

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)

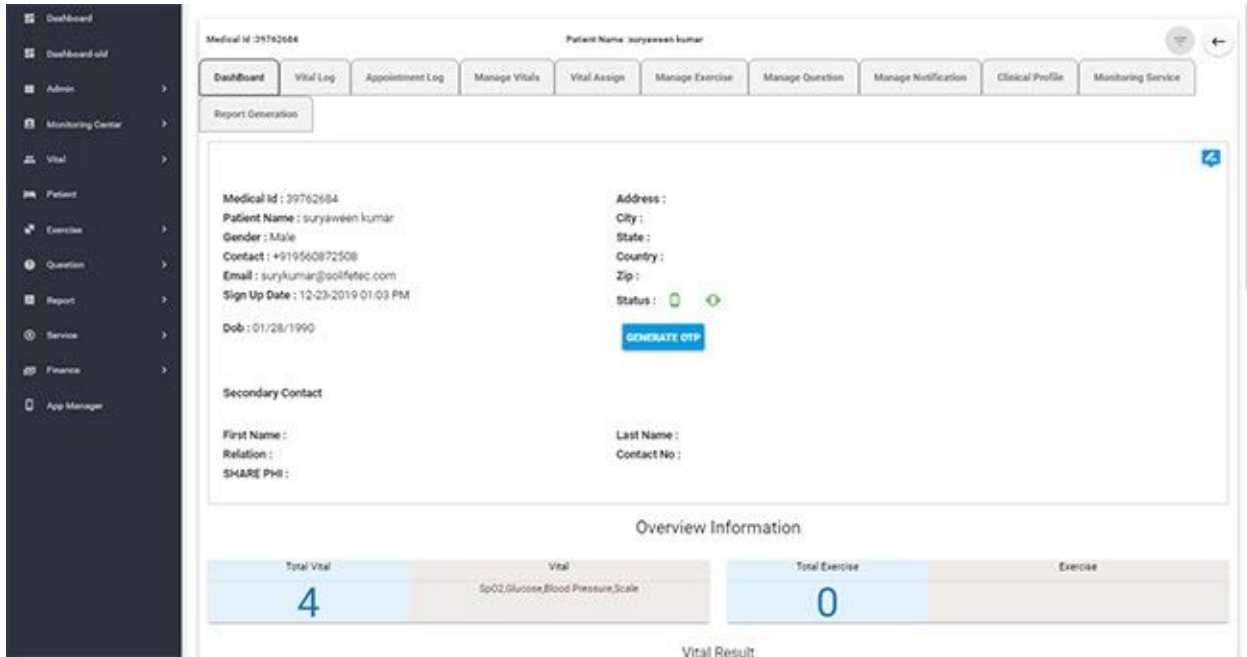
Have limited access to patients' data linked to them by Master admin or Organization admin.

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
- Twilio for SMS sending
- BrainTree for payment gateway.

SCREENS:

1. Dashboard



Medical ID: 39762684 Patient Name: suryanveen kumar

Dashboard Vital Log Appointment Log Manage Vitals Vital Assign Manage Exercise Manage Question Manage Notification Clinical Profile Monitoring Service

Report Generation

Medical Id : 39762684
 Patient Name : suryanveen kumar
 Gender : Male
 Contact : +919560872508
 Email : surykumar@solifetec.com
 Sign Up Date : 12-23-2019 01:03 PM
 Dob : 01/28/1990

Address :
 City :
 State :
 Country :
 Zip :
 Status : 📶 📶

GENERATE OTP

Secondary Contact

First Name :
 Relation :
 SHARE PHI :

