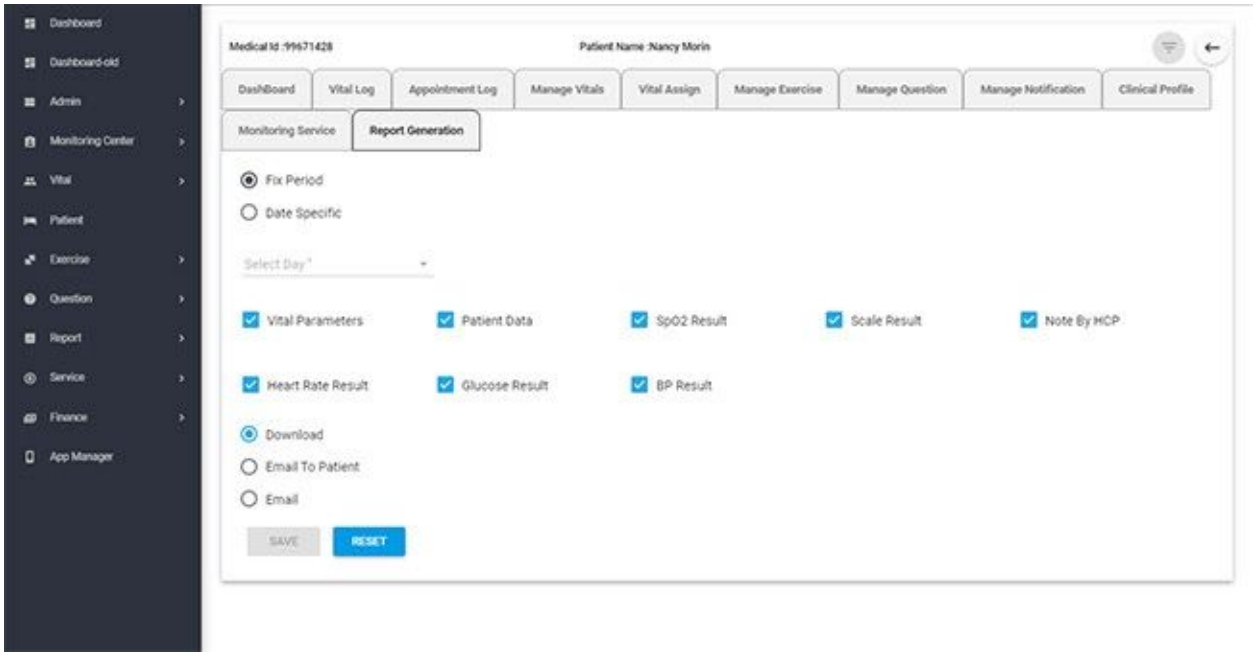
4. Assign Vitals



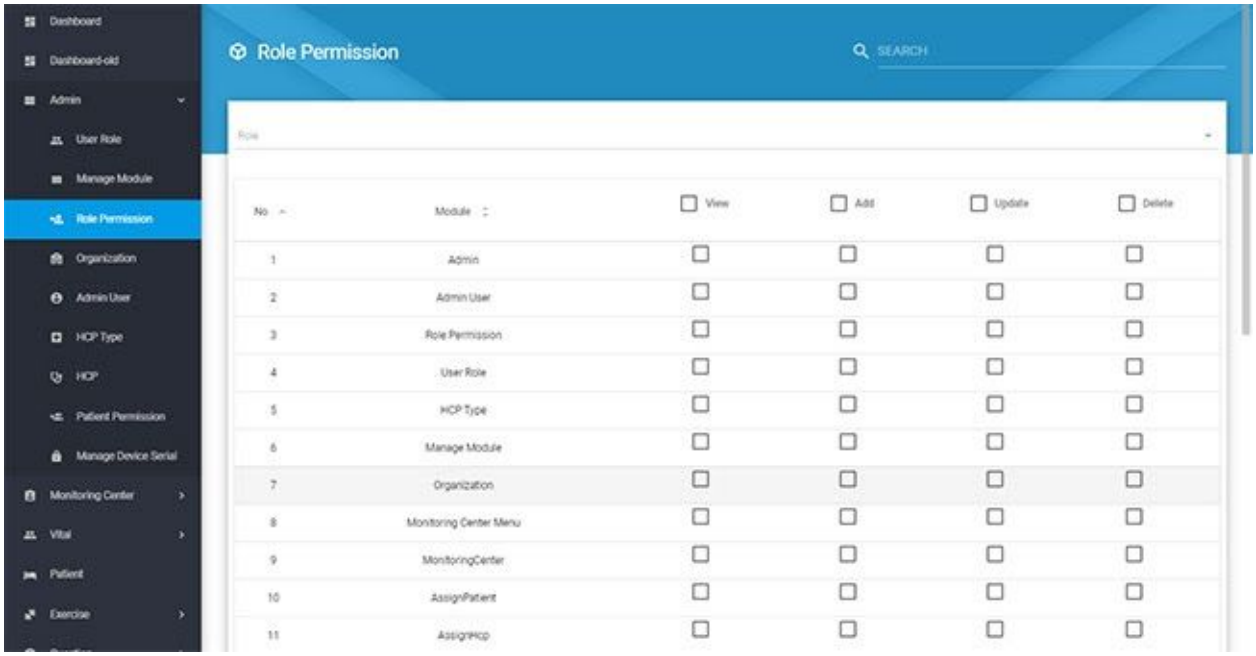
