# Instruction Manual

## 0. Set Up

1. **Frontend**: based on **bootstrap4**

   All packages are managed by *npm* and included in the project folder.

   *If not ready, please use* `npm install xxx` *to install the required package, or use the available cdn*

2. **Backend**: based on **springboot**

   All packages are managed by *maven* and included in the project folder.

   *If not ready, please check the* `pom.xml` *or maven tools to rebuid the project*

3. **Database**: based on **postgresql**

   If you want to use the *transparent encryption* feature, you must download the supporting version. Please refer the following instruction,

   https://wiki.postgresql.org/wiki/Transparent_Data_Encryption#Scope_for_the_first_release_of_TDE

   Notice: in this project, we just use the *username:password = postgre:hellodoge*, If you want to use other user and password, please modify the file `DataBaseUtil.java`

   1. create db

      ```
      CREATE DATABASE health_platform;
      ```

   2. create table

      ```
      CREATE TABLE health_records
      (
          record_id character varying(100) primary key,
          record_date date,
          record_content character varying(100),
          patient_id bigint,
          doctor_name character varying(200),
          hospital_name character varying(200),
          hospital_department character varying(200)
      )

      CREATE TABLE patient_info
      (
          patient_id BIGSERIAL primary key,
          patient_name character varying(20),
          patient_age integer,
          patient_gender character varying(10),
          patient_idcard character varying(20),
          patient_telephone character varying(20),
          patient_htoken character varying(256),
          patient_salt1 character varying(20),
          patient_salt2 character varying(20)
      )

      CREATE TABLE auth_records
      (
          auth_id BIGSERIAL primary key,
          auth_date date,
          auth_by bigint,
          auth_token character varying(20),
          auth_field character varying(100),
          auth_records character varying(1000),
          auth_type integer
      )
      ```

   3. * insert pre-test data

*No. 3 can be ignored if you want to test from the very first begining.*

But if you are new, please insert some predefined data to test.

If you do not have the `pgcrypto` module, please install it by `CREATE EXTENSION pgcrypto;`

```
insert into patient_info values('patient_1',20,'Male','patient_1_idcard','not used
anymore',md5('1111'),'asdf','12ds');

insert into health_records values('hospital_1_department_1_00000001',now(),'reconrd
contents',1,'doctor_1','hospital_1','department_1');

insert into health_records values('hospital_1_department_1_00000002',now(),'reconrd
contents',1,'doctor_2','hospital_1','department_1');

insert into health_records values('hospital_1_department_2_00000001',now(),'reconrd
contents',1,'doctor_3','hospital_1','department_2');

insert into health_records values('hospital_2_department_1_00000001',now(),'reconrd
contents',1,'doctor_4','hospital_2','department_1');
```

# 1. Register

If you visit the platform *for the first time*, It can be regarded as a register process.

In this process, your information will be registered on the platform for future data management.

- e.g. patients can see different medical records from different hospitals.

