Shaheed Sukhdev College of Business Studies
Department of Computer Science

HEALTH STREET

A Health Consulting System

SOFTWARE ENGINEERING PROJECT

(2020-2021)

SUBMITTED BY:-
Isha (18563)
Anushka (18578)
Bhavika (18562)

SUBMITTED TO:-
Mrs. Kavita Rastogi
(SUPERVISOR)

CONTENT TABLE

PROBLEM STATEMENT

In an age where medical science has made marvelous advancements, inefficiencies and errors in healthcare are still persistent because of low-key technology that the healthcare industry adopts for management. People still need to travel far miles to consult the best doctor for their health issues and even for the diseases which can be cured easily at home with the help of little guidance. The health management software will act as an interface between the patients and the doctors to access and provide the best medical facilities possible . This software will not only solve the problem of consulting a doctor anytime in a day but will also help in buying medicines at home and getting appointments for the lab tests. Basically, it will act as a mini hospital wherein the needs of the patients and visitors will be taken care of.

PROCESS MODEL

We have used the Waterfall Model to represent our project

• Waterfall model consists of different phases which are independent and are executed sequentially without any overlap. It has distinct goals for each phase of development like in our project we have different areas which needs to work independently for example booking a doctor's appointment, having a session with the selected doctor, paying the fees, buying the medicines online etc.

• It understands the customer requirements and documents them properly. Similarly in our project we require a proper functioning of what customer looks for during booking an appointment and making the choices with respect to buying medicines and selecting the number of tests that they want to have

• The advancement in the program does not need to be checked upon by the customer during the process. So, this model does not create problem

• It is relatively simple and easy to understand and has a structured approach as compared to other models. Hence, it completely fits well into our health system project

• The requirements are well stated, fixed and understood beforehand just like we have done in our project while taking the customer's information and letting them decide on what they are actually looking for with respect to doctor's specialisation, mode of payment, online or offline consulting, etc.

SOFTWARE REQUIREMENT SPECIFICATION

INTRODUCTION

HEALTH STREET is a trusted and familiar home where users know they'll find a healing touch. It connects them with everything they need to take good care of themselves and their family - assessing health issues, finding the right doctor by ensuring each doctor's profile is verified for medical license, booking diagnostic tests, obtaining medicines, booking offline and online appointments, taking online psychotherapy sessions.

1.1 Purpose:

The purpose of developing the software is to provide a flexible, easier and convenient healthcare experience. It connects thousands of healthcare providers with the patients all over the world. It helps the users to book appointments hassle free and skip long queues.

1.2 Scope:

This system allows user to get instant supervision on their health issues through a smart online health consulting system. Booking appointments manually at hospitals can become challenging especially for the old age group but, through this system patients can easily confirm appointments, enjoy online pharmacy supply which is in collaboration with India's top pharmacies.

1.3 Definition and Abbreviation:

- **RMMM:** Risk Mitigation, Monitoring & Management

1.4 Overview:

The user will first signup/ login into the system. After that a medical form is to be filled containing info. like blood groups, medical issues(if any) etc & submit it.
Then user can :-

- Go under Doctors portal and choose the required doctor in particular specialization & book an appointment with them either online or offline.

- Check out the Pharmacy section under which users can upload the prescription & then choose from a handful of online vendors for medicines and sanitary stuff. Medicines will be delivered at doorstep free of delivery charges.

- Schedule laboratory appointments, info. about availability of labs, time slots and charges for the test will be provided. The test report will be sent to the email-ID mentioned.

- Consultation fee for online/offline appointments, charges for orders placed under pharmacy section, laboratory tests fee & psychotherapy counselling session must be paid under the Billing Department online.

- Patients who require psychotherapy can take up online counselling sessions via video calls by qualified psychiatrists that can be attended by sitting at home.

1.5 References:

- SOFTWARE ENGINEERING, A PRACTITIONER'S APPROACH -By Roger S. Pressman

- AN INTEGRATED APPROACH TO SOFTWARE ENGINEERING -By Pankaj Jalote

OVERALL DESCRIPTION

2.1 Product Function:

- To provide a platform to all patients who have a busy schedule and cannot find suitable time to book appointments with the doctor, this system introduces 24*7 consultation with qualified doctors.

- To provide a platform to Doctors who can keep their clinic's patients engaged by letting them follow-up online or reach new patients and maximise their earnings.

- To provide a platform to millions of patients and thousands of doctors with a simpler, easier healthcare experience.

- It provides online psychotherapy counselling sessions.

- Billing department to look over the payments for consulting fees, pharmacy orders places & therapy sessions.

2.2 User Characteristics:

- **Patients:** First type of user will be the patient who will login to the portal and fill up a medical form after which they can book appointments with doctor, place medicine order or book lab test appointments.

- **Doctor:** Second type of user will be the doctor who's going to login to the portal and take up online consulting sessions with the patients and thus resolve their medical problems, respond to queries made by patients.

- **Admin**: Third type of user is the admin(group of people) who will maintain and handle the software.

2.3 General Constraint:

- This portal will be only available in English.

- Accessibility: Initially, the software should be available as an android application for a small set of users to test.

- System must be user friendly

2.4 Assumption & Dependencies:

- All facilities will be available 24*7 online.
- Users should be connected to the internet to access the system.
- Budget availability: The determined budget is accurate and covers all project expenses.
- Human resource availability: All key project team members are available and have the necessary skills and knowledge to work on the project.
- Performance of contractors, suppliers and vendors: All necessary equipment and goods are available whenever you need them.
- Minimum android version required is Android 7 (Nougat).

