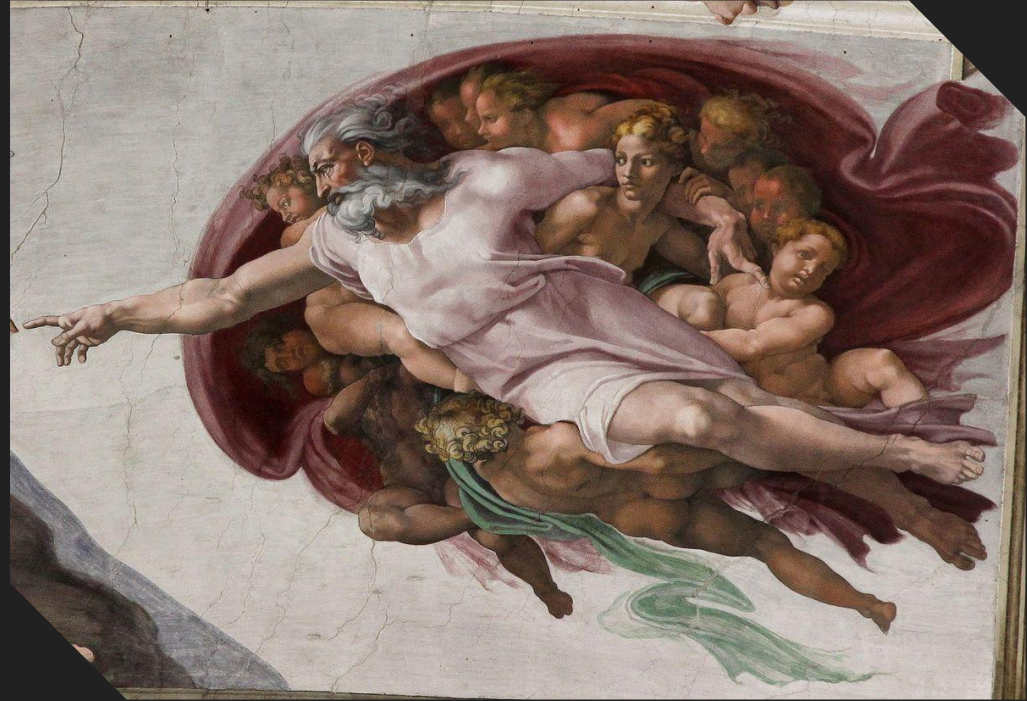




Cerebrum

Problem statement:MK91
Team Leader: Loganyaa S
Team State: Karnataka



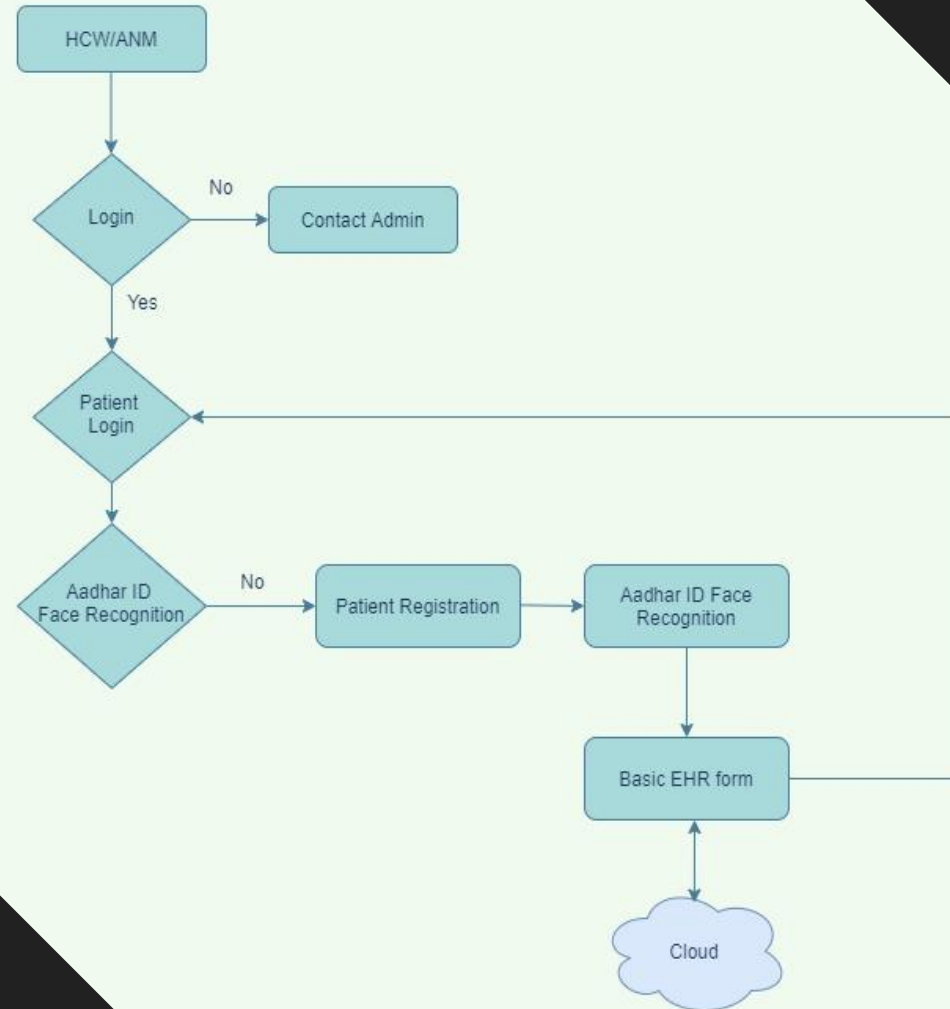
Problem Statement (MK91 - Govt. Of Uttarakhand)

