

Guideline and Use Cases

- Software Testing MTAT.03.159 -

1 Guideline

The use cases are in prioritized order. Try to detect faults in the requirements specification, by following the use cases. The procedure is:

1. Select the use case with the highest priority.
2. Track the use case's scenarios through the document under inspection.
3. During tracking, ensure that the document under inspection fulfills the use case's goal; for example, make sure it provides the needed functionality and that the interfaces are correct. Identify and report the issues that tracking reveals.
4. Select the next use case and repeat from step 1 until the time is up or you've covered all use cases.

2 Use cases

2.1 Taxi: Submit order

Purpose: The driver receives an order from a customer. The driver should be able to submit an order from the terminal in the car. An order can be submitted in all states, except in state "Offline".

Tasks:

1. A customer wants a taxi.
2. The order is entered on the terminal in the car.
3. The order is sent to the central.
4. The order is confirmed by the central.

Variants:

4b No available taxis at the desired time. A new order must be submitted with different pick-up time in a new request from the taxi.

2.2 Central: Submit order

Purpose: Orders are received by the operators. These are submitted into the system.

Tasks:

1. The operator receives an order.
2. The operator submits the order into the system. The order may contain specific requests such as allergy, non-smoker etc. The order can be prioritized, i.e. some customers are more important than others.
3. The system confirms the order to the operator. The order is automatically dispatched to a car.

Variants:

- 3b. If the order is very close in time the system presents an estimate of how long it takes for a car to be available.

2.3 Central: Display traffic overview

Purpose: The operator should be able to see available cars and orders in each zone. This is used to estimate how long it takes for a car to be present at the pick-up location.

Tasks:

1. The operator selects the traffic overview on the terminal.
2. The overview is displayed.

Variants:

- 2b. The system is down and an overview cannot be presented. The operator has to check available cars manually over a voice communication link.

2.4 Taxi: Log in

Purpose: The driver logs on to the system to acknowledge presence and to be able to receive orders. (Note that a driver can drive different taxis at different times. Also note that a taxi has many different drivers, although only one driver at a time.)

Tasks:

1. The car is in state "Offline".
2. The driver swipes the identification card in the terminal in the car.
3. The terminal sends the position and driver information to the central.
4. The central confirms the log in.
5. The car sends the position (zone).
6. The central starts sending overview information on all zones.
7. The car is in the state "Available".

Variants:

1b. The car is not in the state offline. There can be only one driver logged in at the same time in the car terminal. The car has to be in state “Offline” in order to allow new logins.

4b. The card is not valid. The central rejects the driver. The driver and the car are not logged in and remain in state “Offline”.

2.5 Taxi: Receive order

Purpose: The driver receives an order from the central.

Tasks:

1. The car is in the state “Available”.
2. Order is sent to the terminal in the car.
3. The driver accepts the order.
4. The central confirms order.
5. The driver goes to the designated address.
6. The car is in state “Waiting for customer”.

Variants:

3b. The order is neither rejected nor accepted within 2 minutes. The order is automatically canceled.

4b. The order is rejected due to some reason. The taxi remain in state “Available”.

2.6 Taxi: Driving a customer

Purpose: The driver has a customer in the car and is about to transport the customer to the designated address.

Tasks:

1. Car in state “Available”.
2. Driver receives order. See receive order (use-case 2.5).
3. Car in state “Waiting for customer”.
4. Drive to the pick-up location.
5. Wait until customer arrives.
6. Start meter and transportation.
7. Car in state “Driving”.
8. When driver is confident in time of arrival, send arrival zone and time to central.
9. Car in state “Soon available”.

10. Arrival at destination. Charge customer and print out receipt.

11. Car in state "Available". The car sends the position (zone).

Variants:

2b. The driver picks up customer without order. Use case starts at step 6.

6b. Customer does not show up. Car is put in state "Available".

9b. Driver does not use the "Soon available" function. Step 9 is skipped.

2.7 Central: Handle incoming alarms

Purpose: If a driver sounds the alarm, an operator is responsible for handling the event.

Tasks:

1. An incoming alarm opens a voice radio connection to the car. All sounds from the car are sent to the operator.
2. The operator determines the course of action.
3. When the situation causing the alarm is no longer current, the operator resets the alarm. This can only be done by the operator.

Variants:

1b. The event is a false alarm. The operator decides whether it is false or not. The operator chooses to cancel or not.

2.8 Taxi: Alarm event

Purpose: If the driver, for some reason, feels threatened there is an alarm system which notifies the central of the problems.

Tasks:

1. The driver is in some kind of trouble and hits the alarm button.
2. The voice radio channel to the central is opened from the taxi to the central.
3. The taxi sends exact coordinates to the central every 30 seconds.
4. The channel is open until the central resets the alarm. The voice link is terminated.

2.9 Taxi: View traffic overview

Purpose: The driver should be able to see in which zones there are cars and the amount of outstanding orders in each zone.

Tasks:

1. The driver requests traffic overview information on the terminal in the car.
2. Overview information is sent to the terminal from the central.
3. The terminal displays the information.

2.10 Central: Dispatch order

Purpose: Orders can be marked for manual dispatching. These orders have to be manually dispatched by an operator. Default is automatic dispatch.

Tasks:

1. The system notifies the operator in an appropriate time before pick-up time.
2. The operator selects a car to send the order to. The selection of car is based on the taxi number. That is, the selection is not dependent of the current status of the car.
3. The system sends the order.
4. The car sends an acceptance notification of the order. The system automatically confirms the acceptance notification to the car.
5. The system notifies the operator that the order has been accepted.

Variants:

- 3b. Parts of the system are down, making automatic dispatch impossible. The operator has to dispatch all orders manually.
- 4b. The designated car rejects the order or is busy. The order must be manually dispatched to another car.