2.5 Functional Requirements:

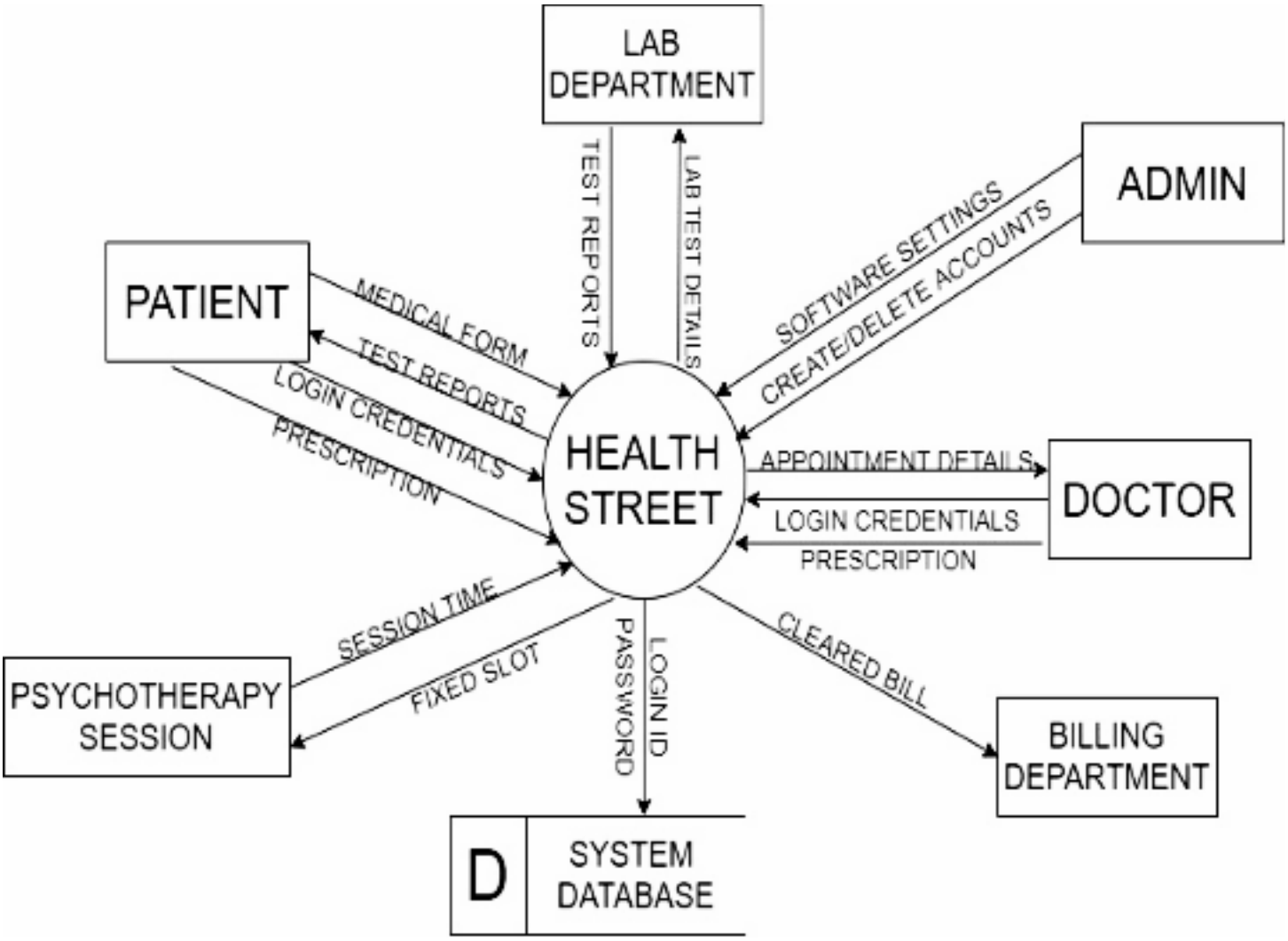
- To enter into the system user has to create an account.
- Medical form: Each patient needs to fill a medical form if they want to book an appointment with a doctor.
- A patient can book appointments with the doctor by two modes i.e. offline/ online consulting.
- Under offline consulting all freezed & unfreezed time slots,hospital venue, doctor details including

specialization,qualification,and ratings will be mentioned to the user.

