Idea/Approach Details

Ministry Category: Ministry of Health and Family Welfare
Problem Code: #MHF7
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UGC Registration No: F.9-2/2014(CPP - I/PU)

Problem Statement:

1. Presently ministry of health and family welfare has started using online appointment system for helping patient get appointments in large tertiary care hospitals like AIIMS. 2. The appointment could be taken for any date and for any provider of choice. However currently there is no mechanism to inform patient if the same provider is not available in the hospital on the scheduled date. 3. The process of rescheduling appointment with any other provider is also not available and for follow-ups the appointment scheduling system does not generate any reminders to the patients and if patient discovers late about the follow-up visit he has to do the entire process of appointment scheduling again to get the appointments done. 4. Digital technology can help to address this issue by identifying mechanism to link the current appointment system with the duty roster of the doctors and also create mechanism for re-appointment of the patients with other providers in case provider of choice is not available. The solution should also include sending follow-up reminders to the patients and helping them to schedule follow-up visits with the doctors without registering for the appointment once again. Desired Outcome: i) This helps in building more trust among patients about the hospital and would also encourage patients to get timely follow-up visits done to improve their health status. ii) Any technology such as web, App or some SMS based system could be used to fulfill this need.

Problem Solution:

The solution to above problem is to develop an application which will improve the appointment scheduling system in the hospitals.This application will make the appointment scheduling system easier as it allows the user various features and facilities which will make the procedure of taking appointment feasible and reliable.The user first need to register on the smart appointment app. for taking appointment,Then user need to select the appointment date and symptoms he/she is suffering from, to check the availability of provider on particular field of specialization.After this the user will select the provider of their choice or any other provider if their choice of provider is not available.If provider is available the user will take the appointment and proceed to further procedure but if the user is in the waiting list the user will either take the appointment for any other date or be in the waiting list or choose both the option.Those who will choose both the option will need to pay twice.But before actual payment the user will get the list of previous appointment no. and waiting no. through which the user can assume whether he/she wants the appointment or not and then decide to pay.The user then make appointment and payment

according to his choice.The payment will be made through online transaction.Once the payment confirmed refund of money will not take place.After this user will get the waiting no. or appointment no. accordingly.Those who want to apply for the follow-up visit from doctor will need to register in the follow-up visit option in the app.The user who got the appointment and those who are in follow up list will get the reminders 2 days prior from their actual appointment date and they need to confirm their appointment within stipulated time .Those who got the appointment if unable to discover the reminders will take re-appointment from present available doctor option(this case is for those who are not in the follow up visit list).Those who are in the follow-up list and who didn't discover the reminder will need to register in the app. again for any other date .Also notifications will be sent to those who are in waiting list if any slot is free but they also need to confirm their within stipulated time.The user can also cancel the appointment.

This application will enable user to get appointment easily,provide reschedule/reappointment facility and provide notifications/reminders facility.Moreover this will save user time and it will prove helpful in fast and quick way to take appointment.

ADVANTAGES

There are many advantages of using this application. Some of them are specified below:

Advantages for the users-

- Flexibility in taking appointment.
- Health status of patients improved.
- Long queues and time wastage issue tackled effectively.
- Cancel appointment and Reschedule or Re-appointment facility
- Easy to use.
- Platform independent.
- Online payment and e-wallet features.
- User received proper Reminders and Notifications.

Advantages for the Government-

- Digitized India..
- One time investment.
- Enhancing approach to making India cashless.
- Less maintenance cost.

