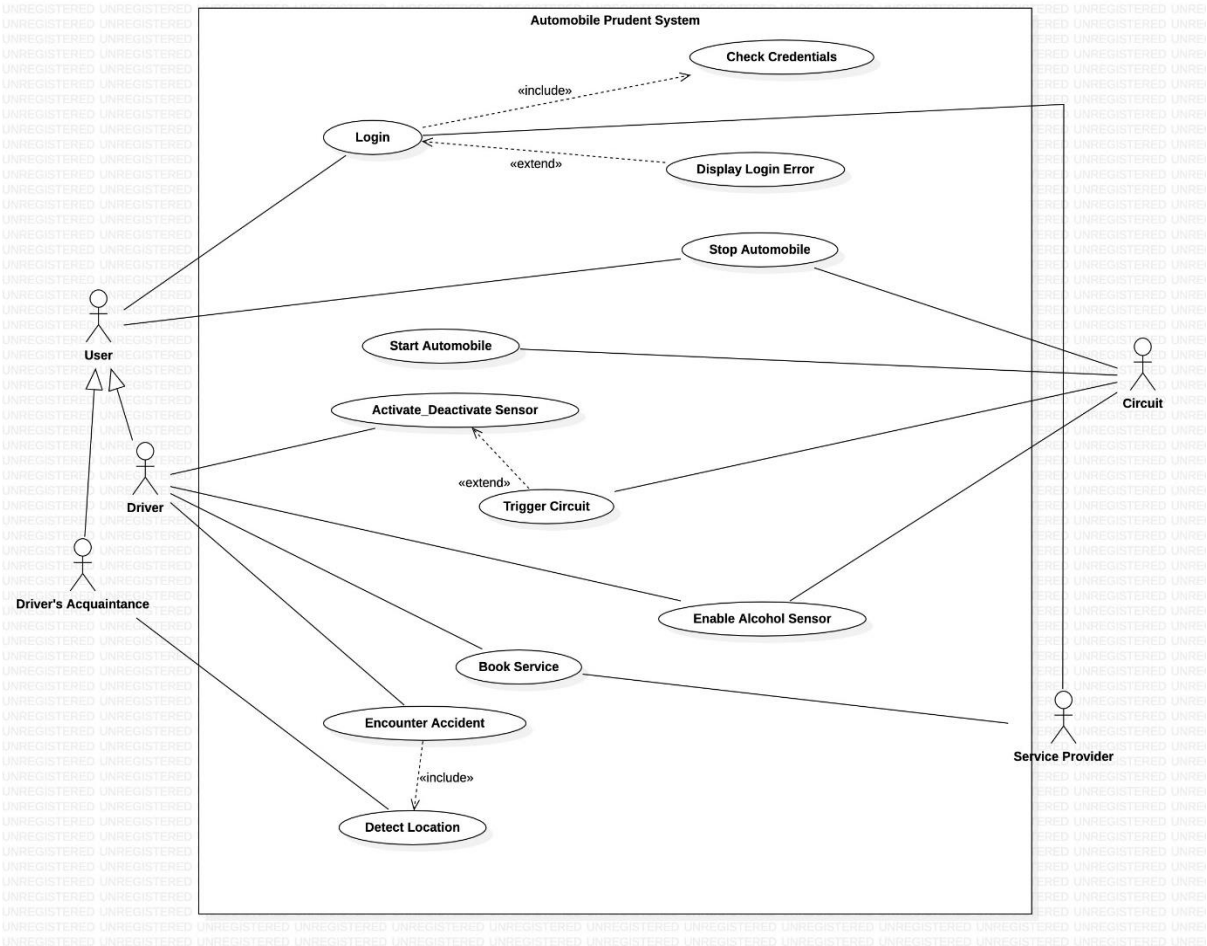
AUTOMOBILE PRUDENT SYSTEM

USE CASE MODEL AND DOCUMENTATION

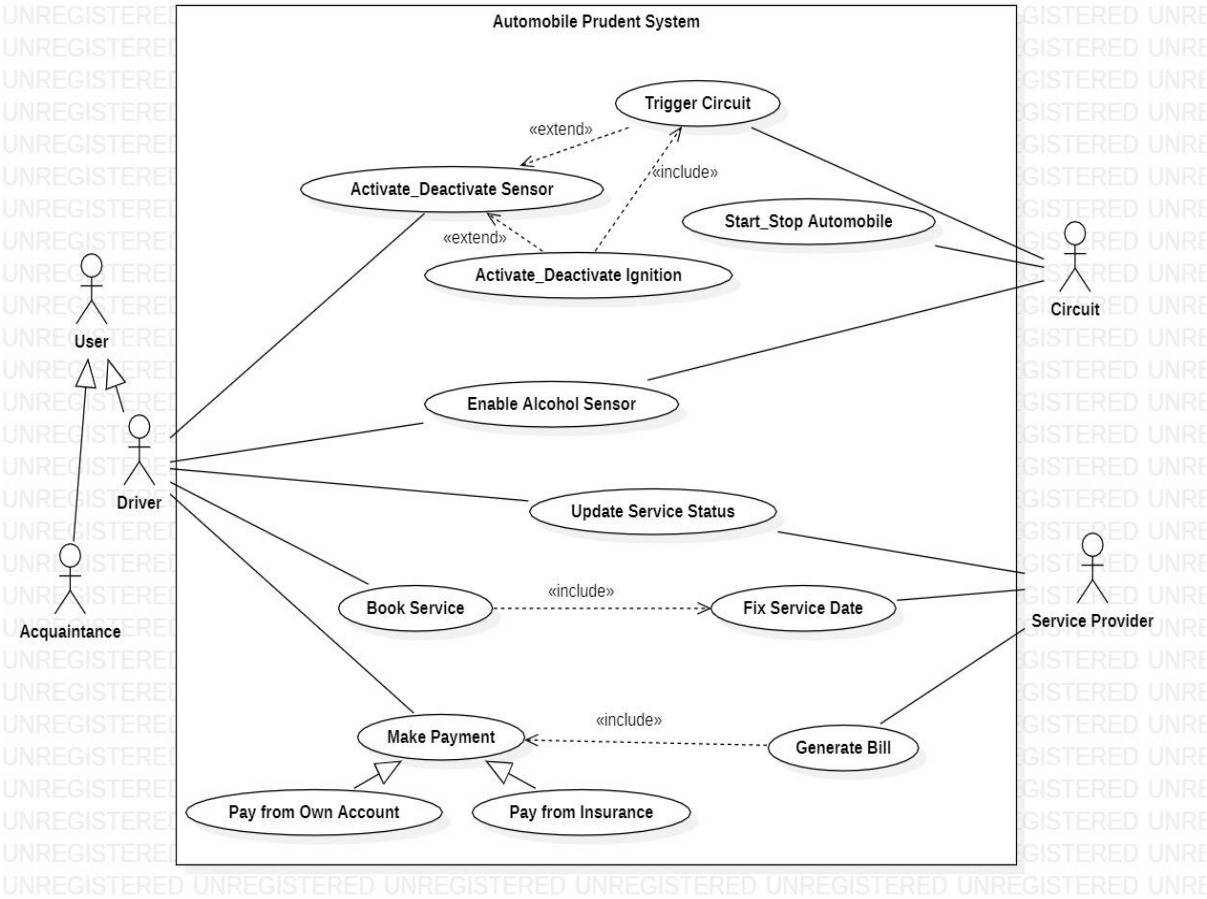
GOKUL.S 2018103026

SRIHARI.S 2018103601

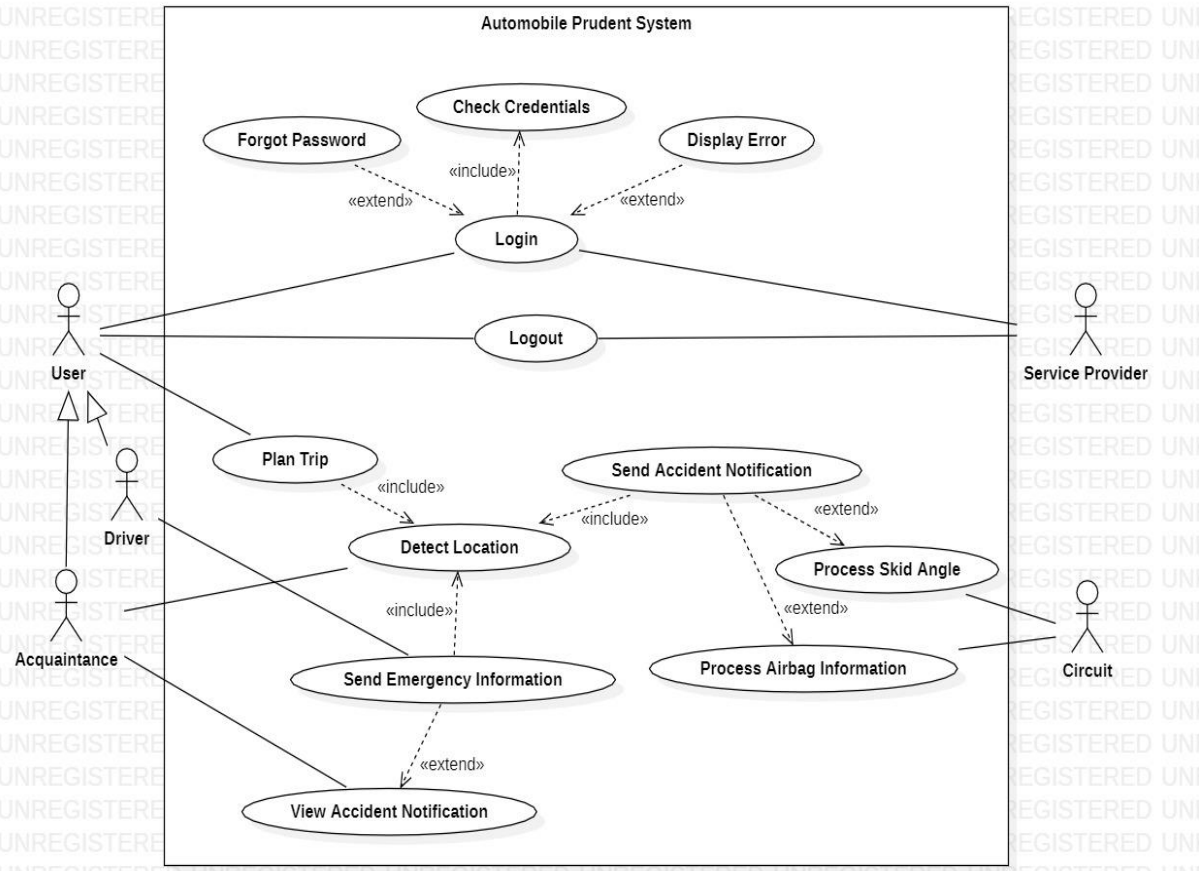
Use Case Diagram - 1



Use Case Diagram - 2



Use Case Diagram – 3



Use Case: Activate/Deactivate Sensor

Scope: System

Level: User goal level

Primary Actor: Driver

Stakeholders and Interests:

- Driver – Wears helmet/seatbelt to initiate the sensor.
- Co-passengers – Reach destination on time.

Preconditions:

Should be a registered and authenticated user.

Success Guarantee:

Should be allowed to start/stop the vehicle based on the state of the scenario.

Main Success Scenario:

- User wears the seat belt.
- Sensor detects the heart-beat and gets activated.
- User is able to start the vehicle.

Extensions:

- User inserts the seatbelt into the buckle.
- Heartbeat isn't detected as he isn't positioned properly.
- Tries starting vehicle but fails.

Special Requirements:

- Requires a state-of-the-art heartbeat sensor (four wheelers)/pressure sensor (two wheelers).

Frequency of Occurrence:

Continuous

Use Case: Activate/Deactivate Ignition

Scope: System

Level: User goal level

Primary Actor: Driver

Stakeholders and Interests:

- Driver – Uses the application to start vehicle without the keys.
- Co-passengers – Reach destination on time.

Preconditions:

Sensor should be activated/deactivated respectively.

Success Guarantee:

Circuit gets triggered to start/stop the automobile.

Main Success Scenario:

- User logs into the application.
- Driver wears the helmet/seatbelt.
- Uses application to start vehicle.
- Vehicle starts.

Extensions:

- User attempts logging into the application.
- Gets flagged with an error due to incorrect credentials.