Key Points

- Acute shortage of accessible health care in smaller towns and remote villages, A system solution to this problem with the following points to be focused on:
 - A. Generation of a cloud based **electronic health record system**, implementing aadhar authentication.
 - B. Access to **medical records and database** for medical professionals using Biometric/**Facial ID**, for emergencies and diagnostic purposes.
 - C. Telemedicine/ Call Centre setup for doctors implementing DTH or **2 way communication technology** without being dependent on ISP.

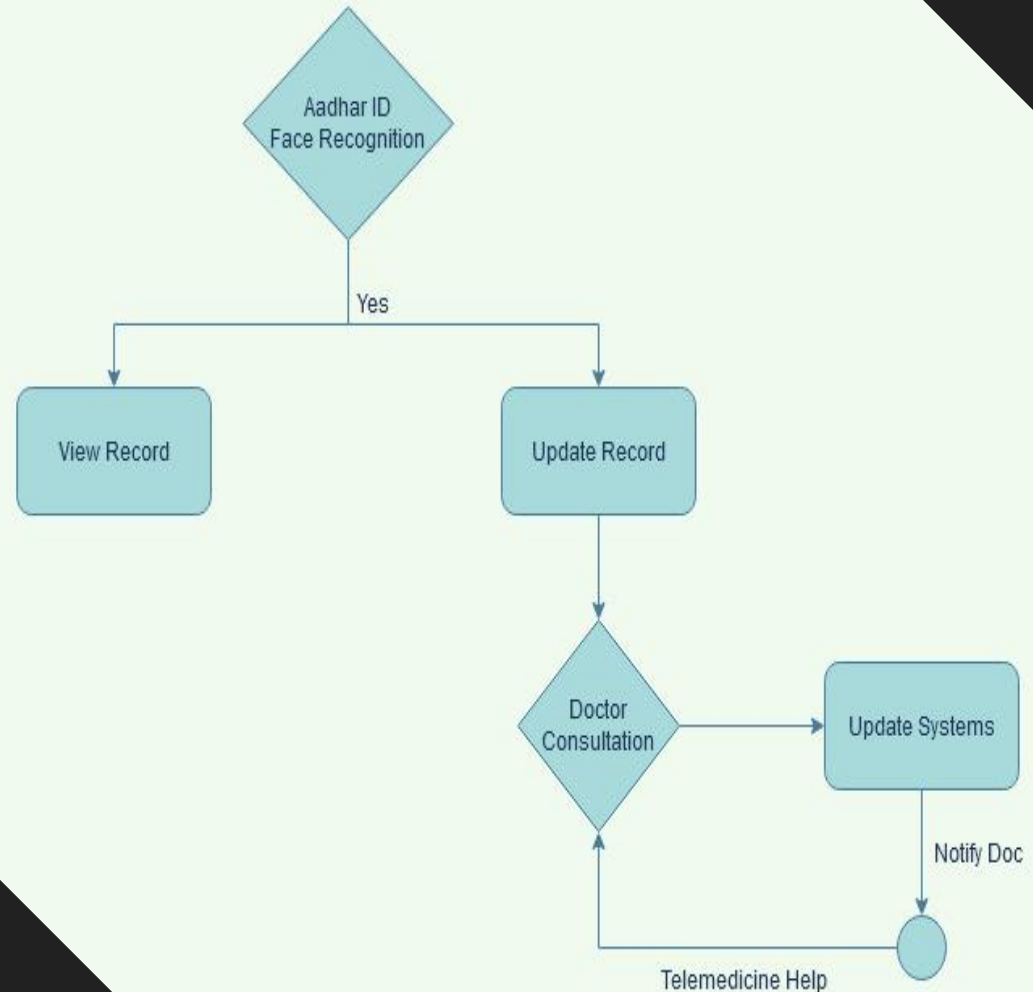
A. Generation Of A Cloud Based EHR

- ❖ Every sub-centre in India requires the presence of two ANMs (Assisted nurse midwife) And one Male Health worker
- ❖ Uttarakhand has 1848 sub-centres with a population of 1.01 Cr (As of 2011 census)
- ❖ EHR once generated is stored securely
- ❖ ANMs are required to conduct outreach programs and update the records once a year.



