VIVEKANAND EDUCATION SOCIETY'S INSTITUTE OF TECHNOLOGY
Department of Computer Engineering

Project Report on

Interoperability of Electronic Health Record

In partial fulfillment of the Fourth Year, Bachelor of Engineering(B.E.) Degree in Computer Engineering at the University of Mumbai Academic Year 2017-2018

Submitted by

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Project Mentor
Mr.Prashant Kanade

(2017-2018)

VIVEKANAND EDUCATION SOCIETY'S INSTITUTE OF TECHNOLOGY

Department of Computer Engineering

Certificate

This is to certify that ***Vinay Dodeja, Akshay Gunani , Dinesh Nandi*** of Fourth Year Computer Engineering studying under the University of Mumbai have satisfactorily completed the project on "**Interoperability of Electronic Health Record**" as a part of their course work of PROJECT-II for Semester-VIII under the guidance of the mentor ***Prashant Kanade*** in the year 2017-2018.

This thesis/dissertation/project report entitled "***Interoperability of Electronic Health Record*** " by ***Vinay Dodeja, Akshay Gunani , Dinesh Nandi*** is approved for the degree of

_____

Programme Outcomes	Grade
PO1,PO2,PO3,PO4,PO5,PO6,PO7, PO8,PO9,PO10,PO11,PO12 PSO1,PSO2	

Date:

Project Guide:

Project Report Approval
For
B. E (Computer Engineering)

This thesis/dissertation/project report entitled "***Interoperability of Electronic Health Record***" by ***Vinay Dodeja, Akshay Gunani , Dinesh Nandi*** is approved for the degree of _____

Internal Examiner

External Examiner

Head of the Department

Principal

Date:
Place:

Declaration

We declare that this written submission represents our ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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(Signature)	(Signature)
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(Name of student and Roll No.)	(Name of student and Roll No.)
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(Signature)	(Signature)
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(Name of student and Roll No.)	(Name of student and Roll No.)

Date:

ACKNOWLEDGEMENT

We are thankful to our college Vivekanand Education Society's Institute of Technology for considering our project and extending help at all stages needed during our work of collecting information regarding the project.

It gives us immense pleasure to express our deep and sincere gratitude to **Mr.Prashant Kanade** for his kind help and valuable advice during the development of project synopsis and for her guidance and suggestions.

We are deeply indebted to Head of the Computer Department **Dr.(Mrs.) Nupur Giri** and our Principal **Dr. (Mrs.) J.M. Nair ,** for giving us this valuable opportunity to do this project.

We express our hearty thanks to them for their assistance without which it would have been difficult in finishing this project synopsis and project review successfully.

We convey our deep sense of gratitude to all teaching and non-teaching staff for their constant encouragement, support and selfless help throughout the project work. It is great pleasure to acknowledge the help and suggestion, which we received from the Department of Computer Engineering.

We wish to express our profound thanks to all those who helped us in gathering information about the project. Our families too have provided moral support and encouragement at several times.

Computer Engineering Department
COURSE OUTCOMES FOR B.E PROJECT

Learners will be to,

Course Outcome	Description of the Course Outcome
CO 1	Able to apply the relevant engineering concepts, knowledge and skills towards the project.
CO2	Able to identify, formulate and interpret the various relevant research papers and to determine the problem.
CO 3	Able to apply the engineering concepts towards designing solution for the problem.
CO 4	Able to interpret the data and datasets to be utilized.
CO 5	Able to create, select and apply appropriate technologies, techniques, resources and tools for the project.
CO 6	Able to apply ethical, professional policies and principles towards societal, environmental, safety and cultural benefit.
CO 7	Able to function effectively as an individual, and as a member of a team, allocating roles with clear lines of responsibility and accountability.
CO 8	Able to write effective reports, design documents and make effective presentations.
CO 9	Able to apply engineering and management principles to the project as a team member.
CO 10	Able to apply the project domain knowledge to sharpen one's competency.
CO 11	Able to develop professional, presentational, balanced and structured approach towards project development.
CO 12	Able to adopt skills, languages, environment and platforms for creating innovative solutions for the project.

ABSTRACT

Health Record of an patient to be clinically significant it needs to be from birth, not less than. As one progresses through one's life, every record of every clinical encounter represents a health associated event in one's life. Each of these records may be important or not at all required depending on the current problems that the person is suffering from. Thus, it becomes necessary that these records be available, arranged as a when person visit doctor, and be clinically relevant to provide a summary of the various healthcare events in the life of a person. An Electronic Health Record (EHR) is a digital version of patient's medical records that get generated during any clinical encounter and make information available instantly

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Chapter 1: Introduction

1.1. Introduction

From the perspective of Indian Medical care system, patients visit several doctors, throughout their life time right from visiting a primary health center to community health. Health records get generated with every clinical meet during the inpatient or emergency visits. However, as it is paper based most of the health records are either lost by the patients or remain in the supervision of health care providers and gets destroyed. As per the maintenance period of medical records generally followed by hospitals is 5 years for out-patient records and 10 years for in patient records. Medical records are however retained permanently. In India we have some intention of EHR. But there are certain barriers to it. The idea behind any technology or a invention is to make things simple and easy for everyone.

To Store the health record of patients to digital system and accessing the record whenever required and it will be so simple that even peoples in rural area can run it and can achieve interoperability of that record without affecting the security and privacy of the user.

1.2. Motivation for the project

The government has initiated various steps in implementing the EHR for our Country.Previously medical record systems are typically paper-based and stored in hard copy files. This system becomes a problem, particularly in the developing world.For a health record of an individual to be clinically meaningful it needs to be from conception or birth, at the very least. As one progresses through one's life, every record of every clinical encounter represents a health related event in one's life. Each of these records may be insignificant or significant depending on the current problems that the person is suffering from. Thus, it becomes imperative that these records be available, longitudinally arranged as a time series, and be clinically relevant to provide a summary of the various healthcare events in the life of a person. The hope is that this technology will save lives as well as money in nations that are currently dealing with some of the world's most deadly diseases in our country**.**

1.3. Drawback of the existing system

Prevailing medical record systems are typically paper-based and stored in hard copy files. This system becomes a problem, particularly in the developing world, when people relocate or if a region becomes politically or economically unstable.Even if existing system (Both EHR & PHR) which are digital, but they are centralized. So centralized system are costly and have many privacy issues and are more prone to be hacked.

1.4. Problem Definition

Healthcare is evolving over the years to accommodate software to play an important role. Health IT is now involved in the development of automated and interoperable healthcare information systems, expected to improve medical care, lower costs, increase efficiency, reduce error and increase patient satisfaction. Electronic Health Record is the central component of health IT infrastructure. It must replace traditional paper-based medical history as it embodies numerous drawbacks such as being at risk as paper records are vulnerable to fire or rain hazards, contain unambiguous physician notes, pose difficulty in searching for a patient's history among thousands or millions of records and fragmented patient documents.

1.5. Methodology used

1) *MongoDB:*

MongoDB is a free and open-source cross-platform document-oriented database program. It is classified as NoSQL database, It uses JSON like structure with schemas.Healthcare provider chains have huge amount of patient data. it is a challenge to store style of structured and unstructured information that is needed, ranging from basic patient info and medical histories to science laboratory results and MRI pictures.ahead, the shortage of centralization makes it difficult for health professionals and patients for accessing right info at the correct time. victimisation MongoDB, aid suppliers will produce an application that gives 360 degree read of the patient, doctor, procedures and alternative sorts of information during a lone datastore. and conjointly aid supplier chains will serve additional patients in minimum time.

Features of mongoDB:-

i) Ad hoc queries:

MongoDB supports field, regular expression searches , vary queries,. Queries can return us specific fields of documents and conjointly embody user-defined javascript functions. Queries may be organized to come back a random sample of results of a given size.

ii) Indexing:

Fields in an exceedingly MongoDB document will be indexed with primary and secondary indices.

iii) Replication:

MongoDB provides high accessibility with duplicate sets. A duplicate set consists of 2 or additional copies of the info. every duplicate set member could act within the role of primary or secondary duplicate at any time. All writes and reads ar done on the first duplicate by default. Secondary replicas maintain a duplicate of the info of the

first victimisationintegral replication. once a primary duplicate fails,
the duplicate set mechanically conducts AN election method to seethat secondary ought
to become the first. Secondaries will optionally
serve browse operations, however that information is barely eventually consistent by default.

iv) Load balancing:

MongoDB scales horizontally victimization sharding. The user chooses a sherd key, that determines however the information in an exceedingly assortment are distributed. the information is split into ranges (based on the sherd key) and distributed across multiple shards. (A sherd could be a master with one or a lot of slaves.). as an alternative, the sherd key is hashed to map to a sherd – facultative a fair information distribution. MongoDB will run over multiple servers, equalization the load or duplicating information to stay the system up and running just in case of hardware failure.

v) File storage:

MongoDB is used as a classification system with load equalization and information replication options over multiple machines for storing files.This perform, known as grid classification system, is enclosed with MongoDB drivers. MongoDB exposes functions for file manipulation and content to developers. GridFS is employed in plugins for Nginx and lighttpd. GridFS divides a file into elements, or chunks, and stores every of these chunks as a separate document.

vi) Aggregation:

Map Reduce may be used for back processing of data and aggregation operations.
The aggregation framework permits users to get the type of results that the SQL cluster BY clause is employed. Aggregation operators may be set up along to create a pipeline – analogous to UNIX pipes. The aggregation framework includes the $lookup operator which might be part of documents from multiple documents, moreover as applied
mathematics operators like variance.

vii) Server-side JavaScript execution:

JavaScript may be employed in queries, aggregation functions (such as Map Reduce), and sent on to the information to be dead.

viii) Capped collections:

MongoDB supports fixed-size collections known as capped collections.This
kind of assortment maintains insertion order and, once the desired size has been reached, behaves sort of a circular queue.

ix) Transactions:

The current stable unleash doesn't support transactions, however transactions are scheduled to be on the market in a very new major unleash.

2) ***NoSQL***:

A NoSQL information provides a mechanism for storage and retrieval of data that's shapely in suggests that apart from the tabular relations employed in relative databases. Such databases have existed since the late Sixties, however didn't obtain the "NoSQL" nickname till a surge of recognition within the early ordinal century, triggered by the requirements of internet two.0 firms like Facebook, Google, and Amazon.com. NoSQL knowledge bases are more and more employed in massive data and time period internet applications. NoSQL systems are typically referred to as "Not solely SQL" to emphasise that they will support SQL-like question languages.

Electronic Health Record (EHR) systems supply important edges for health care. The improved accessibility of health care data from multiple locations contributes to the accuracy and timeliness of care, and may cause overall improved quality of supplying. sensible expertise and relevant analysis demonstrate that there are several technological problems that require to be addressed for contemporary health care systems to be effective in sharing EHRs because the structure and size of the health care knowledge have modified significantly over time. Recent literature shows that the rising NoSQL databases have important benefits like simple and automatic scaling, higher performance and high accessibility that address the constraints of relative databases in distributed healthcare systems. during this paper we tend to reviewed EHRs and also the key options of NoSQL databases. we tend to then evaluated the suitableness of NoSQL databases in meeting the wants of national EHR systems in sharing EHRs in a very distributed system surroundings.

Chapter 2: Literature Survey

2.1 Research Papers -Mentioned in IEEE Format

a. Abstract of each research paper

1. Need for Electronic Health Record

http://ijsrcseit.com/paper/CSEIT1723316.pdf

(Dr. Jitendranath Mungara, Chaitra Rao)

Electronic Health Records are digitalized, real-time, patient-centric records which is becoming the central source of information in the healthcare industry. The need for EHRs to replace paper-based entry and storage of patient data is high. Most developed countries have realized the need to switch to EHRs. India being one of the developing countries has not fully considered the idea of EHRs and is still contemplating on it. 5.2 million medical errors occur in India annually. A major reason for this could be due to lack of interoperability between facilities and absence of patient health record history. Often, personal health data is stored in multiple clinical institutions and in nonsharable formats. To provide effective, meaningful and continuity of care, patient health data must be centrally available and comprehensive. This can be achieved by adopting standardized electronic health record formats as defined in HL7 framework.

2. Implementation of Cloud based Electronic Health Record (EHR) for Indian Healthcare Needs

www.indjst.org/index.php/indjst/article/download/86391/66889

(R. Kavitha*, E. Kannan and S. Kotteswaran)

EHR means the digital version of the patients medical report, in store the data in real time, it contains medication and treatment history which includes the broader view of patients care and it also contains patients medical history, diagnosis, medications, treatment plans, immunization data, allergies, radiology images, laboratory and test results. Methods/Statistical Analysis: The main intention of EHR is to have access to evidence based tools that health providers can make use to make decision and disease diagnosis about the patients care delivery. The current population of India (2014) is 1.27 billion. About 72.2% of the population lives in some 638,000 villages and the rest 27.8% in about 5,480 towns and urban agglomerations. Findings: In our proposed work we develop Electronic Health Records (EHR) to integrate with the health care providers all over India and to implement it with the cloud infrastructure. The main challenges that are addressed in this works are, handling heterogeneous data, data storage, use of data analytics tool for decision making, data privacy and the data security. Application/Improvements: This can be used to integrate the healthcare management system. Once implemented it provides remote medication, vaccination management, disease diagnosis, remote diagnosis and remote real time monitoring and personal health record.

3. MongoDB and NoSQL Databases

http://www.ijcaonline.org/archives/volume167/number10/jain-2017-ijca-914385.pdf

(Vidushi Jain and Aviral Upadhyay)

With the information becoming drastically and the structure of information turning out to be progressively adaptable, MongoDB has supplanted the relational database in numerous applications. In many applications it has outperformed the traditional SQL databases, and hence in this paper there would be modeling about the changes from SQL no NoSQL database also bringing out it's advantages and disadvantages.

4. An Evaluation of NoSQL Databases for Electronic Health Record Systems

https://www.researchgate.net/publication/265797170_An_Evaluation_of_NoSQL_Databases_for_Electronic_Health_Record_Systems

(Mehmet Ercan and Michael Lane)

Electronic Health Record (EHR) systems offer significant benefits for healthcare. The improved availability of healthcare information from multiple locations contributes to the accuracy and timeliness of care, and should lead to overall improved quality of healthcare delivery. Practical experience and relevant research demonstrate that there are many technological issues that need to be addressed for modern healthcare systems to be effective in sharing EHRs as the structure and size of the healthcare data have changed considerably over time. Recent literature shows that the emerging NoSQL databases have significant advantages such as easy and automatic scaling, better performance and high availability which address the limitations of relational databases in distributed healthcare systems. In this paper we reviewed EHRs and the key features of NoSQL databases. We then evaluated the suitability of NoSQL databases in meeting the requirements of national EHR systems in sharing EHRs in a distributed system environment

Chapter 3: Requirements for the proposed system

The requirements for the Interoperability of Electronic Health Record comprises of :-

3.1 Functional Requirements

The below functional requirements states that what system must do in order to achieve the requirements of the project :

1) Managing

Identify and maintain a patient record, Manage patient demographics, Manage problem lists, Manage medical lists, Manage patient history, Manage clinical documents and notes.

2) Storing

Capture and store external clinical documents .Present care plans, guidelines and protocols. Consistency medical history/problem list. Health information exchange- ability to share data across health system with patient's permission.

3.2. Non-Functional Requirements

1)System Security

Given system should be secure as the images are used so this images should not goes in wrong hands. System also gives details about object health and energy spectrum for some clients it might be a personal things so this things should not accessible to anyone

2) Response time should be good

System should have good response time as it takes less time users or clients will get instant results and some actions taken according to its health. Response is also major parameter because when system takes less time for processing the faster computing is done.

3)Should be compatible

As there are many products present so the developed system should be compatible to those and should not misbehave on them when it run.

4)Versatile

The System should be versatile in any situation. There are many new products developed daily so for them the system should adapt their environment and gives better performance on it

3.3. Hardware & Software Requirements

3.3.1. Hardware Requirements

- Processor : Intel core i3
- RAM : 2GB
- Hard Disk Drive : 256GB

3.3.2. Software Requirements

- Operating System : Windows XP or Vista or 7 or higher version
- Mongo DB

Chapter 4: Proposed Design

4.1. Block Diagram:

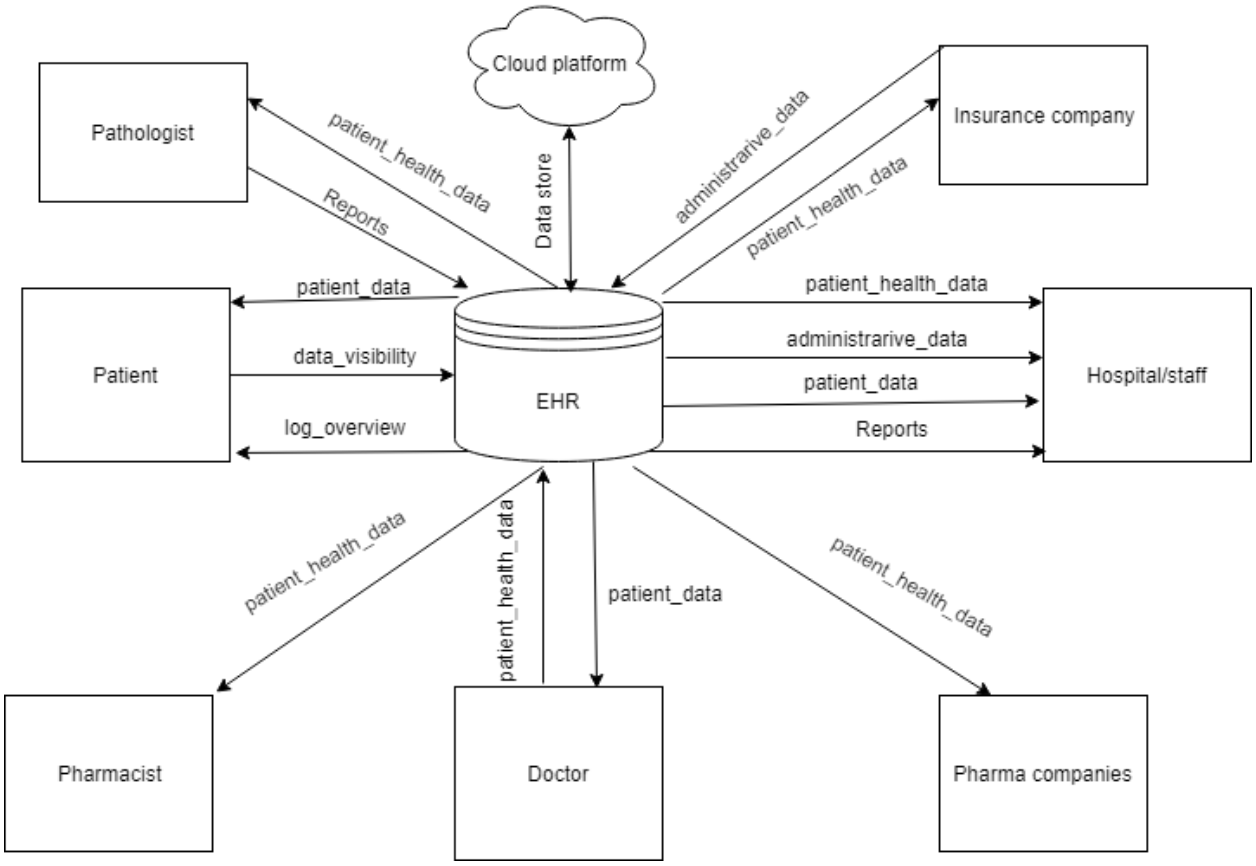

Fig 1

Explanation for the block diagram :

A **block diagram** is a diagram of a system in which the principal parts or functions are represented by blocks connected by lines that show the relationships of the blocks.

Block diagrams are typically used for higher level, less detailed descriptions that are intended to clarify overall concepts without concern for the details of implementation.

The above diagram consist of 7 blocks –patient, doctor, hospital/staff, insurance company, pharma company, pharmacist, pathologist.