Special Requirements:

- Needs a well-designed circuit and an interactive application that integrates it with the vehicle's ignition.

Frequency of Occurrence:

Rare

Use Case: Start Automobile

Scope: System

Level: User goal level

Primary Actor: Circuit

Stakeholders and Interests:

- Driver – Gets the vehicle on the fly.
- Co-passengers – Reach destination on time.
- Circuit – Enables start of the automobile depending on the state of the system.

Preconditions:

Triggered and activated circuit which enables to driver to start the vehicle.

Success Guarantee:

Drivers drives the vehicle.

Main Success Scenario:

- Sensor gets activated.
- Circuit gets triggered.
- Driver gets the vehicle moving.

Extensions:

- Sensor gets activated.
- Circuit gets triggered.
- Vehicle doesn’t start due to insufficient battery charge.

Special Requirements:

- Circuit should be synchronized with the ignition of the vehicle.

Frequency of Occurrence:

Continuous.

Use Case: Stop Automobile

Scope: System

Level: User goal level

Primary Actor: Circuit

Stakeholders and Interests:

- Driver – Gets the vehicle to a halt.
- Co-passengers – Remain safe during the journey.
- Circuit – Enables stop of the automobile depending on the state of the system.

Preconditions:

Triggered and de-activated circuit which enables to driver to stop the vehicle.

Success Guarantee:

Drivers unable to drive the vehicle.

Main Success Scenario:

- Vehicle is moving.
- Sensor gets de-activated as the user removes seatbelt/helmet.
- Circuit gets triggered.
- Vehicle comes to a halt.

Extensions:

- Sensor gets de-activated.
- Circuit gets triggered.
- Vehicle doesn’t stop due to insufficient battery charge.

Special Requirements:

- Circuit should be synchronized with the ignition of the vehicle.

Frequency of Occurrence:

Continuous.

Use Case: Trigger Circuit

Scope: System

Level: User goal level

Primary Actor: Circuit

Stakeholders and Interests:

- Driver – Start/Stop the vehicle.
- Co-passengers – Reach destination on time.
- Circuit – Enables start/stop of the automobile depending on the state of the system.

Preconditions:

An activated/de-activated sensor.

Success Guarantee:

Vehicle starts/stops depending on why the circuit got triggered.

Main Success Scenario:

- User wears the seat belt.
- Sensor detects the heart-beat and gets activated.
- Circuit gets triggered.
- User is able to start/stop the vehicle.

Extensions:

- User wears the seat belt.
- Sensor detects the heart-beat and gets activated.
- Circuit doesn't get triggered due to inconsistent communication with the ignition.

Special Requirements:

- Activate/deactivate functionality of the application should be synchronized with the circuit.

Frequency of Occurrence:

Always

Use Case: Login

Scope: System

Level: User goal level

Primary Actor: User, Service Provider

Stakeholders and Interests:

- User – Avail the services of the system
- Service Provider – Provide services to the users of the system
- Helpline workers – Help the users during crisis.

Preconditions:

Should be a registered and authenticated user of the system.

Success Guarantee:

- User can avail system services.
- Service provider offers required services.

Main Success Scenario:

- User enters login credentials.
- Logs in successfully.

Extensions:

- User enters login credentials.
- Log in unsuccessful.

Special Requirements:

- User needs to be registered to the application.

Frequency of Occurrence:

As and when required.

Use Case: Forgot Password

Scope: System

Level: Sub-functional level

Primary Actor: User, Service Provider

Stakeholders and Interests:

- User – Reset the forgotten password
- Service Provider - Reset the forgotten password, offer services to the user

Preconditions:

Should be a registered and authenticated user of the system.

Success Guarantee:

Enter valid new password.

Main Success Scenario:

- User logs in successfully.

Extensions:

- User enters new password.
- Password requirements not satisfied.
- User unable to reset password.

Special Requirements:

- User needs to be registered to the application.

Frequency of Occurrence:

Rare

Use Case: Check Credentials

Scope: System

Level: Sub-functional level

Primary Actor: User, Service Providers

Stakeholders and Interests:

- User – Avail the services of the system
- Service Provider – Provide services to the users of the system
- Helpline workers – Help the users during crisis.

Preconditions:

- Registered user should have entered login credentials.

Success Guarantee:

- If login credentials match, user can avail services of the system.