5. Vitals Log



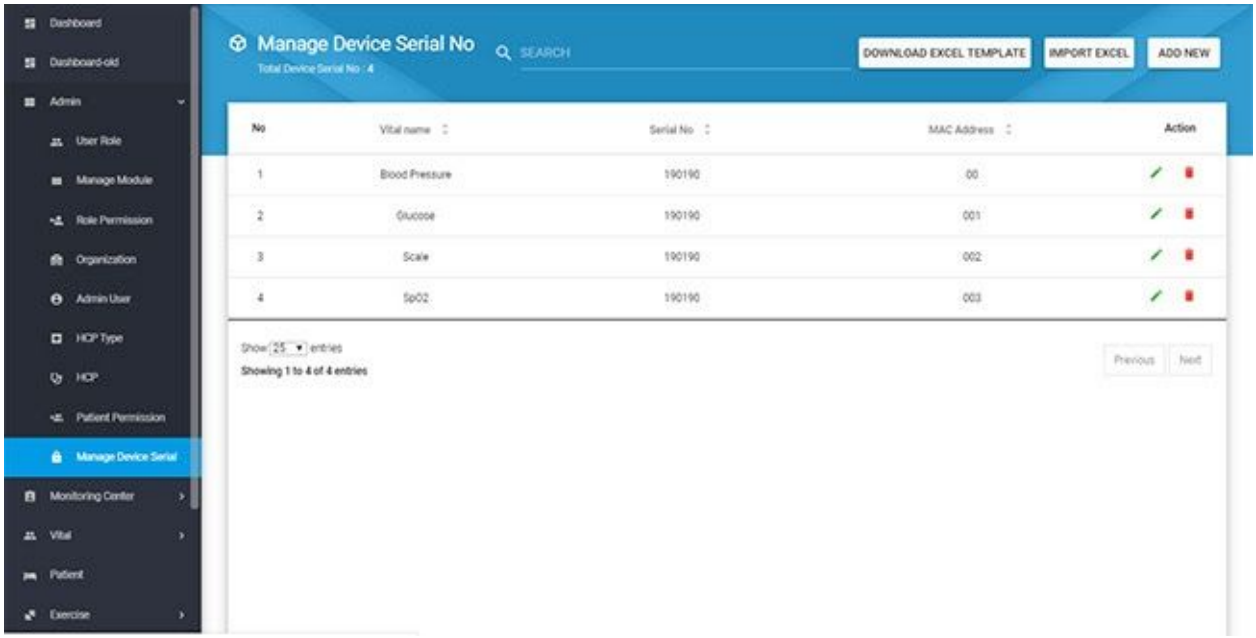
6. Report generation



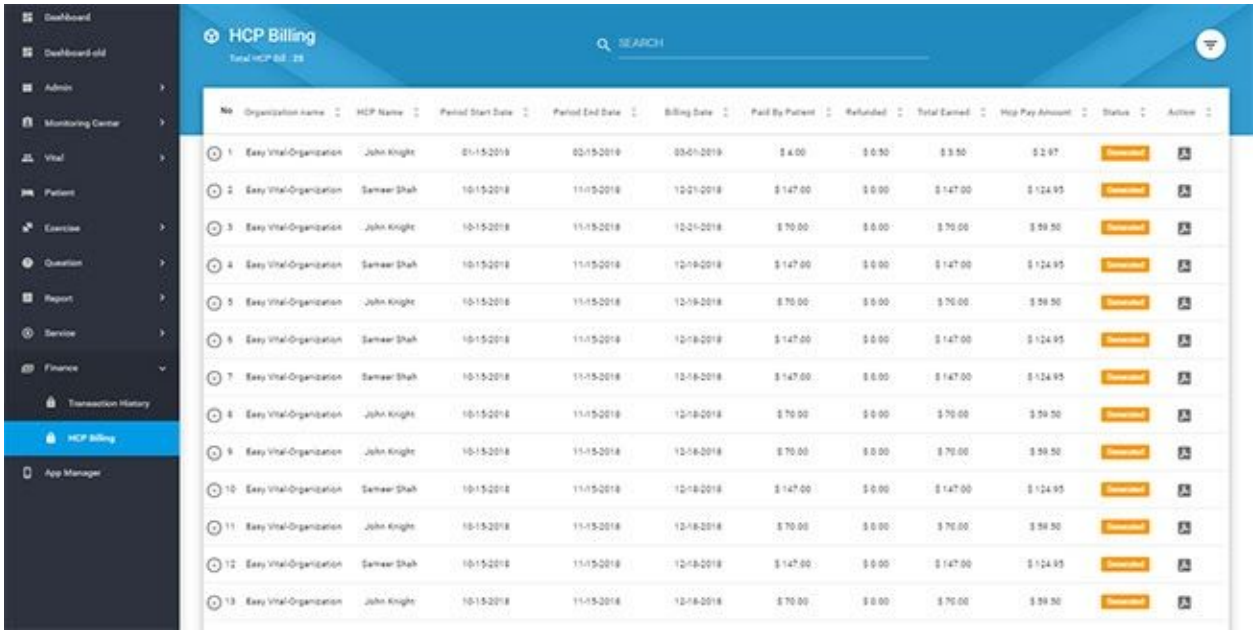
