

EMR

Electronic Medical Record System -Ethiopia

Introduction

Medical Record System (MRS) allows to improve the management of patient health care, enhance healthcare service and allow for rapid communications between health care providers. One of the critical factors of Electronic Medical Recording (EMR) is interoperability the ability of different information systems and applications to communicate, exchange data accurately, effectively and consistently and to process the information that has been exchanged

Functional Requirements - Patients

Requirements	Flag
System Must Record Patient Demographics	Must
System Must retrieve Patient Demographics (Last name, DOB)	Must
System Must allow new patients to register	Must
System Could allow patients to login with their credentials	Could
System Must allow patients to Update their Demographics	Must
System Must allow Patients to make an appointment	Must
System Must allow Patients to Manage an appointment	Must
System Must Scan and Store previous medical history	Must
System Should notify the patients about their appointment	Should
System Must allow the patients to choose a particular Hospital	Must

***Initial requirements are subject to change as per the client requirements.

Functional Requirements - Doctors

Requirements	Flag
System must allow doctor to register	Must
System must allow doctor to view/manage appointments	Must
System must allow doctor to view patients records	Must
System must allow doctor to prescribe medication (Digitally)	Should
System should allow doctor to add lab test for particular patient	Must
System must generate E- Prescription	Must
System Must allow Patients to Manage an appointment	Must
System should allow doctors to view and follow up reports provided by the laboratory	Should
The system must be capable of storing unlimited number of Patient records and documents.	Must

Non Functional Requirements - Doctors

Requirements	Flag
Accessibility - The system must support running in high availability mode	Must
Backup - Ability to perform full system recovery from scheduled backup files with RTO (recovery time objective) less than 4 hours.	Must
Accessibility - The management interface must be accessible via web browser	Could
Performance - The system must be capable of performing full documents search in a reasonable amount of time (less than 5 seconds).	Must
Fault tolerance – The system must be available and active all the time	Must
Compatibility – The system must run on all popular platforms	Must
Security – Confidential Patients and Hospital data must be stored and accessed securely	Must
Usability - The System must be intuitive and user friendly	Must
Extendibility – The system must allow adding new features and carry-forward of customisations for the next major releases.	Should

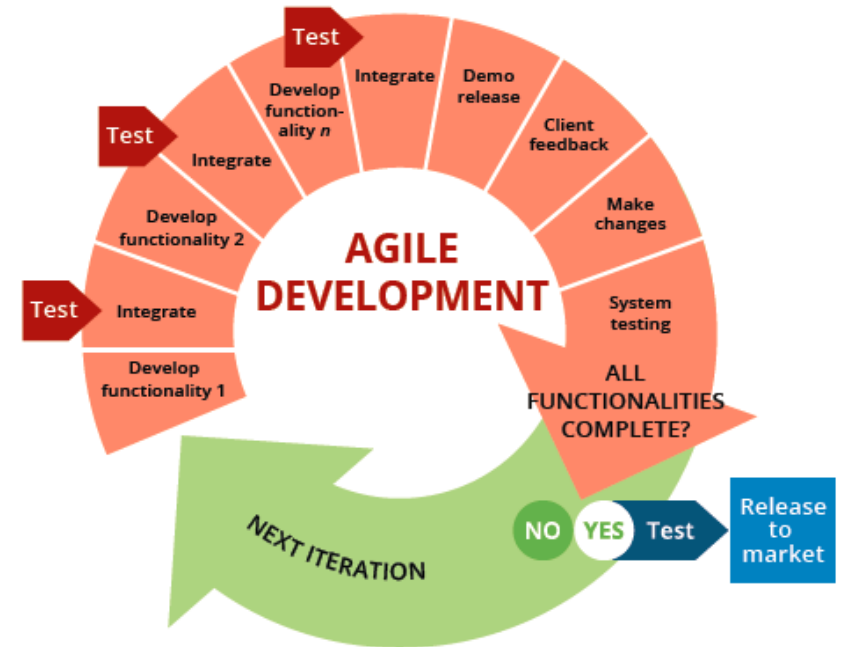
Technical Requirements – Hardware

- Computer connected to the Internet (LAN for now)
- Document imaging, or scanners, Printers and other related devices
- Storage and Backup Devices
- Client Server – Computer which maintains EMR data and Software Services.
- Computers for the Hospital Staff and Doctors.
- Network devices for connecting clients and server