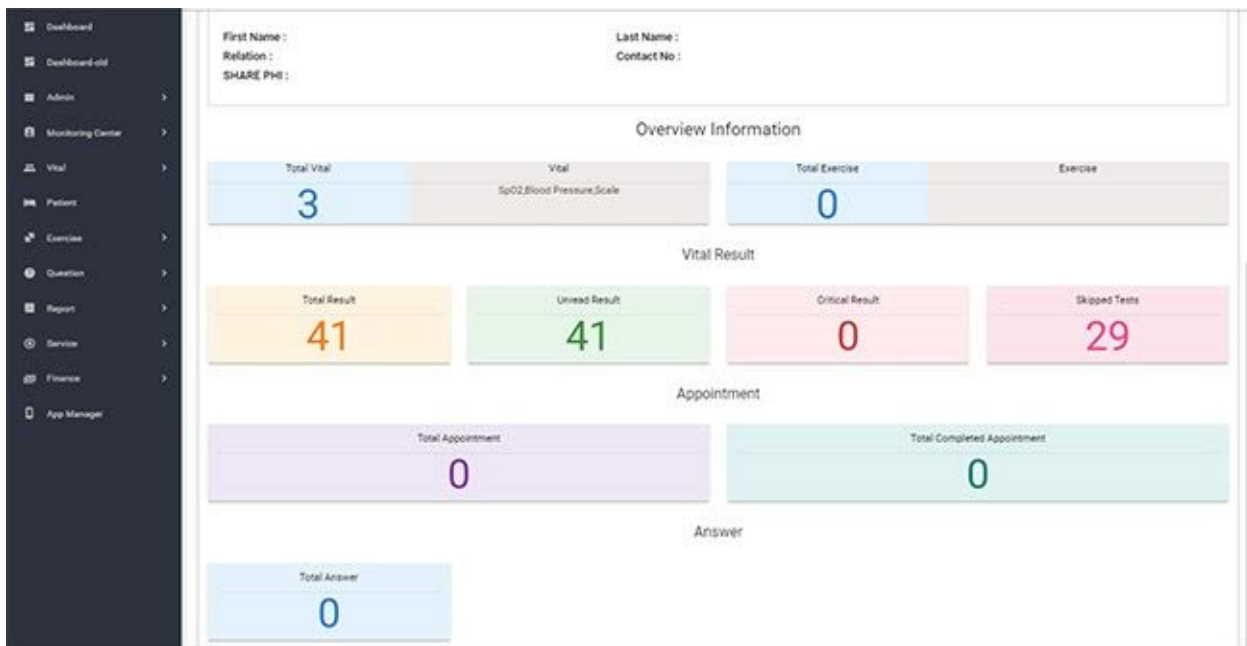
Last Name :
 Contact No :

Overview Information

Total Vital	Vital	Total Exercise	Exercise
4	SpO2, Glucose, Blood Pressure, Scale	0	

Vital Result

2. Dashboard - stats



First Name :
 Relation :
 SHARE PHI :

Last Name :
 Contact No :