DISADVANTAGES

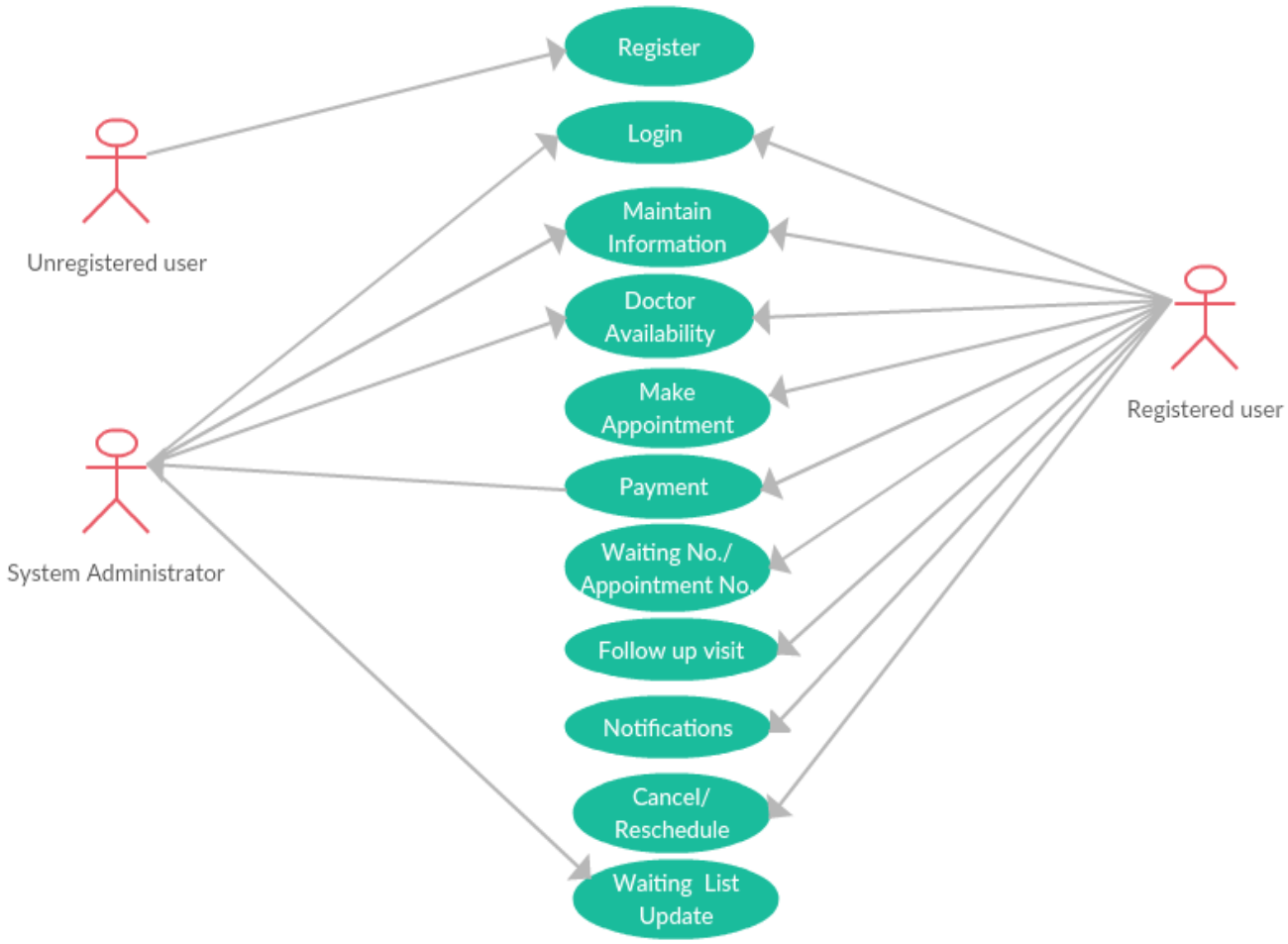
Although there are many advantages for this application, disadvantages may still arise in some situations. We have specified some situations below-

1. Users who neither confirm nor cancel will get the appointment from present available doctors only.
2. As this application is associated with third parties, any trouble at their site will also effect this application.
3. Money would not be refunded in case user cancel the appointment by their own choice and those who are in the waiting list but unable to get the appointment.
4. Users who has already got the appointment and those who are in the follow -up visit list will have to re-confirm their appointment within stipulated time.

TECHNOLOGY STACK

Programming Language	Java
IDE	Android Studio
Database	Oracle

USE CASE DIAGRAM



USE CASE SPECIFICATION DOCUMENT

Use Case: Register

1. Brief Description
This use case describes the registration process for the user.

2. Actors
Unregistered user.

3. Precondition
There are no preconditions in this use case.

4. Basic Flow of Events
- The use case begins when the user selects the register option.
- The user fills all the required fields in the form.
- After the details are filled then the user selects “Submit” option.
- The details are saved in the database.
- The use case ends.