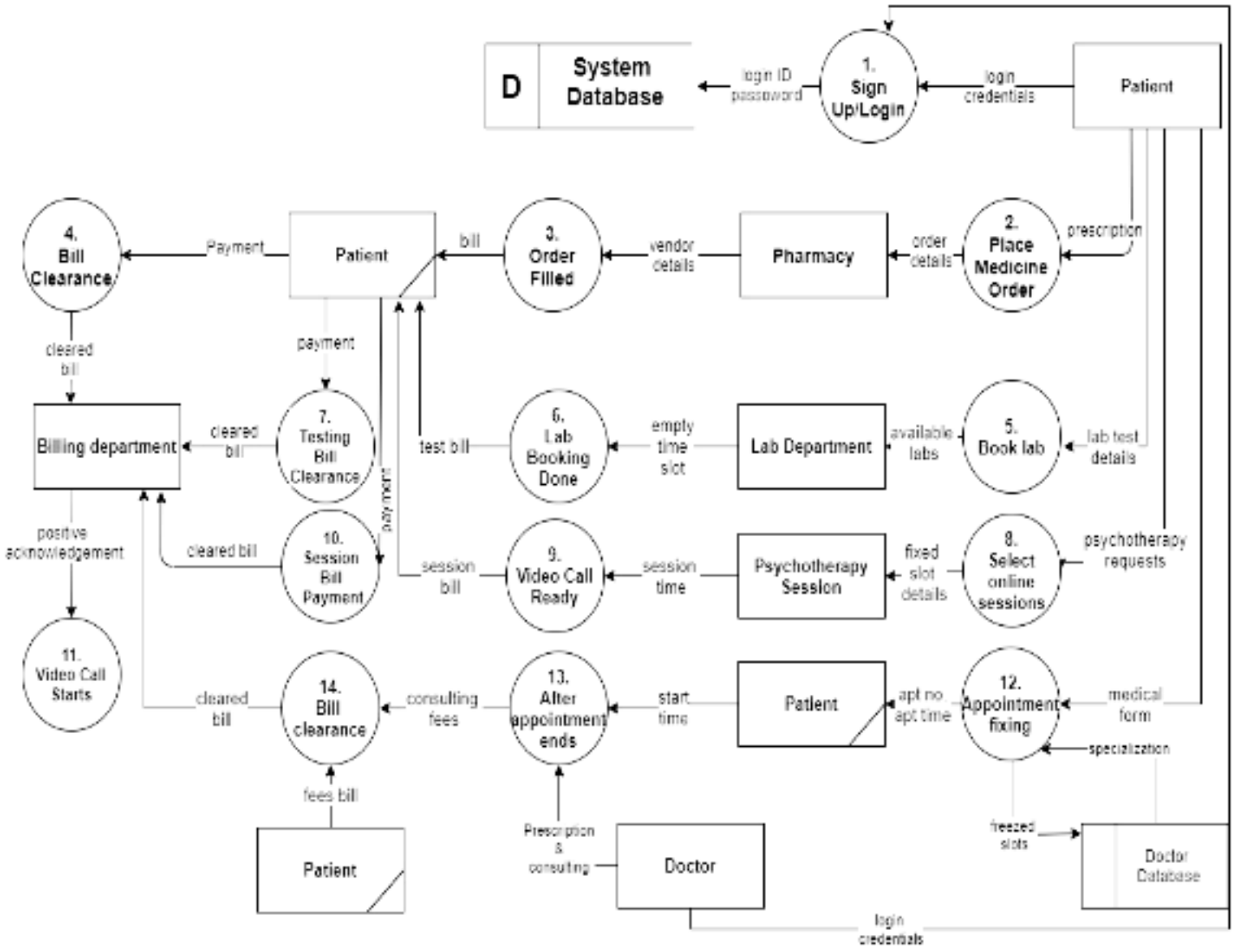
- Under online consulting all unfreezed slots, doctor details as mentioned above will be shown to the user.
- Under the Pharmacy section , only a verified prescription must be uploaded by the user before placing a medicine order.
- All available online vendors details will be shown to the user.
- Software should use cookies to store temporary progress.
- Lab test reports will reach users via email only after successful payment for tests.
- Enquiries related to reports are welcomed via email.
- Payment for the medicine order must be paid under the billing department beforehand through credit/debit card.
- Cash on delivery is accepted only for pharmacy orders.
- Patients can give optional ratings for the patient-doctor experience.