Overview Information

Total Vital	Vital	Total Exercise	Exercise
3	SpO2, Blood Pressure, Scale	0	

Vital Result

Total Result	Unread Result	Critical Result	Skipped Tests
41	41	0	29

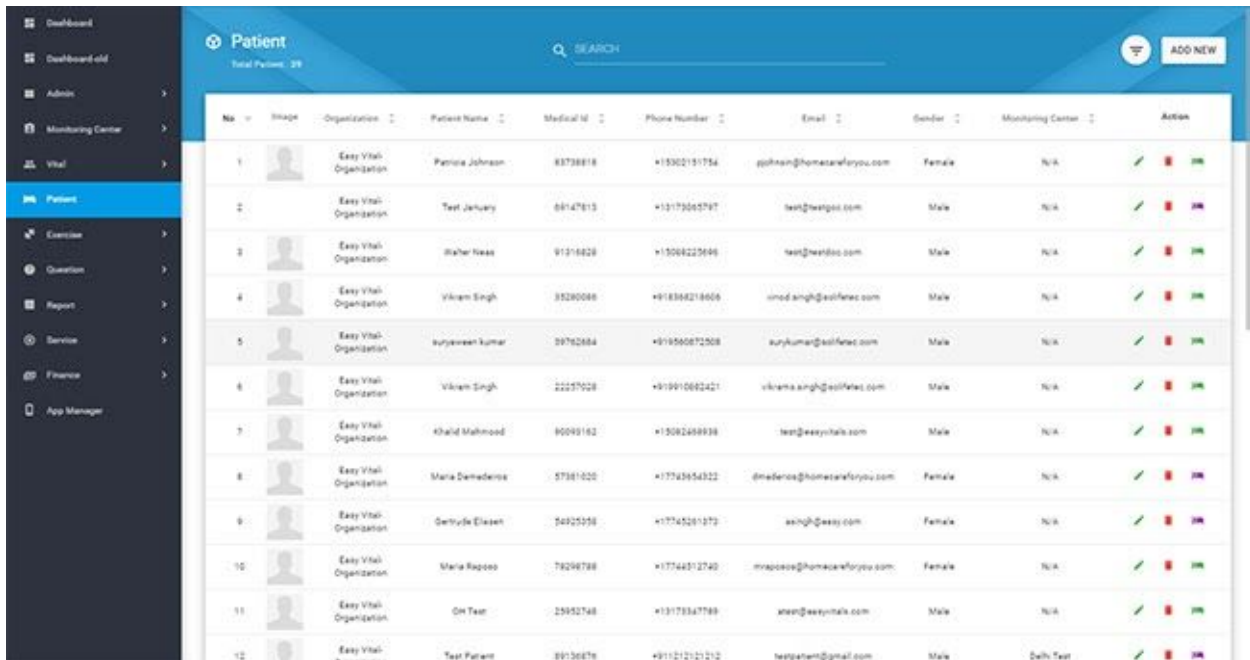
Appointment

Total Appointment	Total Completed Appointment
0	0

Answer

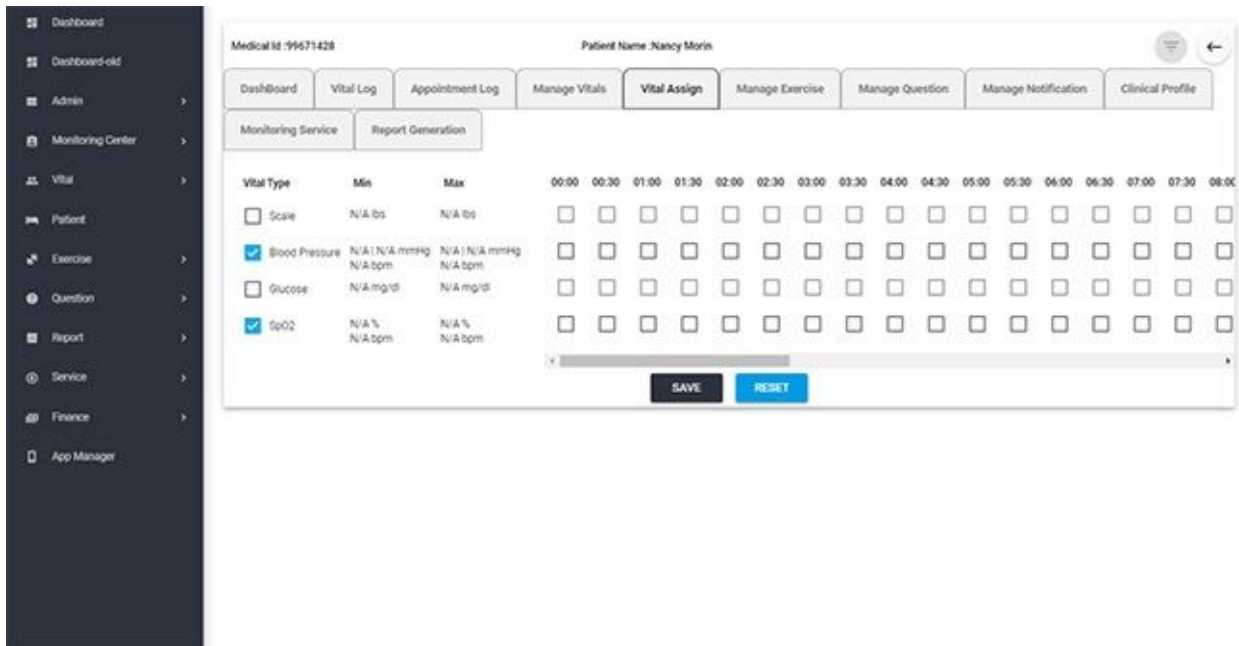
Total Answer
0

3. Patient summary



No.	Image	Organization	Patient Name	Medical ID	Phone Number	Email	Gender	Monitoring Center	Action
1		Easy Vital Organization	Pamela Johnson	8378818	+1502151734	pphman@homecare4you.com	Female	N/A	✓ ✗ ⚙️
2		Easy Vital Organization	Test January	86147613	+13173065797	test@twelgeo.com	Male	N/A	✓ ✗ ⚙️
3		Easy Vital Organization	Walter Nees	9121829	+15082226496	test@twelgeo.com	Male	N/A	✓ ✗ ⚙️
4		Easy Vital Organization	Vikram Singh	35260086	+918346218608	vmsd.singh@easyvital.com	Male	N/A	✓ ✗ ⚙️
5		Easy Vital Organization	Surjaveen Kumar	29762884	+919560872008	surjkumar@easyvital.com	Male	N/A	✓ ✗ ⚙️
6		Easy Vital Organization	Vikram Singh	22257028	+919910882421	vikram.singh@easyvital.com	Male	N/A	✓ ✗ ⚙️
7		Easy Vital Organization	Khalid Mahmood	86093162	+15082488938	test@easyvital.com	Male	N/A	✓ ✗ ⚙️
8		Easy Vital Organization	Maria Demadura	57381020	+1774564322	mdemadura@homecare4you.com	Female	N/A	✓ ✗ ⚙️
9		Easy Vital Organization	Bertrude Elesen	54325358	+17745281573	eeigh@easy.com	Female	N/A	✓ ✗ ⚙️
10		Easy Vital Organization	Maria Raposo	78298788	+17744312740	mraposo@homecare4you.com	Female	N/A	✓ ✗ ⚙️
11		Easy Vital Organization	On Test	25952748	+13173347788	onetest@easyvital.com	Male	N/A	✓ ✗ ⚙️
12		Easy Vital Organization	Test Patient	89136876	+911212121212	testpatient@gmail.com	Male	Daily Test	✓ ✗ ⚙️