*Notice: In this demo, verification code will be shown on the bottom after click the send button, you need to copy and paste it*
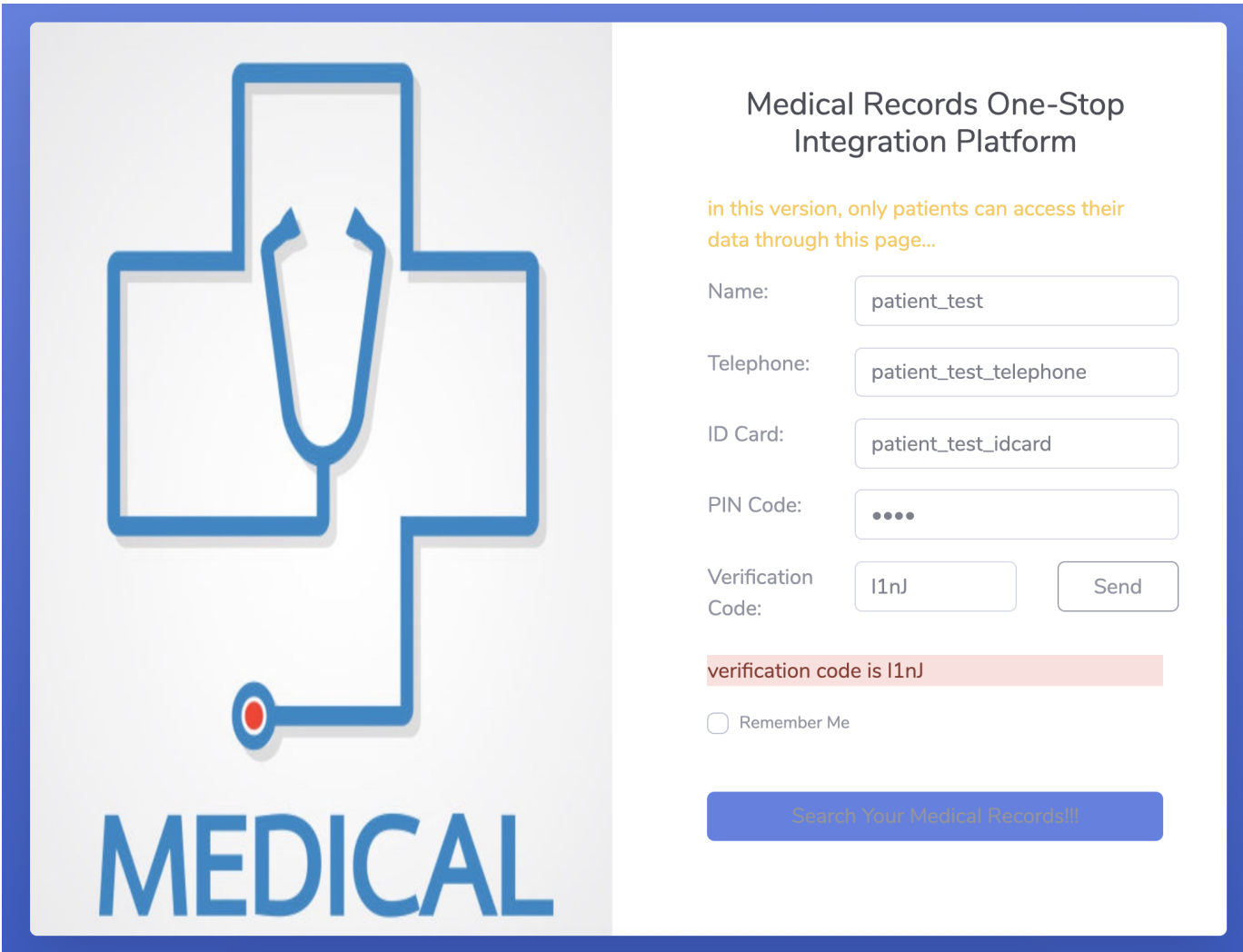


# 2. Login(for the already exist patient's account)

If you visit the platform for the second time, it will be regarded as a login process, we provide the following account.

**patient_1, patient_1_telephone, patient_1_idcard, 1111** is the pre-inserted patient information.

Medical Records One-Stop Integration Platform

in this version, only patients can access their data through this page...

Name: patient_1

Telephone: patient_1_telephone

ID Card: patient_1_idcard

PIN Code: ••••

Verification Code: ppru [Send]

verification code is ppru

☐ Remember Me

[Search Your Medical Records!!!]