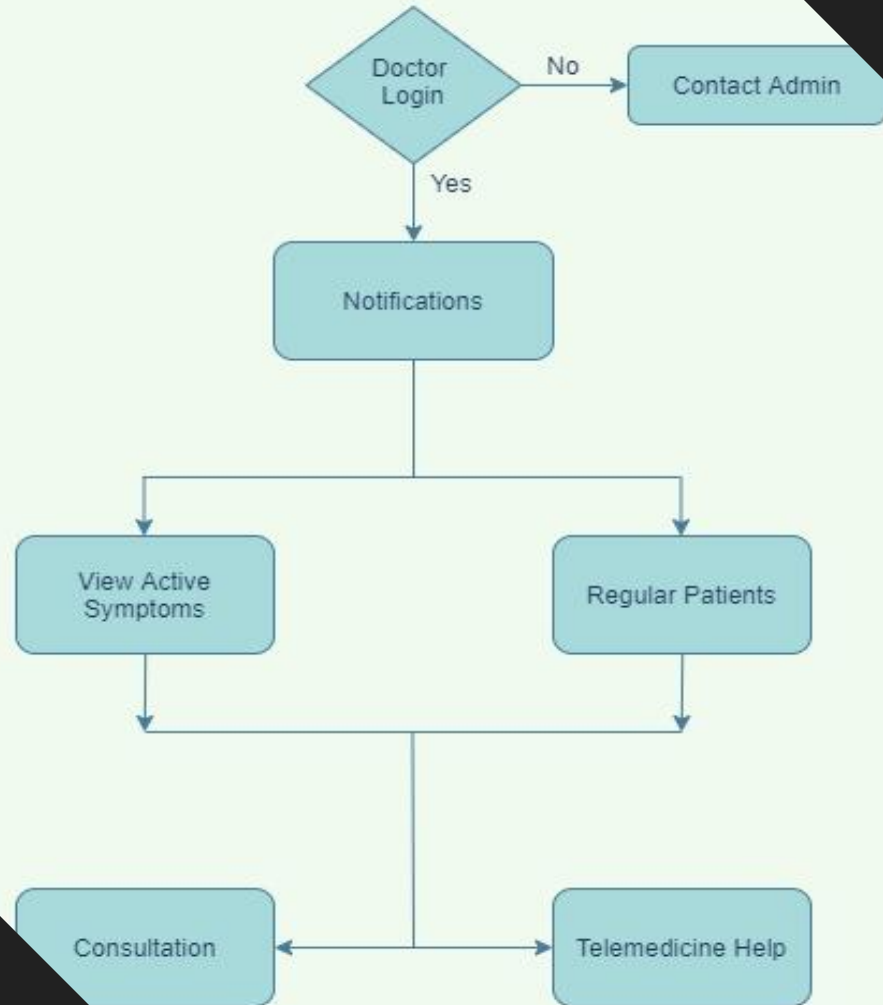
B. Access to Medical Records

- ❖ Active patient symptoms are updated by the ANM.
- ❖ The Urban centre doctor is notified by our system.
- ❖ The doctor has access to the patients health record
- ❖ The doctor can choose to prescribe medication or opt for a telemedicine consultation



B.1 Doctor Activities

- ❖ Notifications for the doctor will be sent based on two criteria.
- ❖ Symptoms and Regular check-ups
- ❖ Doctors can view the patient's records and decide on Consultation or Telemedicine.



DEMO

HCW Interface

Digital Healthcare Signin

Nurse Login

Unique Identification Number

Password

[LOGIN](#)

Login page for ANM

Registration Form

आधार/राशन कार्ड/पत्र नंबर (Aadhar/Ration Card/Govt. ID)

पूरा नाम (Name)

लिंग (Gender)

मोबाइल नंबर (Mobile Number)

रक्त समूह (Blood Group)

dd-mm-yyyy



घर का पता (Address)

वैवाहिक स्थिति (Marital Status)

व्यवसाय (Occupation)

तंबाई/सेंटिमीटर (Height (in centimeters))

वजन/किलोग्राम में (Weight (in kilograms))

माता - पिता का नाम (Relation (Son Or Daughter Or))

एलर्जी (Allergies)

शल्यिक इतिहास (Surgical History)

Obstetric (Complications during pregnancy)

अन्य (Substance (Drinking, Smoking, etc))

ब्रह्म / SUMIT

Registering Information of a New Patient

Patient Login

AADHAR CARD NUMBER

Authenticate

Logging into Patient Records using Facial
Recognition Authentication

Active Patient Ailment Form

Aadhar/Ration Card/Govt. ID

नाम (Name)

लिंग (Gender)

आयु (Age)

रक्त समूह (Blood Group)

वजन (किलोग्राम में) (Weight (in kilograms))

नई या अनुवर्ती जांच? (New or follow up check up?)

☐ नया चेक-अप (New Check-up)

☒ अनुवर्ती परामर्श (Follow-up)


तापमान (फारेनहाइट) (Temperature [F])


रक्तचाप (सिस्टोलिक/डायस्टोलिक) (Blood Pressure [Sys/Diast])

आपकी शिकायत (Your Complaint)

SUBMIT




Filling up Medical Issues being faced by the Patient



Rohan's Org - 2020-...