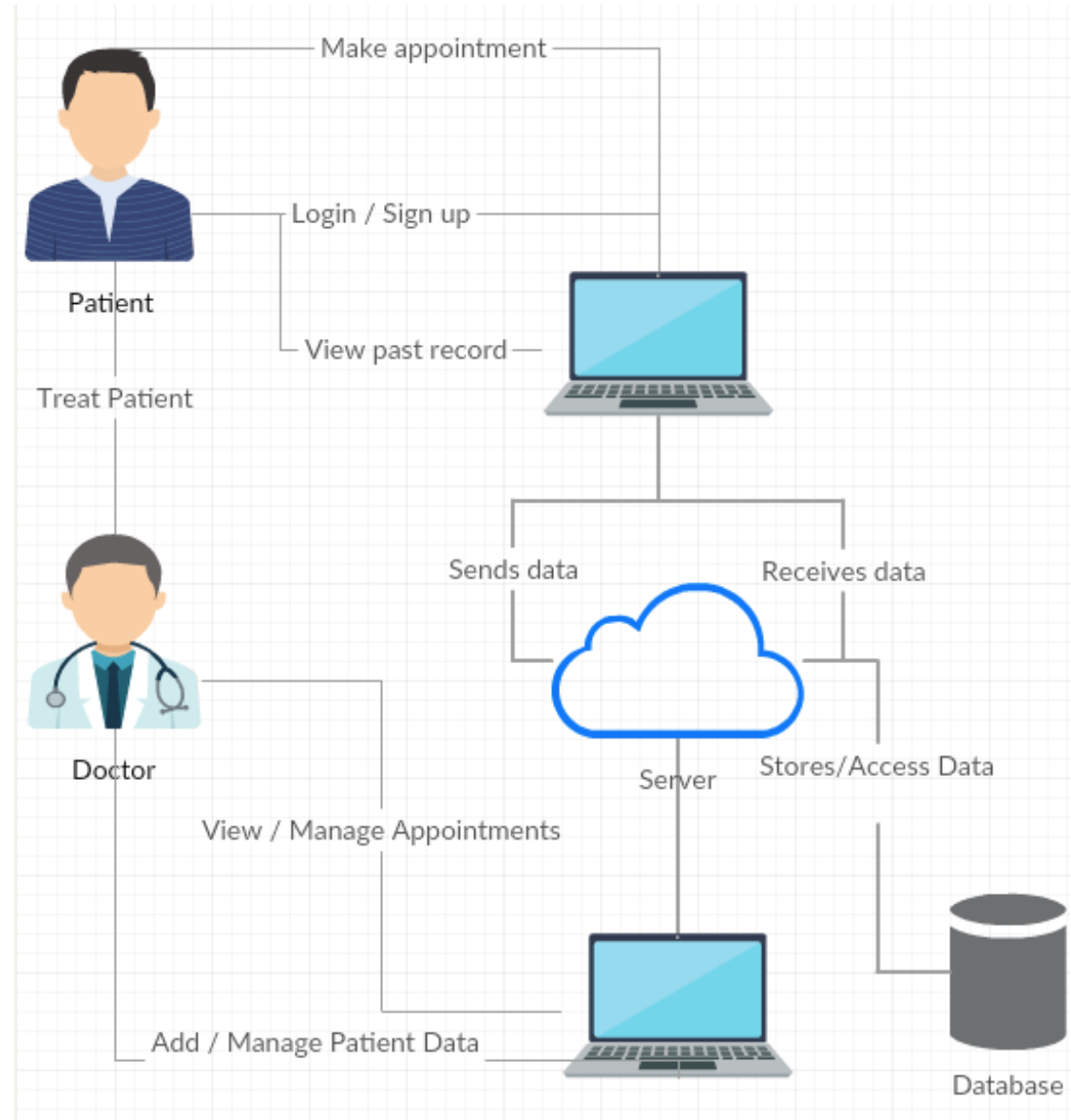
Note: The above requirement are subject to change based on the growing functionalities.