2.6 DFD

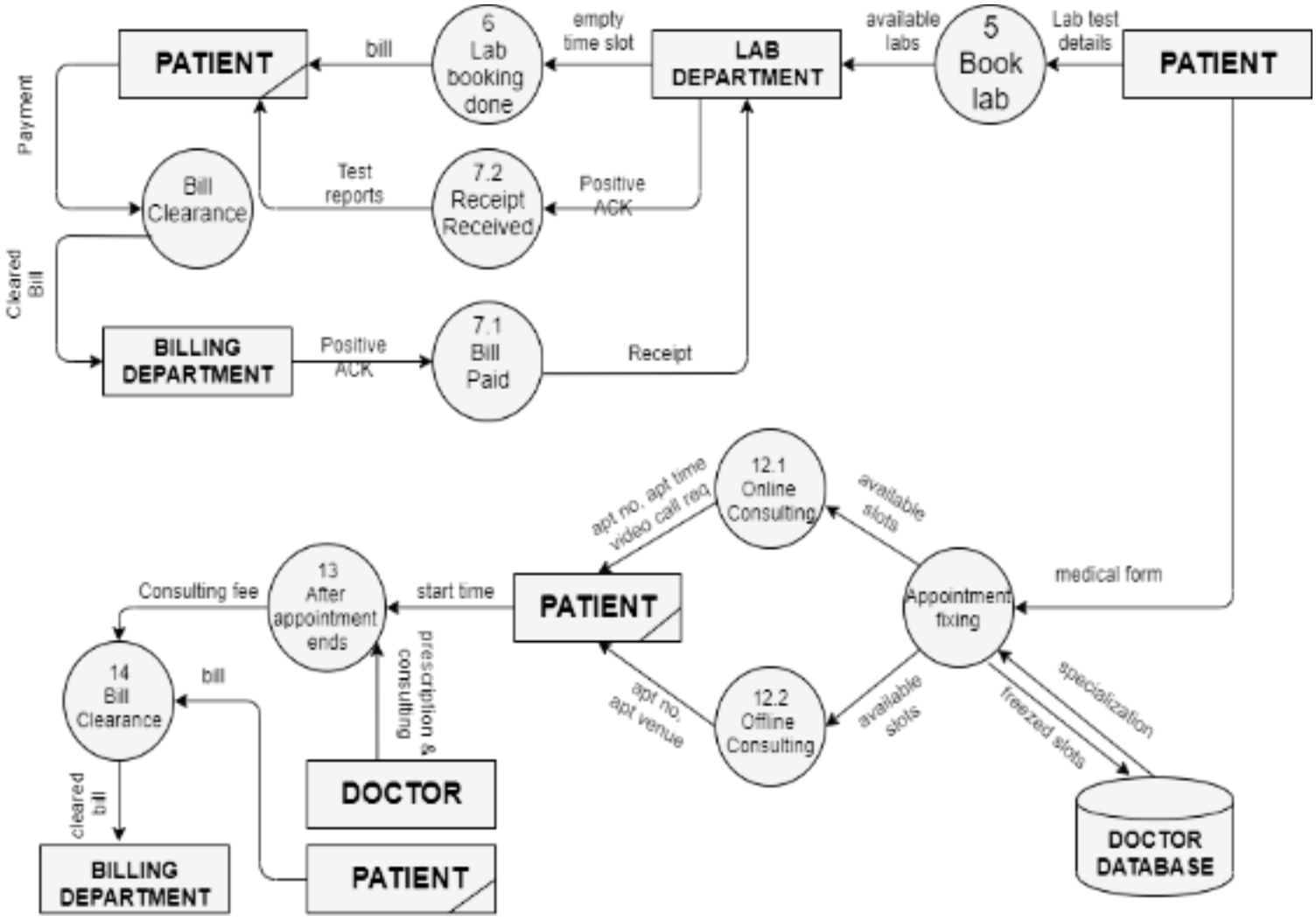
CONTEXT LEVEL



FIRST LEVEL DFD



SECOND LEVEL DFD



SPECIFIC REQUIREMENTS

3.1 External Interface Requirements:

3.1.1 User Interface:

UI Screens are :

- **LOGIN/SIGN-UP:-** Screen for login and signup for users.
- **MEDICAL FORM**:- HTML based form to obtain necessary details of a patient.
- **DOCTOR PORTAL:-** Database of the qualified doctors and their specialization including ratings.
- **APPOINTMENT PORTAL:-**After doctor selection, users can choose either offline/online consulting, unfreezed time slots will be mentioned.
- **PHARMACY PORTAL:-** Customers can place orders for medicine by choosing from the online vendors available & uploading prescription.
- **PSYCHOTHERAPY SESSIONS:-** Patients can take up online counselling by psychiatrist through video calls over skype, available time slots will be mentioned.
- **BILLING DEPARTMENT:-** Payment for orders, consulting fees ,counselling session to be paid here, either through Debit/Credit details.
- **REPORT ACCESS:-** After choosing the time slots for lab tests, email-ID will be asked from the user through which test reports will be accessed.

3.1.2 Hardware Interface:

OPERATING SYSTEM : Windows and Unix based/Android
PROCESSOR: Intel i5 or above.
RAM: 512MB or above.

3.1.3 Software Interface:

HTML, PHP, MYSQL, JAVASCRIPT,CSS

3.1.4 Communication Interface:

E-mail, Skype

NIC (Network Interface Card) - It is a computer hardware component that allows computers to connect to a network.

3.2 Performance Requirements:

- The user will be able to submit a medical form in less than 5 sec.
- Providing user's the doctors database for appointment booking will be done in less than 7 sec.
- The System must support 1000 people at a time
- The user-interface screen shall respond within 5 seconds.

3.3 Design Constraint:

System will run on windows/unix based platforms as well as android platforms.

3.4 Other Requirements:

Non functional requirements:

- User interface- User interface screen will respond within 5 seconds.
- Capacity-The system must support 1000 people at a time.
- Administrator and many other users can access the system but the access level is controlled for each user according to their work scope.

DATA DICTIONARY

1. Signup Details: Name+City+Country+UserID+Phone_no

2.Name: Fname+Mname+Lname

3.Phone_no: digit+digit+digit+digit+digit+digit+digit+digit+ digit+ digit

4.LabTEST_details: Labname+Labno+Testname+Charges+ Prescription_no

5.Appointment Type: Online|Offline

6.Pharmacy_detail:
Vendor_name+orderID+order_charges+Pharmacy_name+Address

7.Address: House_no+street_no+city_name+Pincode

8.Doctor details: Qualification+Specification+Work_Exp+Rating

9.Login:emailID+Password

10.Password: char*

11.Medical Form:
PatientID+Pname+City+BloodGroup+Weight+Medical_Issue

12.Appointment details:
Appt_no+Date+Time+Treatment_type+Charges+Appt_type

13.Time:Hours+Minutes+Seconds

14.Prescription:
Pres_no+DOB_patient+height+weight+medicine_names+quantity

DATABASE DESIGN

TABLE 1 (USER SIGNUP)

Attribute	Data type	Constraint
Fname	VARCHAR	null
Lname	VARCHAR	null
City	VARCHAR	null
Country	VARCHAR	null
Phone_no	Number	null
User_ID	Integer	PRIMARY KEY
Password	VARCHAR	null

TABLE 2 (DOCTOR DETAILS)

Attribute	Data type	Costraint
Dfname	VARCHAR	null
Dlname	VARCHAR	null
Doc_ID	Number	Primary key
Specialization	VARCHAR	null
Qualification	VARCHAR	null
Work_EXP	VARCHAR	null

Rating	Integer	null

TABLE 3 (FORM DETAILS)

Attribute	Data type	Constraint
Patient_ID	Integer	PRIMARY KEY
Patient_name	VARCHAR	Not null
City	VARCHAR	Not null
Blood group	VARCHAR	DEFAULT ‘ unknown’
Weight	Float	DEFAULT ‘unknown’
Medical_issue	VARCHAR	null

TABLE 4 (APPOINTMENT DETAILS)

Attribute	Data type	Constraint
Appt_no	Integer	PRIMARY KEY
Appt_date	DATE	null
Time	TIME	null
Type_treatment	VARCHAR	null
Patient_ID	Integer	null
Charges	Float	null
Online_consulting	VARCHAR	null

Offline_consulting	VARCHAR	null

TABLE 5 (PRESCRIPTION)

Attribute	Data type	Constraint
Presc_no	Integer	PRIMARY KEY
D.O.B_patient	VARCHAR	null
Height	Integer	null
Weight	Float	null
Medicines	VARCHAR	null
Quantity	Integer	null

TABLE 6 (PHARMACY)