4.2 Design of the proposed system with proper explanation of each :
a. Data Flow Diagram (Level 0,1,2)

DFD LEVEL 0

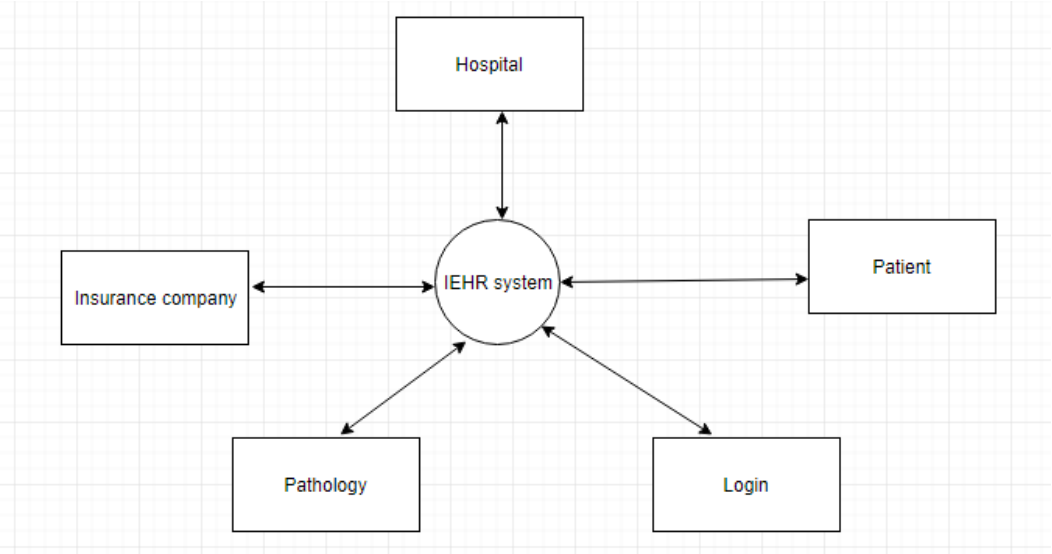

Fig 3.1

DFD LEVEL 1

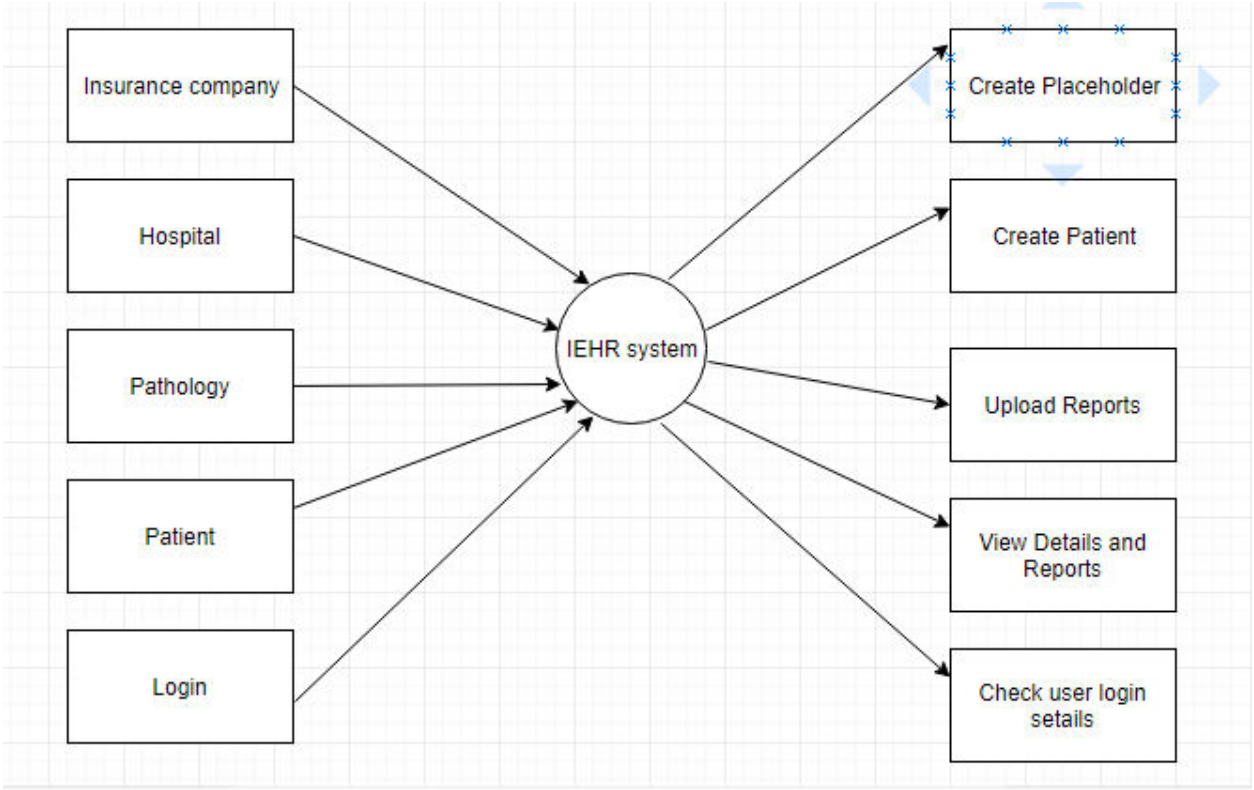

Fig 3.2

DFD LEVEL 2

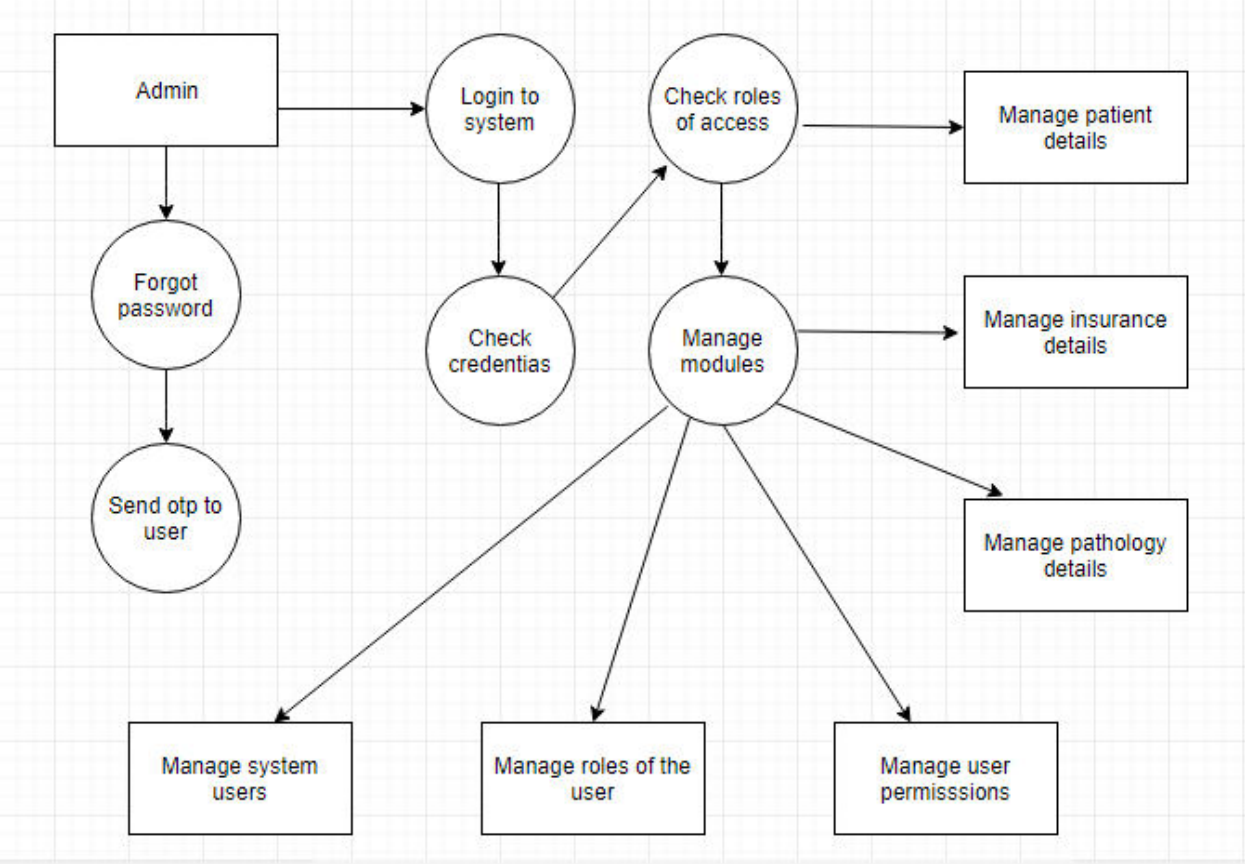

Fig 3.3

A **data flow diagram** (**DFD**) is a graphical representation of the "flow" of data through an information system, odeling its *process* aspects. A DFD is often used as a preliminary step to create an overview of the system without going into great detail, which can later be elaborated.

Level 0 DFD shows the system and their corresponding users .level 0 gives the overview of the system and further explained in detail in another level.

Level 1 DFD has 5 main modules hospital, insurance company, pathology, patient and login.

Hospital can upload or can view the patient data that is stored onto the system, pathlogy can also view the records of patient and can upload the reports of patient .

Level 2 DFD elaborates any 1 module of level 1.Here,we elaborate data sets further in detail.It includes admin who can login into the system and can see the roles and can give access to various parties who wants to see the patients record and according to that it gives allowance whether he/she can see the data or not.

b. Flowchart for the proposed system

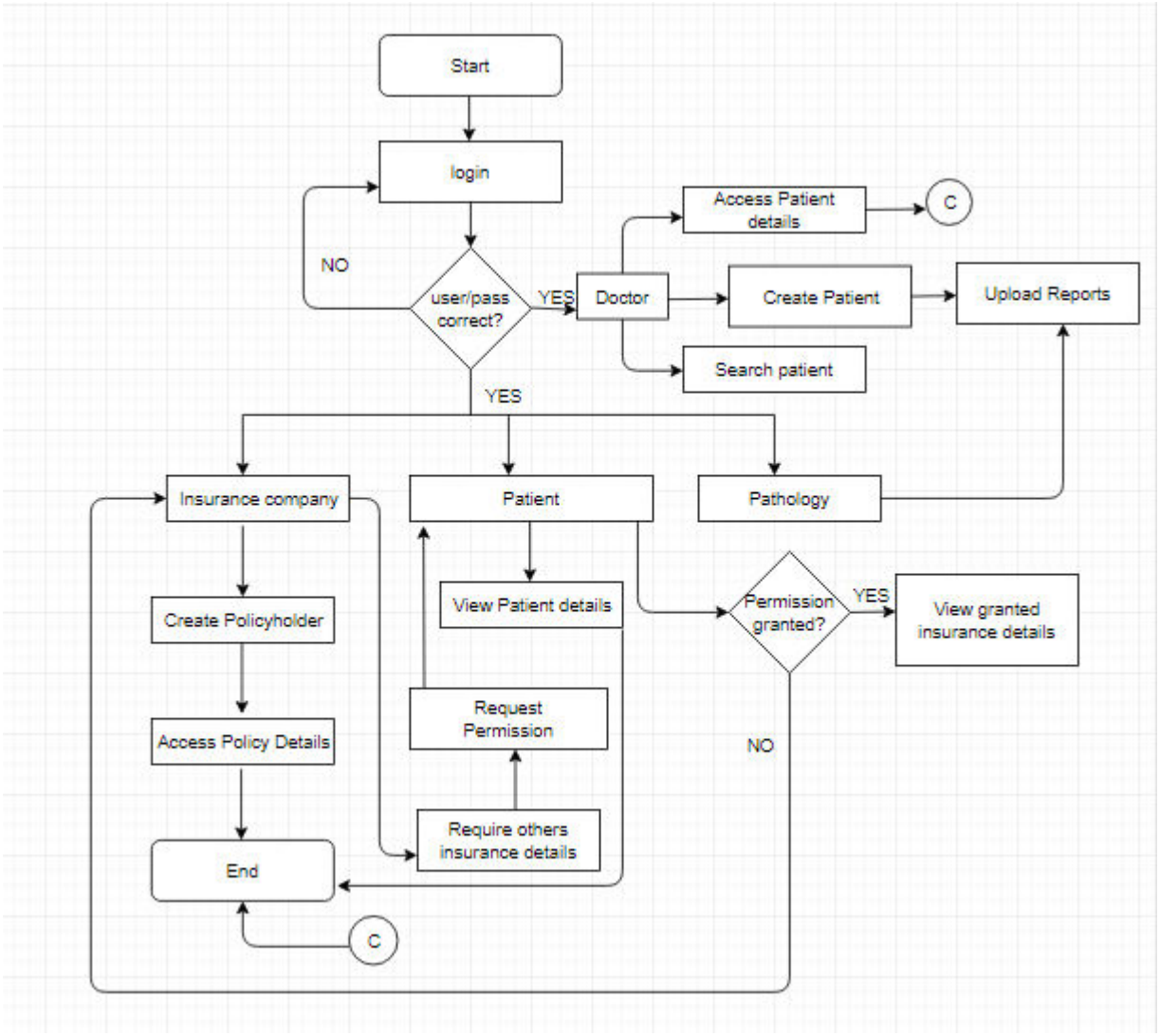

Fig 4

c. Gantt Chart:

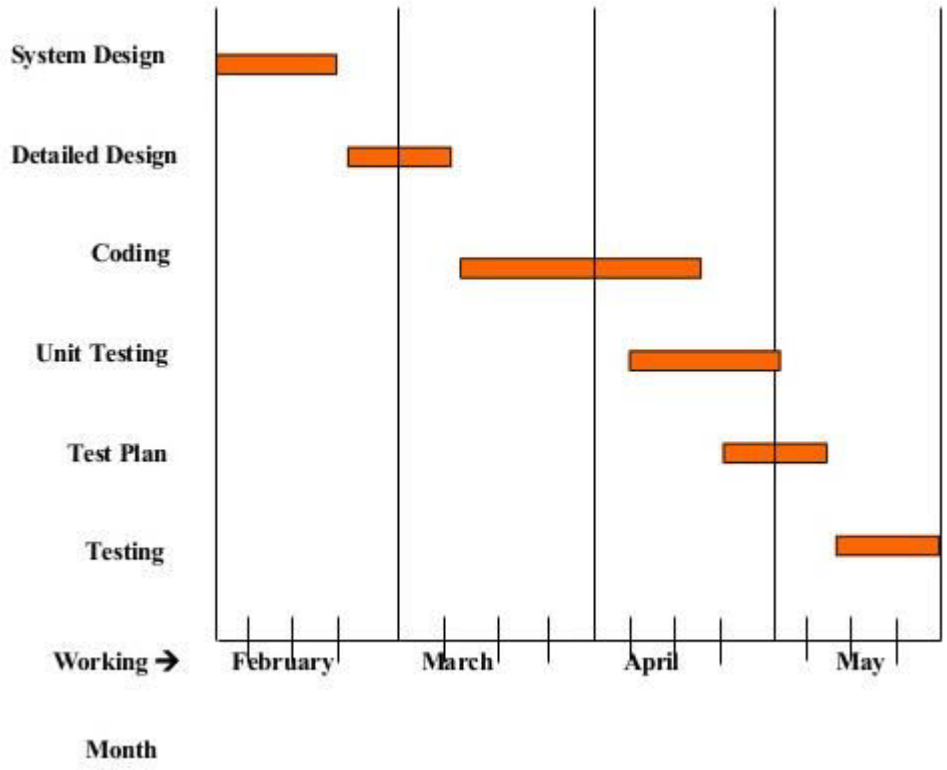

Fig 5

5.Implementation Details

5.1 User Interface for Website

Website Code:
//Login.php

```
<?php include('server.php')

?>
<!DOCTYPE html>
<html>
<head>
  <title>IEHR Login</title>
  <link rel="stylesheet" type="text/css" href="style.css">
</head>
<body>
 <div class="iehr">
 <img src="logo.png" align="left" >
  <h1>Interoperability of Electronic Health Record</h1>
 </div>
  <div class="header">
        <h2>Login</h2>
  </div>

  <form method="post" action="login.php">
        <?php include('errors.php'); ?>
        <div class="input-group">
              <label>Username</label>
              <input type="text" name="username" >
        </div>
        <div class="input-group">
              <label>Password</label>
              <input type="password" name="password">
        </div>
        <div class="input-group">
              <button type="submit" class="btn" name="login_user">Login</button>
        </div>
        <p>
              Not yet a member? <a href="register.php">Sign up</a>
        </p>
  </form>
  <footer class="footer-basic-centered">
```

```
                        <p class="footer-company-motto">&copy 2018 - Made with <span><i
class="fas fa-heart"> </i></span> at VESIT

</p>

      </footer>
</body>
</html>

//register.php
<?php include('server.php') ?>
<!DOCTYPE html>
<html>
<head>
  <title>IEHR Register</title>
  <link rel="stylesheet" type="text/css" href="style.css">
</head>
<body>

  <div class="iehr">
   <img src="logo.png" align="left" >
  <h1>Interoperability of Electronic Health Record</h1>
  </div>
  <div class="header">
        <h2>Register</h2>
  </div>

  <form method="post" action="register.php">
        <?php include('errors.php'); ?>
        <div class="input-group">
          <label>Username</label>
          <input type="text" name="username" value="<?php echo $username; ?>">
        </div>
        <div class="input-group">
          <label>Email</label>
          <input type="email" name="email" value="<?php echo $email; ?>">
        </div>
        <div class="input-group">
          <label>Password</label>
          <input type="password" name="password_1">
        </div>
        <div class="input-group">
          <label>Confirm password</label>
          <input type="password" name="password_2">
        </div>
```

```
        <div class="input-group">
          <button type="submit" class="btn" name="reg_user">Register</button>
        </div>
        <p>
                Already a member? <a href="login.php">Sign in</a>
        </p>
  </form>
</body>
</html>
```

```
//otp_send_p.php
<html>
<head>
<title>OTP</title>
<link rel="stylesheet" href="style.css" type="text/css" >
</head>
<body>
 <div class="iehr">
 <img src="logo.png" align="left" >
  <center><h1>Interoperability of Electronic Health Record</h1></center>
 </div>
<div class="iehr">


</h4>

</div>

<?php

session_start();

if(isset($_GET['number'])){

        $number = $_GET['number'];
        $_SESSION['number']= $number;
}
$_SESSION["API_KEY"] = "04916fd8-a79e-11e7-94da-0200cd936042";
// this is it's actual use to check number is set or not
function sendSMS($number){

        $AUTO_GEN ="/AUTOGEN";
        $curl = curl_init();
```

```
        curl_setopt_array($curl, array(
          CURLOPT_URL => "http://2factor.in/API/V1/" .$_SESSION["API_KEY"] .
"/SMS/+91" . $number . $AUTO_GEN,
          CURLOPT_RETURNTRANSFER => true,
          CURLOPT_ENCODING => "",
          CURLOPT_MAXREDIRS => 10,
          CURLOPT_TIMEOUT => 30,
          CURLOPT_HTTP_VERSION => CURL_HTTP_VERSION_1_1,
          CURLOPT_CUSTOMREQUEST => "POST"
          //CURLOPT_POSTFIELDS => " {\"From\": \  " {0Se2n2derId}\",\"To\":
\"{CommaSeparatedContacts}\", \"Msg\": \"{MessageBody}\", \"SendAt\":
\"{OptionScheduleTime}\"}",
        ));

        $response = curl_exec($curl);
        $err = curl_error($curl);

        curl_close($curl);

        if ($err) {
          return 158;// error code for sms  sending error
        } else {
          return $response;
        }
}

function verifyOTP($otp){

        $VERIFY ="/VERIFY/";
        $curl = curl_init();

        curl_setopt_array($curl, array(
          CURLOPT_URL => "http://2factor.in/API/V1/" . $_SESSION["API_KEY"] . "/SMS" .
$VERIFY . $_SESSION["details"] . "/" . $otp,
          CURLOPT_RETURNTRANSFER => true,
          CURLOPT_ENCODING => "",
          CURLOPT_MAXREDIRS => 10,
          CURLOPT_TIMEOUT => 30,
          CURLOPT_HTTP_VERSION => CURL_HTTP_VERSION_1_1,
          CURLOPT_CUSTOMREQUEST => "POST"
          //CURLOPT_POSTFIELDS => " {\"From\": \  " {0Se2n2derId}\",\"To\":
\"{CommaSeparatedContacts}\", \"Msg\": \"{MessageBody}\", \"SendAt\":
\"{OptionScheduleTime}\"}",
        ));
```

```
        $response = curl_exec($curl);
        $err = curl_error($curl);

        curl_close($curl);

        if ($err) {
          return 258;// error code for sms verification
        } else {
          return $response;
        }
}


function IsUserRegistered($number,$con){
        if($number=="" || empty($number)){
                //invalid data
                return 503;
        }else{
                //query for checking existance of user
                $query = "SELECT id from patientdata where number=$number";
                $res = mysqli_query($con,$query);
                $res = mysqli_fetch_array($res);
                if(empty($res)){
                        return false;
                }else{
                        return true;
                }
        }
}
$con = mysqli_connect("localhost", "root", "");
if(!$con){
        die('Could not connect:'.mysqli_error());
}

mysqli_select_db($con, "patient");

if(isset($_GET["submit"])){
        if(isset($_GET["number"])){
                //IsUserRegistered($_GET["number"],$con);
                if(IsUserRegistered($_GET["number"],$con)){
                        //user is registered
                        $server_return = sendSMS($_GET["number"]);
                        if($server_return == 158){
                                echo "Internal error <br> Error: Sending failed";
                        }else{
                                $json_string = json_decode($server_return,true);
```

```
                                //print_r($json_string);
                                //echo $json_string["Status"];
                                if($json_string["Status"]=== "Success"){
                                        //message sent succssfully
                                        //save the session details for verification
                                        $_SESSION["details"] = $json_string["Details"];
                                        echo $_SESSION["details"];
                                        //$_SESSION["flag"] =true;
                                }
                        }
                        //echo "user is registered";
                }else{
                        //new user redirect to registration page
                        //echo "new user";
                        //echo '</br>';
                        //echo '<a href = "pp.html">Click here to register</a>';
                        header("Location:pp.html");
                }
        }else{
                //csenatch the otp for user verfification
                $verification_Response = verifyOTP($_GET["otp"]);
                if($verification_Response == 258){
                        echo "Error: <br> OTP Authentication failed , either wrong OTP is
entered or connection time out occured. try again";
                }else{
                        $json_string = json_decode($verification_Response,true);
                        //print_r($json_string);
                        //echo $json_string["Status"];

                        if($json_string["Status"]=== "Success" && !($json_string["Status"] ===
"Error")){
                                //user verification successful
                                // redirect user to main page now
                                //echo "success";
                                //$string = $number;

                                //query main issue hai idhar zero row return ho raha hai
                                $query = 'SELECT * FROM patientdata WHERE number=\" .
$_SESSION['number'] . '\";
                                $result = mysqli_query($con, $query);

                                //print_r($result);

                                if (!$result) {
                                        printf("Error: %s\n", mysqli_error($con));
                                        exit();
```

```
}



$rows = mysqli_fetch_array($result);
//print_r($rows);


echo"<br>";
echo"<center>";
echo "<table border=5>";
echo"<tr>";
echo"<td>First Name</td>";
echo"<td>Last Name</td>";
echo"<td>Age</td>";
echo"<td>id</td>";
echo"<td>id type</td>";
echo"<td>DOB</td>";
echo"<td>number</td>";
echo"<td>gender</td>";
echo"<td>address</td>";
echo"<td>blood_group</td>";
echo"<td>sugar_level</td>";
echo"<td>blood_pressure</td>";
echo"<td>image</td>";


echo"</tr>";
echo  "<tr>";

                    echo  "<td>";
                    echo $rows['first_name'];
                    echo  "</td>";

                    echo  "<td>";
                    echo $rows['last_name'];
                    echo  "</td>";

                    echo  "<td>";
                    echo $rows['age'];
                    echo "</td>";

                    echo "<td>";
                     $id=$rows['id'];
                    echo $id;
                    echo "</td>";
```

```
                                                    echo "<td>";
                                                    echo $rows['id_type'];
                                                    echo "</td>";

                                                    echo "<td>";
                                                    echo $rows['DOB'];
                                                    echo "</td>";

                                                    echo "<td>";
                                                    echo $rows['number'];
                                                    echo "</td>";

                                                    echo "<td>";
                                                    echo $rows['gender'];
                                                    echo "</td>";

                                                    echo "<td>";
                                                    echo $rows['address'];
                                                    echo "</td>";

                                                    echo "<td>";
                                                    echo $rows['blood_group'];
                                                    echo "</td>";

                                                    echo "<td>";
                                                    echo $rows['sugar_level'];
                                                    echo "</td>";

                                                    echo "<td>";
                                                    echo $rows['blood_pressure'];
                                                    echo "</td>";

                                                    echo "<td>";
                                                    $img= $rows['image'];
                                                    //echo"<a
href='download.?dow=$target'>Download</a><br>";
                                                    echo"<a href='images/$img' target='_blank'>view
file</a>";

                                                    echo "</td>";
                                                    echo  "</tr>";



                                        echo "</table>";
```

```
                                        echo "<br/>";
                                        echo "<table border=5>";
                                       echo"<tr>";
                                       echo"<td>Reports</td>";
                                                        echo "<td>";
                                                        //$doc= $rows['report'];
                                                        //echo"<a
href='download.?dow=$target'>Download</a><br>";
                                                        //echo"<a href='uploads/$id/' target='_blank'>view
file</a>";
                                                        //echo dirname("uploads/$id/", 1);
                                                        //echo "Here are our files";
$path = "uploads/$id/";
$dh = opendir($path);
$i=1;
while (($file = readdir($dh)) !== false) {
  if($file != "." && $file != ".." && $file != "index.php" && $file != ".htaccess" && $file !=
"error_log" && $file != "cgi-bin") {
      echo "<a href='$path/$file'>$file</a><br />";
    $i++;
  }
}
closedir($dh);
                                                        echo "</td>";
                                                        echo  "</tr>";



                                        echo "</table>";
                                        echo"</center>";
                                }else{
                                       echo "error";
                                }

                        }
                }
}else{
        echo "Please enter valid 10 digit number";
}

if(isset($_GET["number"])){
        //take user input for otp he received
        $html = '
        <form action="./otpsend_p.php" method = "get">
                <label>Received OTP:<input type="text" name = "otp"/></label>
                <input type = "submit" name = "submit"/>
```

```
        </form>
        ';

        echo $html;
}
?>
 <footer class="footer-basic-centered">

                        <p class="footer-company-motto">&copy 2018 - Made with <span><i
class="fas fa-heart"> </i></span> at VESIT

</p>

      </footer>
</body>
</html>
```

```
//index.php
<?php
  session_start();

  if (!isset($_SESSION['username'])) {
        $_SESSION['msg'] = "You must log in first";
        header('location: login.php');
  }
  if (isset($_GET['logout'])) {
        session_destroy();
        unset($_SESSION['username']);
        header("location: login.php");
  }


?>
<!DOCTYPE html>
<html>
<head>
        <title>IEHR Home</title>
        <link rel="stylesheet" type="text/css" href="style.css">
```

```
</head>
<body>


 <div class="iehr">
 <img src="logo.png" align="left" >
  <center><h1>Interoperability of Electronic Health Record</h1></center>
 </div>
<div class="iehr">

<a href="index.php" style="text-decoration:none; color: white; font-size:
25px;">Home</a>    
<a href="patient_search_html.php" style="text-decoration:none; color: white; font-size:
25px;">Search Patient</a>    

<a href="pp_html.php"  style="text-decoration:none; color: white; font-size: 25px;">Create
Patient</a>    

<a href="index1.php" style="text-decoration:none; color: white; font-size:
25px;">Upload</a>    
<a href="insurance_html.php" style="text-decoration:none; color: white; font-size:
25px;">Create Policyholder </a>    
<a href="patient_policy_search.php" style="text-decoration:none; color: white; font-size:
25px;">View Insurance data </a>    
<a href="index.php?logout='1'" style="text-decoration:none; color: red; float: right; font-size:
20px; " >Logout</a>

</h4>

</div>

<div class="content">
          <!-- notification message -->
          <?php if (isset($_SESSION['success'])) : ?>
     <div class="error success" >
          <h3>
         <?php
          echo $_SESSION['success'];
          unset($_SESSION['success']);
         ?>
          </h3>
     </div>
          <?php endif ?>

   <!-- logged in user information -->
   <?php  if (isset($_SESSION['username'])) : ?>
```

```
        <p>Welcome <strong><?php echo $_SESSION['username']; ?></strong></p>

        <p>  </p>
   <?php endif ?>
</div>
</br>
</br>
</br>
<div class="about">
From the perspective of Indian Medical care system, patients visit several doctors, throughout their life time right from visiting a primary health center to community health. Health records get generated with every clinical meet during the inpatient or emergency visits. However, as it is paper based most of the health records are either lost by the patients or remain in the supervision of health care providers and gets destroyed. As per the maintenance period of medical records generally followed by hospitals is 5 years for out-patient records and 10 years for in patient records. Medical records are however retained permanently. We do have the concepts of EMR/EHR in India. But there are certain barriers to it. The idea behind any technology or a invention is to make things simpleandeasyforeveryone.

To Store the health record of patients to digital system and accessing the record whenever required.
So simple that even peoples in rural area can run it and to achieve interoperability of that record without affecting the security and privacy of the user.


</div>
 <footer class="footer-basic-centered">

                        <p class="footer-company-motto">&copy 2018 - Made with <span><i class="fas fa-heart"> </i></span> at VESIT

</p>

      </footer>
</body>
</html>



//otp_semd_p.php
<html>
<head>
<title>OTP</title>
<link rel="stylesheet" href="style.css" type="text/css" >
</head>
<body>
```

```
 <div class="iehr">
 <img src="logo.png" align="left" >
  <center><h1>Interoperability of Electronic Health Record</h1></center>
 </div>
<div class="iehr">


</h4>

</div>

<?php

session_start();

if(isset($_GET['number'])){

        $number = $_GET['number'];
        $_SESSION['number']= $number;
}
$_SESSION["API_KEY"] = "04916fd8-a79e-11e7-94da-0200cd936042";
// this is it's actual use to check number is set or not
function sendSMS($number){

        $AUTO_GEN ="/AUTOGEN";
        $curl = curl_init();

        curl_setopt_array($curl, array(
          CURLOPT_URL => "http://2factor.in/API/V1/" .$_SESSION["API_KEY"] .
"/SMS/+91" . $number . $AUTO_GEN,
          CURLOPT_RETURNTRANSFER => true,
          CURLOPT_ENCODING => "",
          CURLOPT_MAXREDIRS => 10,
          CURLOPT_TIMEOUT => 30,
          CURLOPT_HTTP_VERSION => CURL_HTTP_VERSION_1_1,
          CURLOPT_CUSTOMREQUEST => "POST"
          //CURLOPT_POSTFIELDS => " {\"From\": \  " {0Se2n2derId}\",\"To\":
\"{CommaSeparatedContacts}\", \"Msg\": \"{MessageBody}\", \"SendAt\":
\"{OptionScheduleTime}\"}",
        ));

        $response = curl_exec($curl);
        $err = curl_error($curl);

        curl_close($curl);
```

```
        if ($err) {
          return 158;// error code for sms  sending error
        } else {
          return $response;
        }
}

function verifyOTP($otp){

        $VERIFY ="/VERIFY/";
        $curl = curl_init();

        curl_setopt_array($curl, array(
          CURLOPT_URL => "http://2factor.in/API/V1/" . $_SESSION["API_KEY"] . "/SMS" .
$VERIFY . $_SESSION["details"] . "/" . $otp,
          CURLOPT_RETURNTRANSFER => true,
          CURLOPT_ENCODING => "",
          CURLOPT_MAXREDIRS => 10,
          CURLOPT_TIMEOUT => 30,
          CURLOPT_HTTP_VERSION => CURL_HTTP_VERSION_1_1,
          CURLOPT_CUSTOMREQUEST => "POST"
          //CURLOPT_POSTFIELDS => " {\"From\": \  " {0Se2n2derId}\",\"To\":
\"{CommaSeparatedContacts}\", \"Msg\": \"{MessageBody}\", \"SendAt\":
\"{OptionScheduleTime}\"}",
        ));

        $response = curl_exec($curl);
        $err = curl_error($curl);

        curl_close($curl);

        if ($err) {
          return 258;// error code for sms verification
        } else {
          return $response;
        }
}


function IsUserRegistered($number,$con){
        if($number=="" || empty($number)){
                //invalid data
                return 503;
        }else{
                //query for checking existance of user
                $query = "SELECT id from patientdata where number=$number";
```

```
                $res = mysqli_query($con,$query);
                $res = mysqli_fetch_array($res);
                if(empty($res)){
                        return false;
                }else{
                        return true;
                }
        }
}
$con = mysqli_connect("localhost", "root", "");
if(!$con){
        die('Could not connect:'.mysqli_error());
}

mysqli_select_db($con, "patient");

if(isset($_GET["submit"])){
        if(isset($_GET["number"])){
                //IsUserRegistered($_GET["number"],$con);
                if(IsUserRegistered($_GET["number"],$con)){
                        //user is registered
                        $server_return = sendSMS($_GET["number"]);
                        if($server_return == 158){
                                echo "Internal error <br> Error: Sending failed";
                        }else{
                                $json_string = json_decode($server_return,true);
                                //print_r($json_string);
                                //echo $json_string["Status"];
                                if($json_string["Status"]=== "Success"){
                                        //message sent succssfully
                                        //save the session details for verification
                                        $_SESSION["details"] = $json_string["Details"];
                                        echo $_SESSION["details"];
                                        //$_SESSION["flag"] =true;
                                }
                        }
                        //echo "user is registered";
                }else{
                        //new user redirect to registration page
                        //echo "new user";
                        //echo '</br>';
                        //echo '<a href = "pp.html">Click here to register</a>';
                        header("Location:pp.html");
                }
        }else{
                //csenatch the otp for user verfification
```

```
		$verification_Response = verifyOTP($_GET["otp"]);
		if($verification_Response == 258){
			echo "Error: <br> OTP Authentication failed , either wrong OTP is entered or connection time out occured. try again";
		}else{
			$json_string = json_decode($verification_Response,true);
			//print_r($json_string);
			//echo $json_string["Status"];

			if($json_string["Status"]=== "Success" && !($json_string["Status"] === "Error")){
				//user verification successful
				// redirect user to main page now
				//echo "success";
				//$string = $number;

				//query main issue hai idhar zero row return ho raha hai
				$query = 'SELECT * FROM patientdata WHERE number=\" . $_SESSION['number'] . '\";
				$result = mysqli_query($con, $query);

				//print_r($result);

				if (!$result) {
					printf("Error: %s\n", mysqli_error($con));
					exit();
				}



				$rows = mysqli_fetch_array($result);
				//print_r($rows);


				echo"<br>";
				echo"<center>";
				echo "<table border=5>";
				echo"<tr>";
				echo"<td>First Name</td>";
				echo"<td>Last Name</td>";
				echo"<td>Age</td>";
				echo"<td>id</td>";
				echo"<td>id type</td>";
				echo"<td>DOB</td>";
				echo"<td>number</td>";
				echo"<td>gender</td>";
```

```
echo"<td>address</td>";
echo"<td>blood_group</td>";
echo"<td>sugar_level</td>";
echo"<td>blood_pressure</td>";
echo"<td>image</td>";


echo"</tr>";
echo  "<tr>";

                    echo  "<td>";
                    echo $rows['first_name'];
                    echo  "</td>";

                    echo  "<td>";
                    echo $rows['last_name'];
                    echo  "</td>";

                    echo  "<td>";
                    echo $rows['age'];
                    echo "</td>";

                    echo "<td>";
                     $id=$rows['id'];
                    echo $id;
                    echo "</td>";

                    echo "<td>";
                    echo $rows['id_type'];
                    echo "</td>";

                    echo "<td>";
                    echo $rows['DOB'];
                    echo "</td>";

                    echo "<td>";
                    echo $rows['number'];
                    echo "</td>";

                    echo "<td>";
                    echo $rows['gender'];
                    echo "</td>";

                    echo "<td>";
                    echo $rows['address'];
                    echo "</td>";
```

```
                                                    echo "<td>";
                                                    echo $rows['blood_group'];
                                                    echo "</td>";

                                                    echo "<td>";
                                                    echo $rows['sugar_level'];
                                                    echo "</td>";

                                                    echo "<td>";
                                                    echo $rows['blood_pressure'];
                                                    echo "</td>";

                                                    echo "<td>";
                                                    $img= $rows['image'];
                                                    //echo"<a
href='download.?dow=$target'>Download</a><br>";
                                                    echo"<a href='images/$img' target='_blank'>view
file</a>";

                                                    echo "</td>";
                                                    echo  "</tr>";



                                     echo "</table>";
                                     echo "<br/>";
                                     echo "<table border=5>";
                                    echo"<tr>";
                                    echo"<td>Reports</td>";
                                                    echo "<td>";
                                                    //$doc= $rows['report'];
                                                    //echo"<a
href='download.?dow=$target'>Download</a><br>";
                                                    //echo"<a href='uploads/$id/' target='_blank'>view
file</a>";
                                                    //echo dirname("uploads/$id/", 1);
                                                    //echo "Here are our files";
$path = "uploads/$id/";
$dh = opendir($path);
$i=1;
while (($file = readdir($dh)) !== false) {
  if($file != "." && $file != ".." && $file != "index.php" && $file != ".htaccess" && $file !=
"error_log" && $file != "cgi-bin") {
      echo "<a href='$path/$file'>$file</a><br />";
    $i++;
```

```
   }
}
closedir($dh);
                                                    echo "</td>";
                                                    echo  "</tr>";



                                        echo "</table>";
                                        echo"</center>";
                                }else{
                                        echo "error";
                                }

                        }
                }
}else{
        echo "Please enter valid 10 digit number";
}

if(isset($_GET["number"])){
        //take user input for otp he received
        $html = '
        <form action="./otpsend_p.php" method = "get">
                <label>Received OTP:<input type="text" name = "otp"/></label>
                <input type = "submit" name = "submit"/>
        </form>
        ';

        echo $html;
}
?>
 <footer class="footer-basic-centered">

                        <p class="footer-company-motto">&copy 2018 - Made with <span><i
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</p>

      </footer>
</body>
</html>


//pp.php
<?php
```

```
$firstname = $_POST['firstname'];
$middlename = $_POST['middlename'];
$lastname = $_POST['lastname'];
$id = $_POST['id'];
$idtype = $_POST['idtype'];
$dob = $_POST['dob'];
$age = $_POST['age'];
$gender = $_POST['gender'];
$address = $_POST['address'];
$bt = $_POST['bt'];
$sugar = $_POST['sugar'];
$bp = $_POST['bp'];
$phone = $_POST['number'];

$msg ="";

$target = "images/".basename($_FILES['image']['name']);
$con = mysqli_connect("localhost", "root", "");
if(!$con){
	die('Could not connect:'.mysqli_error());
	}


mysqli_select_db($con, "patient");
$image = $_FILES['image']['name'];
$query = "INSERT INTO patientdata( first_name, middle_name, last_name, id, id_type,DOB,
number,age,gender, address, blood_group, sugar_level, blood_pressure, image)
VALUES('$firstname','$middlename','$lastname', '$id', '$idtype','$dob','$phone','$age',
 '$gender','$address', '$bt', '$sugar', '$bp', '$image')";
if(isset($_POST['upload'])){



	if(move_uploaded_file($_FILES['image']['tmp_name'], $target)){
		$msg = "image uploaded";

		}
		else{
			$msg = "problem uploading image";
		}

}
 if(!mysqli_query($con,$query))
{
	die('Error in inserting records '.mysqli_error($con));
	}else{
```

```
                if(!is_dir('uploads/'.$id)){
                mkdir('uploads/'.$id,0777,true);}

        echo "Data inserted";
        //header("Refresh: 2; url=index.php");
}
?>

//server.php
<?php
session_start();

// initializing variables
$username = "";

$email    = "";
$errors = array();

// connect to the database
$db = mysqli_connect('localhost', 'root', '', 'registration');

// REGISTER USER
if (isset($_POST['reg_user'])) {
  // receive all input values from the form
  $username = mysqli_real_escape_string($db, $_POST['username']);
  $email = mysqli_real_escape_string($db, $_POST['email']);
  $password_1 = mysqli_real_escape_string($db, $_POST['password_1']);
  $password_2 = mysqli_real_escape_string($db, $_POST['password_2']);

  // form validation: ensure that the form is correctly filled ...
  // by adding (array_push()) corresponding error unto $errors array
  if (empty($username)) { array_push($errors, "Username is required"); }
  if (empty($email)) { array_push($errors, "Email is required"); }
  if (empty($password_1)) { array_push($errors, "Password is required"); }
  if ($password_1 != $password_2) {
        array_push($errors, "The two passwords do not match");
  }

  // first check the database to make sure
  // a user does not already exist with the same username and/or email
  $user_check_query = "SELECT * FROM users WHERE username='$username' OR
email='$email' LIMIT 1";
  $result = mysqli_query($db, $user_check_query);
  $user = mysqli_fetch_assoc($result);

  if ($user) { // if user exists
```

```
    if ($user['username'] === $username) {
      array_push($errors, "Username already exists");
    }

    if ($user['email'] === $email) {
      array_push($errors, "email already exists");
    }
  }

  // Finally, register user if there are no errors in the form
  if (count($errors) == 0) {
          $password = md5($password_1);//encrypt the password before saving in the database

          $query = "INSERT INTO users (username, email, password)
                              VALUES('$username', '$email', '$password')";
          mysqli_query($db, $query);
          //$_SESSION['username'] = $username;

  //      $_SESSION['success'] = "You are now logged in";
          header('location: login.php');
  }
}

// ...

// ...

// LOGIN USER
if (isset($_POST['login_user'])) {
  $username = mysqli_real_escape_string($db, $_POST['username']);
  $password = mysqli_real_escape_string($db, $_POST['password']);


  if (empty($username)) {
          array_push($errors, "Username is required");
  }
  if (empty($password)) {
          array_push($errors, "Password is required");
  }


  if (count($errors) == 0) {
          $password = md5($password);
          $query = "SELECT username , password , user_role FROM users WHERE
username='$username' AND password='$password'";
          $results = mysqli_query($db, $query);
```

```
while($row=mysqli_fetch_array($results))
{
        $usernam=$row["username"];
        $passwordd=$row["password"];
        $userrole=$row["user_role"];
        if($username==$usernam && $password==$passwordd){
                $_SESSION["user_role"]=$userrole;
                if($_SESSION["user_role"]=='admin')
                {
                        $_SESSION['username'] = $username;
//i? karn//a ha$_SESSION['user_role'] = $user_role; iska kya



 $_SESSION['success'] = "You are now logged in";

 header('location: index.php');
                }elseif($_SESSION["user_role"]=='patient'){
                        $_SESSION['username'] = $username;
//i? karn//a ha$_SESSION['user_role'] = $user_role; iska kya



 $_SESSION['success'] = "You are now logged in";
                header('location: index_p.php');
                }elseif($_SESSION["user_role"]=='insurance'){
                        $_SESSION['username'] = $username;
//i? karn//a ha$_SESSION['user_role'] = $user_role; iska kya



 $_SESSION['success'] = "You are now logged in";
                header('location: index_i.php');
                }elseif($_SESSION["user_role"]=='pathologist'){
                        $_SESSION['username'] = $username;
//i? karn//a ha$_SESSION['user_role'] = $user_role; iska kya



 $_SESSION['success'] = "You are now logged in";
                header('location: index_path.php');
                }elseif($_SESSION["user_role"]=='doctor'){
                        $_SESSION['username'] = $username;
//i? karn//a ha$_SESSION['user_role'] = $user_role; iska kya
```

```
            $_SESSION['success'] = "You are now logged in";
                        header('location: index_d.php');
                        }
                        else{
                array_push($errors, "Wrong username/password combination ");
        }

                }
        }
 ///    if (mysqli_num_rows($results) == 1 ) {

        //  $_SESSION['username'] = $username;
         //i? karn//a ha$_SESSION['user_role'] = $user_role; iska kya



//$_SESSION['success'] = "You are now logged in";

 //         header('location: index.php');
 //       }else {
 //                array_push($errors, "Wrong username/password combination");
 //       }

  }


}
?>


//upload.php
<?php
session_start();

include_once 'dbconfig.php';
$id = $_POST['id'];

if(isset($_POST['btn-upload']))
{
//if(!is_dir('uploads/'.$id)){
//$folder=mkdir('uploads/'.$id,0777,true)
//}

   // if
        //{mkdir('uploads/'.$id,0777,true};
```

```
        $date=date("Y-m-d ");
        $file = $date."-".$_FILES['report']['name'];
   $file_loc = $_FILES['report']['tmp_name'];
        $file_size = $_FILES['report']['size'];
        $file_type = $_FILES['report']['type'];
        $folder="uploads/".$id."/";

                // new file size in KB
        $new_size = $file_size/1024;
        // new file size in KB

        // make file name in lower case
        $new_file_name = strtolower($file);
        // make file name in lower case

        $final_file=str_replace(' ','-',$new_file_name);

        if(move_uploaded_file($file_loc,$folder.$final_file))
        {
                mysqli_query($con, "UPDATE patientdata SET report='$final_file' WHERE
id='$id' ");
                ?>
                <script>
                alert('successfully uploaded');
      window.location.href='index1.php?success';
      </script>
                <?php
        }
        else
        {
                ?>
                <script>
                alert('error while uploading file');
      window.location.href='index1.php?fail';
      </script>
                <?php
        }
}
?>

//insurance_html.php
<?php

  ?>
  <html>
<head>
```

```
<title>Insurance</title>
<link rel="stylesheet" type="text/css" href="style.css">
</head>
<body>
  <div class="iehr">
 <img src="logo.png" align="left" >
  <h1><center>Interoperability of Electronic Health Record</center></h1>
  </div>
  <div class="iehr">

<a href="index_i.php" style="text-decoration:none; color: white; font-size:
25px;">Home</a>    
<a href="insurance_html.php" style="text-decoration:none; color: white; font-size:
25px;">Create Policyholder</a>    
<a href="patient_policy_search.php" style="text-decoration:none; color: white; font-size:
25px;">View Data</a>    
<a href="index_i.php?logout='1'" style="text-decoration:none; color: red; float: right; font-size:
20px; " >Logout</a>

</h4>

</div>
  <div class="header">
        <h2>Policy Details</h2>
  </div>

<form name="pp" enctype="multipart/form-data"  onsubmit="return validateForm()"
action="insurance.php" method="post" >
<div class="input-group">
<label>Patient ID:</label>
<input type="text" name="id"  value="" required>
        </div>
<div class="input-group">
<label>Patient Name:</label>
<input type="text" name="name"  value="">
        </div>
                <div class="input-group">
<label>Phone Number:</label>
<input type="text" name="number"  value="">
        </div>
        <div class="input-group">
<label>Insurance:</label>
<input type="text" name="insurance" value="">
</div>
<div class="input-group">
<label>Proposer Code:</label>
```

```
<input type="text" name="Proposer_Code"  value="">
        </div>
        <div class="input-group">
<label>Policy Number(Prev):</label>
<input type="text" name="Policy_Previous"  value="">
        </div>
        <div class="input-group">
<label>Policy Number:</label>
<input type="text" name="Policy_Current"  value="">
        </div>
<div>
<label>Start Date</label>
<input type="date" name="start_date" value="">
</div></br>
<div>
<label>End Date</label>
<input type="date" name="End_date" value="">
</div></br>
        <div>
<label>Sector</label>
<select name="sector">
<option value="ps">please select</option>
<option value="rural">Rural</option>
<option value="urban">Urban</option>
</select>
</div></br>
<div class="input-group">
<label>Any Medical Condition?</label>
<input type="text" name="med"  value=""></br>
        </div>
          <button type="submit" onClick="location.href='insurance.html'" class="btn"
name="reg_user">Create</button>
          <div class="input-group">
</form>
</div>
</body>
</html>

//insurane.php
<?php
$id = $_POST['id'];
$Policy_Previous = $_POST['Policy_Previous'];
$Policy_Current = $_POST['Policy_Current'];
$name = $_POST['name'];
$insurance = $_POST['insurance'];
$start_date = $_POST['start_date'];
```

```
$End_date = $_POST['End_date'];
$sector = $_POST['sector'];
$med = $_POST['med'];
$number = $_POST['number'];
$Proposer_Code = $_POST['Proposer_Code'];
$con = mysqli_connect("localhost", "root", "");
if(!$con){
	die('Could not connect:'.mysqli_error());
	}


mysqli_select_db($con, "insurance");
$query = "INSERT INTO insurancedata( id, name,
number,insurance,Proposer_Code,Policy_Previous,Policy_Current,start_date,End_date, sector,
med) VALUES('$id','$name',
'$number','$insurance','$Proposer_Code','$Policy_Previous','$Policy_Current','$start_date','$End
_date','$sector','$med')";
$result = mysqli_query($con, $query);
 if(!$result)
{
	die('Error in inserting records '.mysqli_error($con));
	}else{
	echo "Data inserted";
	//header("Refresh: 2; url=index.php");
}
?>

//view_policy.php
<html>
<head>
<title>OTP</title>
<link rel="stylesheet" href="style.css" type="text/css" >
</head>
<body>


<?php

session_start()

if(isset($_GET['number'])){

	$number = $_GET['number'];
	$_SESSION['number']= $number;
}
$_SESSION["API_KEY"] = "04916fd8-a79e-11e7-94da-0200cd936042";
```

```
// this is it's actual use to check number is set or not
function sendSMS($number){

        $AUTO_GEN ="/AUTOGEN";
        $curl = curl_init();

        curl_setopt_array($curl, array(
          CURLOPT_URL => "http://2factor.in/API/V1/" .$_SESSION["API_KEY"] .
"/SMS/+91" . $number . $AUTO_GEN,
          CURLOPT_RETURNTRANSFER => true,
          CURLOPT_ENCODING => "",
          CURLOPT_MAXREDIRS => 10,
          CURLOPT_TIMEOUT => 30,
          CURLOPT_HTTP_VERSION => CURL_HTTP_VERSION_1_1,
          CURLOPT_CUSTOMREQUEST => "POST"
          //CURLOPT_POSTFIELDS => " {\"From\": \  " {0Se2n2derId}\",\"To\":
\"{CommaSeparatedContacts}\", \"Msg\": \"{MessageBody}\", \"SendAt\":
\"{OptionScheduleTime}\"}",
        ));

        $response = curl_exec($curl);
        $err = curl_error($curl);

        curl_close($curl);

        if ($err) {
          return 158;// error code for sms  sending error
        } else {
          return $response;
        }
}

function verifyOTP($otp){

        $VERIFY ="/VERIFY/";
        $curl = curl_init();

        curl_setopt_array($curl, array(
          CURLOPT_URL => "http://2factor.in/API/V1/" . $_SESSION["API_KEY"] . "/SMS" .
$VERIFY . $_SESSION["details"] . "/" . $otp,
          CURLOPT_RETURNTRANSFER => true,
          CURLOPT_ENCODING => "",
          CURLOPT_MAXREDIRS => 10,
          CURLOPT_TIMEOUT => 30,
          CURLOPT_HTTP_VERSION => CURL_HTTP_VERSION_1_1,
          CURLOPT_CUSTOMREQUEST => "POST"
```

```
            //CURLOPT_POSTFIELDS => " {\"From\": \  " {0Se2n2derId}\",\"To\":
\"{CommaSeparatedContacts}\", \"Msg\": \"{MessageBody}\", \"SendAt\":
\"{OptionScheduleTime}\"}",
        ));

        $response = curl_exec($curl);
        $err = curl_error($curl);

        curl_close($curl);

        if ($err) {
          return 258;// error code for sms verification
        } else {
          return $response;
        }
}


function IsUserRegistered($number,$con){
        if($number=="" || empty($number)){
                //invalid data
                return 503;
        }else{
                //query for checking existance of user
                $query = "SELECT id from patientdata where number=$number";
                $res = mysqli_query($con,$query);
                $res = mysqli_fetch_array($res);
                if(empty($res)){
                        return false;
                }else{
                        return true;
                }
        }
}
$con = mysqli_connect("localhost", "root", "");
if(!$con){
        die('Could not connect:'.mysqli_error());
}

mysqli_select_db($con, "patient");

if(isset($_GET["submit"])){
        if(isset($_GET["number"])){
                //IsUserRegistered($_GET["number"],$con);
                if(IsUserRegistered($_GET["number"],$con)){
                        //user is registered
```

```
                        $server_return = sendSMS($_GET["number"]);
                        if($server_return == 158){
                                echo "Internal error <br> Error: Sending failed";
                        }else{
                                $json_string = json_decode($server_return,true);
                                //print_r($json_string);
                                //echo $json_string["Status"];
                                if($json_string["Status"]=== "Success"){
                                        //message sent succssfully
                                        //save the session details for verification
                                        $_SESSION["details"] = $json_string["Details"];
                                        echo $_SESSION["details"];
                                        //$_SESSION["flag"] =true;
                                }
                        }
                        echo "user is registered";
                }else{
                        //new user redirect to registration page
                        //echo "new user";
                        //echo '</br>';
                        //echo '<a href = "pp.html">Click here to register</a>';
                        header("Location:pp.html");
                }
        }else{
                //csenatch the otp for user verfification
                $verification_Response = verifyOTP($_GET["otp"]);
                if($verification_Response == 258){
                        echo "Error: <br> OTP Authentication failed , either wrong OTP is
entered or connection time out occured. try again";
                }else{
                        $json_string = json_decode($verification_Response,true);
                        //print_r($json_string);
                        //echo $json_string["Status"];

                        if($json_string["Status"]=== "Success" && !($json_string["Status"] ===
"Error")){
                                //user verification successful
                                // redirect user to main page now
                                //echo "success";
                                //$string = $number;

                                //query main issue hai idhar zero row return ho raha hai
                                $query = 'SELECT * FROM patientdata WHERE number=\" .
$_SESSION['number'] . '\";
                                $result = mysqli_query($con, $query);
```

```
//print_r($result);

if (!$result) {
        printf("Error: %s\n", mysqli_error($con));
        exit();
}



$rows = mysqli_fetch_array($result);
//print_r($rows);



echo "<table border=5>";
echo"<tr>";
echo"<td>First Name</td>";
echo"<td>Last Name</td>";
echo"<td>Age</td>";
echo"<td>id</td>";
echo"<td>id type</td>";
echo"<td>DOB</td>";
echo"<td>number</td>";
echo"<td>gender</td>";
echo"<td>address</td>";
echo"<td>blood_group</td>";
echo"<td>sugar_level</td>";
echo"<td>blood_pressure</td>";
echo"<td>image</td>";


echo"</tr>";
echo  "<tr>";

                echo  "<td>";
                echo $rows['first_name'];
                echo  "</td>";

                echo  "<td>";
                echo $rows['last_name'];
                echo  "</td>";

                echo  "<td>";
                echo $rows['age'];
                echo "</td>";
```

```
                                                    echo "<td>";
                                                     $id=$rows['id'];
                                                    echo $id;
                                                    echo "</td>";

                                                    echo "<td>";
                                                    echo $rows['id_type'];
                                                    echo "</td>";

                                                    echo "<td>";
                                                    echo $rows['DOB'];
                                                    echo "</td>";

                                                    echo "<td>";
                                                    echo $rows['number'];
                                                    echo "</td>";

                                                    echo "<td>";
                                                    echo $rows['gender'];
                                                    echo "</td>";

                                                    echo "<td>";
                                                    echo $rows['address'];
                                                    echo "</td>";

                                                    echo "<td>";
                                                    echo $rows['blood_group'];
                                                    echo "</td>";

                                                    echo "<td>";
                                                    echo $rows['sugar_level'];
                                                    echo "</td>";

                                                    echo "<td>";
                                                    echo $rows['blood_pressure'];
                                                    echo "</td>";

                                                    echo "<td>";
                                                    $img= $rows['image'];
                                                    //echo"<a
href='download.?dow=$target'>Download</a><br>";
                                                    echo"<a href='images/$img' target='_blank'>view
file</a>";

                                                    echo "</td>";
                                                    echo  "</tr>";
```

```
                                        echo "</table>";
                                        echo "<br/>";
                                        echo "<table border=5>";
                                       echo"<tr>";
                                       echo"<td>Reports</td>";
                                                    echo "<td>";
                                                    //$doc= $rows['report'];
                                                    //echo"<a
href='download.?dow=$target'>Download</a><br>";
                                                    //echo"<a href='uploads/$id/' target='_blank'>view
file</a>";
                                                    //echo dirname("uploads/$id/", 1);
                                                    //echo "Here are our files";
$path = "uploads/$id/";
$dh = opendir($path);
$i=1;
while (($file = readdir($dh)) !== false) {
  if($file != "." && $file != ".." && $file != "index.php" && $file != ".htaccess" && $file !=
"error_log" && $file != "cgi-bin") {
      echo "<a href='$path/$file'>$file</a><br />";
    $i++;
  }
}
closedir($dh);
                                                    echo "</td>";
                                                    echo  "</tr>";



                                        echo "</table>";
                                }else{
                                        echo "error";
                                }

                        }
                }
}else{
        echo "Please enter valid 10 digit number";
}

if(isset($_GET["number"])){
        //take user input for otp he received
        $html = '
```

```
        <form action="./otpsend_p.php" method = "get">
                <label>Received OTP:<input type="text" name = "otp"/></label>
                <input type = "submit" name = "submit"/>
        </form>
        ';

        echo $html;
}
?>
</body>
</html>
```