4. Assign Vitals



Medical ID: 99671428 Patient Name: Nancy Morin

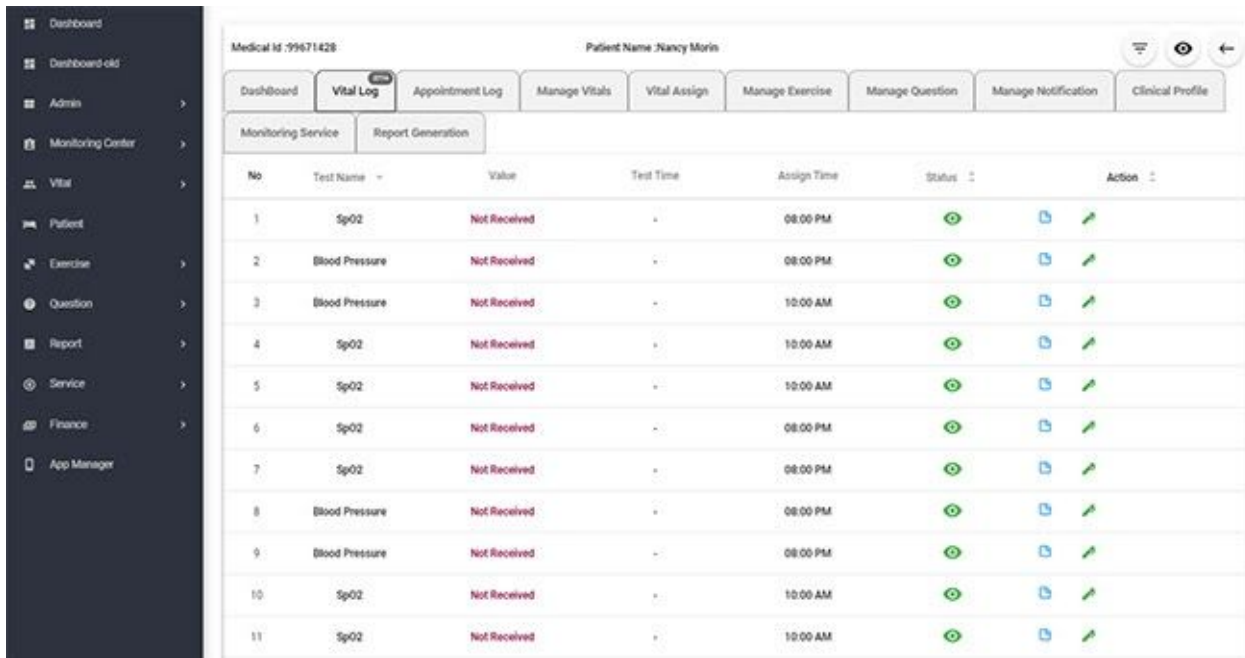
Dashboard Vital Log Appointment Log Manage Vitals **Vital Assign** Manage Exercise Manage Question Manage Notification Clinical Profile

Monitoring Service Report Generation

Vital Type	Min	Max	00:00	00:30	01:00	01:30	02:00	02:30	03:00	03:30	04:00	04:30	05:00	05:30	06:00	06:30	07:00	07:30	08:00
<input type="checkbox"/> Scale	N/A lbs	N/A lbs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Blood Pressure	N/A N/A mmHg N/A bpm	N/A N/A mmHg N/A bpm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Glucose	N/A mg/dl	N/A mg/dl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> SpO2	N/A % N/A bpm	N/A % N/A bpm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SAVE RESET