Attribute	Data type	Constraint
Pharmacy_name	VARCHAR	null
Address	VARCHAR	null
Presc_no	Integer	Foreign key ref. Prescription table
Vendor_name	VARCHAR	null
order_ID	Integer	Primary key
med_Charges	FLOAT	-
Phone_no	Number	-

TABLE 7 (LAB_TEST)

Attribute	Data type	Constraint
Lab_name	VARCHAR	null
Lab_no.	Integer	PRIMARY KEY
Test_name	VARCHAR	null
Report	VARCHAR	-
Charges	Float	-
Presc_no	Integer	FOREIGN KEY ref PRESCRIPTION TABLE

RISK MANAGEMENT
RISK TABLE

S.no	RISK	IMPACT	PROB.	CATEGORY
1	Project cost exceeds	2	50%	PC
2	Technology doesn't meet expectations	2	20%	TE
3	Losing budget	2	30%	PC
4	Lack of promotion	1	40%	BU
5	Misinterpretation between staff	2	30%	Comm
6	Delivery deadline extends	3	40%	PSc

IMPACT TYPE:
1- Catastrophic
2-Critical
3-Marginal
4-Negligible

CATEGORY:
PC- Project cost
TE- Technical risk
BU- Business risk
Comm- Communication risk
PSc- Project schedule

RMMM Plan for Risk : Misinterpretation between staff

1. MITIGATION: In health consulting system, Misinterpretation between staff is one of critical risks that occurs due to staff members making assumptions,lack of accountability or not understanding non-verbal communication which may result in an inefficient SRS acting as a prerequisite for a bad quality project thus leading to another critical risk i.e exceeding Project budget.

2. MONITORING: Misinterpretation can be monitored by analysing the degree to which the team has gelled, by practicing active learning during a conversation that will improve concentration,understanding,response & memory of conversation.Be precise and to the point.

3. MANAGEMENT: Address issues immediately and openly.Clearly observing what is being said and talking in person if something is not understood. Pick the right time

to speak when everyone is active and energetic.Recognize and respect personal differences.

ESTIMATION FUNCTION POINT

S.no	QUESTIONS	GRADE VALUE
1.	Does the system require reliable backup and recovery?	3
2.	Are specialised data communication required to transfer information to or from the application?	3
3.	Are there distributed processing functions	2
4.	Is performance Critical?	2
5.	Will the system run in an existing, heavily utilized operational environment ?	3
6.	Does the system require online data entry?	4
7.	Does the online data entry require the input transaction to be built over multiple screens or operations?	2
8.	Are the ILFs updated online?	3
9.	Are the inputs, outputs, files, or inquiries complex?	2
10.	Is the internal processing complex?	3
11.	Is the code designed to be reusable?	3
12.	Are conversions and installations included in different organizations?	3
13.	Is the system designed for multiple installations in different organizations?	2
14.	Is the application designed to facilitate change and for ease of use by the user?	3

VALUE ADJUSTMENT FACTOR: $\sum fi=38$

Rate on each factor on scale 0 to 5:

0: No influence
1: Incidental
2: Moderate
3: Average
4: Significant
5: Essential

Information Domain Value	Estimated Count	Weighing Factor	Weighing Count
EXTERNAL INPUT	5	4	20
EXTERNAL OUTPUT	5	5	25
EXTERNAL INQUIRIES	1	4	4
NUMBER OF LOGICAL FILES	2	10	20
EXTERNAL INTERFACE FILES	0	7	0