7. Admin Roles permission



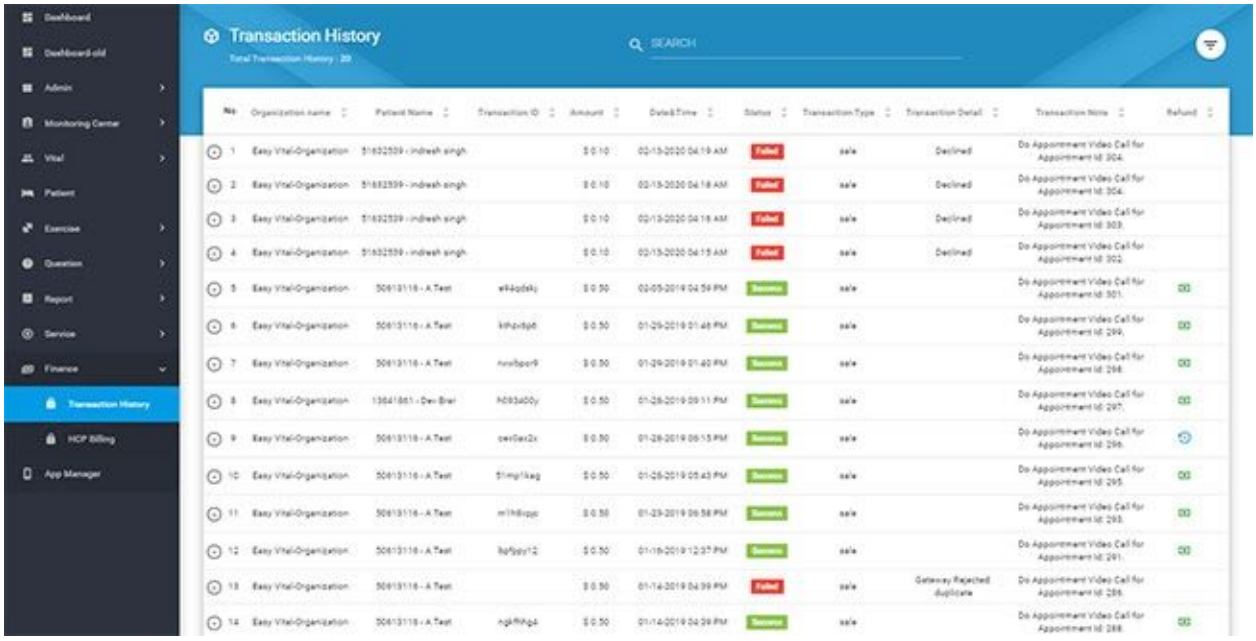
8. Device serial no.