Main Success Scenario:

- Registered user enters login credentials.
- System checks its validity.
- User successfully logs in upon entering consistent details.

Extensions:

- Registered user enters login credentials.
- System checks its validity.
- User is unable to log-in due to inconsistency in the entered details.

Special Requirements:

- User needs to be registered to the application.

Frequency of Occurrence:

Whenever user tries to log in.

Use Case: Display Error

Scope: System

Level: Sub-functional level

Primary Actor: User, Service Providers

Stakeholders and Interests:

- User – Avail a flawless entry into the application.
- Service Provider – Provide services to the users of the system
- Helpline workers – Help the users during crisis.

Preconditions:

- Registered user should have entered login credentials.

Success Guarantee:

- Enters incorrect login credentials.

Main Success Scenario:

- Registered user enters login credentials.
- System checks its validity.
- User unsuccessful in logging in upon entering inconsistent details.
- User flagged with an error.

Extensions:

- Registered user enters login credentials.
- System checks its validity.
- User successfully logs in upon entering consistent details.
- User not flagged with any error.

Special Requirements:

- User needs to be registered to the application.

Frequency of Occurrence:

As and when required.

Use Case: Logout

Scope: System

Level: Sub-functional level

Primary Actor: Users, Service Providers

Stakeholders and Interests:

- User – Logout of the system
- Service Provider – Logout of the system

Preconditions:

Should be a registered and authenticated user of the system.

Success Guarantee:

- Logged out of the system.

Main Success Scenario:

- User avails Plan Trip usecase of the application.
- Calculates the distance of the destination from his current location.
- Logs out of the application.

Extensions:

- User books service for his vehicle.
- Tries logging out of the system.
- But unable to do so due to bugs in the mobile.

Special Requirements:

- User needs to be registered to the application.

Frequency of Occurrence:

As and when required.

Use Case: Enable Alcohol Sensor

Scope: System

Level: User goal level

Primary Actor: Driver

Stakeholders and Interests:

- Driver – To be notified when drunk.
- Co-passengers – Ensure safe journey.

Preconditions:

Should be a registered and authenticated user of the system.

Success Guarantee:

- Vehicle is stopped.

Main Success Scenario:

- Drunk driver wears his helmet/seatbelt.
- Alcohol Sensor detects the consumption of alcohol.
- Primary sensor gets deactivated.
- Circuit gets triggered.
- Driver is unable to start his vehicle.

Extensions:

- Sober driver wears his helmet/seatbelt.
- Alcohol Sensor isn't enabled.
- Primary sensor gets activated.
- Circuit gets triggered.
- Driver is able to start his vehicle.

Special Requirements:

- System requires a state-of-the-art alcohol sensor

Frequency of Occurrence:

Rare

Use Case: Plan Trip

Scope: System

Level: User goal level

Primary Actor: User

Stakeholders and Interests:

- User – Plan trip in advance
- Co-passengers – Can join the user on his trip.

Preconditions:

Should be a registered and authenticated user of the system.

Success Guarantee:

- User gets precise knowledge of the destination.

Main Success Scenario:

- User avails the plan trip usecase.
- Enters the destination in the application.
- System reports back with information about the trip.

Extensions:

- User avails the plan trip usecase.
- Enters the destination in the application.
- System reports back an error due to invalid destination.

Special Requirements:

- User needs to be registered to the application.

Frequency of Occurrence:

As and when required

Use Case: Detect Location

Scope: System

Level: User goal level

Primary Actor: Driver's Acquaintances

Stakeholders and Interests:

- Driver – Helps him plan the trip
- Co-passengers – Can join the user on his trip.
- Helpline workers – Can receive accident location and provide timely help
- Driver's Acquaintances – Can track the driver's current location.

Preconditions:

Should be a registered and authenticated user of the system.

Success Guarantee:

- Acquaintance gets precise knowledge of the driver's current location.

Main Success Scenario:

- Driver goes on a long drive.
- There isn't any information about him for a long period of time.
- His mother tracks his current location.

Extensions:

- Driver goes on a long drive.
- There isn't any information about him for a long period of time.
- His mother tries to track his current location.
- But is unable to do so due to bugs in the GSM module.

Special Requirements:

- System requires a GSM module.