Access ManagerSupportBilling

Project 0

AtlasRealmCharts

FILTER {"filter": "example"}

QUERY RESULTS 1-1 OF 1

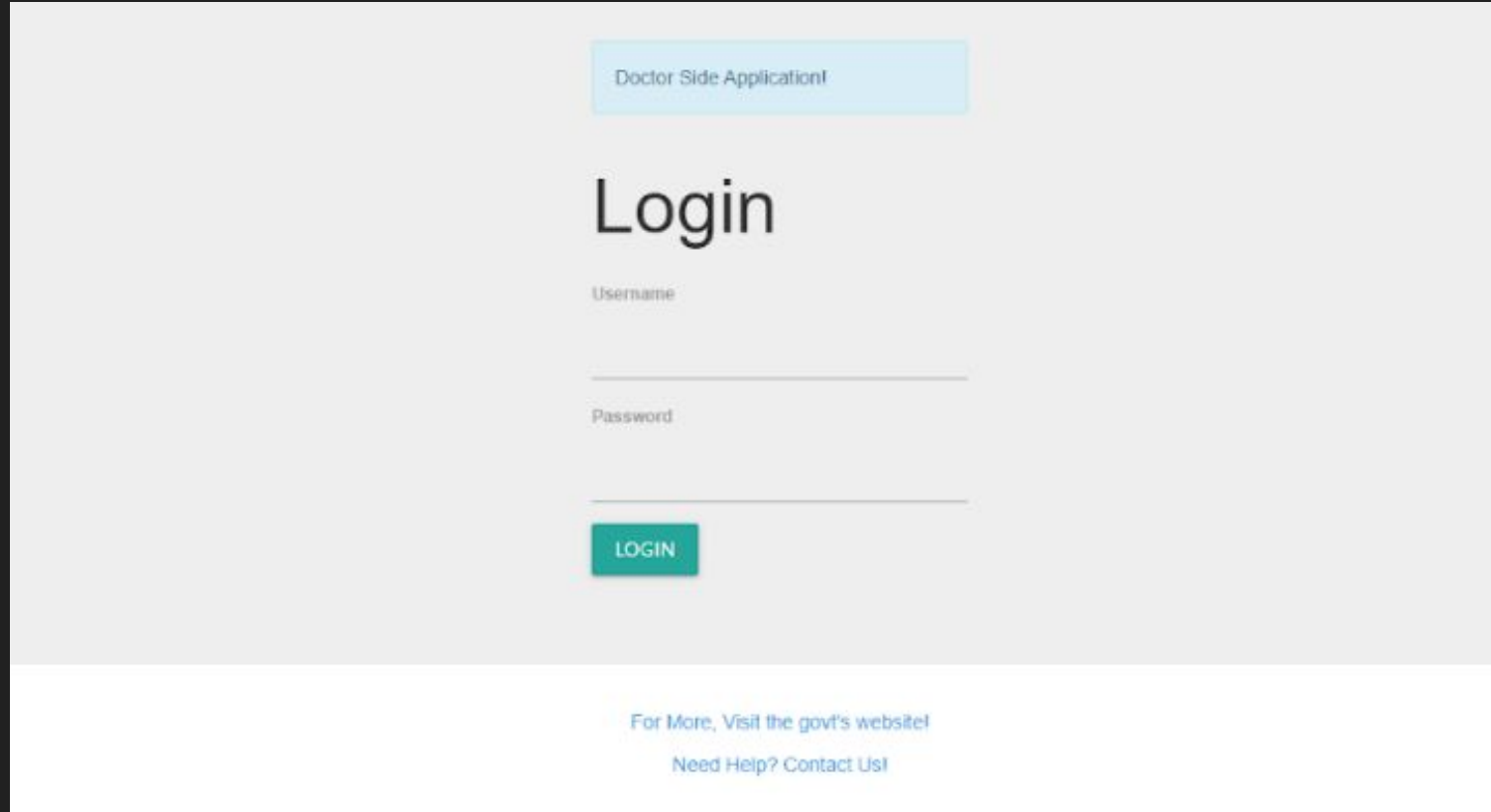
>

```
_id: ObjectId("5f2458e2f6a91f0118e3bbac")
uid: 741236121
name: "fjkdvaD0$jkWfDHCKDFWE$.FBBFujh<s"
gender: "sdfghenfjkbvggyvNADN$bhsajb"
age: 31
bldgroup: "jbdsyafvFvjvAgbwise"
dob: 1989-07-31T00:00:00.000+00:00
address: "DsgJdgBhfHf.3fsaqjkwfDHCKDFWE$.FBBFDsgsgeBfss"
married: "hdsbvBGBfsgdb$muphdsbvBGBfsgdbhnfgbv"
occupation: "FtgeryNKJfwfgeaEadgdwraRGHcskb"
height: 175
weight: 89
relation: "MkjnjqffeBhdsbvBGBfsgdbgreBgfjefknsddss"
allergies: "sdfknDUGewufvFNHDEUHNcadvjkwfDHCKDFWE$.FBBF"
surgHist: "fnskjanIsjkwfDHCKDFWE$.FBBFavaHfjewbvfsavav"
obstetric: "fajkwfDuynfjkYNHDEUHNcadvjkoAFhuivhiu"
habits: "sajkfjkwfDHCKDFWE$.FBBFaegbYaaIafTftawivfaf1ja"
__v: 0
```