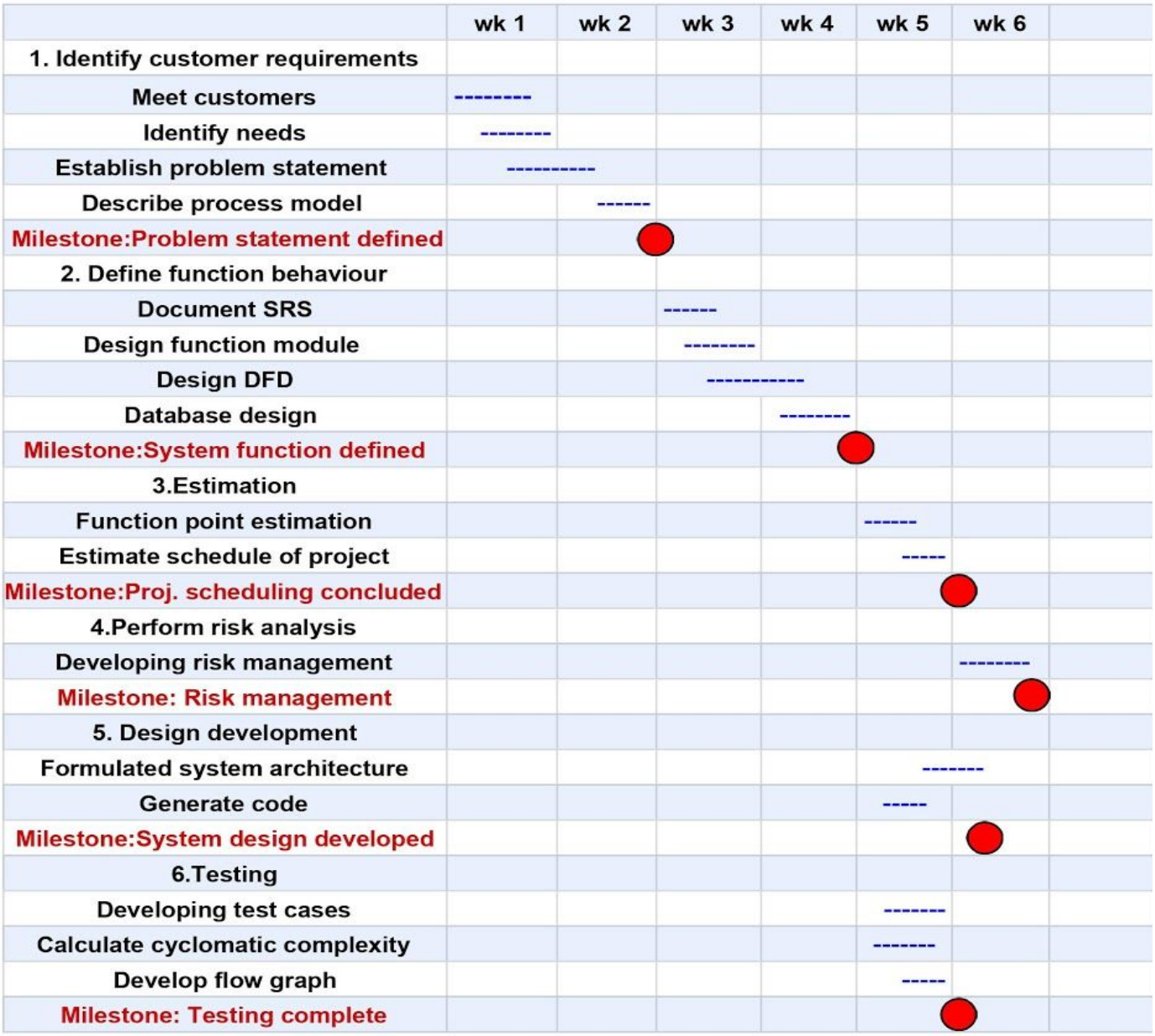
COUNT TOTAL : 20 + 25 + 5 + 20= 69

FUNCTION POINT METRIC = count total*(0.65+(0.01*∑fi))

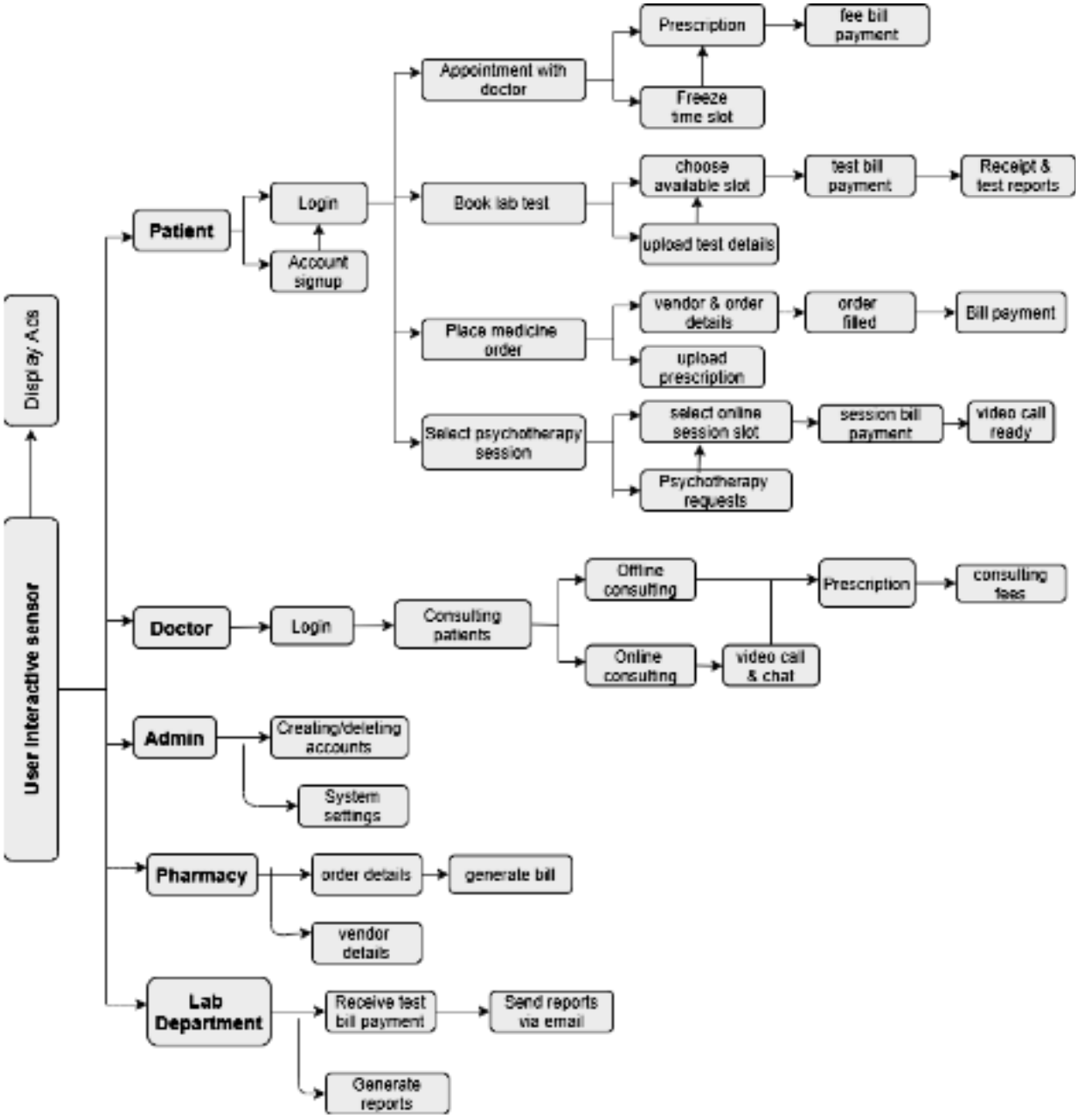
= 69*(0.65+(0.01*38))