5. Vitals Log



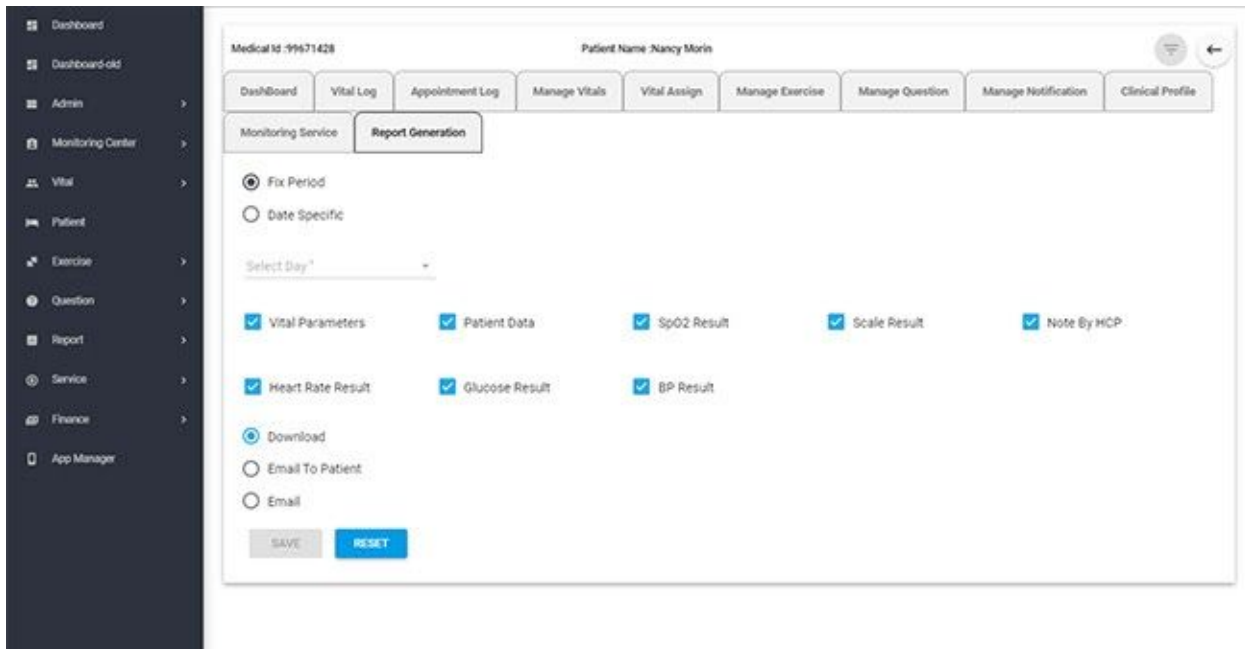
Medical ID: 99671428 Patient Name: Nancy Morin

Dashboard Vital Log Appointment Log Manage Vitals Vital Assign Manage Exercise Manage Question Manage Notification Clinical Profile

Monitoring Service Report Generation

No	Test Name	Value	Test Time	Assign Time	Status	Action
1	SpO2	Not Received	-	08:00 PM	Not Received	[Action]
2	Blood Pressure	Not Received	-	08:00 PM	Not Received	[Action]
3	Blood Pressure	Not Received	-	10:00 AM	Not Received	[Action]
4	SpO2	Not Received	-	10:00 AM	Not Received	[Action]
5	SpO2	Not Received	-	10:00 AM	Not Received	[Action]
6	SpO2	Not Received	-	08:00 PM	Not Received	[Action]
7	SpO2	Not Received	-	08:00 PM	Not Received	[Action]
8	Blood Pressure	Not Received	-	08:00 PM	Not Received	[Action]
9	Blood Pressure	Not Received	-	08:00 PM	Not Received	[Action]
10	SpO2	Not Received	-	10:00 AM	Not Received	[Action]
11	SpO2	Not Received	-	10:00 AM	Not Received	[Action]

6. Report generation



Medical ID: 99671428 Patient Name: Nancy Morin

Dashboard Vital Log Appointment Log Manage Vitals Vital Assign Manage Exercise Manage Question Manage Notification Clinical Profile