# 3. Retrieve medical records from the platform

These data are existed in the platform (already retrieved from the hospital before)



**Medical Records Panel**

| Hospital Filter | Department Filter | Doctor Filter | Date Filter |
|---|---|---|---|
| all_hospitals | all_departments | all_doctors | 01/01/2020 - 12/30/2020 |

[Search Now!]

chose the filter you want

Retrieve records with a new Report_ID

Search:

| Record ID | Record Date | Record Content | Doctor Name | Hospital Name | Department Name |
|---|---|---|---|---|---|
| hospital1_department1_00000001 | 2020-10-01 | record contents | doctor_1 | hospital_1 | department_1 |
| hospital1_department1_00010001 | 2020-11-01 | record contents | doctor_1 | hospital_1 | department_1 |
| hospital1_department1_01000002 | 2020-11-10 | record contents | doctor_3 | hospital_1 | department_1 |
| hospital1_department2_00000001 | 2020-10-03 | record contents | doctor_4 | hospital_1 | department_2 |
| hospital2_department1_00000001 | 2020-10-02 | record contents | doctor_2 | hospital_2 | department_1 |
| test | 2020-11-02 | test | test | test | test |

[Grant Priviledges to Doctors] [Delete from Platform]

# 4. Retrieve medical records from the hospital

Retrieve data from the hospital with **telephone number** and **report_id**

*Notice: parameters are transfered in the x = hash(hash(telephone||inner_report_id||salt)||nonce) format as discussed before.*

Here we just treat x is valid and insert a test record into the platform.

| patient_1_telephone | inner_test | Retrieve New Records via ID |

this panel simulates the function of scanning a QR code

pass hash(hash(telephone||inner_report_id||salt)||nonce)

Search: [          ]

| Record ID | Record Date | Record Content | Doctor Name | Hospital Name | Department Name |
|---|---|---|---|---|---|
| 21c2cddb49cfbf0ffc3a1123210ac612 | 2020-11-03 | test | test | test | test |
| 935ceb291c45dae7f7746eb598bcd6f7 | 2020-11-03 | test | test | test | test |
| hospital1_department1_00000001 | 2020-10-01 | record contents | doctor_1 | hospital_1 | department_1 |
| hospital1_department1_00010001 | 2020-11-01 | record contents | doctor_1 | hospital_1 | department_1 |
| hospital1_department1_01000002 | 2020-11-10 | record contents | doctor_3 | hospital_1 | department_1 |
| hospital1_department2_00000001 | 2020-10-03 | record contents | doctor_4 | hospital_1 | department_2 |
| hospital2_department1_00000001 | 2020-10-02 | record contents | doctor_2 | hospital_2 | department_1 |
| test | 2020-11-02 | test | test | test | test |

| Grant Priviledges to Doctors | Delete from Platform |

# 5. Update personal information

Patients have the right to update their own information stored on the platform. (only for proof of concept)

**Basic Information**

| Name | ID Card |
|---|---|
| patient_1 | patient_1_idcard_new |

**Update Your Information**

| patient_1_idcard_new | Update ID Card | New PIN Code, 4 digits | Update PIN Code |

# 6. Delete data from the platform

Patients have the rights to delete data already exist on the platform

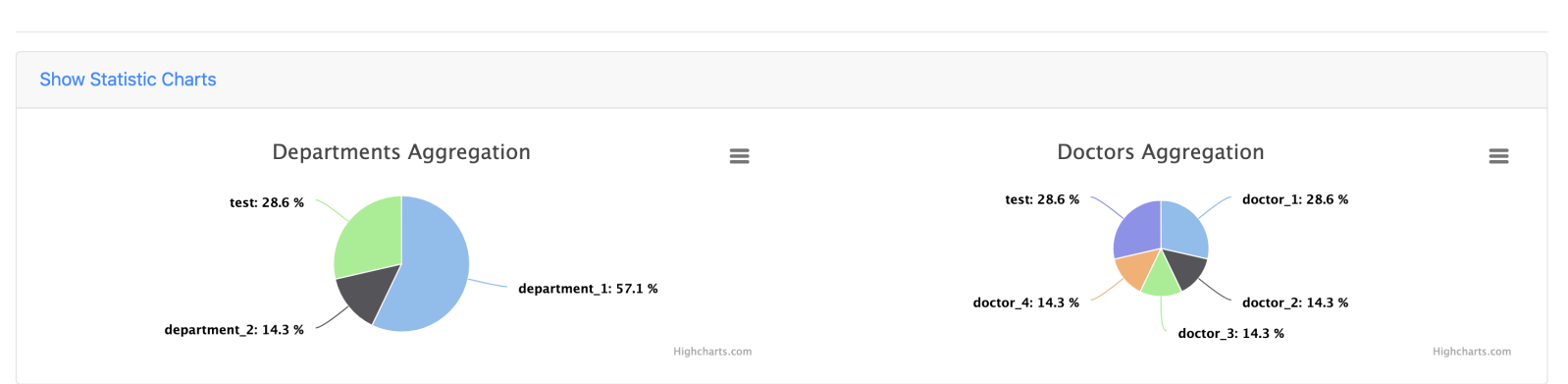*Notice: they still can retrieve it from the hospital with telephone and inner_report_id*