Feature Requests

Encrypted Database Records

Doctor User Interface



Doctor Side Application

Login

Username

Password

LOGIN

[For More, Visit the gov't website!](#)

[Need Help? Contact Us!](#)

Login page for Doctor

Greetings Dr Test!

Active Symptoms:

A Symptom	15 new
B Symptom	4 new
C Symptom	
D Symptom	

Regular Patients:

Patient A	
Patient B	new
Patient C	
Patient D	

Telemedicine Schedule:

Patient 1	13:30 new
Patient 2	14:30 new

Requested Pharma:

PMed 1	Avail new
PMed 2	N/A new
PMed 3	Avail new

Activity Dashboard for Doctor

Dr Abc Test

Qualification- MBBS, MD

Phone No- 9876543210

01/07/2020

Patient Details:

Name: Ailing PName

Age: 20

Gender:M

Chief Complaint: high fever ,weakness

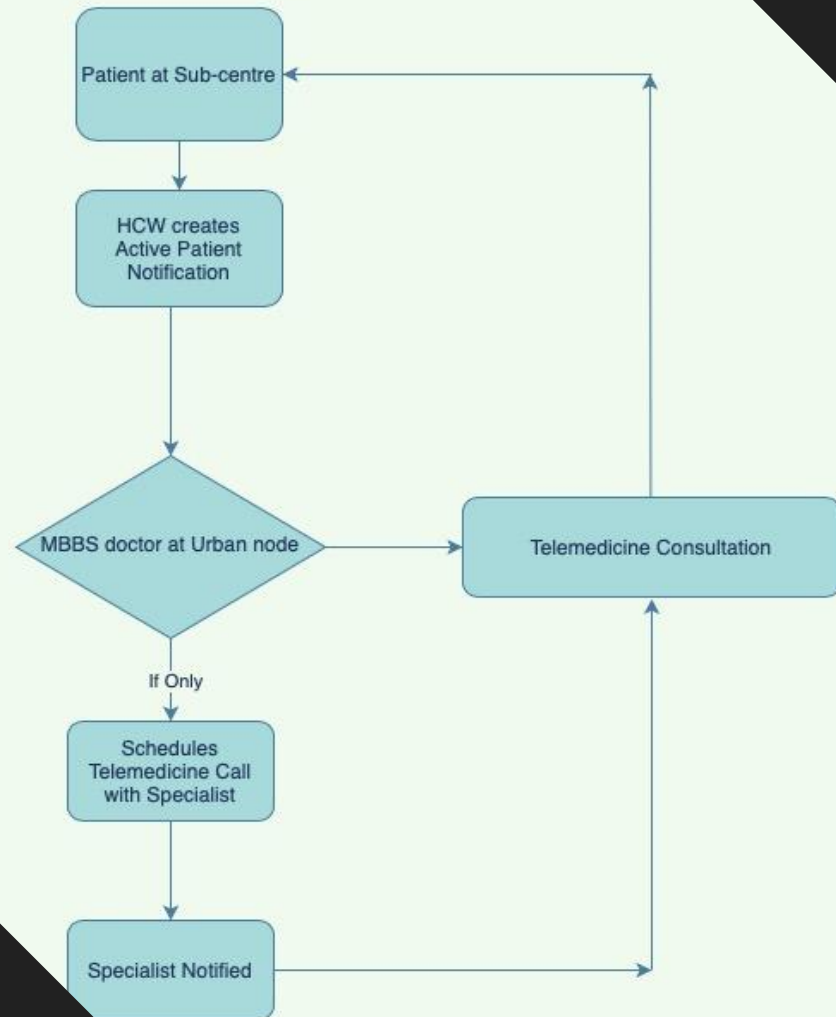
Physical Examination:Rise in temprature, etc, etc, etc

Diagnosis:

Enter Diagnosis:

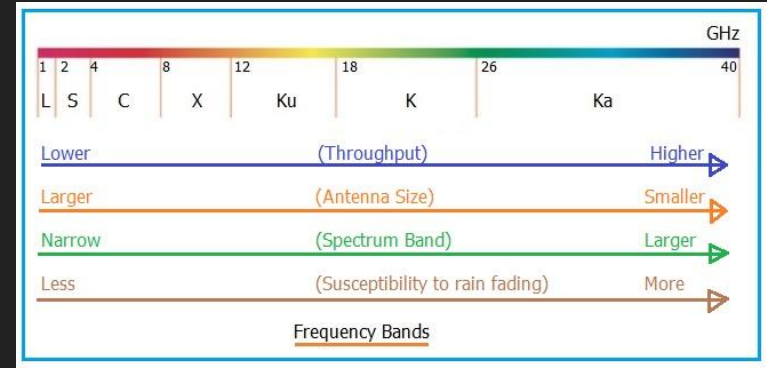
C. Telemedicine setup for Doctor Patient Interaction