Software development lifecycle

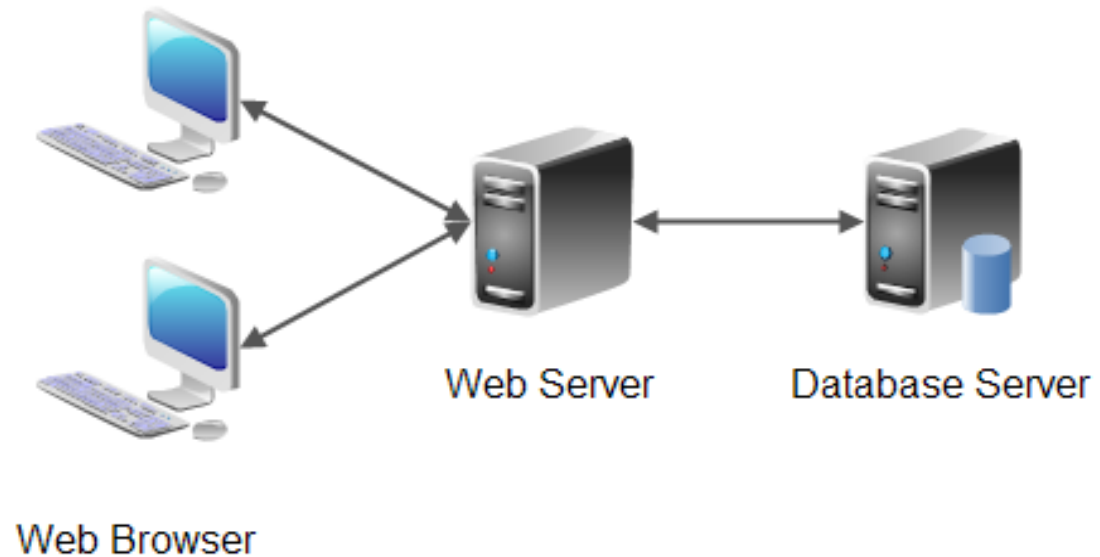
- This system will be developed based the agile development model
 - Quick – Go – Live
 - Fast Track product evolution
 - Creates Proof of concept in the early stages.
 - Allows to test different types of functionalities and user experiences for best results
 - Minimizes risks



Rich picture System proposed



System Architecture

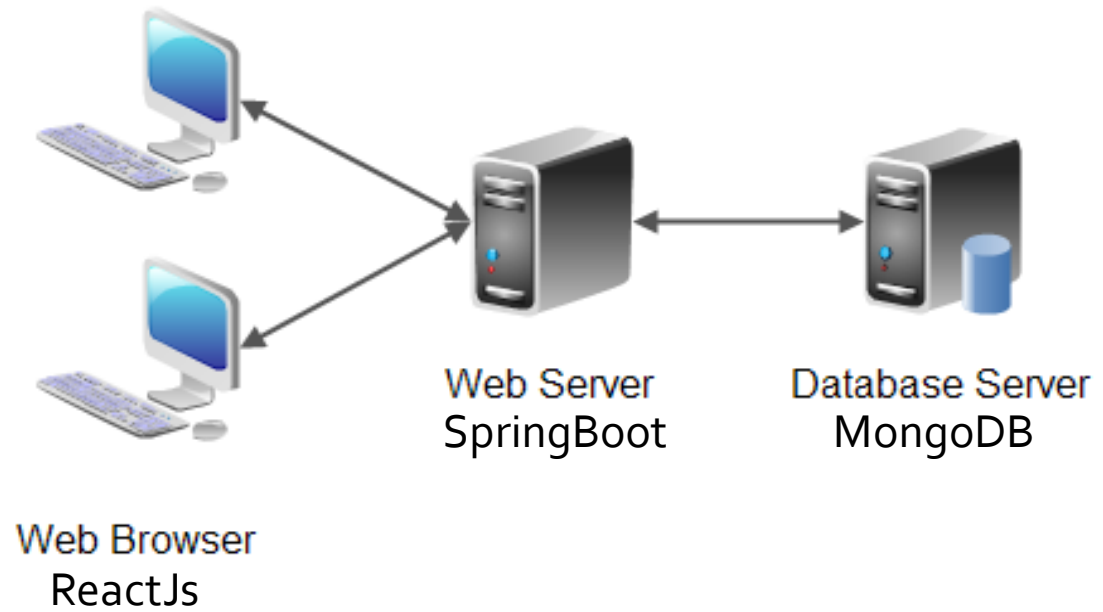


- Rich User Experience –Responsive design, user friendly across multiple platforms and various screen sizes.
- Ease of access – Can work from anywhere within the hospital with LAN access.