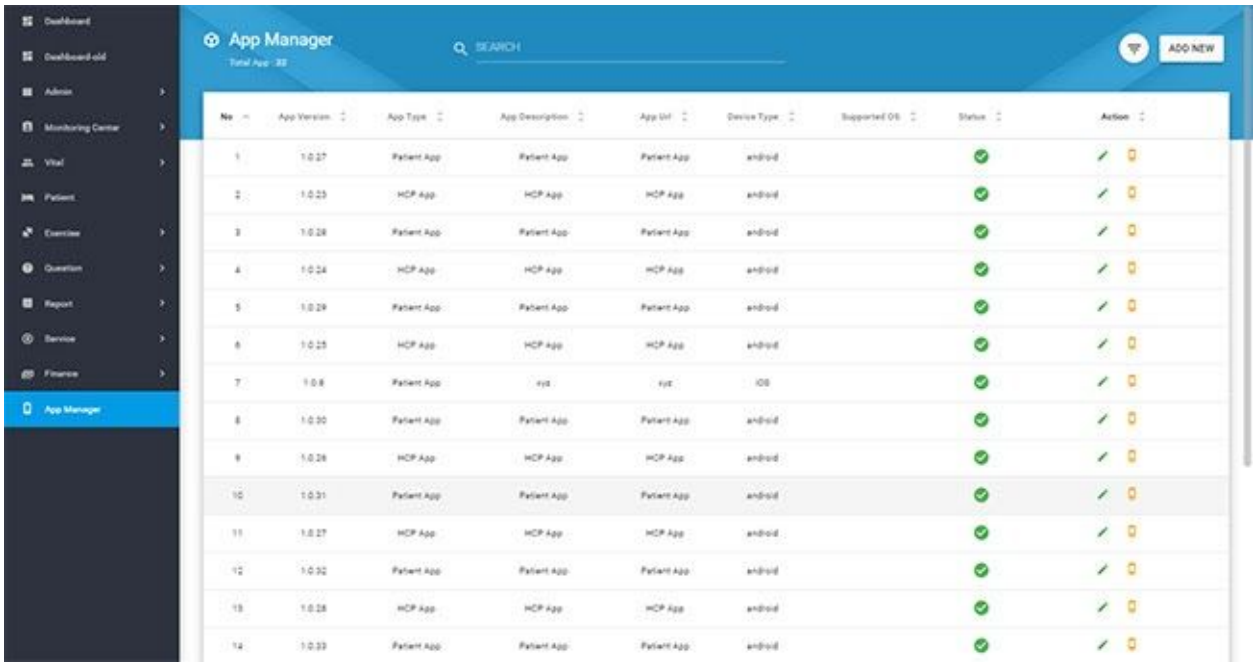
9. HCP billing



10. Transaction history



11. App Manager



App screens:

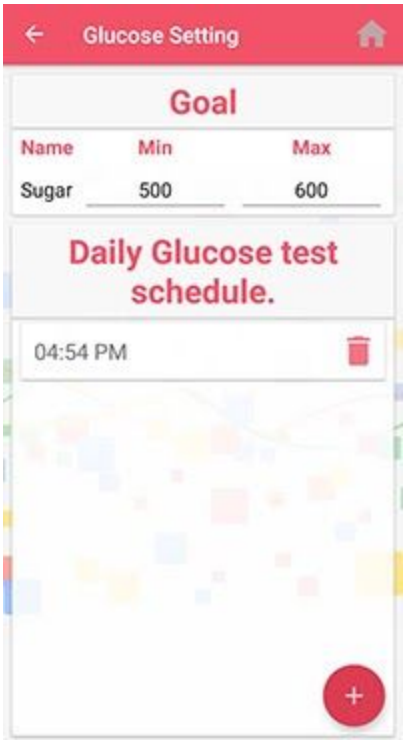
Home
Welcome, indresh singh
Vitals
Calendar
Exercise
Video Call

Vitals Test
SpO2
Blood Glucose
Blood Pressure
Scale
Vitals Test
Vitals Hi...
Vitals Se...
Purchas...