= 71.07

TIMELINE CHART

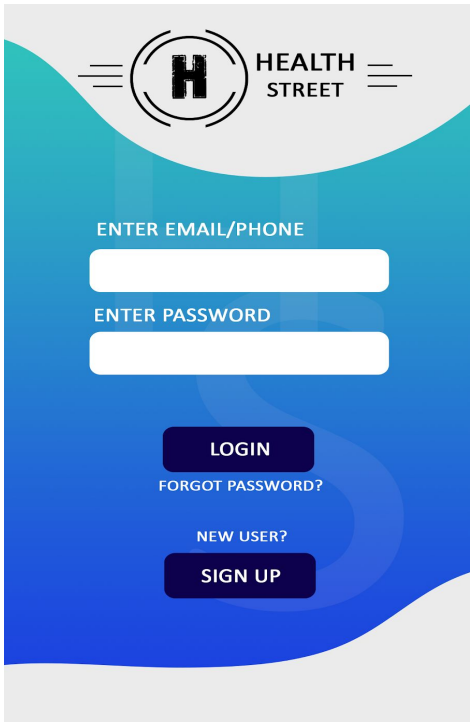


ARCHITECTURE DESIGN

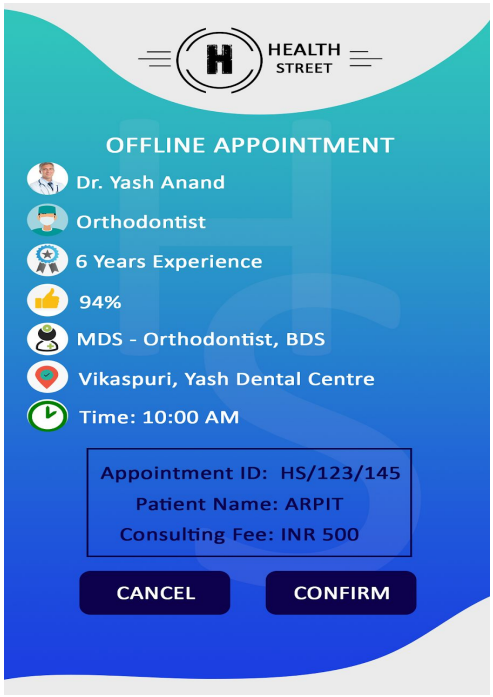


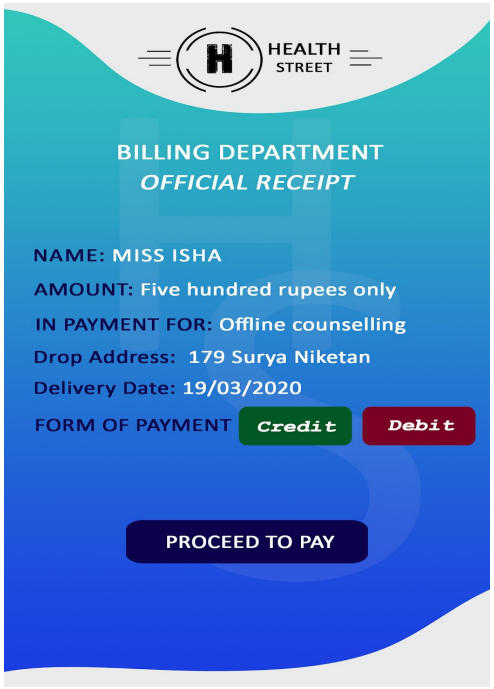
INTERFACE DESIGN

Input Screens



Output Screens





CODING

```
int main()                                                                    .
{ int choice; char ch1,ch2,ch3;                                                1
Do                                                                             2
{
cout<<"\t\t\t WELCOME TO HEALTHSTREET \t\t\t\n
\t\t\t Menu:\n\t 1.SignUp\n\t 2. Login \n\t 3. Book an appointment\n\t  4.Order
medicine\n\t 5. Billing department\n\t 6. Psychotherapy sessions"\n\t7.Book lab
tests\n\tEnter your Choice:\t";
cin>>ch;                                                                       3
switch(ch)                                                                     4
{   case 1: cout<<”New user ? Sign up! \n";
            SignUp();      break;                                              5
  case 2: cout<<"Please login to proceed.\n";
            Login();       break;                                              6
   case 3: cout<<"Appointment bookings !\n"                                    7
        do                                                                     8
          {   cout<<"Choose the type of consulting:\n
              Press:\n\t 1.Online consulting\n\t
                          2. Offline consulting\t\nEnter Your Choice";
              cin>>ch1;                                                        9
              switch (ch1)                                                     10
               {    Case 1:      Online();
                                 Break;                                        11
                    case 2:      Offline();
                                 Break;                                        12
                  default: cout<<"Enter a valid choice!\n"
                                  Break;                                       13
```

```
                cout<<"Want to schedule more appointments?(Y/N)";
                 cin>>ch2;
               }                                                                    14
```

```
               while(ch2=='Y'||ch2=='y');
                Break;                                                          15
```

```
case 4:    Pharmacy();
               Break;                                                           16
```

```
case 5:    Deposit();
               break;                                                           17
```

```
case 6:   Psychotherapy();
               Break;                                                           18
```

```
case 7:   testing();
                break;                                                          19
```

```
default: cout<<"Enter a valid Choice\n";
                  Break;
  }                                                                             20
```

```
 cout<<"Want to perform more?(Y/N)";
cin>>ch3; }                                                                     21
```

```
while(ch3=='Y'||ch3=='y');                                                      22
```

```
 return 0;
 }                                                                              23
```

```
Online ( )
{
 bool m= true;
 cout<<"Choose type of specialist,under category doctor  and select suitable slot for
online consulting and pay the consulting fee online";
 cin>> type_ofspecialist>>doctor_name>>timeslot;                                24
```