Monitoring Service Report Generation

Fix Period
 Date Specific

Select Day: -

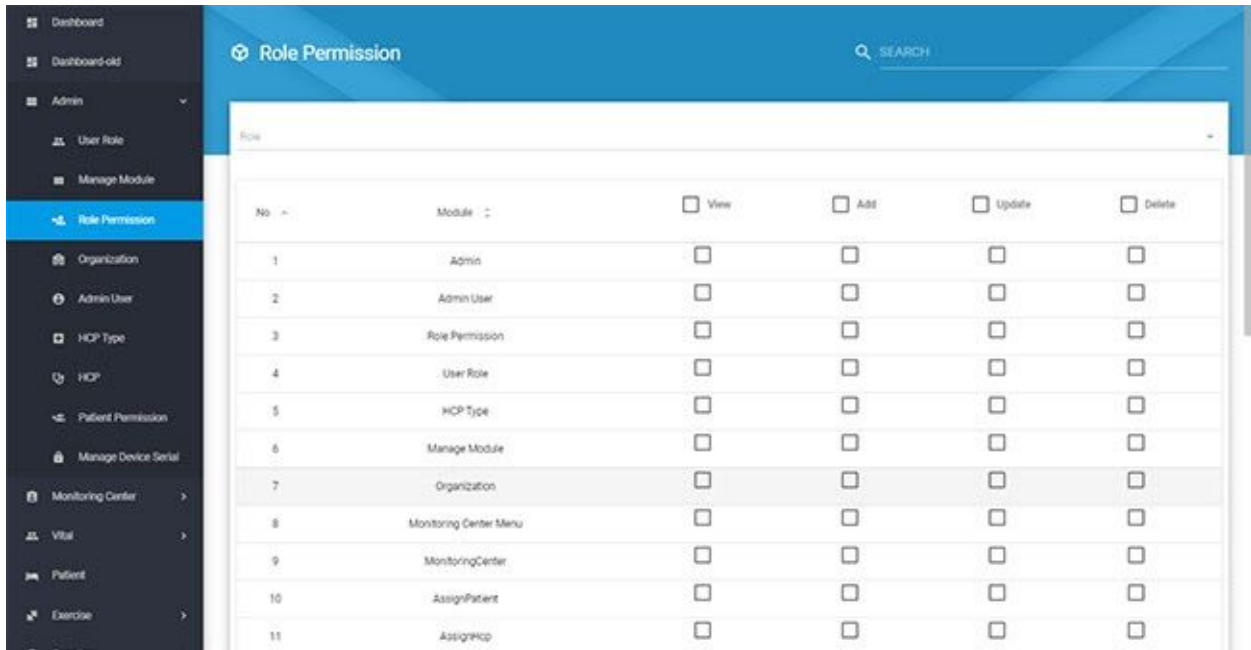
Vital Parameters
 Patient Data
 SpO2 Result
 Scale Result
 Note By HCP

Heart Rate Result
 Glucose Result
 BP Result

Download
 Email To Patient
 Email

SAVE RESET








7. Admin Roles permission



Role No.	Module	View	Add	Update	Delete
1	Admin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Admin User	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Role Permission	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	User Role	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	HCP Type	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Manage Module	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Organization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Monitoring Center Menu	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	MonitoringCenter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	AssignPatient	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	AssignHCP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. Device serial no.



No.	Vital name	Serial No.	MAC Address	Action
1	Blood Pressure	190190	00	 
2	Glucose	190190	001	 
3	Scale	190190	002	 
4	SpO2	190190	003	 