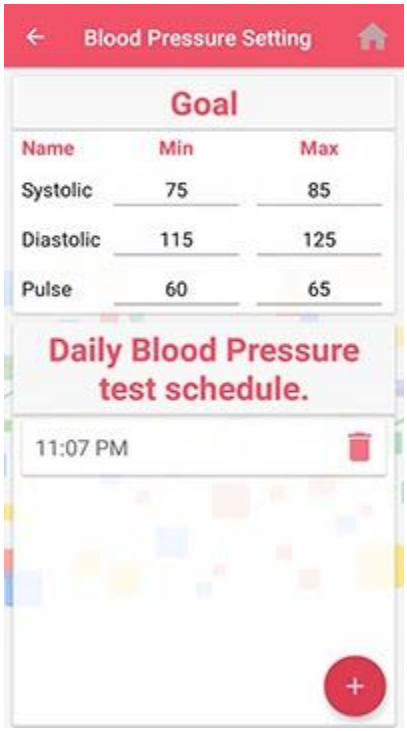
Vitals Setup
ACTIVE VITALS TESTS
SpO2
02:15 PM
Glucose
04:54 PM
Blood Pressure
11:07 PM
Scale
INACTIVE VITALS TESTS
Vitals Test
Vitals Hi...
Vitals Se...
Purchas...

Vitals History
ACTIVE VITALS
SpO2
95 %,69 bpm
05-29-2018 02:15 PM
Glucose
402 mg/dl
05-21-2018 03:10 PM
Blood Pressure
121 | 78 mmHG,63 bpm
05-21-2018 03:12 PM
Scale
167.2 lbs
05-21-2018 03:14 PM
INACTIVE VITALS
Vital result saved successfully.
Vitals Test
Vitals Hi...
Vitals Se...
Purchas...

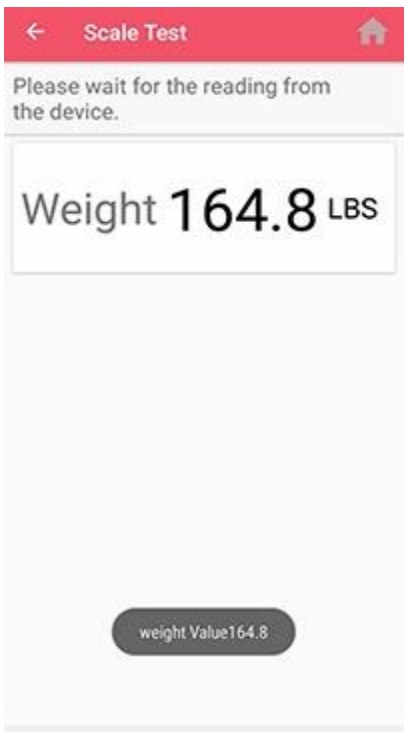
Calendar
My Tasks
13
Feb
Thu
Vital Test: SpO2
02:15 PM
Vital Test: Glucose
04:54 PM
Vital Test: Blood Pressure
11:07 PM
14
Feb
Fri
Vital Test: SpO2
02:15 PM
Vital Test: Glucose
04:54 PM
Vital Test: Blood Pressure
11:07 PM


Glucose Setting
Goal
Name
Min
Max
Sugar
500
600
Daily Glucose test schedule.
04:54 PM

Blood Glucose Test
Please wait for the reading from the device.
Glucose 402 mg/dL
Min 500 | Max 600