- ❖ Active patients are notified to an MBBS doctor.
- ❖ Decides to involve a specialist or conduct diagnosis himself.
- ❖ The MBBS Doctor schedules an appointment with the specialist
- ❖ Telemedical call is made over DTH bi-directional connection

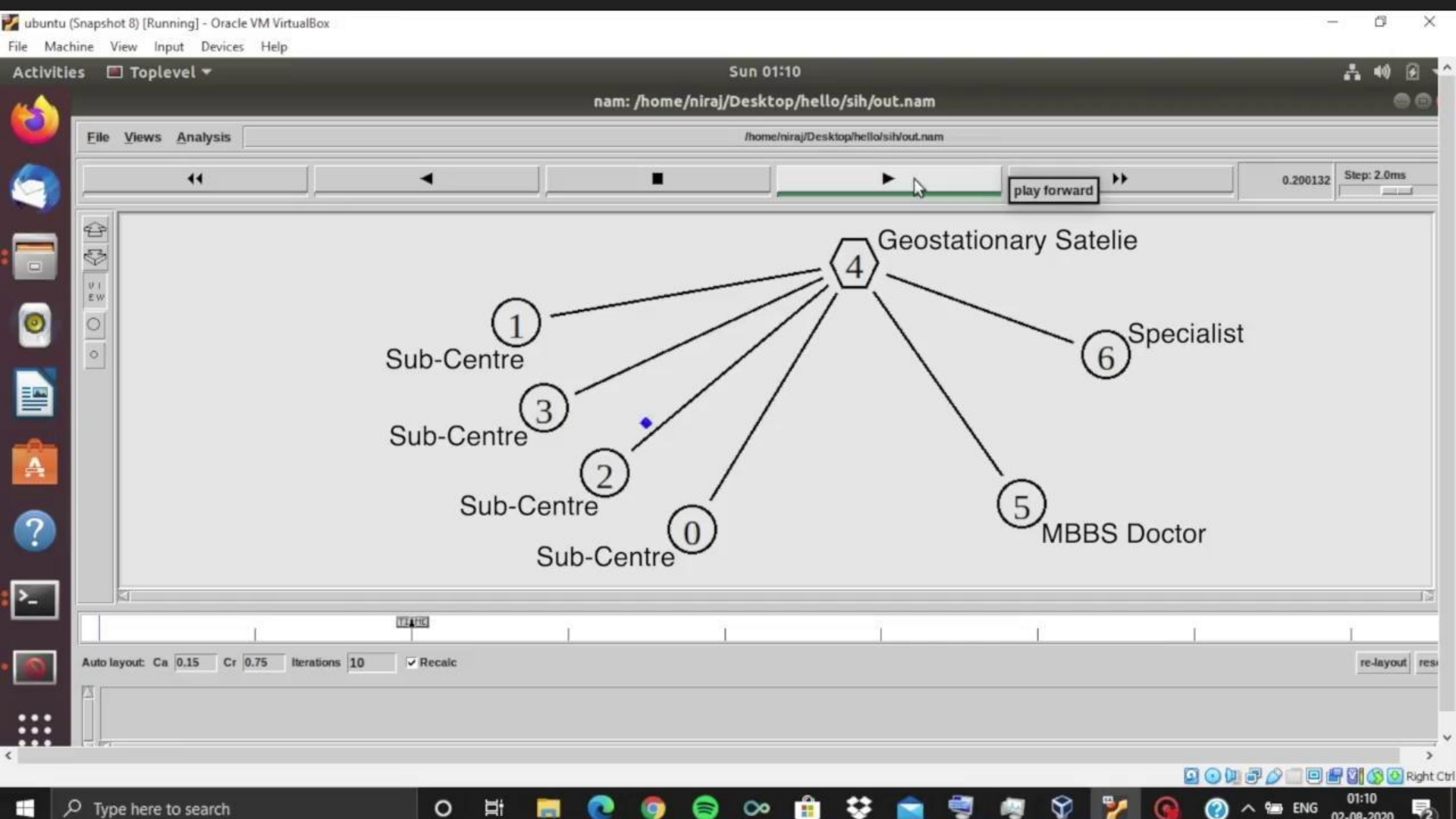


Connectivity and Bandwidth

- ❖ The diverse landscape of Uttarakhand poses major problems with respect to connectivity and disruption to information transfer.
- ❖ DTH signals commonly used will be disrupted by rain fading
- ❖ We propose the government to make available the use of satellite Ku Band frequency
- ❖ Antenna size required is smaller (Reducing frost damage as surface area is smaller)
- ❖ Provides wide beam coverage.



its frequency range allows to achieve high efficiency



Users and Beneficiary of our System

- ❖ The HCWs at sub-centre level and Doctors at the urban-centre levels are our end Users
- ❖ The ultimate beneficiaries are the patients in the rural areas of Uttarakhand
- ❖ We are preventing access by the patients because of the limited access to smartphones and a flexible internet connection
- ❖ To ensure professional handling of sensitive medical information.