5. Alternative Flows
5.1 Re-registration
If in step 3, the existing user registers again then,
- An error message ”Already Exist” will be displayed.
- The use case resumes at step 1.

6. Sub-flows
There are no sub flows in this use case.

7. Post Condition
There are no post conditions associated with this use case.

Use Case: Login

1. Brief Description

This use case describes how the user logs into the application .After login, it allows the users to access various services of the application.

2. Actors

- System administrator
- Registered user

3. Preconditions

- The unregistered user should be registered first.

3. Basic Flow of Events

- The use case begins when the user enters his/her login details.
- The system verifies the login details
- After verification, the user can now access the application.
- The use case ends.

4. Alternative Flows

5.1 Invalid User Id/Password

If in step 2 of the basic flow, the details entered are invalid, then

- The use case displays an error message.
- The use case resumes at step 1.

5.2 Forgot password

If user forgets his/her password, then

- The user will select forgot password option.
- The use case ends.

6. Sub-flows

6.1 History

If user wants to see his/her history of appointments then the user will click on history option. The use case ends.

6.2 My Profile

If user wants to see his/her profile then the user will click on my profile option and edit profile option also.The use case ends.

6.3 My Appointment

If user wants to see his/her current profile details then the user will click on my Appointment option.

7. Post Condition

After login user will be allowed to access the application to use services for which they have been given rights.

Use Case: Maintain Information

1. Brief Description

This use case describes how information is maintained.

2. Actors

- System Administrator
- Registered User

3. Preconditions

The registered user should be logged in and system administrator should have admin rights.

4. Basic Flow Of Events

- The use case begins when the user selects the maintain information option.
- The user then selects out of the sub-flows and proceeds.
- The use case ends
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5. Alternative Flows

There are no alternative flows in this use case.

6. Sub-flows

6.1 Appointment Dates

The user can select the suitable date of appointment and check what slots are available.

6.2 Symptom Checker/Field Of Specialization

The user can specify their symptoms and obtain information as to which type of doctor they should visit.

7. Post-Conditions

The Admin will be able to collect the data (punctual or historical) to build statistics.

Use Case: Doctor's Availability

1. Brief Description

This use case lets the user check the availability of doctor's in a specified field of specialization on a given date.

2. Actors

- System Administrator
- Registered User

3. Preconditions

The registered user must select the required appointment date and symptoms.

4. Basic Flow Of Events

- The use case begins when the user selects the option Doctor's Availability
- The system displays the desired doctor information.
- The user select the particular doctor.
- The use case ends here.

5. Alternative Flows

5.1 Doctor available.

- Proceed for the appointment.

5.2 Situation when doctors is not available in particular date and time slot.

- The use case displays message "Doctor not available".

6. Sub-flows

There are no sub-flows in this use case.

7.Post-Conditions

- Doctor and time availability for both who got the appointment and who are in the waiting list.
- Doctor details(Name,Specialization,Department)
- Possibility- user can make appointment.

Use Case:Make Appointment

1.Brief Description

This use case allows user to make appointment .

2.Actors

Registered user.

3. Preconditions

- The system offers list of all previous appointment no. and waiting no.

4. Basic Flow of Events

- The use case begins when user selects make appointment option.
- After this user is directed to payment window.
- The use case ends here

5.Alternative Flows

There is no alternative flow in this use case.

6.Sub-flows

There are no sub flows in this use case.

7.Post Condition

- User will find a payment option and proceed for the payment.

Use Case: Payment

1. Brief Description
This user can proceed to make payment.

2. Actors
- Registered User
- System Administrator

3. Preconditions
- The appointment has already been made.

4. Basic Flow of Events
- The use case begins when the user selects the payment option.
- User then provides his/her banking credentials.
- The merchant site will process the transaction.
- Transaction id is generated and a confirmation message will be displayed.
- A notification is sent to admin consisting the same transaction details.
- The use case ends.

5. Alternative Flows
5.1 Invalid credentials
If in step 2 of the basic flow the details are not valid, then
- The use case displays an error message.
- The use case resumes at step 1.

5.2 Request time-out
If in step 3 of the basic flow the session takes too long, then
- The use case displays a timeout message.
- The use case resumes at step 2.