| Record ID | Record Date | Record Content | Doctor Name | Hospital Name | Department Name |
|---|---|---|---|---|---|
| 935ceb291c45dae7f7746eb598bcd6f7 | 2020-11-03 | test | test | test | test |
| hospital1_department1_00000001 | 2020-10-01 | record contents | doctor_1 | hospital_1 | department_1 |
| hospital1_department1_00010001 | 2020-11-01 | record contents | doctor_1 | hospital_1 | department_1 |
| hospital1_department1_01000002 | 2020-11-10 | record contents | doctor_3 | hospital_1 | department_1 |
| hospital1_department2_00000001 | 2020-10-03 | record contents | doctor_4 | hospital_1 | department_2 |
| hospital2_department1_00000001 | 2020-10-02 | record contents | doctor_2 | hospital_2 | department_1 |

| Grant Priviledges to Doctors | Delete from Platform |

# 7. Visualize and analyze the data(only for proof of concept)

Platform can provide ability to analyze and visualize the already existed data for the patient

**Show Statistic Charts**

Departments Aggregation

test: 28.6 %
department_1: 57.1 %
department_2: 14.3 %

Highcharts.com

Doctors Aggregation

test: 28.6 %
doctor_1: 28.6 %
doctor_4: 14.3 %
doctor_2: 14.3 %
doctor_3: 14.3 %

Highcharts.com

# 8. Share the data

Select the records you want to share

| Record ID | Record Date | Record Content | Doctor Name | Hospital Name | Department Name |
|---|---|---|---|---|---|
| 935ceb291c45dae7f7746eb598bcd6f7 | 2020-11-03 | test | test | test | test |
| hospital1_department1_00000001 | 2020-10-01 | record contents | doctor_1 | hospital_1 | department_1 |
| hospital1_department1_00010001 | 2020-11-01 | record contents | doctor_1 | hospital_1 | department_1 |
| hospital1_department1_01000002 | 2020-11-10 | record contents | doctor_3 | hospital_1 | department_1 |
| hospital1_department2_00000001 | 2020-10-03 | record contents | doctor_4 | hospital_1 | department_2 |
| hospital2_department1_00000001 | 2020-10-02 | record contents | doctor_2 | hospital_2 | department_1 |

| Grant Priviledges to Doctors | Delete from Platform |
|---|---|

Scan the QR code or Click the link

Please scan this QRCode to get the report



If the QRCode is crashed, please click this link ...

Click me!!!

Doctor can see the records selected by patients.

These medical records access rights are granted by  patient_1, Granted token is 5cos4hcu

Search: 

| Record ID | Record Date | Record Content | Doctor Name | Hospital Name | Department Name |
|---|---|---|---|---|---|
| 935ceb291c45dae7f7746eb598bcd6f7 | 2020-11-03 | test | test | test | test |
| hospital1_department1_00010001 | 2020-11-01 | record contents | doctor_1 | hospital_1 | department_1 |
| hospital1_department2_00000001 | 2020-10-03 | record contents | doctor_4 | hospital_1 | department_2 |

*Notice: All the shared action are recorded in the platform, and you can also use it to re-develop some abuse detection*

For now, If you shared data over 5 times, alert will be triggered.