Unique features of our application

- ❖ Data security
 - The database is encrypted using a slow hashing function.
- ❖ Protocols Followed
 - EHR protocols (Standard Electronic Health Records Protocol)
 - HL-7 (Interoperability protocols)
- ❖ Unique ID generation
- ❖ Modular approach
 - Functional Independence increases
 - Easier development and maintenance
- ❖ Interoperability with other government activities.

Government programs to be integrated

- ❖ AB PMJAY (Ayushman Bharat Pradhan Mantri Jan Arogya Yojna)
 - It is a part of Indian Government's National Health Policy which aims to provide free healthcare to its bottom 40% poor and vulnerable population.
- ❖ MSBY (Mukhyamantri Swasthya Bima Yojna)
 - Is a government run health insurance scheme for household identified by Govt of Uttarakhand.
- ❖ NUHM (National Urban Health Mission)
 - To provide integrated and sustainable system for PHC delivery with focus on urban poor living (future scope)
- ❖ HMIS (Health Management Information System)
 - Ministry of Health and Family Welfare launched the National Rural Health Mission (NRHM) to ensure necessary architectural corrections to basic health care delivery system.

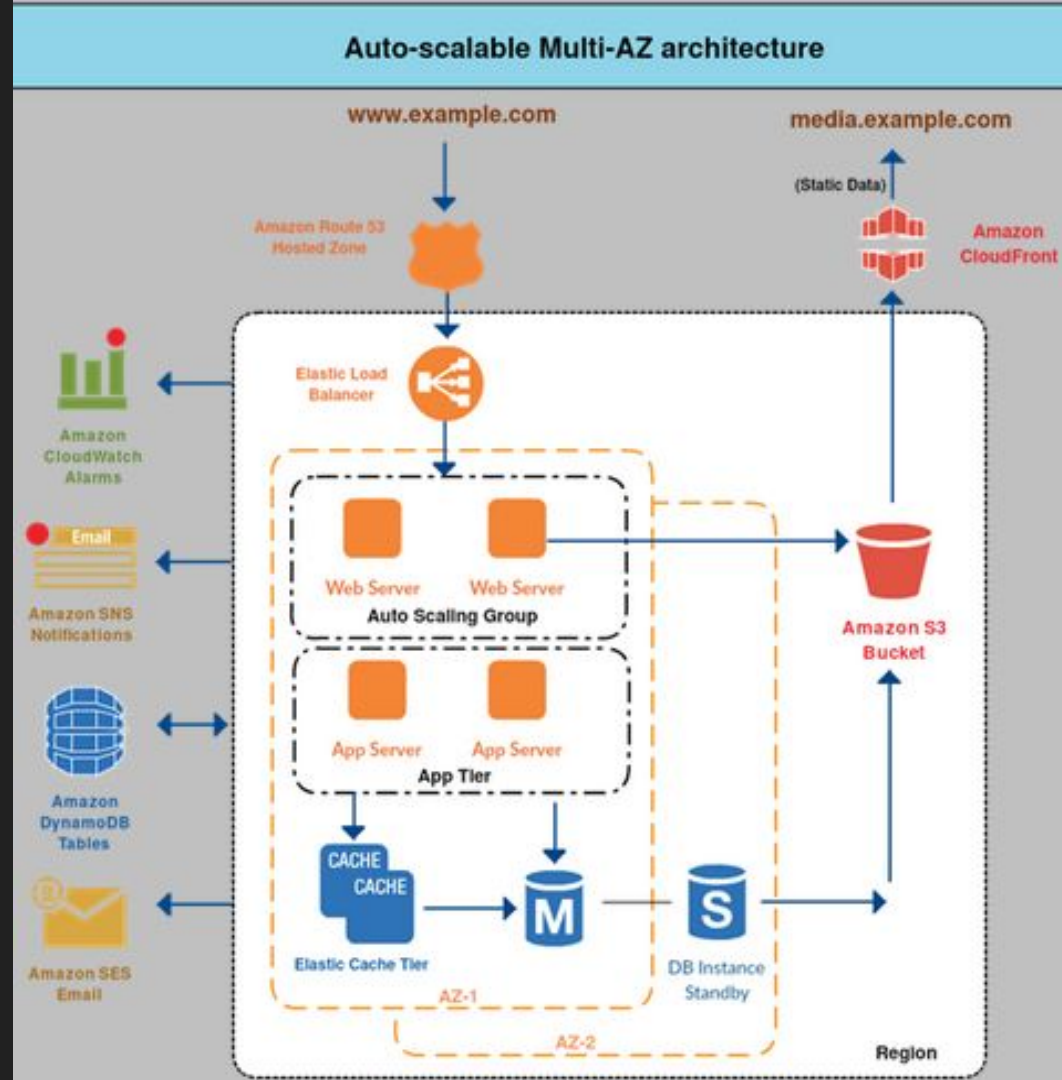
Budget Plan

Item	Cost per Item	Quantity / Time Validity(months)	Total Amount
Laptop (Initial Installments only)	22,999	1848	4,25,02,152
Cloudfront : AWS	13.6	10TB	1,39,264
TeleMedicine Connections	TBD	TBD	TBD
Training of HCWs	-	-	4,00,000
Payment of Employees	-	-	25,00,000
IoT Devices Budget :	-	-	12,00,000
Miscellaneous	-	-	20,00,000
		Total Cost (INR)	4,87,41,416