6.Testing

1. Login Module :Following Test cases were considered to ensure the working of Login Module.

Test Case id	Test Case	Expected output	Actual output	Test case result
1	Valid Username Valid Password	Login Success	Login Success	Pass
2	Valid Username Invalid Password	Login Failure	Login Failure	Pass
3	Invalid Username Valid Password	Login Failure	Login Failure	Pass
4	Invalid Username Invalid Password	Login Failure	Login Failure	Pass

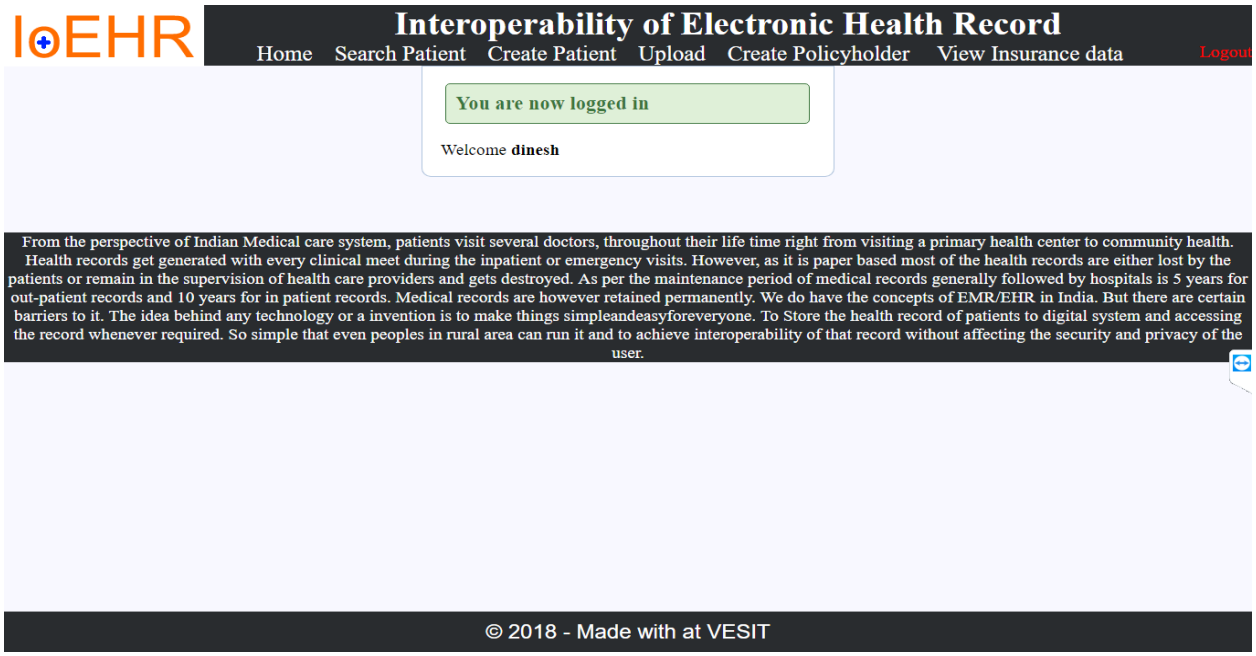
Search Module : Following test cases were considered to ensure the working of search module.