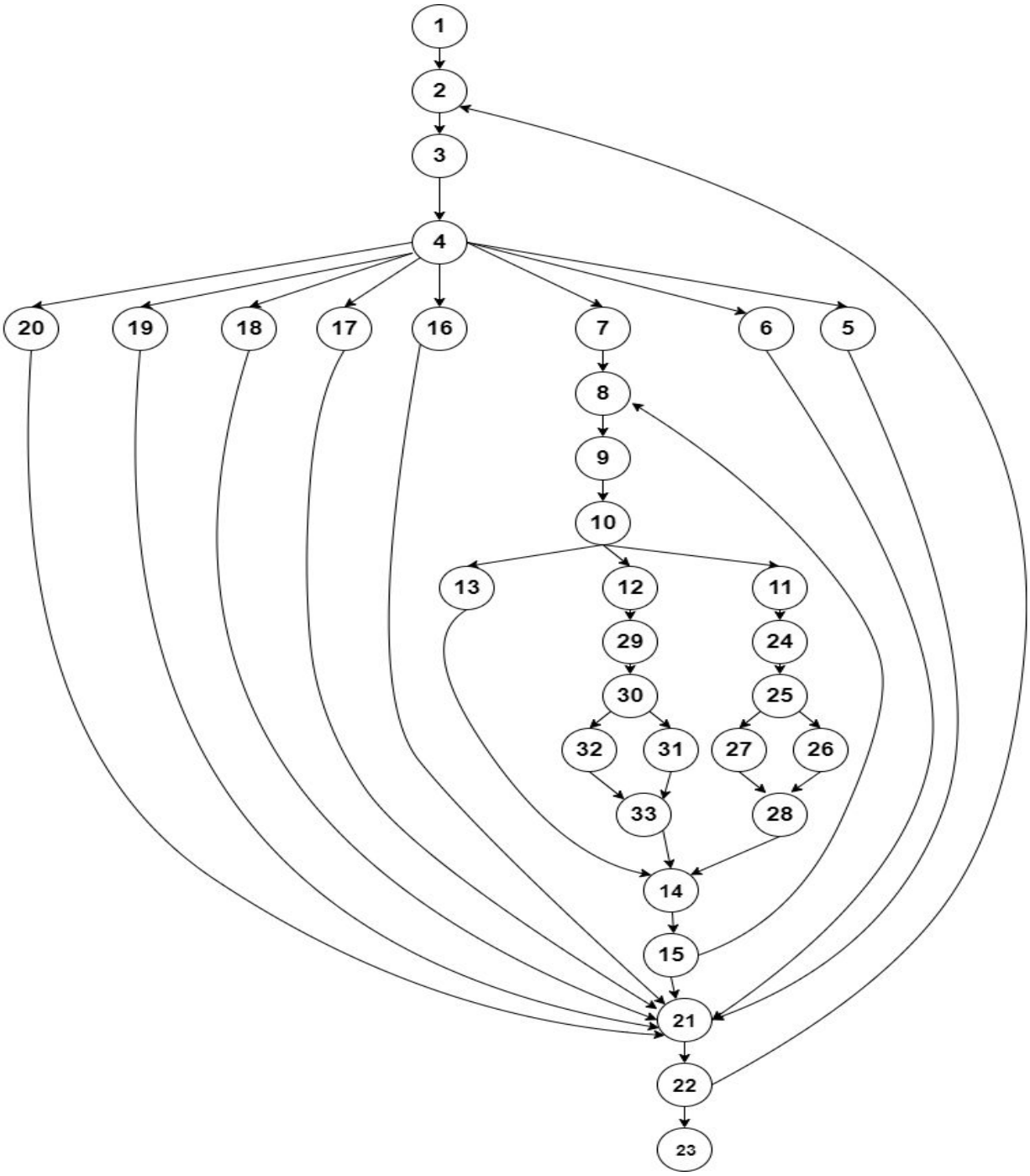
```
m=Deposit( );                                                                   25
```

```
if(m)
 {
cout<<"Congrats! Appointment confirmed.";   }                                   26
```

```
else
cout<<"Oops!! Appointment not scheduled.";                                    27

 }                                                                            28

Offline ( )
{
 bool l = true;
 cout<<"Choose type of specialist,under  Category doctor and select suitable time  for
offline consulting";
cout<<"Confirm your appointment by paying consulting fee online";             29

  l=Deposit( );                                                               30

if(l)
 {
cout<<"Congrats! Appointment confirmed.";}                                    31

else
cout<<"Oops!! Appointment not scheduled.";                                    32

}                                                                             33
```

BASIS PATH TESTING

FLOW GRAPH



CYCLOMATIC COMPLEXITY

No. of edges E = 45
No. of nodes, N = 33
Cyclomatic complexity = **E - N + 2** = 45-33+2 =14

OR

No. of Regions: R=14
Cyclomatic complexity = R =14

OR

INDEPENDENT PATHS

Path 1: 1-2-3-4-5-21-22-23
Path 2: 1-2-3-4-6-21-22-23
Path 3: 1-2-3-4-16-21-22-23
Path 4: 1-2-3-4-17-21-22-23
Path 5: 1-2-3-4-18-21-22-23
Path 6: 1-2-3-4-19-21-22-23
Path 7: 1-2-3-4-20-21-22-23
Path 8: 1-2-3-4-7-8-9-10-13-14-15-21-22-23
Path 9:1-2-3-4-7-8-9-10-12-29-30-31-33-14-15-21-22-23
Path10:1-2-3-4-7-8-9-10-12-29-30-32-33-14-15-21-22-23
Path11: 1-2-3-4-7-8-9-10-11-24-25-27-28-14-15-21-22-23
Path12: 1-2-3-4-7-8-9-10-11-24-25-26-28-14-15-21-22-23
Path13: 1-2-3-4-16-21-22-2
Path14: 1-2-3-4-7-8-9-10-13-14-15-8