Three -Tier Architecture & Benefits

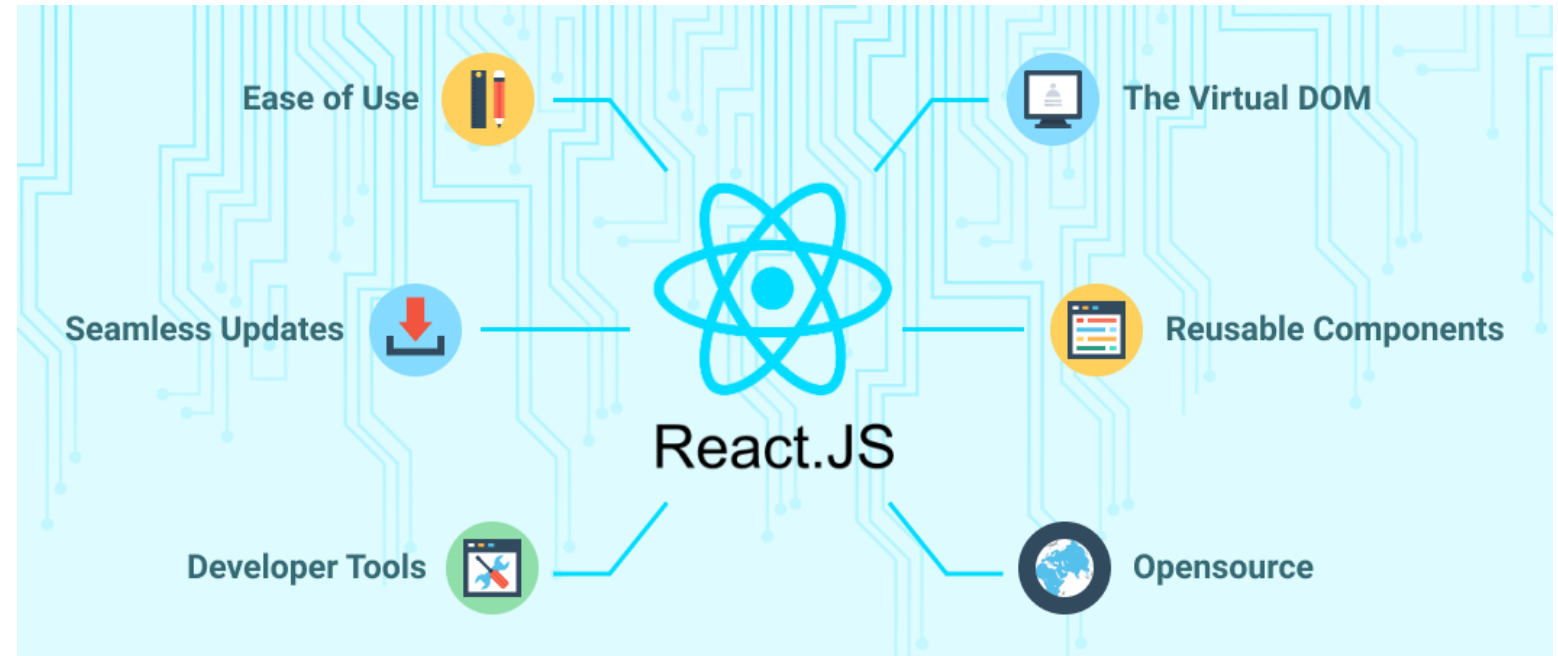
- Scalability—The application can balance huge loads to satisfy more Web requests without adding servers to the Application and Data tiers.
- Performance—The Presentation tier can cache requests, network utilization is minimized, and the load is reduced on the Application and Data tiers.
- Availability—If the server is down with sufficient caching, the Presentation tier can process Web requests.

Technical Stack

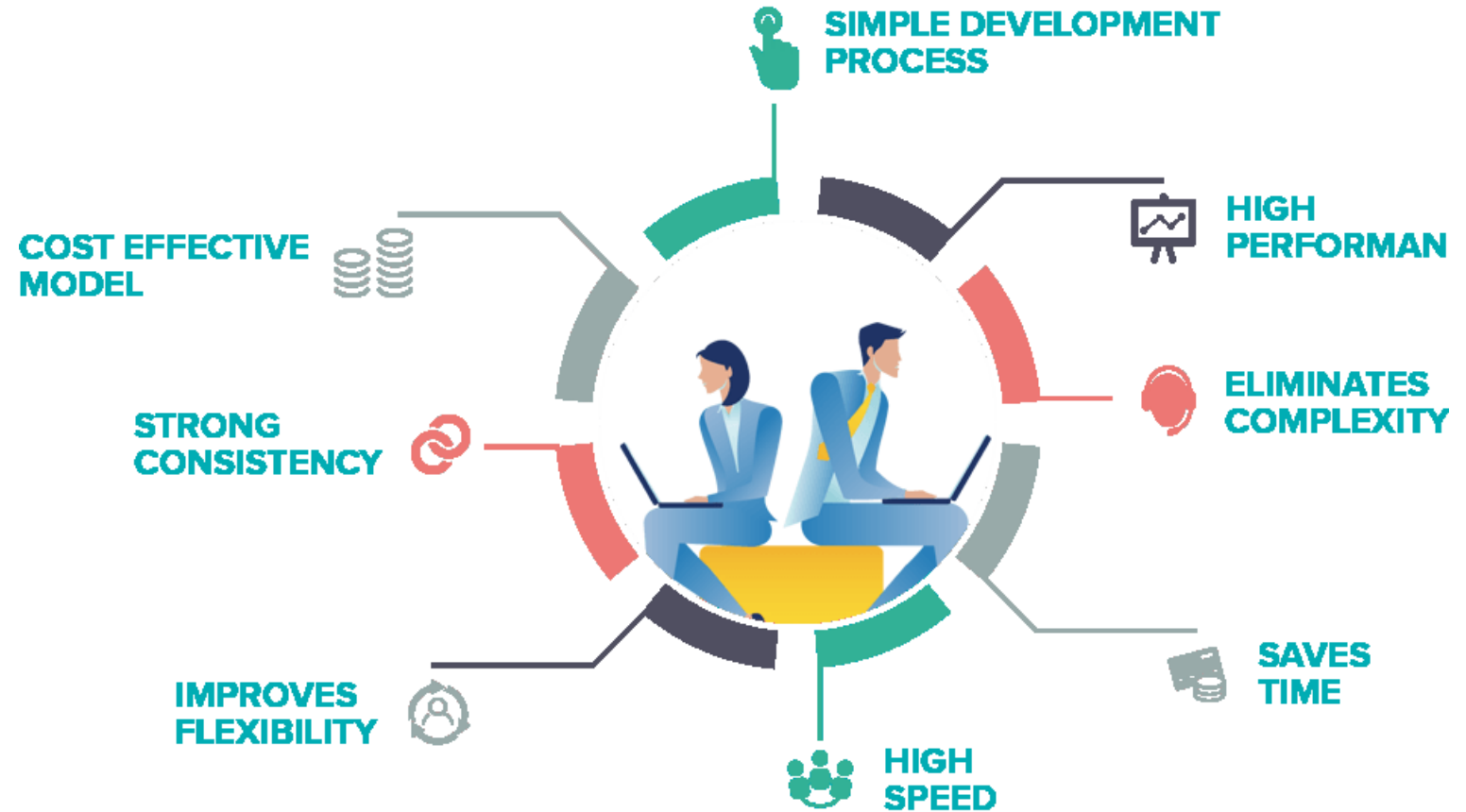


- Web Browser / Front-end – ReactJs, Bootstrap 4
- Web Server / API - Spring Boot Rest web services
- Database server - MongoDB

Why ReactJS?



Why NoSQL ?



System Overview

Staff Login

Login to your account

☐ Remember me

LOGIN

 [Forgot password?](#)

Patient Listing

EMR LOGO

Search here...



Welcome,
Dr. Yacob Gebretensae ▾

Exp

14

Awards

13

Clients

213

Menu



Dashboard



Appointment



Taskboard



Patients ▾



All Patients



Add Patient



Patient Profile



Invoice



Departments <

← All Patient



/ Patient



/ All Patient

Patients List

W

M

Y



All

Image	Patients ID	Name	Age	Address	Number	Last Visit	Status
50x50	0000598	Daniel	32	71 Pilgrim Avenue Chevy Chase, MD 20815	404-447-6013	11 Jan 2018	APPROVED
50x50	0000258	Alexander	22	123 6th St. Melbourne, FL 32904	404-447-6013	15 Jan 2018	APPROVED
50x50	0000369	Richard	26	123 6th St. Melbourne, FL 32904	404-447-6013	16 Jan 2018	APPROVED
50x50	0000147	Samuel	45	71 Pilgrim Avenue Chevy Chase, MD 20815	404-447-6013	17 Jan 2018	APPROVED
50x50	0000123	Stephen	55	71 Pilgrim Avenue Chevy Chase, MD 20815	404-447-6013	18 Jan 2018	APPROVED
50x50	0000456	Joseph	27	70 Bowman St. South Windsor, CT 06074	404-447-6013	19 Jan 2018	APPROVED
50x50	0000789	Cameron	38	123 6th St. Melbourne, FL 32904	404-447-6013	19 Jan 2018	PENDING
50x50	0000987	Alex	39	123 6th St. Melbourne, FL 32904	404-447-6013	20 Jan 2018	APPROVED