Frequency of Occurrence:

As and when required

Use Case: Send Emergency Information

Scope: System

Level: User goal level

Primary Actor: User

Stakeholders and Interests:

- User – Requests help under emergency situation.
- Co-passengers – Avail help along with the driver during emergency situations.
- Helpline workers – Can receive accident location and provide timely help

Preconditions:

Should be a registered and authenticated user of the system.

Success Guarantee:

- Helpline workers reach spot of accident.

Main Success Scenario:

- Driver is on a trip.
- Encounters an accident.
- His brother gets notified.
- He shares the spot of accident to the helpline workers.
- Helpline workers reach spot of accident and rescues the driver.

Extensions:

- Driver is on a trip.
- Encounters an accident.
- He becomes unconscious.
- He dies.

Special Requirements:

- User needs to be registered to the application.

Frequency of Occurrence:

Rare

Use Case: View Accident Notification

Scope: System

Level: User goal level

Primary Actor: Driver's Acquaintances

Stakeholders and Interests:

- Driver – Requests help under emergency situation.
- Co-passengers – Avail help along with the driver during emergency situations.
- Driver's Acquaintance – Can perform a timely action in case of an emergency.

Preconditions:

Should be a registered and authenticated user of the system.

Success Guarantee:

- Can use the send emergency usecase.

Main Success Scenario:

- Driver is on a trip.
- Encounters an accident.
- His brother receives notification from the system.
- He shares the spot of accident to the helpline workers.
- Helpline workers reach spot of accident and rescues the driver.

Extensions:

- Driver is on a trip.
- Encounters an accident.
- His brother receives notification from the system.
- He hasn't checked the application.
- Helpline workers aren't informed.
- Driver dies.

Special Requirements:

- User needs to be registered to the application.

Frequency of Occurrence:

Rare.

Use Case: Send Accident Notification

Scope: System

Level: Sub-functional level

Primary Actor: Circuit

Stakeholders and Interests:

- Driver – Requests help under emergency situation.
- Co-passengers – Avail help along with the driver during emergency situations.
- Driver's Acquaintance – Can perform a timely action in case of an emergency.
- Helpline workers – Can receive accident location and provide timely help

Preconditions:

- Should be a registered and authenticated user of the system.
- The airbag state/ skid angle should be in the danger level.

Success Guarantee:

- The location of the driver gets tracked.
- His acquaintances get notified.

Main Success Scenario:

- Driver is on a trip.
- Encounters an accident.
- His car's airbag gets ejected.
- His brother receives notification from the system.
- He shares the spot of accident to the helpline workers.
- Helpline workers reach spot of accident and rescues the driver.

Extensions:

- Driver is on a trip.
- Encounters an accident.
- Due to bugs in his airbag system, it doesn't get ejected.
- His brother doesn't receive any notification.
- Driver dies.

Special Requirements:

System requires a state-of-the-art level detector/ airbag system that is synchronized with the circuit.

Frequency of Occurrence:

Rare.

Use Case: Process Airbag Information

Use Case: Process Skid Angle

Scope: System

Level: User goal level

Primary Actor: Circuit

Stakeholders and Interests:

- Driver – Requests help under emergency situation.
- Co-passengers – Avail help along with the driver during emergency situations.
- Driver's Acquaintance – Can perform a timely action in case of an emergency.
- Helpline workers – Can receive accident location and provide timely help

Preconditions:

Should be a registered and authenticated user of the system.

Success Guarantee:

Can use send accident notification use case.

Main Success Scenario:

- Driver is on a trip.
- Encounters an accident
- His bike gets thrown off the road.
- Level detector senses an accident.
- Acquaintances receive accident notification.
- Helpline workers reach the spot of the accident.
- Driver is saved.

Extensions:

- Driver is on a trip.
- Encounters a minor accident.
- Level detector doesn't sense any mishap.
- His brother doesn't receive any notification.

Special Requirements:

System requires a state-of-the-art level detector/ airbag system that is synchronized with the circuit.

Frequency of Occurrence: Continuous.

Use Case: Update Service Status

Scope: System

Level: User goal level

Primary Actor: Service Provider

Stakeholders and Interests:

- Driver – To get his vehicle serviced.
- Service Provider – Can provide timely updates during the service process.