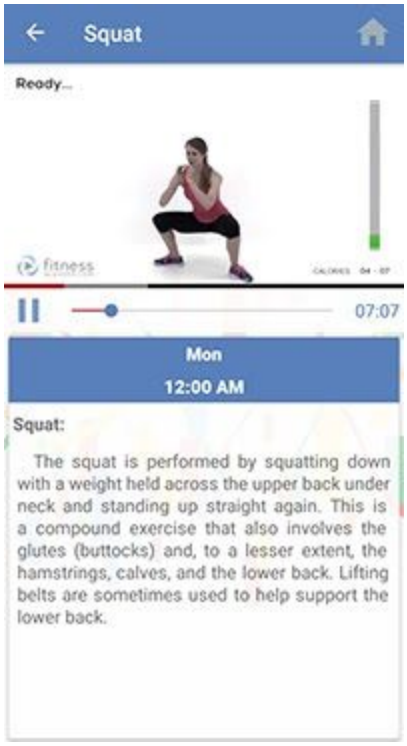

Blood Pressure Setting
Goal
Name Min Max
Systolic 75 85
Diastolic 115 125
Pulse 60 65
Daily Blood Pressure test schedule.
11:07 PM

Blood Pressure Test
Please wait for the reading from the device.
SYS 109 mmHg
Min 75 | Max 85
DIA 73 mmHg
Min 115 | Max 125
Pulse Rate 89 bpm
Min 60 | Max 65


Scale Test
Please wait for the reading from the device.
Weight 164.8 LBS
weight Value164.8

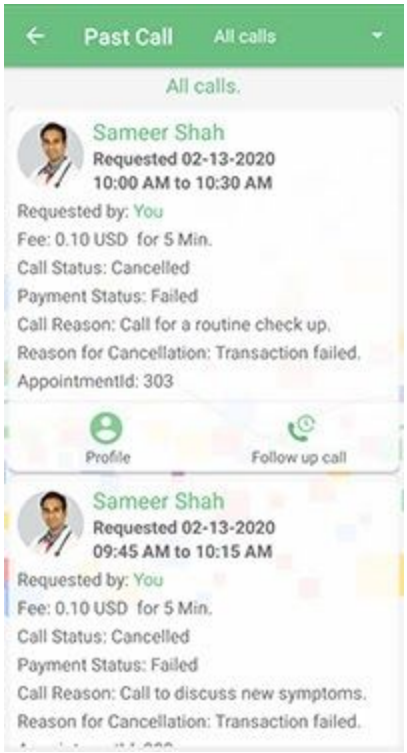
Scale History
Week
Month
13th-Jan to 13th-Feb
Scale
166
165.5
165
164.5
164
Value
2/13/20
2/13/20
2/13/20
Date & Time
History
Date Time Scale
02-13-2020 10:15 AM 164

Exercise
Squat
The squat is performed by squatting down with a weight
Mon
12:00 AM


Squat
Ready...
07:07
Mon
12:00 AM
Squat:
The squat is performed by squatting down with a weight held across the upper back under neck and standing up straight again. This is a compound exercise that also involves the glutes (buttocks) and, to a lesser extent, the hamstrings, calves, and the lower back. Lifting belts are sometimes used to help support the lower back.

Video Call
Request Call
Pending Calls
Approved Calls
Completed Calls

Request Call
Find Health Care Personnel-HCP availability.
Type: All
Preferred Date: 02-13-2020
From Time
10:21 AM
To Time
11:59 PM
Search
Available HCP on 02-13-2020
Sameer Shah
Family Physician
Degree: MBBS
Designation: Doctor
Fee: 0.10 USD for 5 Mins
Request call
Not Available HCP on 02-13-2020
John Knight
Family Physician


Past Call
All calls
All calls.
Sameer Shah
Requested 02-13-2020
10:00 AM to 10:30 AM
Requested by: You
Fee: 0.10 USD for 5 Min.
Call Status: Cancelled
Payment Status: Failed
Call Reason: Call for a routine check up.
Reason for Cancellation: Transaction failed.
AppointmentId: 303
Profile
Follow up call
Sameer Shah
Requested 02-13-2020
09:45 AM to 10:15 AM
Requested by: You
Fee: 0.10 USD for 5 Min.
Call Status: Cancelled
Payment Status: Failed
Call Reason: Call to discuss new symptoms.
Reason for Cancellation: Transaction failed.