Appointment Booking

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1000000

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Exp
14

Awards
13

Clients
213

Menu

Dashboard

Appointment

Taskboard

Patients ▾

- All Patients
- Add Patient
- Patient Profile
- Invoice

Departments <

Book Appointment

Appointment

Book Appointment

First Name

Last Name

Date of Birth

- Gender -

Enter Your Email

Phone

- Service -

- Doctor -

Appointment Date

Please type what you want...

Submit

Cancel

DoctorTask Board

EMR LOGO

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Welcome,
Dr. Jacob Gebretensae

Exp 14 Awards 13 Clients 213

Menu

- Dashboard
- Appointment
- Taskboard
- Patients
 - All Patients
 - Add Patient
 - Patient Profile
 - Invoice
- Departments

TaskBoard

Home / Apps / TaskBoard

Operation Planned

#L1008

Bariatric surgeries/Gastric yypass

Lorem Ipsum is simply dummy text of the printing and typesetting industry.

Team 50x51 50x51 50x50



#L1010

Septal Myotomy

Lorem Ipsum is simply dummy text of the printing and typesetting industry.

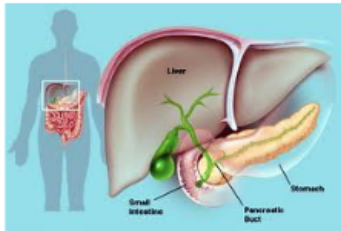


Operation In progress

#L1011

Pancreatectomy

The standard chunk of Lorem Ipsum used since the 1500s is reproduced below for those interested. Sections 1.10.32 and 1.10.33 from "de Finibus Bonorum et Malorum" by Cicero



Team 50x51 50x50



Operation Completed

#L1005

Thoracic Aortic Dissection Repair

If you are going to use a passage of Lorem Ipsum, you need to be sure there isn't anything embarrassing hidden in the middle of text.

Team 50x51 50x51 50x50 50x50



Doctor Listing

EMR LOGO

Welcome,
Dr. Yacob Gebretensae

Exp 14 Awards 13 Clients 213

Menu

- Dashboard
- Appointment
- Taskboard
- Patients**
 - All Patients
 - Add Patient
 - Patient Profile
 - Invoice
- Departments

All Doctors

/ Doctor / All Doctors

Search here...

Dr. John Smith
Dentist
795 Folsom Ave, Suite 600 San Francisco, faCADGE 94107

Hossein Shams
Gynecologist
795 Folsom Ave, Suite 600 San Francisco, faCADGE 94107

Maryam Amiri
Nursing
795 Folsom Ave, Suite 600 San Francisco, faCADGE 94107

Tim Hank
Audiology
795 Folsom Ave, Suite 600 San Francisco, faCADGE 94107

John Smith
Physical Therapy
795 Folsom Ave, Suite 600 San Francisco, faCADGE 94107

Frank Camly
Physical Therapy
795 Folsom Ave, Suite 600 San Francisco, faCADGE 94107

Gary Camara
Dentist
795 Folsom Ave, Suite 600 San Francisco, faCADGE 94107

Add New Doctor

+

Patient Medical records

EMR LOGO

Search here...



Welcome,
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Exp	Awards	Clients
14	13	213

Menu

- [Dashboard](#)
- [Appointment](#)
- [Taskboard](#)
- [Patients](#)
 - All Patients
 - Add Patient
 - Patient Profile
 - Invoice
- [Departments](#)

Patient Medical Record

[Home](#) / [Pages](#) / Patient Medical Record

Mike's Medical Record

1024X640

1024X640

1024X640

1024X640

1024X640

1024X640

More Importantly

“Money is an illusion”

- Yacob Gebretensae

We love
Illusion



We prefer GBP

Credits

- Yacob Gebretensae, Data Scientist, MD, Healthcare researcher, London, UK.
- Niranchana Gowthaman - M.Sc. Software Engineering, UK
- Raghavendra Prabhakar – M.Sc. Applied Computing and Information Technology, UK