Test Case id	Test Case	Expected Output	Actual Output	Test Case Result
1	Searching for the patient	Show the searched patient	Show the searched patient	Pass
2	Searching Invalid patient	“No such patient found” Message	“No such patient found” Message	Pass

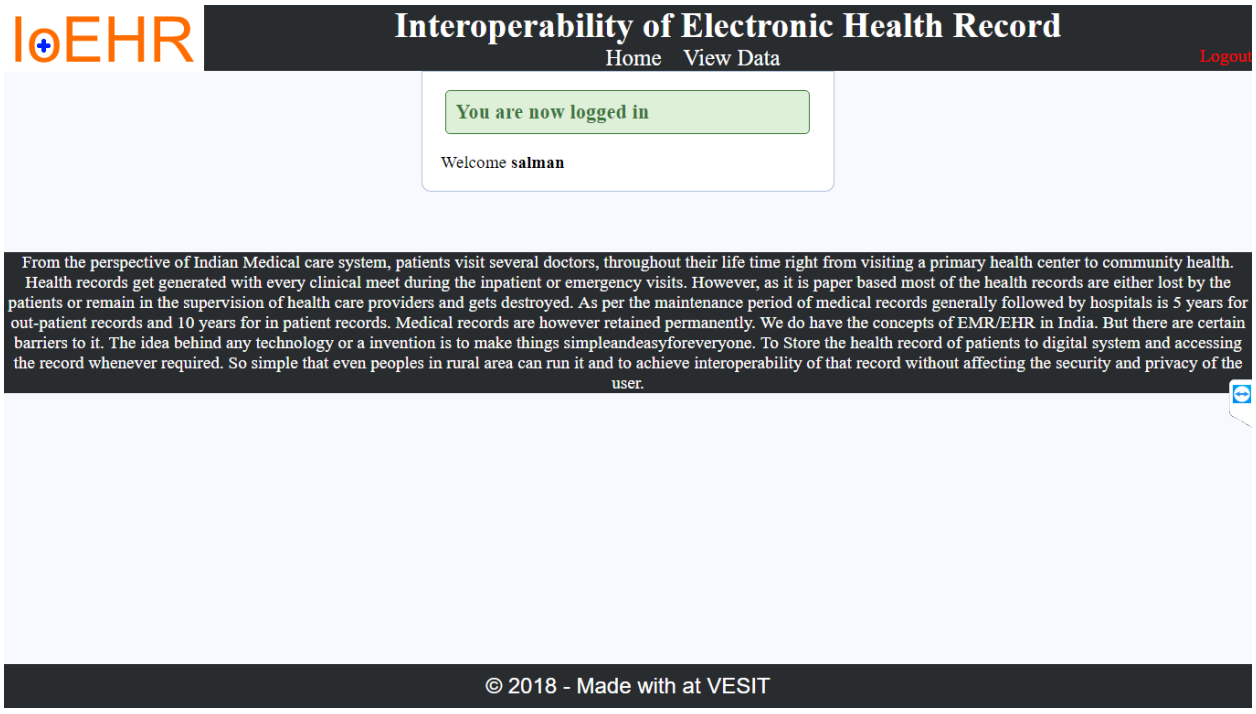
7.Result Analysis

1.Snapshots of the user interface:

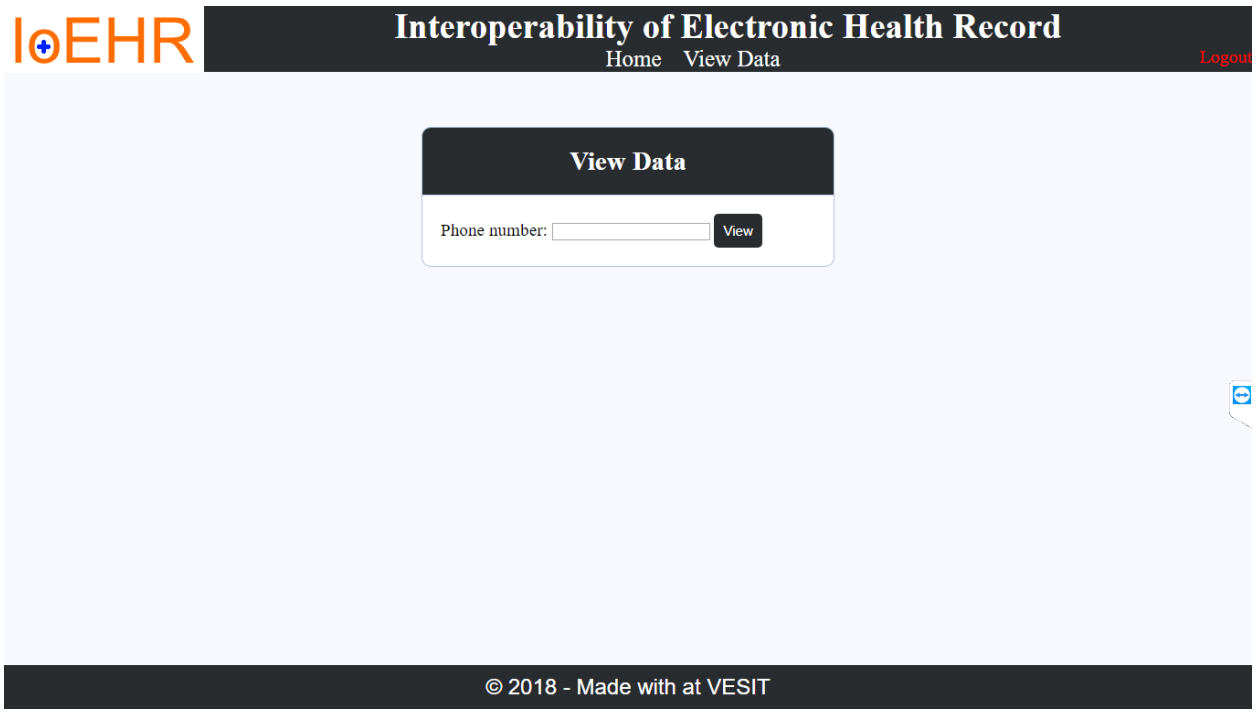
Admin login:

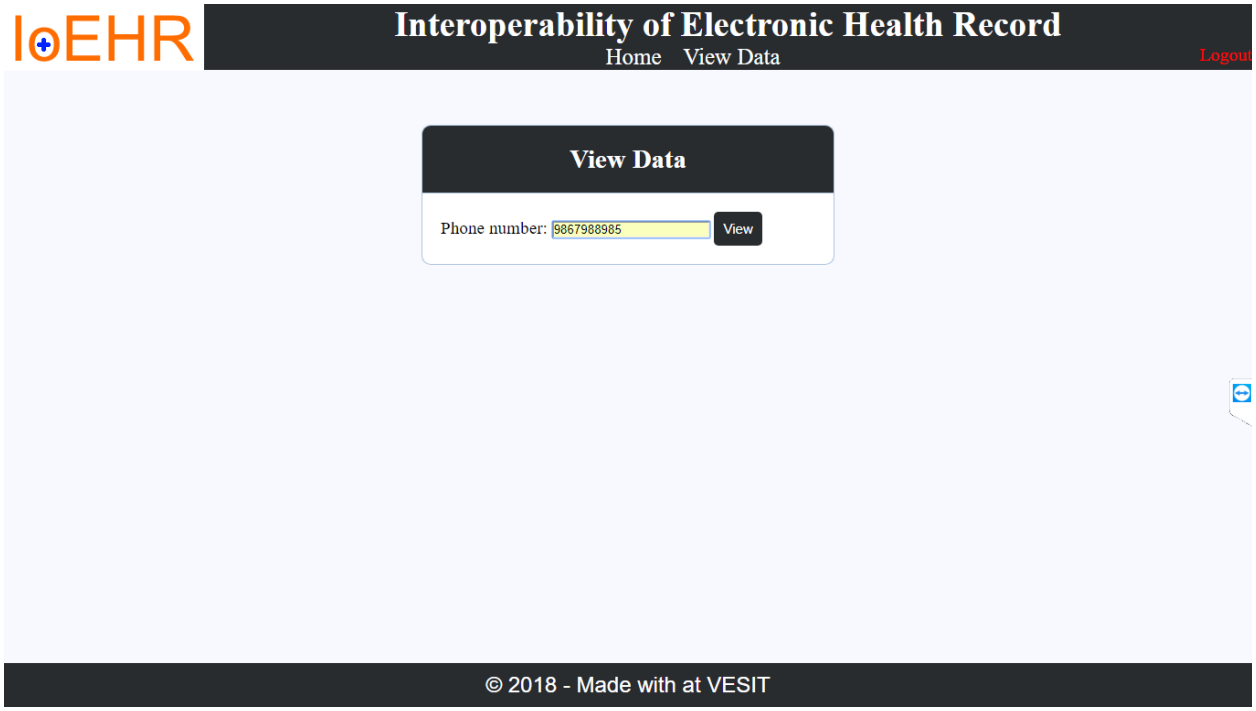


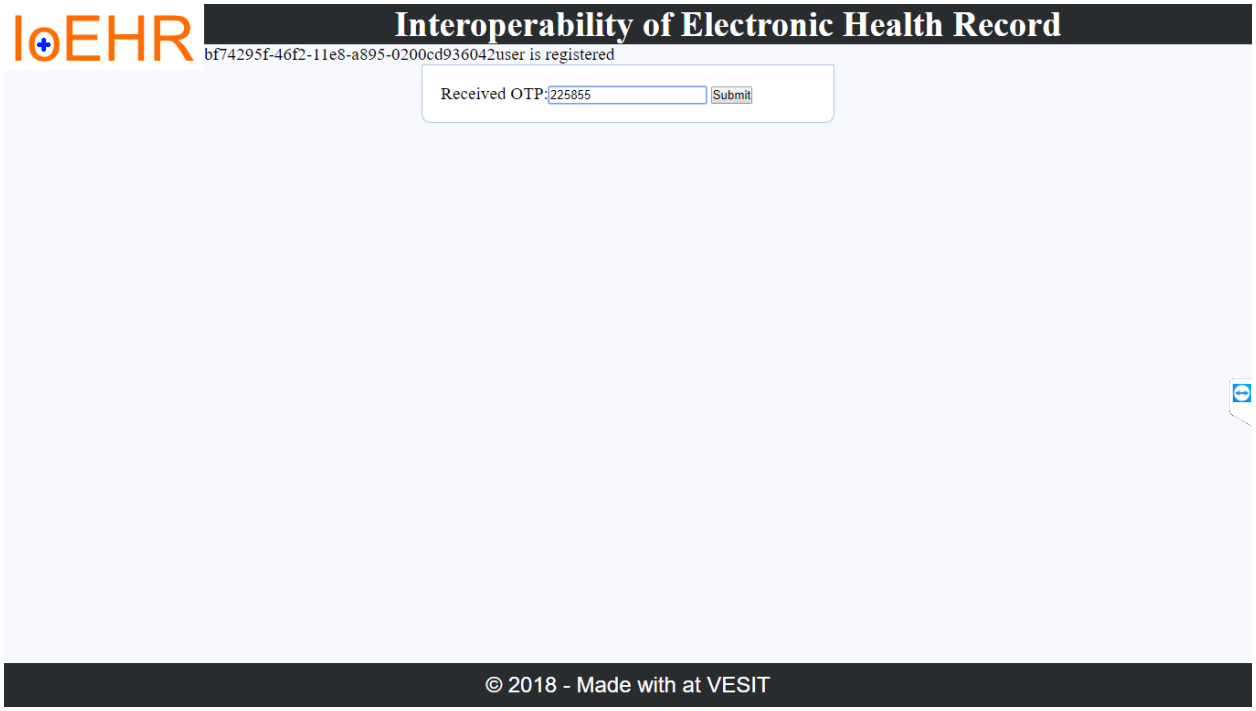
Patient_Login:



Patient-Search:




IoEHR
Interoperability of Electronic Health Record
Home View Data
Logout
View Data
Phone number: 9867988985
View
© 2018 - Made with at VESIT


IoEHR
Interoperability of Electronic Health Record
bf74295f-46f2-11e8-a895-0200cd936042user is registered
Received OTP: 225855
Submit
© 2018 - Made with at VESIT

IoEHR

Interoperability of Electronic Health Record

First Name	Last Name	Age	id	id type	DOB	number	gender	address	blood_group	sugar_level	blood_pressure	image
salman	khan	23	670987654321	OpenMRS Identification Number	1995-02-07	9867988985	male	bandra	O+ve	Low	High	view file

Reports	2018-04-23--salman-khan-letter1.jpg 51092-up.js 96656-visual.java

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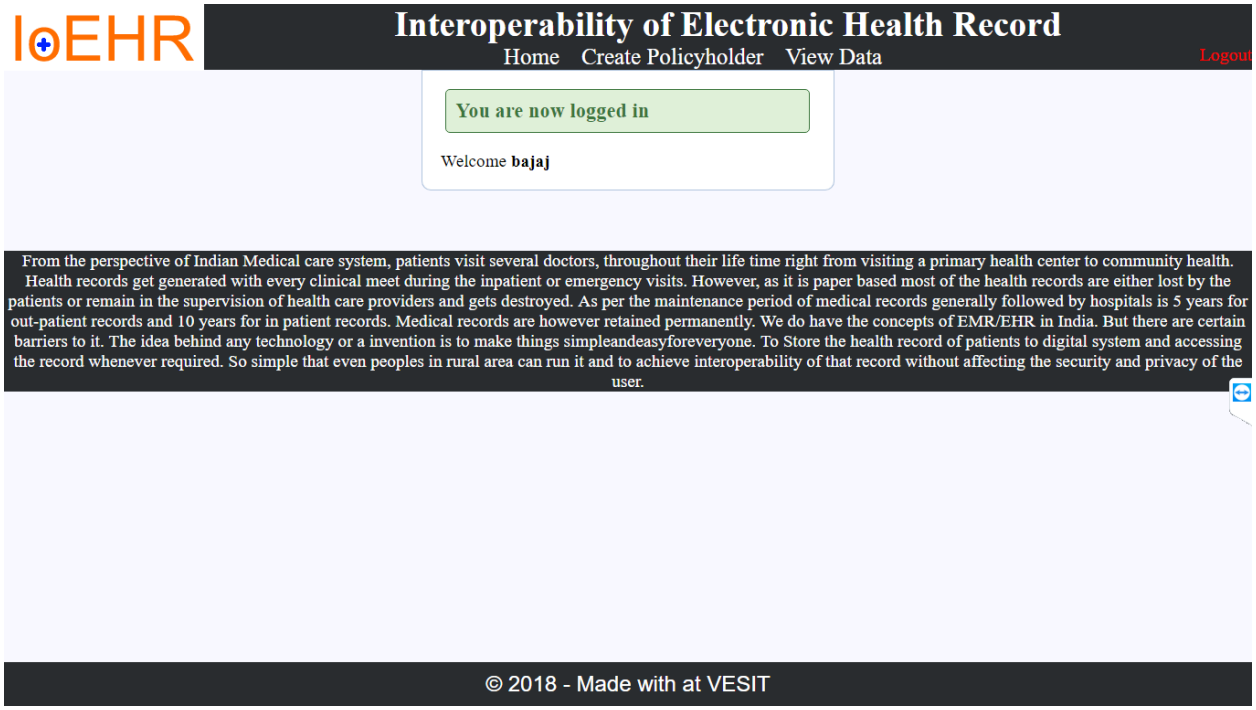
View Policy


IoEHR
Interoperability of Electronic Health Record
Home
Create Policyholder
View Data
Logout
You are now logged in
Welcome bajaj
From the perspective of Indian Medical care system, patients visit several doctors, throughout their life time right from visiting a primary health center to community health. Health records get generated with every clinical meet during the inpatient or emergency visits. However, as it is paper based most of the health records are either lost by the patients or remain in the supervision of health care providers and gets destroyed. As per the maintenance period of medical records generally followed by hospitals is 5 years for out-patient records and 10 years for in patient records. Medical records are however retained permanently. We do have the concepts of EMR/EHR in India. But there are certain barriers to it. The idea behind any technology or a invention is to make things simpleandeasyforeveryone. To Store the health record of patients to digital system and accessing the record whenever required. So simple that even peoples in rural area can run it and to achieve interoperability of that record without affecting the security and privacy of the user.
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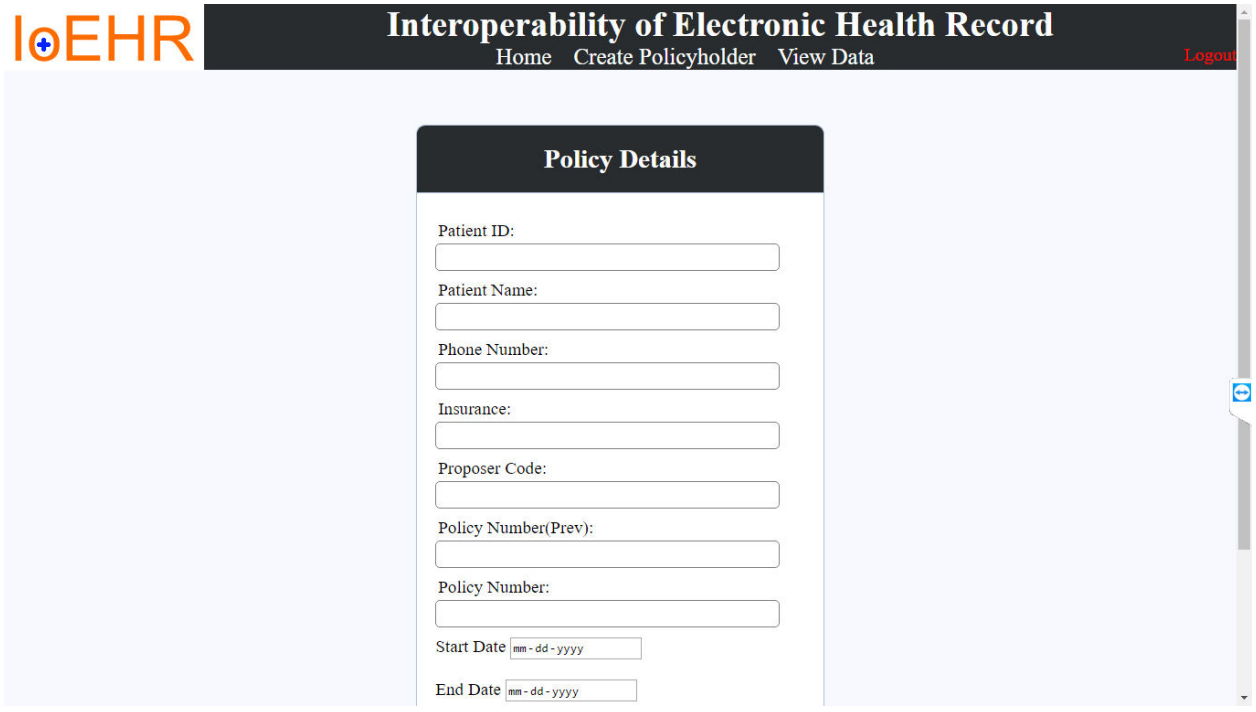
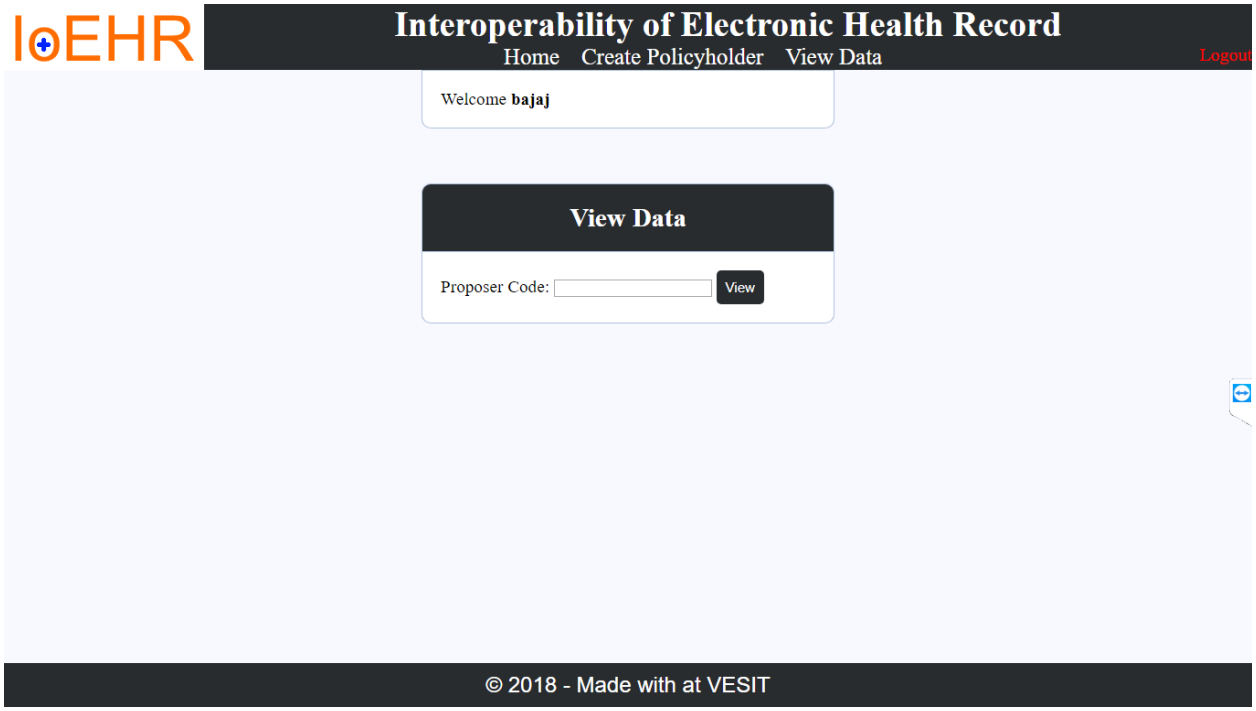
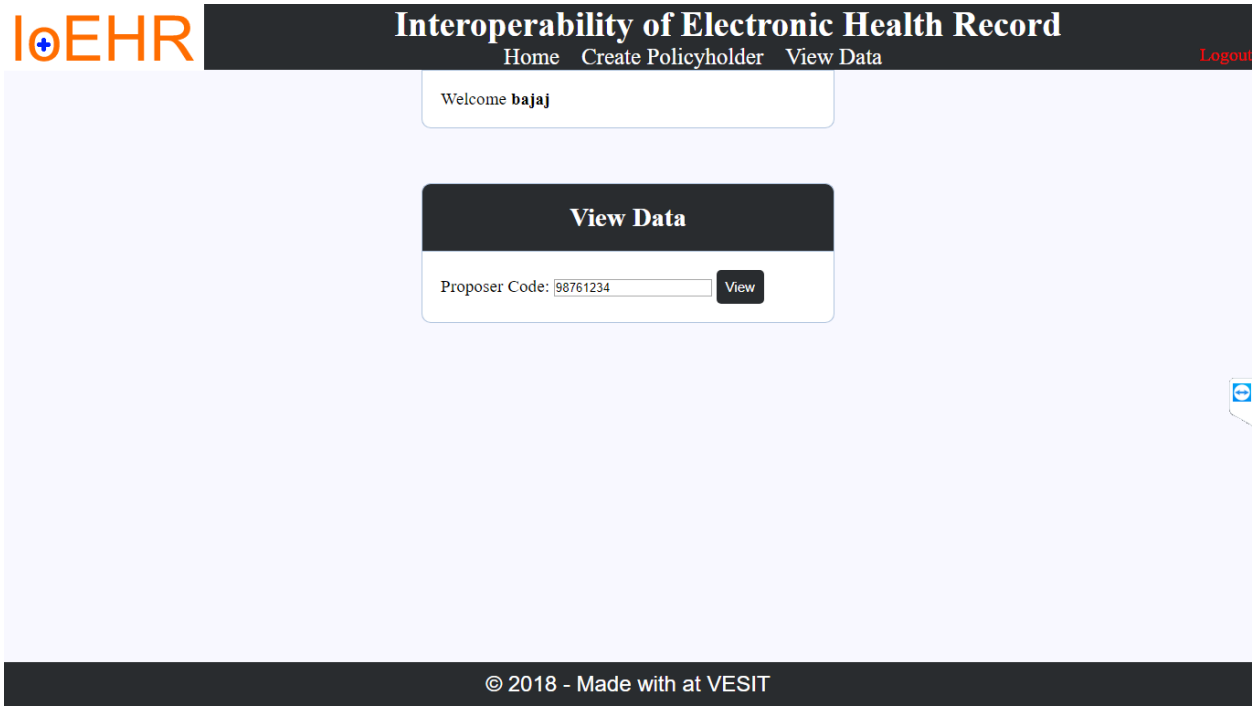