Showing 1 to 4 of 4 entries

Previous Next

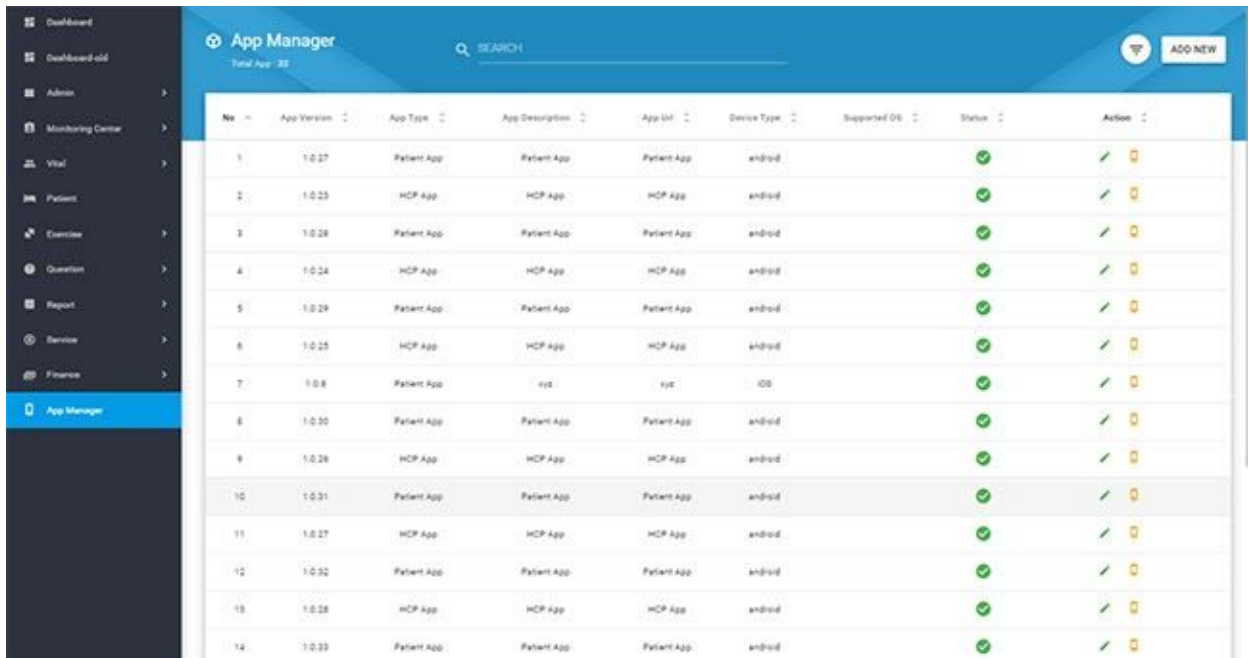
9. HCP billing

HCP Billing											
Total HCP Bill: 25											
No	Organization name	HCP Name	Period Start Date	Period End Date	Billing Date	Paid By Patient	Refunded	Total Earned	Hcp Pay Amount	Status	Action
1	Easy Vital-Organization	John Knight	01-15-2018	02-15-2018	03-01-2018	\$ 4.00	\$ 0.00	\$ 3.50	\$ 2.97	Completed	
2	Easy Vital-Organization	Sanwar Shah	10-15-2018	11-15-2018	12-01-2018	\$ 147.00	\$ 0.00	\$ 147.00	\$ 124.95	Completed	
3	Easy Vital-Organization	John Knight	10-15-2018	11-15-2018	12-01-2018	\$ 70.00	\$ 0.00	\$ 70.00	\$ 59.50	Completed	
4	Easy Vital-Organization	Sanwar Shah	10-15-2018	11-15-2018	12-10-2018	\$ 147.00	\$ 0.00	\$ 147.00	\$ 124.95	Completed	
5	Easy Vital-Organization	John Knight	10-15-2018	11-15-2018	12-10-2018	\$ 70.00	\$ 0.00	\$ 70.00	\$ 59.50	Completed	
6	Easy Vital-Organization	Sanwar Shah	10-15-2018	11-15-2018	12-10-2018	\$ 147.00	\$ 0.00	\$ 147.00	\$ 124.95	Completed	
7	Easy Vital-Organization	Sanwar Shah	10-15-2018	11-15-2018	12-10-2018	\$ 147.00	\$ 0.00	\$ 147.00	\$ 124.95	Completed	
8	Easy Vital-Organization	John Knight	10-15-2018	11-15-2018	12-10-2018	\$ 70.00	\$ 0.00	\$ 70.00	\$ 59.50	Completed	
9	Easy Vital-Organization	John Knight	10-15-2018	11-15-2018	12-10-2018	\$ 70.00	\$ 0.00	\$ 70.00	\$ 59.50	Completed	
10	Easy Vital-Organization	Sanwar Shah	10-15-2018	11-15-2018	12-10-2018	\$ 147.00	\$ 0.00	\$ 147.00	\$ 124.95	Completed	
11	Easy Vital-Organization	John Knight	10-15-2018	11-15-2018	12-10-2018	\$ 70.00	\$ 0.00	\$ 70.00	\$ 59.50	Completed	
12	Easy Vital-Organization	Sanwar Shah	10-15-2018	11-15-2018	12-10-2018	\$ 147.00	\$ 0.00	\$ 147.00	\$ 124.95	Completed	
13	Easy Vital-Organization	John Knight	10-15-2018	11-15-2018	12-10-2018	\$ 70.00	\$ 0.00	\$ 70.00	\$ 59.50	Completed	





