Item	Cost per Item	Quantity / Time Validity(months)	Total Amount
Tablet (Initial Installments only)	4,999	1848	92,38,152
Cloudfront : AWS	13.6	10TB	1,39,264
TeleMedicine Connections	TBD	TBD	TBD
Training of HCWs	-	-	4,00,000
Payment of Employees	-	-	25,00,000
IoT Devices Budget :	-	-	12,00,000
Miscellaneous	-	-	20,00,000
		Total Cost (INR)	1,54,77,416

Scalability

- ❖ Our system model is entirely compliant when it comes to large scale sizing
- ❖ AWS provides simple and cost effective solutions for scaling a Web Application



Future Scope

- ❖ Create a Dashboard in the future in order to show the Healthline workers and Govt. officials an overview of a situation of Uttarakhand.
- ❖ Apply Data Mining tools to find alert the Officials if a particular Village is undergoing an outspread of a Disease.
- ❖ Economic advantages in the long run.
- ❖ Implement regional language in all aspects of our system



ADMIN



Dashboard



Charts



Pages



Chat

+ 15



Mailbox



Settings



Page layouts

NEW



Navigation



Widget

NEW

CONTACT



NAME OF CONTACT

COMPANIEV@GMAIL.COM
+375 (24) 4757 58677 478

NAME OF CONTACT

COMPANIEV@GMAIL.COM
+375 (24) 4757 58677 478

NAME OF CONTACT

COMPANIEV@GMAIL.COM
+375 (24) 4757 58677 478PATIENTS
REGISTERED
12,56,789PAGES VIEW
134SHARES
100

OVERALL DISTRICT WISE STATS

BIRTH RATE

2018 - 20



TUBERCULOSIS STATS

2018 - 20



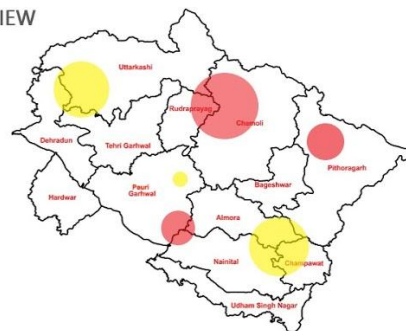
CALENDER



< JUNE >

S	M	T	W	T	F	S
			1	2	3	4
5	6	7		9	10	11
12	13	14	15	16		18
19	20	21	22	23	24	25
26	27	28	29	30	31	

MAP OVERVIEW



Accountability and Governance

- ❖ A level of accountability is placed upon the HCWs and the ANMs at the Sub-centres.
- ❖ Data we collect will enhance monitoring of Sub-centre level activities by the government.
- ❖ A comprehensive Health Profile for the State of Uttarakhand will be available for emergencies and resource allocation.
- ❖ Using the Health Profile, targeted medication and pharmaceutical stock can be deployed to vulnerable regions identified.

Resources and References

- **Uttarakhand Demographics:**

http://rchiips.org/NFHS/pdf/NFHS4/UT_FactSheet.pdf
<http://rchiips.org/nfhs/NFHS-4Reports/Uttarakhand.pdf>

- **Satellite networking :**

<https://www.isi.edu/nsnam/ns/doc/node200.html>
<https://axessnet.com/en/ku-band-satellite-frequency/>
<https://www.satellitetoday.com/telecom/2011/04/01/looking-for-capacity-options-in-extended-ku-band-segment/>

- **State Profile:**

<https://health.uk.gov.in/pages/display/120-state-profile>

- **EHR:**

<https://www.aafp.org/practice-management/health-it/product/features-functions.html>
<https://www.aimprosoft.com/blog/how-to-make-an-electronic-health-records-system/>

- **Implementing Tech Stack:**

<https://github.com/googleapis/nodejs-storage>
<https://medium.com/@HolmesLaurence/integrating-node-and-python-6b8454bfc272>
<https://medium.com/@parthkalaria/storing-and-retrieving-files-from-mongodb-using-mean-stack-and-gridfs-aebd8b91cf38>
<https://stackoverflow.com/questions/49479015/getting-form-data-to-mongodb-database-using-express>

‘As Sub-centres are the first contact point with the community, the success of any nationwide programme would depend largely on a well functioning system that provides services of acceptable standard to the people’

Thank You