IoEHR
Interoperability of Electronic Health Record
Home
Create Policyholder
View Data
Logout
Policy Details
Patient ID:
Patient Name:
Phone Number:
Insurance:
Proposer Code:
Policy Number(Prev):
Policy Number:
Start Date mm-dd-yyyy
End Date mm-dd-yyyy



Insurance Access:



IoEHR

Interoperability of Electronic Health Record

bajaj

Data not available

Make request

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IoEHR

Interoperability of Electronic Health Record

Home

Logout

Request Data

Phone number: 9867988985 Request

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IoEHR

Interoperability of Electronic Health Record

30f330e6-46f2-11e8-a895-0200cd936042

Received OTP: 698838 Submit

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IoEHR

Interoperability of Electronic Health Record

ID	Name	Number	insurance	Proposer Code	Previous Policy	Current Policy	Start Date	End Date	Sector	Medical Conditions
123456789023	dinesh	9867988985	maxbupa	98761234	398610	673014	2018-04-27	2026-07-22	urban	NO

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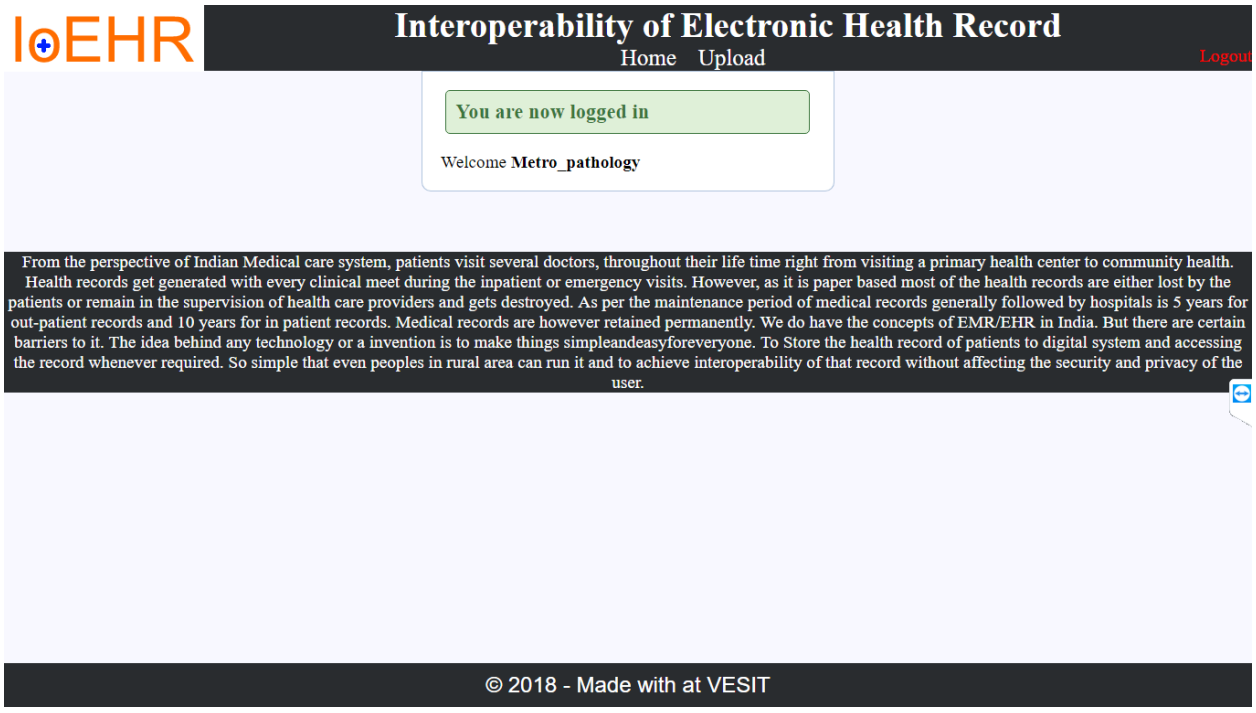
Pathology:


IoEHR
Interoperability of Electronic Health Record
Home Upload
Logout
You are now logged in
Welcome Metro_pathology
From the perspective of Indian Medical care system, patients visit several doctors, throughout their life time right from visiting a primary health center to community health. Health records get generated with every clinical meet during the inpatient or emergency visits. However, as it is paper based most of the health records are either lost by the patients or remain in the supervision of health care providers and gets destroyed. As per the maintenance period of medical records generally followed by hospitals is 5 years for out-patient records and 10 years for in patient records. Medical records are however retained permanently. We do have the concepts of EMR/EHR in India. But there are certain barriers to it. The idea behind any technology or a invention is to make things simpleandeasyforeveryone. To Store the health record of patients to digital system and accessing the record whenever required. So simple that even peoples in rural area can run it and to achieve interoperability of that record without affecting the security and privacy of the user.
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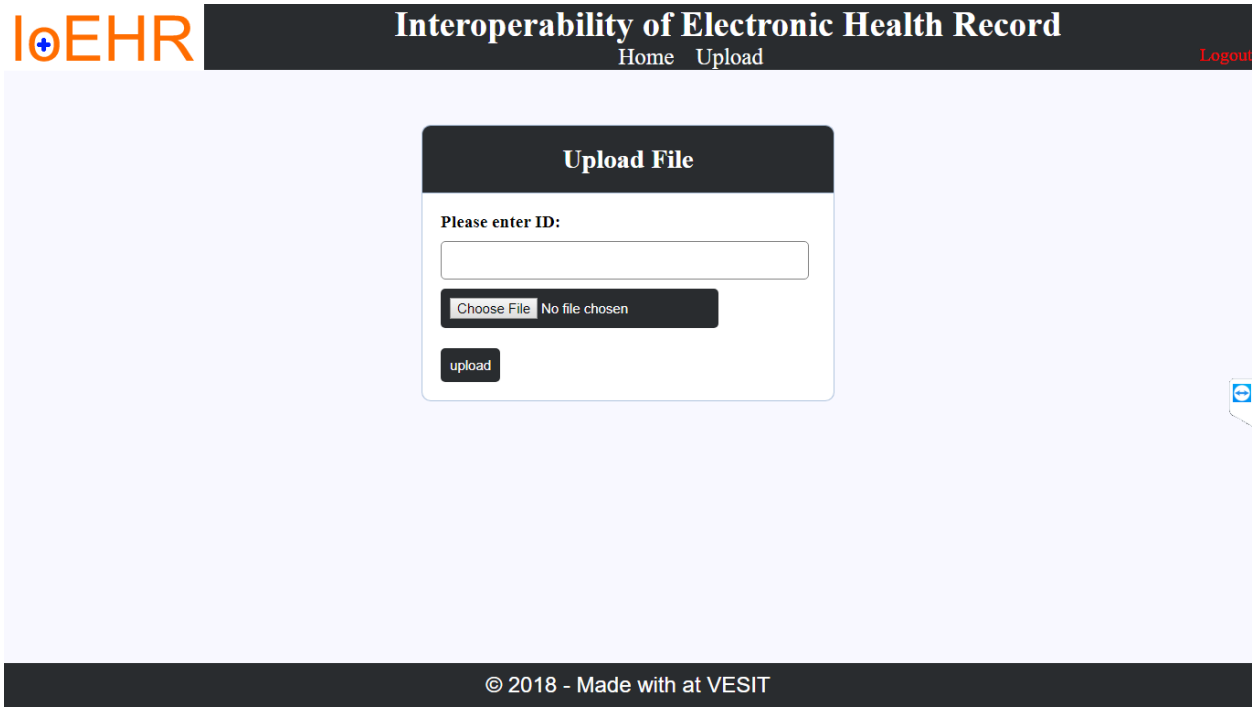
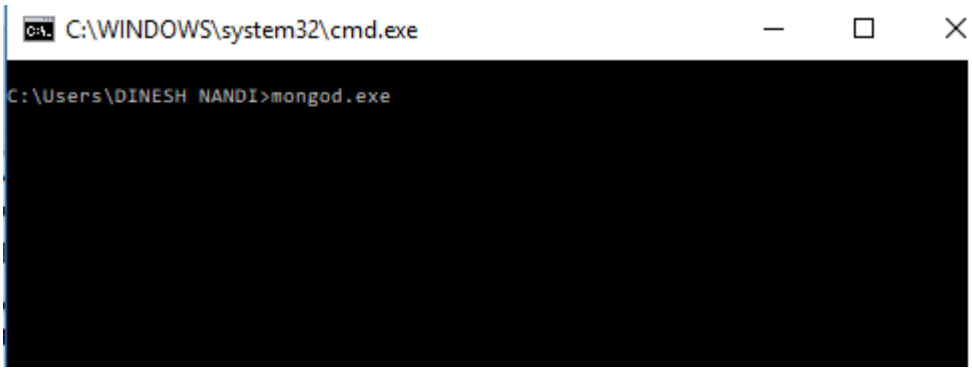
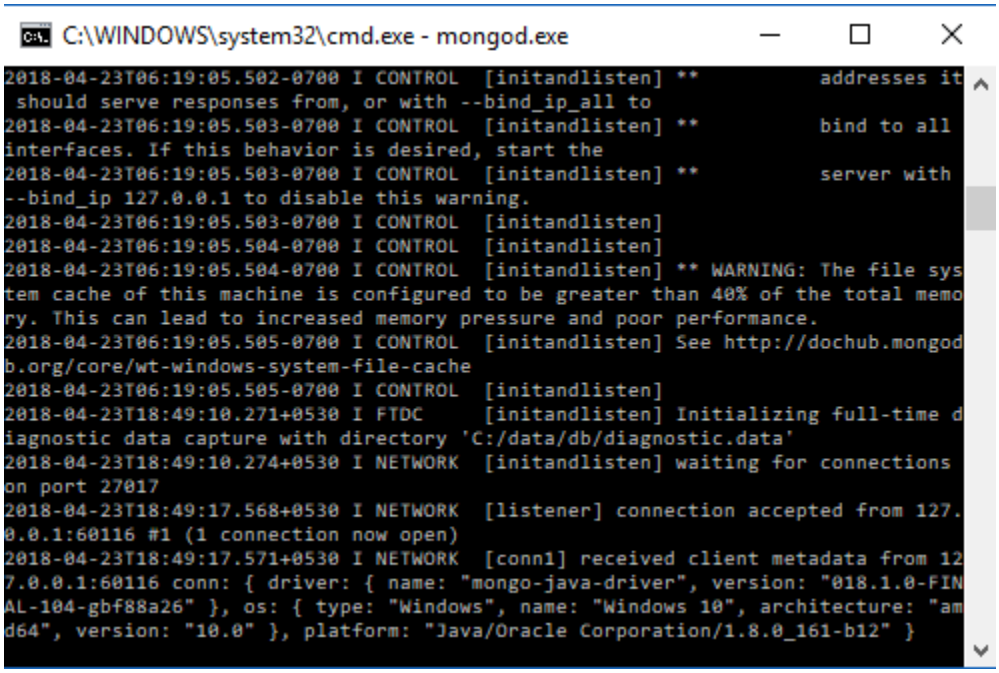
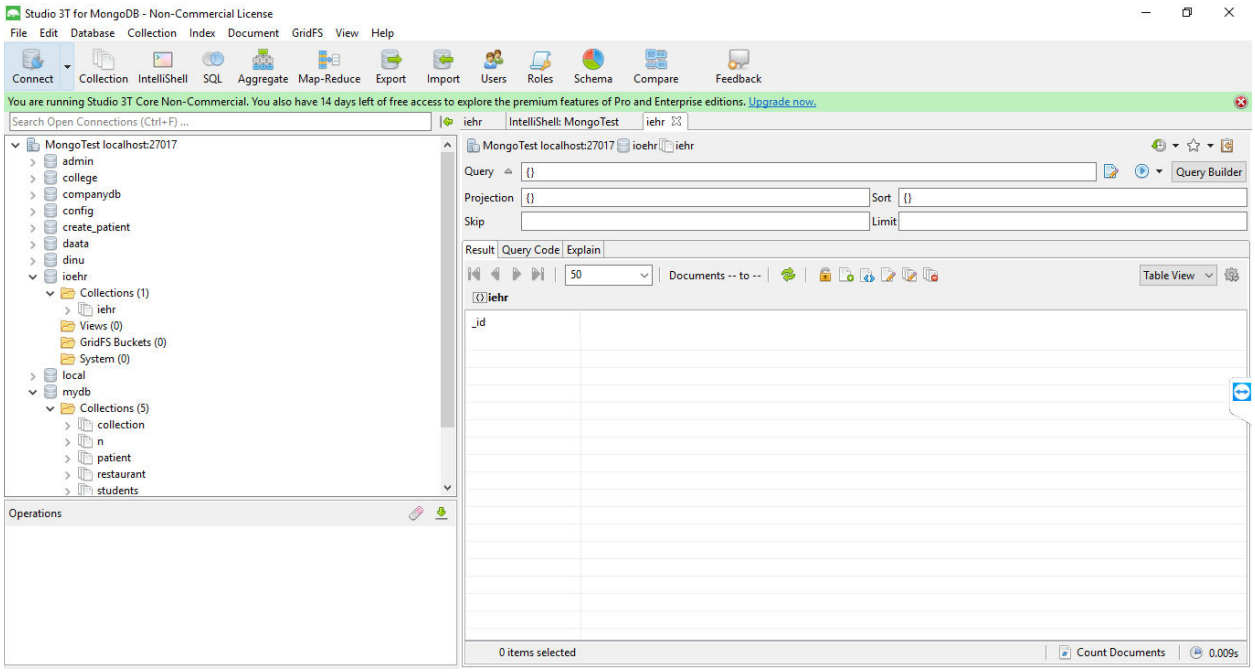

IoEHR
Interoperability of Electronic Health Record
Home Upload
Logout
Upload File
Please enter ID:
Choose File No file chosen
upload
© 2018 - Made with at VESIT

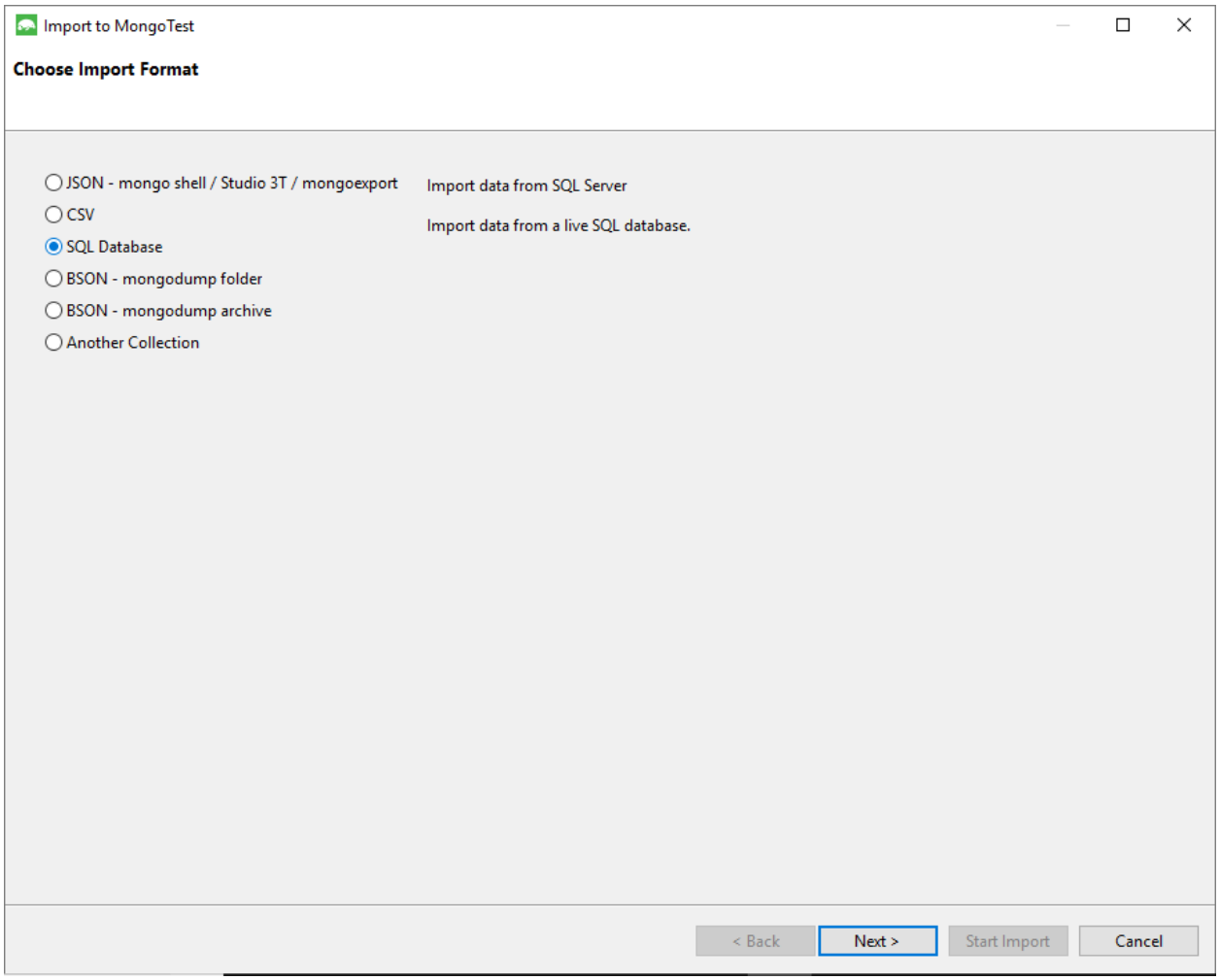
Mongodb shell:

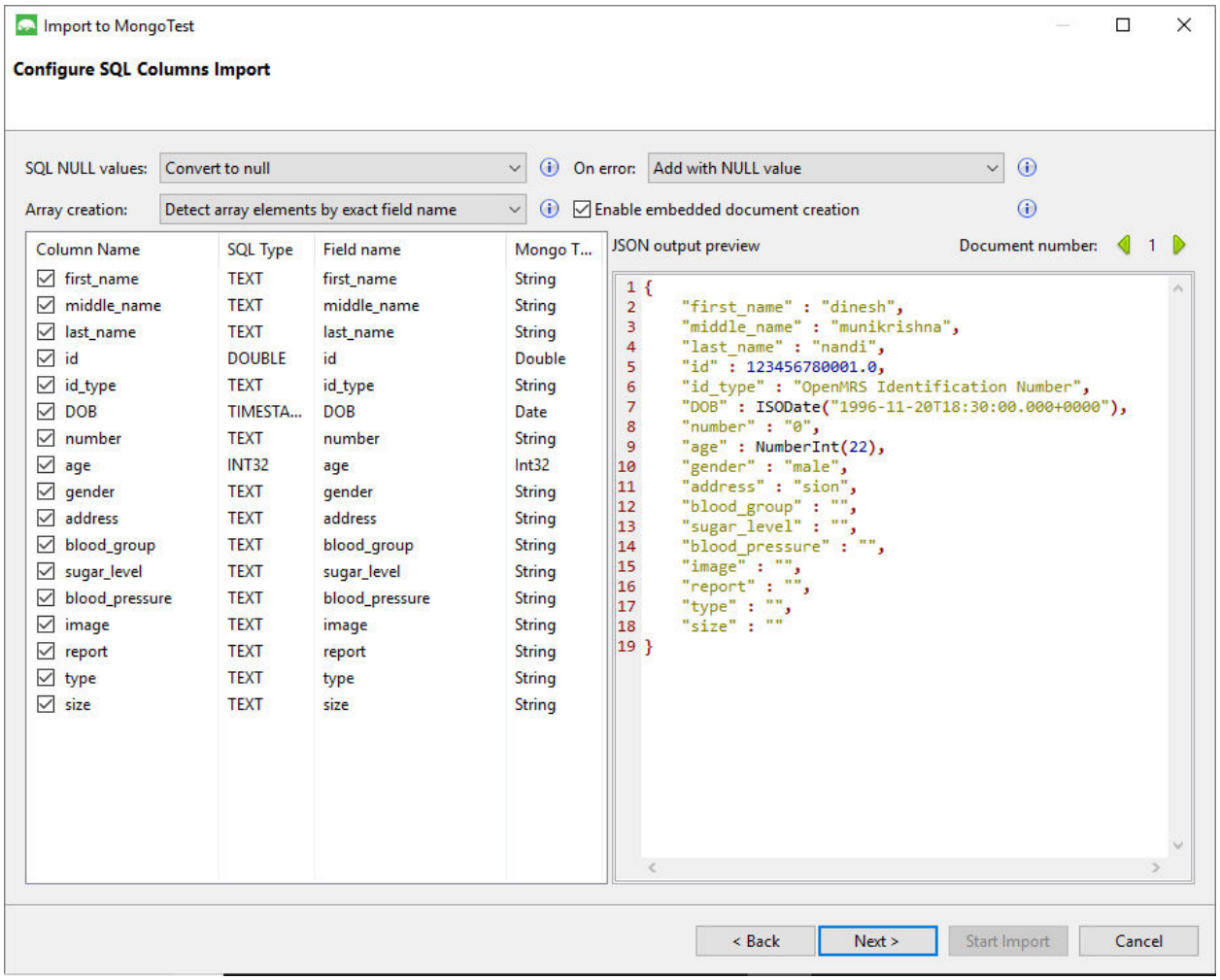


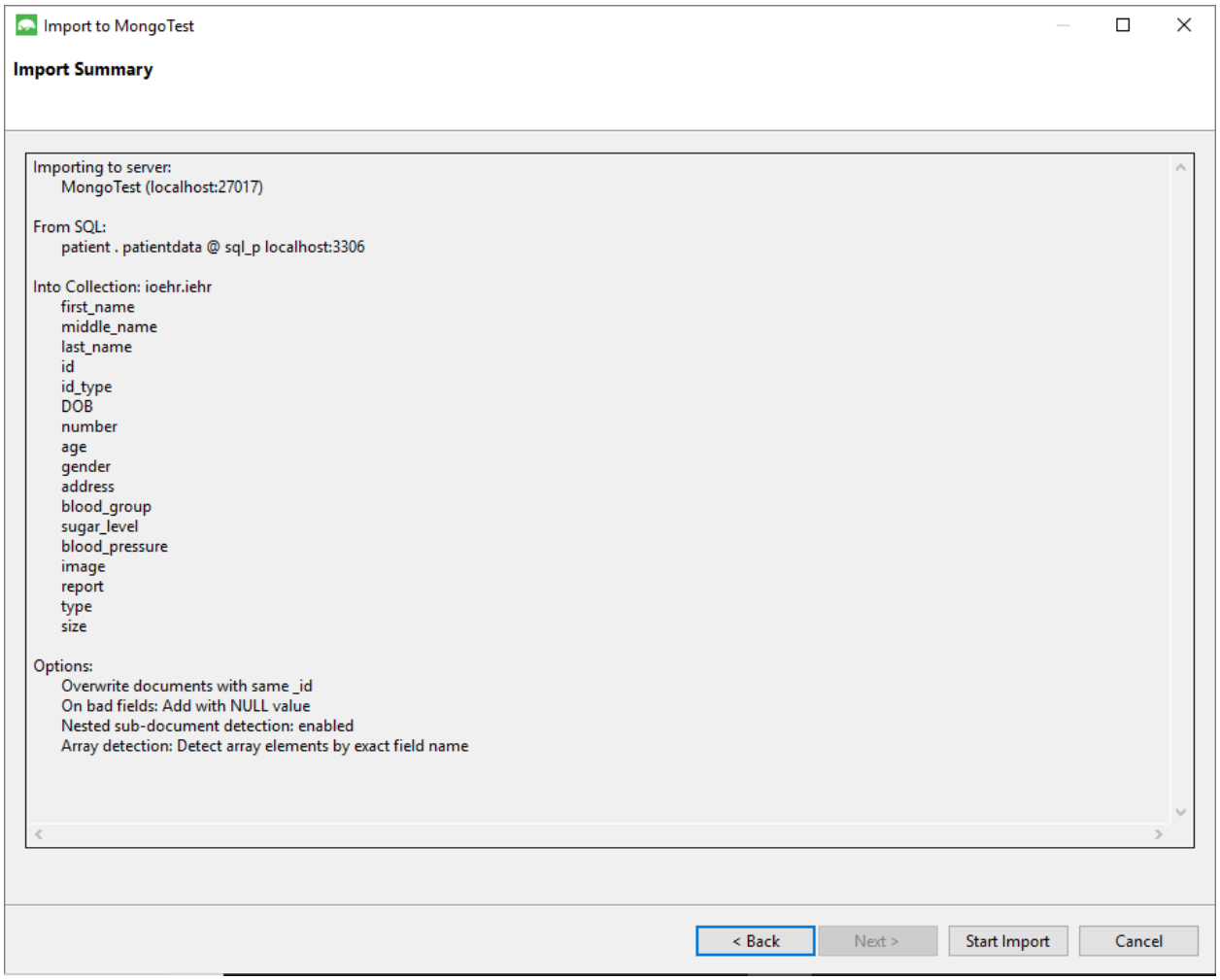


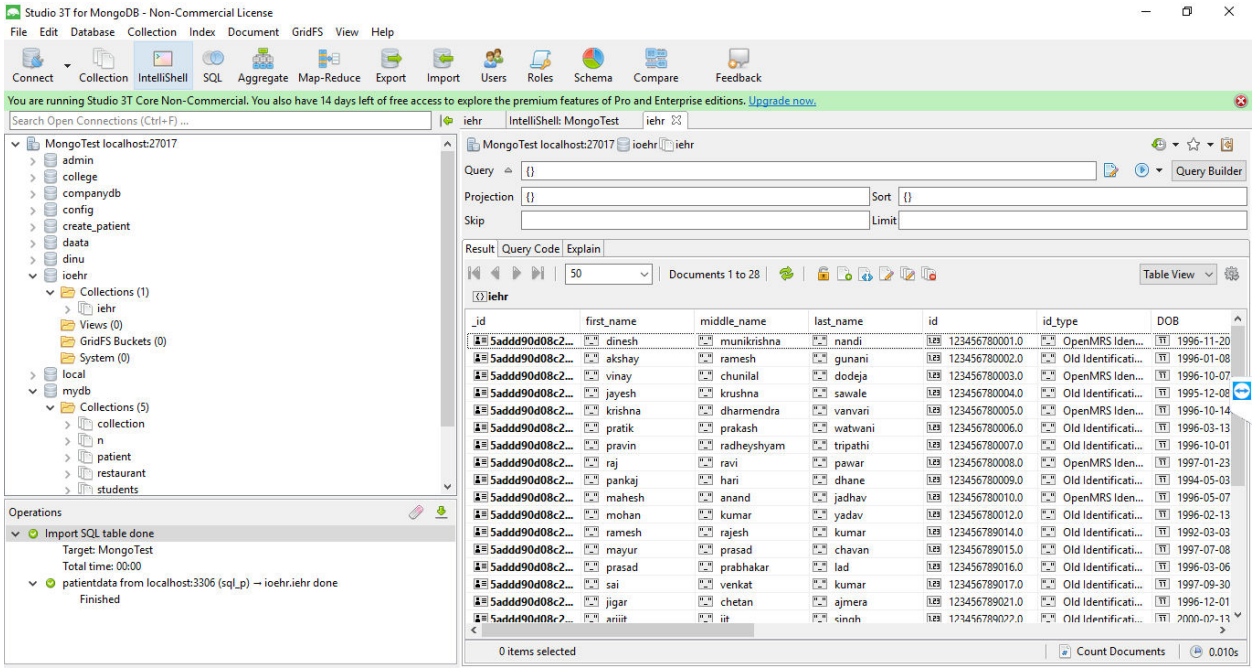
Mongo implementation:




Import to MongoTest
Choose Import Format
JSON - mongo shell / Studio 3T / mongoexport
CSV
SQL Database
BSON - mongodump folder
BSON - mongodump archive
Another Collection
Import data from SQL Server
Import data from a live SQL database.
< Back
Next >
Start Import
Cancel


Import to MongoTest
Configure SQL Columns Import
SQL NULL values: Convert to null
On error: Add with NULL value
Array creation: Detect array elements by exact field name
Enable embedded document creation
Column Name | SQL Type | Field name | Mongo T...
first_name | TEXT | first_name | String
middle_name | TEXT | middle_name | String
last_name | TEXT | last_name | String
id | DOUBLE | id | Double
id_type | TEXT | id_type | String
DOB | TIMESTA... | DOB | Date
number | TEXT | number | String
age | INT32 | age | Int32
gender | TEXT | gender | String
address | TEXT | address | String
blood_group | TEXT | blood_group | String
sugar_level | TEXT | sugar_level | String
blood_pressure | TEXT | blood_pressure | String
image | TEXT | image | String
report | TEXT | report | String
type | TEXT | type | String
size | TEXT | size | String
JSON output preview
Document number: 1
{
"first_name" : "dinesh",
"middle_name" : "munikrishna",
"last_name" : "nandi",
"id" : 123456780001.0,
"id_type" : "OpenMRS Identification Number",
"DOB" : ISODate("1996-11-20T18:30:00.000+0000"),
"number" : "0",
"age" : NumberInt(22),
"gender" : "male",
"address" : "sion",
"blood_group" : "",
"sugar_level" : "",
"blood_pressure" : "",
"image" : "",
"report" : "",
"type" : "",
"size" : ""
}
< Back
Next >
Start Import
Cancel