6. Sub-flows
There are no sub flows in this use case.

7.Post Conditions
There are no post condition in this use case.

Use Case: Waiting no. /Appointment no. allotment

1. Brief Description
This use case describes how the allotment of waiting no./Appointment no. To the user.

2. Actors
- Registered User

3. Preconditions
- The user should have made the appointment and the payment.

4. Basic Flow of Events
- The are no basic flow of events.

5. Alternative Flows
There are no sub flows in this use case.

6. Sub-flows
There are no sub flows in this use case.

7. Post Conditions
The user will get the reminders/notifications for the same.

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Use Case: Follow-up visit

1. Brief Description
The use case describes how the user apply for the follow-up visit.

2. Actors
- Registered User

3. Preconditions
- The user has already taken the appointment from the doctor at least once.
- This user would not be in the waiting list.

4. Basic Flow of Events
- The user now apply for the follow-up visit.
- Details are updated in the database.
- The use case ends.

5. Alternative Flows
There are no alternative flows in this use case.

6. Sub-flows
There are no sub flows in this use case.

7. Post Conditions
- A details of the user is saved in the system to be matched later with that of user’s at the time of meeting with the doctor.
- The user will get the reminders/notifications for the same.

Use Case: Notifications

1. Brief Description
This use case describes that the reminders/notifications will be sent to the appointment no./waiting no. Holder along with those who have registered in follow-up visit..

2. Actors
- Registered User

3. Preconditions
- The user should have either appointment no. or waiting no.
- The user who already taken the appointment from the doctor should registered in the follow-up visit

4. Basic Flow of Events
- The reminder will be sent before 2 days of the appointment time to appointment no. Holder and user in the follow-up visit.
- The notification will be sent to the waiting no. Holder if any time slot is vacant.

5. Alternative Flows
There are no sub flows in this use case.

6. Sub-flows
There are no sub flows in this use case.

7. Post Conditions
The user will respond to the reminders/notifications.

Use Case: Cancel/Reschedule Appointment

1. Brief Description
This use case describes the cancellation and rescheduling appointments by the user.

2. Actors
Registered user.

3. Precondition
- The user must have made the appointment earlier.
- The user must get a notification for rescheduling the appointment if any other user has cancelled the appointment.

4. Basic flow of the event
- The use case begins when the user have a waiting number or application number if not in the waiting list.
- The user chooses between cancel and reschedule appointment options.
- After choosing the cancel option the appointment would be cancelled.
- After choosing the reschedule appointment the user would be redirected to the use cases Doctors availability and make appointment.
- The details are saved to the database.
- The use case ends.

5. Alternative flows
If in step 4 the doctor is not available in accordance to the user the user must go to the step 3 to cancel the appointment.

6. Sub flows
There are no sub flows in this use case.

7. Post Condition
There are no post conditions in this use case.

Use Case: Waiting list update

1. Brief Description

This use case describes the updated waiting list after cancel and rescheduled appointments.

2. Actors

System administrator.

3. Precondition

- The number of user have already visited should be known.
- The cancelled appointments should be available.
- The rescheduled appointments should be available.

4. Basic flow of the event

- This use case checks the waiting list.
- Checks the already visited users.
- Checks the cancelled appointments.
- Checks the rescheduled appointments.
- Update the waiting list.
- The use case ends here.

5. Alternative flow

There is no alternative flow in this use case.

6. Sub flow

There is no sub flow in this use case.

7. Post condition

There is no post condition in this use case.

DEPENDENCIES

The main dependencies of our application are-

1) **Internet** – Without internet connection application will not work as it works only on network.
2) Works only on **smart phones** and **tablets** etc.
3) **Merchant sites** such as PayPal, paytm etc. Without these sites, the user will not be able to do transactions successfully. It is very important part of any application dealing with payment.
4) **Database server** – Database server plays a significant role in performing all the operations of the application- Whether it is the case of login or registering a new user or updating the address, etc.
5) **Application server** – It is required to run all the application services related to our appointment application.

SHOW STOPPER

Some of the reasons which may act as show stopper in this case are -

1) Downtime for the application in case of maintenance.
2) Third party software not working.
3) System overload.
4) Failure of Database connectivity.