Preconditions:

Driver and the Service Provider should be registered and authenticated users of the system.

Success Guarantee:

Driver gets notified when his vehicle is ready to be picked up.

Main Success Scenario:

- Driver books service for his vehicle using the application.
- Checks the status of the service.
- Collects the vehicle once its ready.

Extensions:

- Driver books service for his vehicle using the application.
- Checks the status of the service.
- Service Provider fails to update the status regularly.
- Driver is unable to catch-up with the service status.

Special Requirements:

- Interactive application for the Service Provider to update service details.

Frequency of Occurrence:

As and when required.

Use Case: Fix Service Date

Scope: System

Level: User goal level

Primary Actor: Driver

Stakeholders and Interests:

- Driver – To get his vehicle serviced.
- Service Provider – Can provide timely updates during the service process.

Preconditions:

- Should be a registered and authenticated user of the system.
- Driver should use the book service functionality.

Success Guarantee:

- Date of service gets fixed.

Main Success Scenario:

- Driver books service for his vehicle using the application.
- Date of service is fixed.
- Driver drops his vehicle for service.

Extensions:

- Driver books service for his vehicle using the application.
- Service Provider has a tight schedule on the desired date of service.
- Date of service isn’t confirmed.

Special Requirements:

- Interactive application for the user to fix the date of service.

Frequency of Occurrence:

As and when required.

Use Case: Generate Bill

Scope: System

Level: User goal level

Primary Actor: Service Provider

Stakeholders and Interests:

- Driver – To get his vehicle serviced.
- Service Provider – Generating the final bill for the service.

Preconditions:

- Should be a registered and authenticated user of the system.
- Driver should have scheduled a service beforehand.

Success Guarantee:

- Driver makes the payment.

Main Success Scenario:

- Driver books service for his vehicle using the application.
- Date of service is fixed.
- Service Provider generates the bill after the service is over.
- Driver makes payment and picks his vehicle.

Extensions:

- Driver books service for his vehicle using the application.
- Date of service is fixed.
- He doesn’t drop the vehicle at the specified date
- Service process gets halted.
- Bill isn’t generated.

Special Requirements:

- Interactive application for the Service Provider to update the bill.

Frequency of Occurrence:

As and when required.

General Use Case: Make Payment

Specialized Use Case: Pay From Own Account

Specialized Use Case: Pay From Insurance

Scope: System

Level: User goal level

Primary Actor: Driver

Stakeholders and Interests:

- Driver – To get his vehicle serviced.
- Service Provider – Enable the user to make payment

Preconditions:

- Should be a registered and authenticated user of the system.
- Driver should have scheduled a service beforehand.
- Service Provider should have generated the bill.

Success Guarantee:

- Driver picks up the vehicle.

Main Success Scenario:

- Driver books service for his vehicle using the application.
- Date of service is fixed.
- Service Provider generates the bill after the service is over.
- Driver makes payment and picks his vehicle.

Extensions:

- Driver books service for his vehicle using the application.
- Date of service is fixed.
- Service Provider generates the bill after the service is over.
- Transaction made by the driver fails.

Special Requirements:

- Interactive application for the driver to make payment.

Frequency of Occurrence:

As and when required.

Use Case: Encounter Accident

Scope: System

Level: User goal level

Primary Actor: Driver.

Stakeholders and Interests:

- Driver – Requests help under emergency situation.
- Co-passengers – Avail help along with the driver during emergency situations.
- Driver's Acquaintance – Can perform a timely action in case of an emergency.

Preconditions:

- Should be a registered and authenticated user of the system.

Success Guarantee:

- Location of the injured driver is sent to his acquaintances and helpline workers.

Main Success Scenario:

- Driver is on a trip.
- Encounters an accident.
- His brother receives notification from the system.
- He shares the spot of accident to the helpline workers.
- Helpline workers reach spot of accident and rescues the driver.

Extensions:

- Driver is on a trip.
- Encounters an accident.
- His brother receives notification from the system.
- He hasn't checked the application.
- Helpline workers aren't informed.
- Driver dies.

Special Requirements:

- User needs to be registered to the application.
- System requires a state-of-the-art level detector/ airbag system that is synchronized with the circuit.

Frequency of Occurrence:

Rare.