Import to MongoTest
Import Summary
Importing to server:
MongoTest (localhost:27017)
From SQL:
patient . patientdata @ sql_p localhost:3306
Into Collection: ioehr.iehr
first_name
middle_name
last_name
id
id_type
DOB
number
age
gender
address
blood_group
sugar_level
blood_pressure
image
report
type
size
Options:
Overwrite documents with same _id
On bad fields: Add with NULL value
Nested sub-document detection: enabled
Array detection: Detect array elements by exact field name
< Back
Next >
Start Import
Cancel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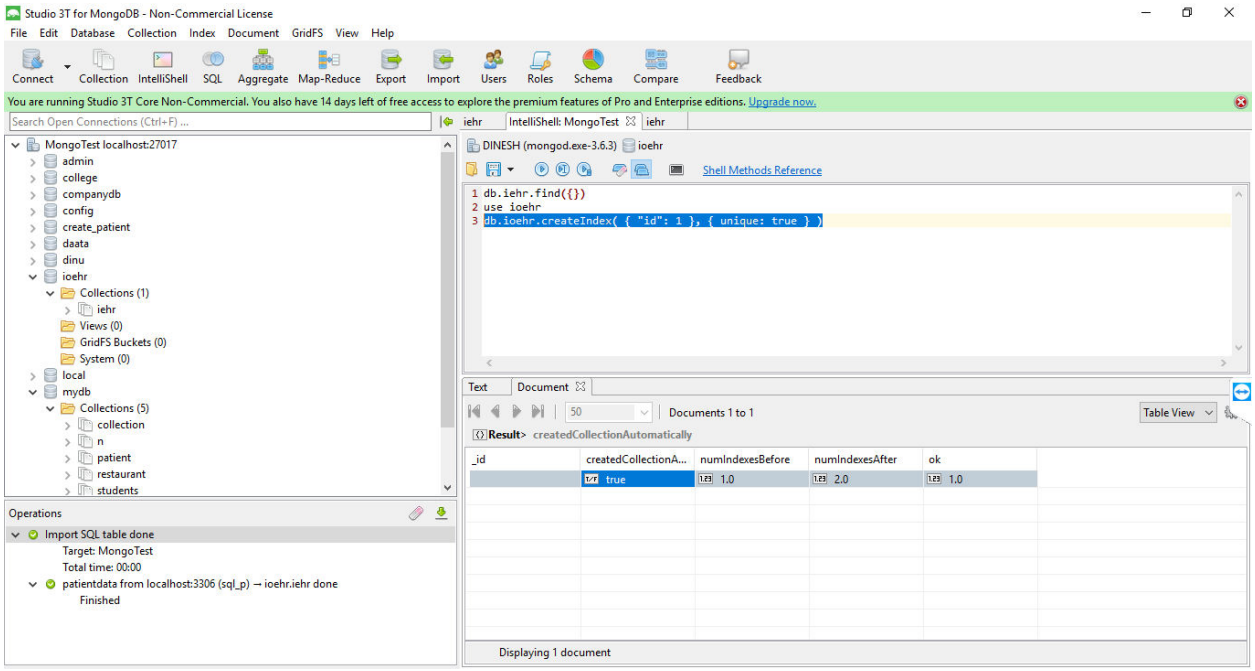
Connect Collection IntelliShell SQL Aggregate Map-Reduce Export Import Users Roles Schema Compare Feedback
You are running Studio 3T Core Non-Commercial. You also have 14 days left of free access to explore the premium features of Pro and Enterprise editions. Upgrade now.
Search Open Connections (Ctrl+F) ...
iehr
IntelliShell: MongoTest
iehr
MongoTest localhost:27017
admin
college
companydb
config
create_patient
daata
dinu
ioehr
Collections (1)
iehr
Views (0)
GridFS Buckets (0)
System (0)
local
mydb
Collections (5)
collection
n
patient
restaurant
students
Operations
Import SQL table done
Target: MongoTest
Total time: 00:00
patientdata from localhost:3306 (sql_p) → ioehr.iehr done
Finished
MongoTest localhost:27017 ioehr iehr
Query {}
Query Builder
Projection {}
Sort {}
Skip
Limit
Result Query Code Explain
50
Documents 1 to 28
Table View
ioehr
_id first_name middle_name last_name id id_type DOB
5addd90d08c2... dinesh munikrishna nandi 123456780001.0 OpenMRS Iden... 1996-11-20
5addd90d08c2... akshay ramesh gunani 123456780002.0 Old Identificati... 1996-01-08
5addd90d08c2... vinay chunilal dodeja 123456780003.0 OpenMRS Iden... 1996-10-07
5addd90d08c2... jayesh krushna sawale 123456780004.0 Old Identificati... 1995-12-08
5addd90d08c2... krishna dharmendra vanvari 123456780005.0 OpenMRS Iden... 1996-10-14
5addd90d08c2... pratik prakash watwani 123456780006.0 Old Identificati... 1996-03-13
5addd90d08c2... pravin radheyshyam tripathi 123456780007.0 Old Identificati... 1996-10-01
5addd90d08c2... raj ravi pawar 123456780008.0 OpenMRS Iden... 1997-01-23
5addd90d08c2... pankaj hari dhane 123456780009.0 Old Identificati... 1994-05-03
5addd90d08c2... mahesh anand jadhav 123456780010.0 OpenMRS Iden... 1996-05-07
5addd90d08c2... mohan kumar yadav 123456780012.0 Old Identificati... 1996-02-13
5addd90d08c2... ramesh rajesh kumar 123456789014.0 Old Identificati... 1992-03-03
5addd90d08c2... mayur prasad chavan 123456789015.0 Old Identificati... 1997-07-08
5addd90d08c2... prasad prabhakar lad 123456789016.0 Old Identificati... 1996-03-06
5addd90d08c2... sai venkat kumar 123456789017.0 Old Identificati... 1997-09-30
5addd90d08c2... jigar chetan ajmera 123456789021.0 Old Identificati... 1996-12-01
0 items selected
Count Documents
0.010s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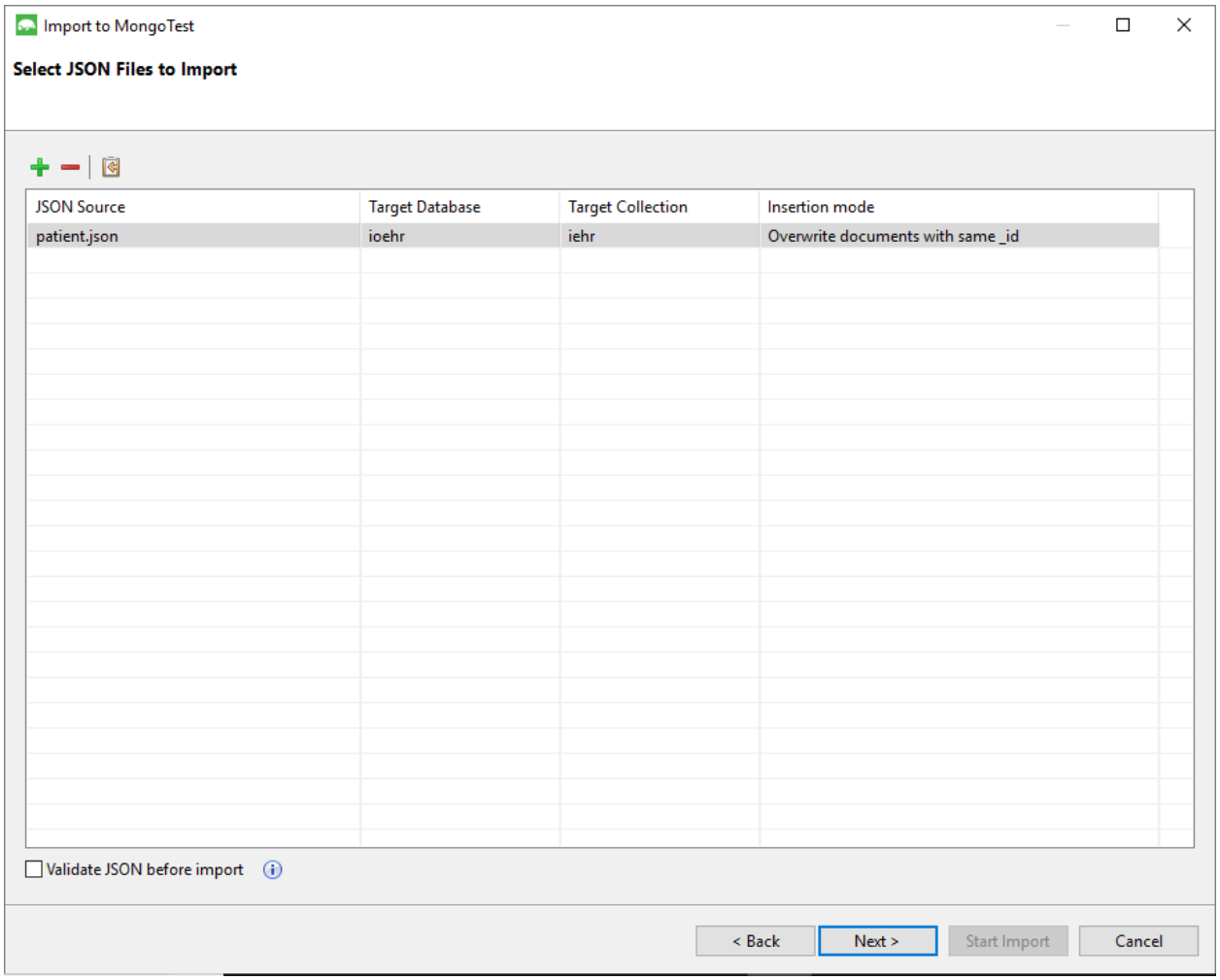
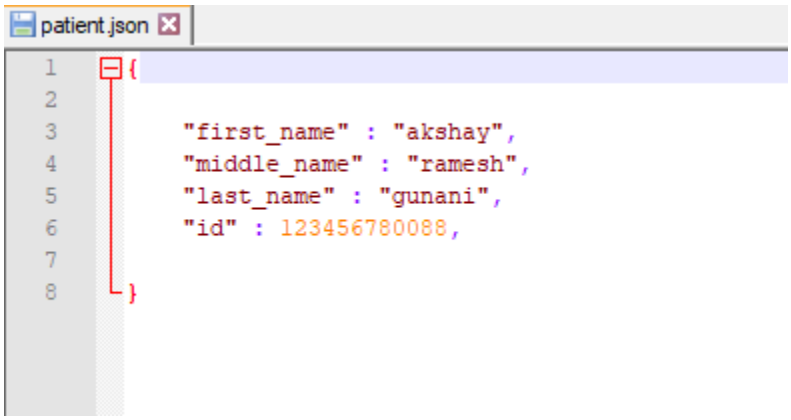
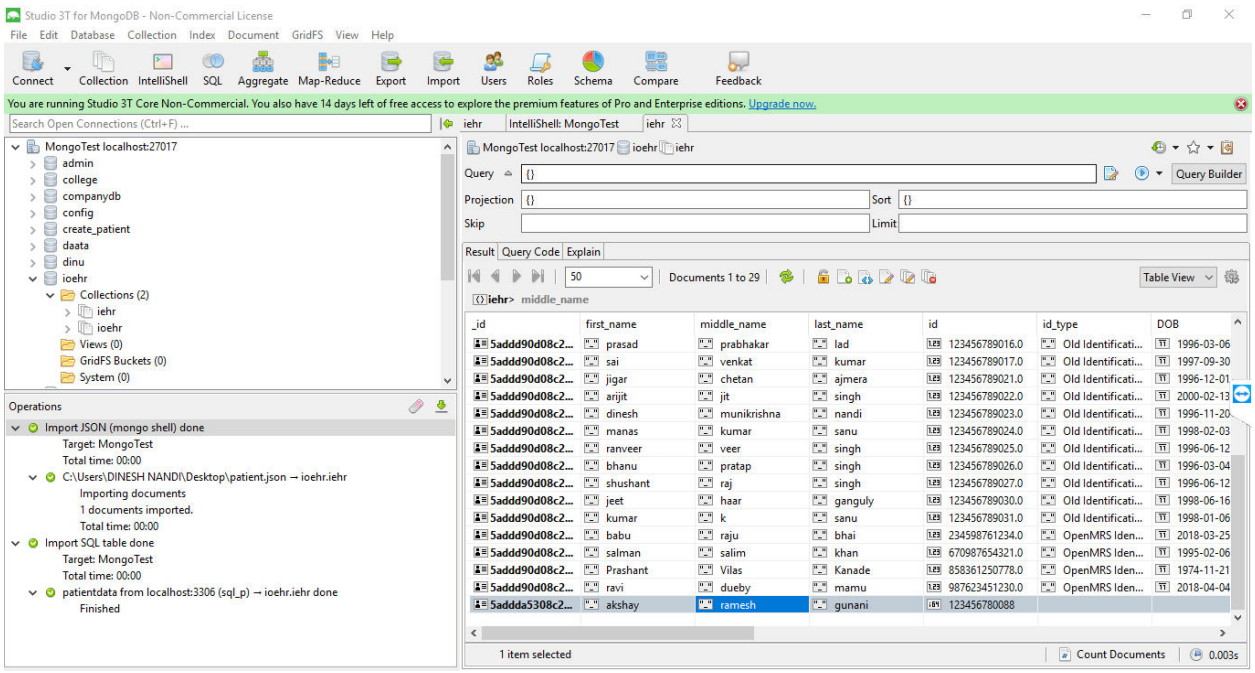
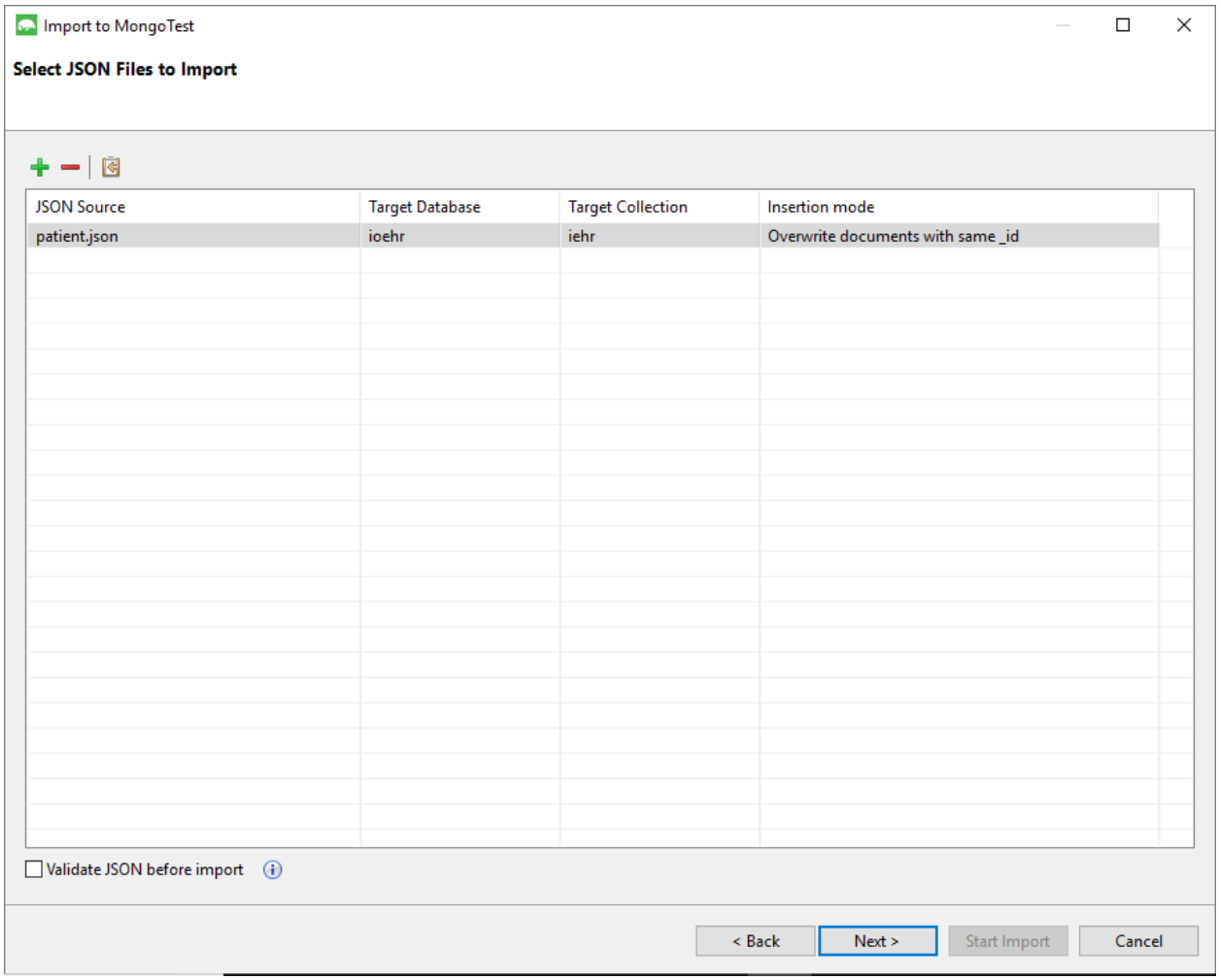
Search Open Connections (Ctrl+F) ...
iehr
IntelliShell: MongoTest
iehr
MongoTest localhost:27017
admin
college
companydb
config
create_patient
daata
dinu
ioehr
Collections (1)
iehr
Views (0)
GridFS Buckets (0)
System (0)
local
mydb
Collections (5)
collection
n
patient
restaurant
students
Operations
Import SQL table done
Target: MongoTest
Total time: 00:00
patientdata from localhost:3306 (sql_p) → ioehr.iehr done
Finished
DINESH (mongod.exe-3.6.3) ioehr
Shell Methods Reference
1 db.iehr.find({})
2 use ioehr
3 db.ioehr.createIndex({ "id": 1 }, { unique: true })
Text
Document
50
Documents 1 to 1
Table View
Result> createdCollectionAutomatically
_id createdCollectionA... numIndexesBefore numIndexesAfter ok
true 1.0 2.0 1.0
Displaying 1 document

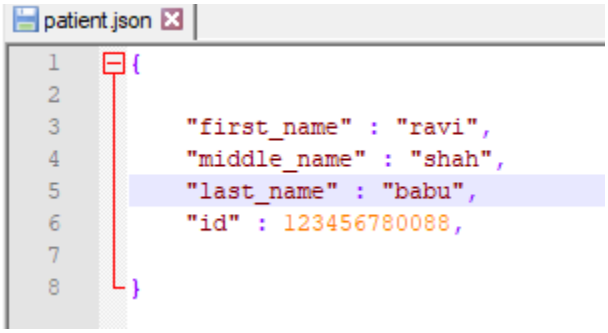

Import to MongoTest
Select JSON Files to Import
JSON Source
Target Database
Target Collection
Insertion mode
patient.json
ioehr
iehr
Overwrite documents with same _id
Validate JSON before import
< Back
Next >
Start Import
Cancel

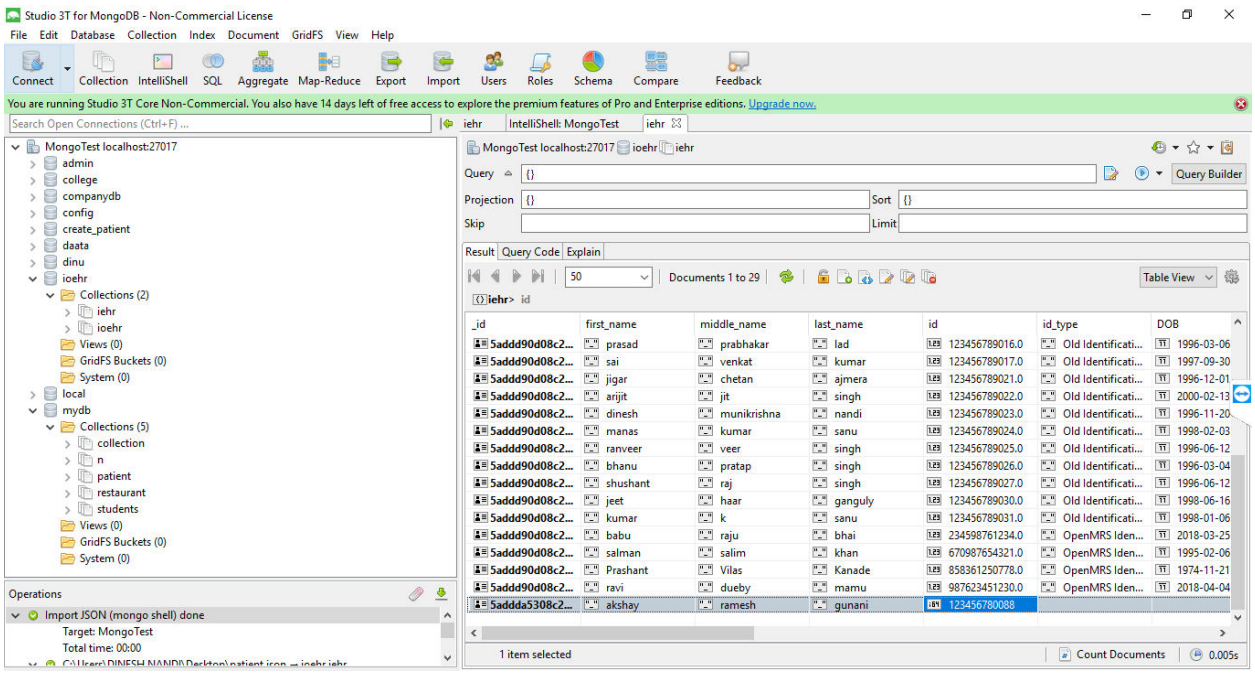

patient.json
{
"first_name" : "akshay",
"middle_name" : "ramesh",
"last_name" : "gunani",
"id" : 123456780088,
}



_id	first_name	middle_name	last_name	id	id_type	DOB
5addd90d08c2...	prasad	prabhakar	lad	123456789016.0	Old Identificati...	1996-03-06
5addd90d08c2...	sai	venkat	kumar	123456789017.0	Old Identificati...	1997-09-30
5addd90d08c2...	jigar	chetan	ajmera	123456789021.0	Old Identificati...	1996-12-01
5addd90d08c2...	arijit	jit	singh	123456789022.0	Old Identificati...	2000-02-13
5addd90d08c2...	dinesh	munikrishna	nandi	123456789023.0	Old Identificati...	1996-11-20
5addd90d08c2...	manas	kumar	sanu	123456789024.0	Old Identificati...	1998-02-03
5addd90d08c2...	ranveer	veer	singh	123456789025.0	Old Identificati...	1996-06-12
5addd90d08c2...	bhanu	pratap	singh	123456789026.0	Old Identificati...	1996-03-04
5addd90d08c2...	shushant	raj	singh	123456789027.0	Old Identificati...	1996-06-12
5addd90d08c2...	jeet	haar	ganguly	123456789030.0	Old Identificati...	1998-06-16
5addd90d08c2...	kumar	k	sanu	123456789031.0	Old Identificati...	1998-01-06
5addd90d08c2...	babu	raju	bhai	2345987612340	OpenMRS Iden...	2018-03-25
5addd90d08c2...	salman	salim	khan	670987654321.0	OpenMRS Iden...	1995-02-06
5addd90d08c2...	Prashant	Vilas	Kanade	858361250778.0	OpenMRS Iden...	1974-11-21
5addd90d08c2...	ravi	dueby	mamu	987623451230.0	OpenMRS Iden...	2018-04-04
5addda5308c2...	akshay	ramesh	gunani	123456780088		


Import to MongoTest
Select JSON Files to Import
JSON Source
Target Database
Target Collection
Insertion mode
patient.json
ioehr
iehr
Overwrite documents with same _id
Validate JSON before import
< Back
Next >
Start Import
Cancel


patient.json
{
"first_name" : "ravi",
"middle_name" : "shah",
"last_name" : "babu",
"id" : 123456780088,
}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Search Open Connections (Ctrl+F) ...
iehr
IntelliShell: MongoTest
iehr
MongoTest localhost:27017
admin
college
companydb
config
create_patient
daata
dinu
ioehr
Collections (2)
iehr
ioehr
Views (0)
GridFS Buckets (0)
System (0)
local
mydb
Collections (5)
collection
n
patient
restaurant
students
Views (0)
GridFS Buckets (0)
System (0)
Operations
Import JSON (mongo shell) done
Target: MongoTest
Total time: 00:00
MongoTest localhost:27017 ioehr iehr
Query {}
Query Builder
Projection {}
Sort {}
Skip
Limit
Result Query Code Explain
50
Documents 1 to 29
Table View
iehr> id
_id first_name middle_name last_name id id_type DOB
5addd90d08c2... prasad prabhakar lad 123456789016.0 Old Identificati... 1996-03-06
5addd90d08c2... sai venkat kumar 123456789017.0 Old Identificati... 1997-09-30
5addd90d08c2... jigar chetan ajmera 123456789021.0 Old Identificati... 1996-12-01
5addd90d08c2... arijit jit singh 123456789022.0 Old Identificati... 2000-02-13
5addd90d08c2... dinesh munikrishna nandi 123456789023.0 Old Identificati... 1996-11-20
5addd90d08c2... manas kumar sanu 123456789024.0 Old Identificati... 1998-02-03
5addd90d08c2... ranveer veer singh 123456789025.0 Old Identificati... 1996-06-12
5addd90d08c2... bhanu pratap singh 123456789026.0 Old Identificati... 1996-03-04
5addd90d08c2... shushant raj singh 123456789027.0 Old Identificati... 1996-06-12
5addd90d08c2... jeet haar ganguly 123456789030.0 Old Identificati... 1998-06-16
5addd90d08c2... kumar k sanu 123456789031.0 Old Identificati... 1998-01-06
5addd90d08c2... babu raju bhai 2345987612340 OpenMRS Iden... 2018-03-25
5addd90d08c2... salman salim khan 670987654321.0 OpenMRS Iden... 1995-02-06
5addd90d08c2... Prashant Vilas Kanade 858361250778.0 OpenMRS Iden... 1974-11-21
5addd90d08c2... ravi dueby mamu 9876234512300 OpenMRS Iden... 2018-04-04
5addda5308c2... akshay ramesh gunani 123456780088
1 item selected
Count Documents
0.005s

8. Conclusions

8.1 Limitations

The only limitation is that every time for data access a one-time pin (OTP) is required.

8.3 Conclusion

From a recent analytics it is estimated that the health care industry could save billions by using big data health analytics to mine the information in Electronic Health Records, insurance claims, prescription order, clinical studies, Government reports and lab results. Analytics are majorly used to systematically review clinical data to provide decision based on the available data. Interesting thing is that instead of seeing only 20 patients a day doctors are available to see 75 to 100 people and get ahead of the wave. The main future of health care is to provide such physician support tools. Also to concentrate on areas such as to develop programs to prevent falls by patients in the hospital, predict the length of hospitals stays, create early warning system to spot complications after a procedure and reduce the number of people being readmitted for the same condition. The work is carried out to standardize the health record of the people for India. This work will finally have the EHR for India and finally provides many merits such as patient treatment cost will be reduced, patient data are managed efficiently, authentication of data is provided, indexing the authentication using cloud etc. Only the authorized experts can view the patient's details, since the data is very sensitive.

8.4 Future Scope

In future an android application can be developed for patient's as well as doctors for fast and easy access of the system resulting in having the whole IoEHR system as an mobile application at their fingertips.
Implementation of bockchain technology to achieve single longitudinal patient records, Master patient indices, Claims adjudication, Supply chain management in our system.

9.References

1. http://www.indjst.org/index.php/indjst/article/download/86391/66889
2. http://www.indjst.org/index.php/indjst/article/view/86391
3. https://www.ncbi.nlm.nih.gov/pubmed/19663162
4. https://docs.mongodb.com/manual/core/index-unique/

Paper 1:

Title:- Interoperability of Electronic Health Record

Published:- YES

Journal:- International Journal for Research in Applied Science & Engineering Technology.

Link:- https://ijraset.com/fileserve.php?FID=14486

Paper 2:

Title:- Merging of different Healthcare databases for Easy Access

Published:- Ready to publish