10. Transaction history

Transaction History											
Total Transaction History: 20											
No	Organization name	Patient Name	Transaction ID	Amount	Dated/Time	Status	Transaction Type	Transaction Detail	Transaction Note	Refund	
1	Easy Vital-Organization	\$182239 - Indresh Singh		\$ 0.10	02-19-2020 04:19 AM	Failed	sale	Declined	Do Appointment Video Call for Appointment ID: 304.		
2	Easy Vital-Organization	\$182239 - Indresh Singh		\$ 0.10	02-19-2020 04:18 AM	Failed	sale	Declined	Do Appointment Video Call for Appointment ID: 304.		
3	Easy Vital-Organization	\$182239 - Indresh Singh		\$ 0.10	02-19-2020 04:18 AM	Failed	sale	Declined	Do Appointment Video Call for Appointment ID: 303.		
4	Easy Vital-Organization	\$182239 - Indresh Singh		\$ 0.10	02-19-2020 04:19 AM	Failed	sale	Declined	Do Appointment Video Call for Appointment ID: 302.		
5	Easy Vital-Organization	50613116 - A Test	wh0d6k	\$ 0.50	02-05-2019 04:59 PM	Success	sale		Do Appointment Video Call for Appointment ID: 301.	00	
6	Easy Vital-Organization	50613116 - A Test	wh0d6k	\$ 0.50	01-29-2019 01:48 PM	Success	sale		Do Appointment Video Call for Appointment ID: 299.	00	
7	Easy Vital-Organization	50613116 - A Test	hnu8p9	\$ 0.50	01-29-2019 01:40 PM	Success	sale		Do Appointment Video Call for Appointment ID: 298.	00	
8	Easy Vital-Organization	13841851 - Dwi Bar	N083aD0y	\$ 0.50	01-28-2019 09:11 PM	Success	sale		Do Appointment Video Call for Appointment ID: 297.	00	
9	Easy Vital-Organization	50613116 - A Test	se0x2x	\$ 0.50	01-28-2019 09:13 PM	Success	sale		Do Appointment Video Call for Appointment ID: 296.	00	
10	Easy Vital-Organization	50613116 - A Test	51mg1aag	\$ 0.50	01-28-2019 09:43 PM	Success	sale		Do Appointment Video Call for Appointment ID: 295.	00	
11	Easy Vital-Organization	50613116 - A Test	w198lqpp	\$ 0.50	01-23-2019 09:58 PM	Success	sale		Do Appointment Video Call for Appointment ID: 293.	00	
12	Easy Vital-Organization	50613116 - A Test	kg0jy12	\$ 0.50	01-19-2019 12:37 PM	Success	sale		Do Appointment Video Call for Appointment ID: 291.	00	
13	Easy Vital-Organization	50613116 - A Test		\$ 0.50	01-14-2019 04:39 PM	Failed	sale	Gateway Rejected - duplicate	Do Appointment Video Call for Appointment ID: 289.		
14	Easy Vital-Organization	50613116 - A Test	ngR9Kga	\$ 0.50	01-14-2019 04:39 PM	Success	sale		Do Appointment Video Call for Appointment ID: 288.	00	

11. App Manager



The screenshot displays the 'App Manager' interface. On the left is a dark sidebar with navigation options: Dashboard, Dashboard-old, Admin, Monitoring Center, Vital, Patient, Exercise, Question, Report, Service, Finance, and App Manager (highlighted). The main area has a blue header with 'App Manager' and 'Total App: 33'. Below the header is a table with 14 rows of application data. Each row includes an ID, App Version, App Type, App Description, App Url, Device Type, Supported OS, Status (indicated by a green checkmark), and Action (edit and delete icons).

No	App Version	App Type	App Description	App Url	Device Type	Supported OS	Status	Action
1	1.0.27	Patient App	Patient App	Patient App	android		✓	 
2	1.0.23	HCP App	HCP App	HCP App	android		✓	 
3	1.0.28	Patient App	Patient App	Patient App	android		✓	 
4	1.0.24	HCP App	HCP App	HCP App	android		✓	 
5	1.0.29	Patient App	Patient App	Patient App	android		✓	 
6	1.0.25	HCP App	HCP App	HCP App	android		✓	 
7	1.0.6	Patient App	vvt	vvt	iOS		✓	 
8	1.0.30	Patient App	Patient App	Patient App	android		✓	 
9	1.0.26	HCP App	HCP App	HCP App	android		✓	 
10	1.0.31	Patient App	Patient App	Patient App	android		✓	 
11	1.0.27	HCP App	HCP App	HCP App	android		✓	 
12	1.0.32	Patient App	Patient App	Patient App	android		✓	 
13	1.0.28	HCP App	HCP App	HCP App	android		✓	 
14	1.0.33	Patient App	Patient App	Patient App	android		✓	 

App screens:



