
ITravel

Assignment Workbook

Fall 2018

ITravel	Issue:	Fall 2018
Assignment Workbook	Issue Date:	October 5, 2018
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Revision History

Date	Issue	Description	Author
October 5, 2018	Assignment 2	Adding Glossary (Question 4)	Jayson Pols
October 5, 2018	Assignment 2	Adding system actors (Question 6.1)	Jayson Pols
October 7, 2018	Assignment 2	Adding system use cases (Question 7.1)	Jayson Pols
October 7, 2018	Assignment 2	Adding use case diagram (Question 8.1)	Jayson Pols
November 5, 2018	Assignment 3	Produce a list of candidate classes	Jayson Pols
November 5, 2018	Assignment 3	Filtering the list of candidate classes	Jayson Pols
November 5, 2018	Assignment 3	Produce a potential class diagrams	Jayson Pols
November 6, 2018	Assignment 3	Identified potential class attributes	Jayson Pols
November 6, 2018	Assignment 3	Revised the diagrams	Jayson Pols
November 15, 2018	Assignment 4	Adding sequence diagram for “create reservation” use case	Jayson Pols
November 15, 2018	Assignment 4	Adding detailed “create reservation” classes operations	Jayson Pols
November 19, 2018	Assignment 4	Adding State Chart diagram for “reservation” class	Jayson Pols
November 20, 2018	Assignment 4	Adding a description for the state Chart diagram	Jayson Pols

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iTravel System Glossary

1.1 Introduction

This document is used to define terminology specific to the problem domain, explaining terms, which may be unfamiliar to the reader of the use-case descriptions or other project documents. Often, this document can be used as an informal *data dictionary*, capturing data definitions so that use-case descriptions and other project documents can focus on what the system must do with the information.

1.2 Glossary

The glossary contains the working definitions for the key concepts in the iTravel System.

Term	Definition
Business Manager	An employee working in iTravel Airlines and responsible for framing policies and ensuring that the business operations perform at the optimal level.
Corporate office	A travel agency that belongs to iTravel Airlines and operates in Canada
Regional office	iTravel site-based travel agency that is responsible for the airline business executives.
User account	A user is a person who uses iTravel system. A user has a user account that identifies the user by a username. To log in to an account, a user is typically required to authenticate himself/herself with a password or other credentials for the purposes of accounting, security, logging, and resource management.
Network administrator	A professional responsible for the maintenance of computer hardware and software that comprises iTravel computer network. This normally includes maintaining web servers, managing user accounts and backing up and archiving databases.
Web server	A web server is a computer or virtual machine running a program that delivers (serves) content, such as web pages, using the Hypertext Transfer Protocol (HTTP), over the World Wide Web.
Database server	A central computer in iTravel system that stores database information and performs searches for corporate and regional offices workstations.
Line-of-Business Executive	An employee working in iTravel Airlines and responsible for performing the reservation and cancellation of tickets, confirmation of reservation, and reporting flight status for the airline.
Flight reservation	A legal contract whereby a flight undertakes, in exchange for a certain amount of money, to provide a seat to a specific passenger by aircraft on a specific trip from one specified airport to another.
Flight cancellation	Occurs when an airline cancels a scheduled flight for a certain reason. When flights are canceled, passengers may be entitled to compensation due to rules obeyed by iTravel Airline.
Frequent-Flyer Programs	iTravel marketing program designed to win customer loyalty by giving them “points” for each mile flown. Points can be cashed in later for free flights or upgrade in cabin service.

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iTravel System Actors

Actor	Description
Business Manager	iTravel system user who are responsible for framing policies and ensuring that the business operations perform at the optimal level. The tasks of business managers include, add and remove flights, request for user IDs, generate reports, and manager frequent flier programs
Network Administrator	iTravel system user who are responsible for ensuring around-the-clock connectivity of the corporate office with the regional offices. The tasks of network administrators include, add and delete user accounts, back up and archive databases, and examine Web server and database logs.
Line-of-Business	iTravel system user who are responsible for performing the reservation and cancellation of tickets for the airline. The tasks of line-of-business executives include create and cancel reservations, query status of flights and tickets, and confirm tickets
Passenger	iTravel system user who access the iTravel portal from the Internet and can do all business functions as Line-of-Business.
User	An anonymous and general iTravel actor who can be either a Line-of-Business or Passenger.

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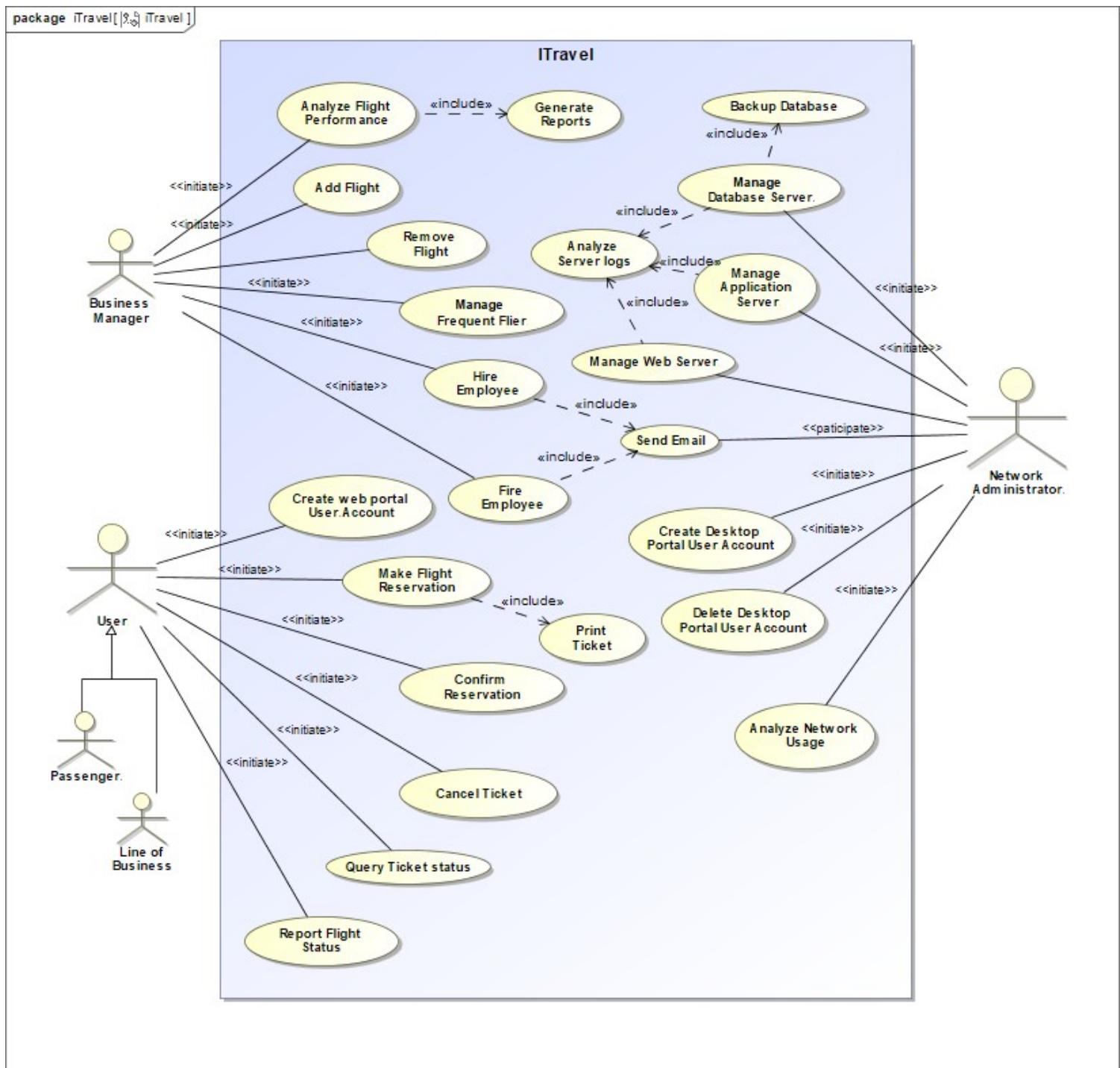
iTravel System Use cases

Use case	Description
Analyze Flight Performance	iTravel provides functions to the business manager to analyze the performance of flights. Based on this analysis the business manager will determine whether a flight generates the expected revenue. The results of the analysis will be utilized also to determine if the capacity of flights is optimally utilized. Hence the business manager will make an appropriate decision (and generate report, through the UC “Generate Report”) whether a new flight need to be established, some flight need to be dropped, or just keep the current system state.
Generate Report	This is a supplier UC that provides a reporting functionality to the business manager to produce different type of business reports as a result of the base UC “Analyze Flight Performance”.
Add Flight	iTravel shall provide the business manager to add new flight. Most likely the business manager will decide to add new flight based on the flights performance analysis.
Remove Flight	iTravel shall provide the business manager to drop an existing flight. Most likely the business manager will decide to drop a running flight based on the flights performance analysis.
Manage Frequent Flier	iTravel shall provide the business manager enough information on customer's transactions, such as information on customers who have either flown the airline more than a predefined number of times or paid more than a predetermined fare. This information helps business managers to determine which customers should be eligible for the promotion of frequent flier program.
Hire Employee	iTravel shall provide the business manager the ability to create a new profile for the new employees (e.g., name, address, position, and responsibilities) and send a request to the Network administrator through the send email UC to create the proper user account and grant the access control and system permissions for this new employee.
Fire Employee	iTravel shall provide the business manager to modify the user profile indicating that this employee is no longer working at iTravel, and to send a request to the Network administrator through the send email UC to revoke all use access permissions of this user, (i.e., delete the user account, but not the user profile).
Send Email	A supplier UC that is needed by both Hire Employee and Fire Employee to send email to the System Administrator.
Manage Web Server	iTravel shall provide the Network administrator the ability to update the Web server with the latest patches and software available.
Manage Application Server	iTravel shall provide the Network administrator the ability to update the application server with the latest patches and software available.

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Manage Database Server	iTravel shall provide the Network administrator the ability to install the Database server with the latest patches and software available.
Analyze Server Logs	This is a supplier UC that provides the Network administrator the ability to examine the interaction logs of the web server, application server, and database server to ensure that there are no hardware or software-related problems.
Back-up DB	iTravel shall provide the Network administrator the ability to perform scheduled and occasionally database back-ups.
Analyze Network Usage	iTravel shall provide the Network administrator the ability to analyze the network usage to determine if the present infrastructure can sustain the demand. If it cannot, ways to scale the hardware infrastructure are determined and implemented. (see Maintain Hardware use case)
Create Desktop Portal User Account	iTravel shall provide the Network administrator the ability to create a new user account at the desktop portal and grant the requested privileges by the business manager. And then notifies the user about this creation.
Delete Desktop Portal User Account	iTravel shall provide the Network administrator the ability to delete (deactivate) an existing user account based on the request of the business manager. And then notifies the user about this deletion.
Make Flight Reservation	iTravel shall provide both the Line-of-business executive and passenger the ability to perform reservations on flights after flight details are added by business managers.
Print Ticket	This is a supplier UC that prints the ticket information after the reservation take place by the base UC “Make Flight Reservaion”
Cancel Reservation	iTravel shall provide both the Line-of-business executive and passenger the ability to perform a cancellation regarding to an existing reservation.
Report Flight Status	iTravel shall provide both the Line-of-business executive and passenger the ability to show the seat availability in the business and executive classes to passengers.
Query Ticket Status	iTravel shall provide both the Line-of-business executive and passenger the ability to query the status of their tickets.
Confirm Reservation	iTravel shall provide both the Line-of-business executive and passenger the ability to perform a confirmation their tickets before the departure of the flight.
Create Web-based Portal	iTravel shall provide both the Line-of-business executive and passenger the ability to create an online account to archive his/her booking for future use and to be considered for the frequent flier discount program.

iTravel System Use Case Diagram



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List of Candidate Classes

=====	Performance Report	Organization
Business manager related nouns	Total Revenue Report	=====
=====	Flight Revenue Report	User related nouns
Business manager	Monthly Flight Revenue Report	=====
Policies	Customer Affinity Report	Reservations
Flights	Month	Cancellations
Flight performance	Year	Line-of-business executive
Flight Addition	e-mail message	Tickets
Flight Removal	Username	Ticket number
Revenue	Role	Passengers
Capacity of flights	Password	Seats
User accounts	=====	Business classes Seats
Users	Network admin related nouns	Executive classes Seats
Role of the user	=====	Flight status
Employee	Corporate office	Ticket status
Network administrator	Regional office	Passenger status
Frequent Flier	Web servers	Passenger name
Discounts	Database servers	Passenger email
Customers	Patches	Flight departure
Airline	Database logs	Reservation counters
Fare	Web server logs	Refund
Flight Transaction	Software-related problem	Tickets Confirmation
Flight number	Hardware -related problem	Waiting list
Origin and destination	Network usage	
Number of seats	Infrastructure	
Type of aircraft	Flight-related transactions	

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Potential iTravel Classes

Class name	Type	Brief Description
BusinessManager	Entity	<p>Business managers can generate reports to view the performance of flights. The types of reports are “Monthly flight revenue”, “Flight revenue report”, “Total revenue report” and “Customer affinity report”</p> <p>Based on the current performance Business Manager decides in a documented format (DecisionReport class) whether to create a new flight, remove existing flight or stay with the current situation.</p>
DecisionReport	Entity	<p>Business Manager create a decision report in which adding or removing flight will be decided. This report needs to be stored and it depends on number of generated reports such as “Monthly flight revenue”, “Flight revenue report”, “Total revenue report” and “Customer affinity report”</p>
Flight	Entity	<p>This entity class will be used to store details of airline routes flown by the airline. For example, Origin, Destination, Departure/arrival times, the date on which the flight is launched, etc. After flight object is created, line-of-business executives and Passengers can make reservations on the airline.</p>
DeletedFlight	Entity	<p>Since we cannot completely delete an existing flight, because we may made transactions on it, we will associate the flight class to the DeletedFlight class to indicate that this Flight is inactive and also we record the rational for this deletion and its date.</p>
FlightAnalysisForm	Boundary	<p>FlightAnalysisForm is used for generating reports. The description of the reports will be displayed to the Business manager. The Business manager can select parameters for generating reports in this form. For example, in the monthly flight revenue report, business managers can select the month and year for which the report should be generated.</p> <p>These parameters are internally used by the application to generate the final report.</p>
FlightAnalysisReport	Boundary	<p>Produces a specific report based on the parameters that are specified in the FlightAnalysisForm.</p>
AddFlightForm	Boundary	<p>The AddFlightForm is used to add new flights to the airline. The information specified in this form is stored in the flight entity class.</p>
RemoveFlightForm	Boundary	<p>The RemoveFlightForm is used to add remove flight(s) from the airline.</p>
AnalyzeFlightPerformanceController	Control	<p>A controller class to manage report generation, analysis process and adding or removing flight processes.</p>

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AccountCreationRequest	Entity	A business manager decides when a new user account needs to be created by sending an e-mail message (creation request) to the network administrator. This message request needs to be archived and documented.
UserRole	Entity	Each user in iTravel has a role and is specified when user profile is created. This entity class maintain all roles used within the system.
NetworkAdministrator	Entity	An entity class to manage the detail information for Network administrator.
AccountCreationRequestlForm	Boundary	Business managers use this form to request new user account. The request is sent to a network administrator by e-mail.
ManageUserController	Control	A control class that manage sending user account creation/deletion request.
User	Entity	The User class is a general class to hold the common information for the user's profile. For example, First name, Last name, email address, user role, etc.
Passenger	Entity	A specification entity class of User class to hold attributes and operations specific for Passenger user type.
FrequentFlier	Entity	This class is used to store the frequent flier policy. E.g., the minimum number of flown flights and the minimum amount paid for the airline (whether it is departed or not, but not cancelled). This information specifies the discount (expressed in percentage) applicable to passengers. If a discount is applicable, the fare is computed after deducting the applicable discount.
PassengerFlightFrequency	Entity	<p>As a result of a large number of flights transactions by the airline, there will be a large amount of data in the Reservation class. Therefore, we use this class (as a separate class) to aggregate the detailed data stored per passenger. Each instance (record) in this entity class is related to one passenger and has the total number of flown flights and the total amount paid by the passenger so far to the airline. This information when compared with that in the frequent flier program will determine whether the passenger is eligible to the discount or not.</p> <p>Note that, if the discount is applied the accumulated amounts in this class will be adjusted (reset).</p>
PromotionProgramActivationFo rm	Boundary	PromotionProgramActivationForm is used for managing the frequent fliers program. This form provides some parameters on which Business Manager can enable the frequent fliers program. For example, the number of times that a passenger has flown the flight and the total amount paid by passengers as fare. When a business manager enables (store) the frequent fliers program on these parameters, the eligible passengers for the discount can be determined using the information available so far for the passenger in the PassengerFlightFrequency.

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ManageFrequentFlierController	Control	A control class to manage the application logic for enabling frequent flier programs.
LineOfBusinessExecutive	Entity	A specification entity class of User class to hold attributes and operations specific for Line-of-business executive user type, such as, site responsibility (Corporate office, Regional office).
Reservation	Entity	<p>This class is used to manage the reservation transactions made by passengers/Line of business who have reserved a seat on the flight, so that ticket can be generated. It includes information such as, ticketNo, dateOfJourney, TicketConfirmed etc.</p> <p>Information to which flight the reservation is made and to what passenger came from the association links. This class is associated also to the FlightSeat class.</p> <p>If the flight is full, the reservation will be recorded (as waiting) and the passenger will be added to the waiting list for this flight.</p> <p>The TicketConfirmed attribute is updated when users confirm their ticket. The passenger e-mail address is also included as an attribute, to be used for enabling the frequent flier program.</p>
FlightSeat	Entity	A seat number and type are assigned to the passenger during the reservation process. Based on the type of the seat, business or executive class and in which aircraft is located, the fare of the ticket will be generated.
Aircraft	Entity	An entity class to maintain detail information for the airplanes that are flying within iTravel.
FlightStatus	Entity	<p>When a passenger reserves a seat on an airline, the number of seats available for reservation should reduce by one. Similarly, if a flight is overbooked, excess passengers should be placed in queue (waiting list). The updated status of a flight should be available to passengers when they reserve their seat. To ensure that an updated status of a flight is always available, I have used the FlightStatus class. As soon as the first ticket is booked on a flight, an entry related to this flight is created in the FlightStatus class to hold the requested seats (including booked and in waiting). This entry is updated as reservations and cancellations transactions are made.</p> <p>This class will enhance the access-time performance of the flight status enquiry made by passenger or line of business.</p>
WaitingList	Entity	An entity class to hold the information on the current reservations waiting for some cancelation to take place.
FlightTicketPrintOut	Boundary	This class manages the printing process for passengers.
TicketReservationForm	Boundary	The TicketReservationForm is used for making reservations to flights.
CreateReservationController	Control	A control class to manage the application logic for flight reservation process.

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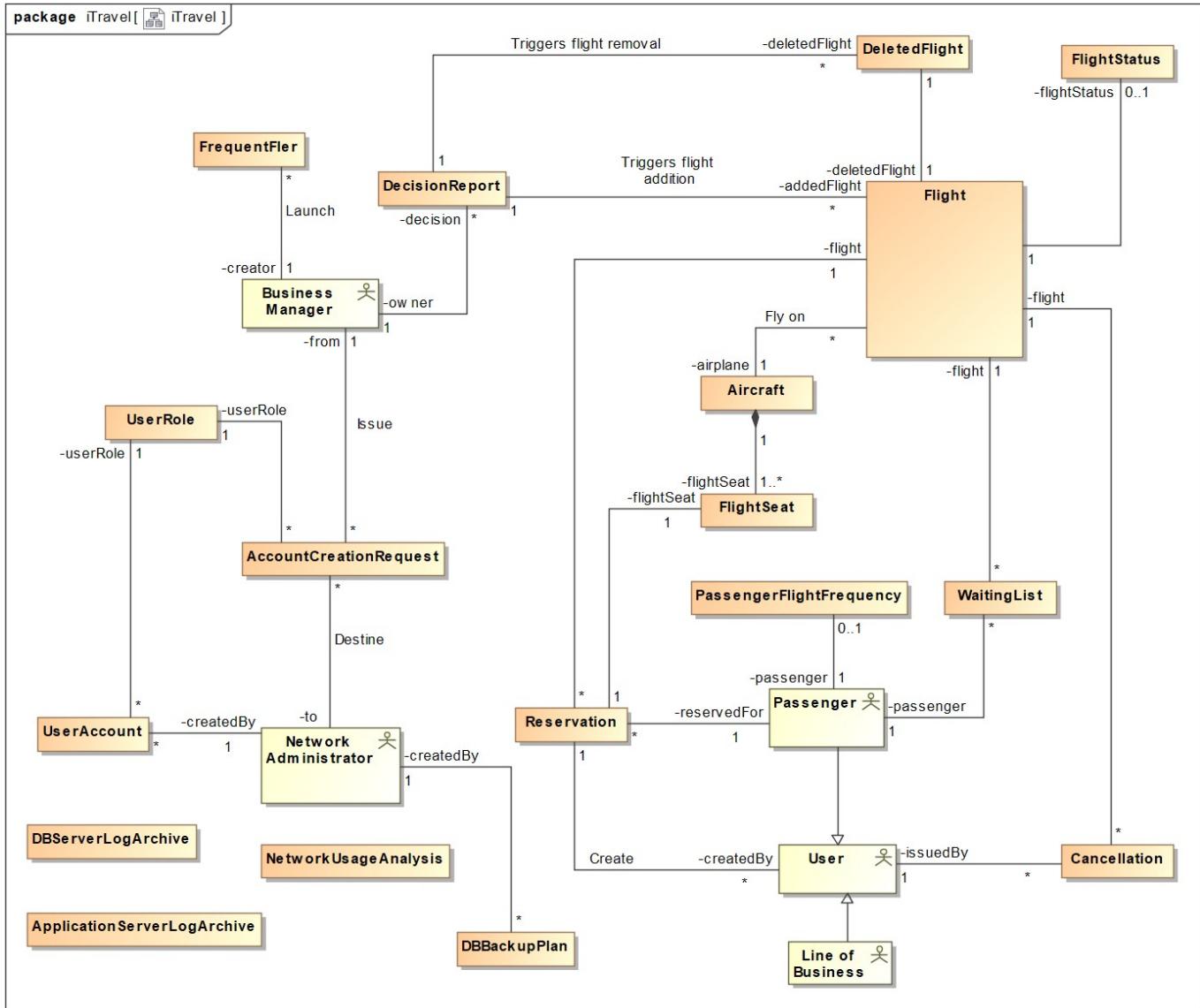
Cancellation	Entity	To store the cancellation transactions information related to tickets that have been cancelled by the passenger/Line of business. This information is required only for accountability of refunded fare and reservations.
TicketCancellationForm	Boundary	The TicketCancellationForm is used for canceling reservations. The only parameter required on this form is the ticket number. After the ticket number is specified and submitted, the ticket is marked as canceled and status of the flight is updated in the FlightStatus class.
CancelReservationController	Control	This class managing the process for flight cancelation and triggers the event to complete a flight reservation transaction that was in a waiting list.
UserAccount	Entity	Network Administrator creates users accounts, based on the Business Manager request. User account class includes user information such as user name, password, and a flag attribute to indicate whether or not the user has changed the password after logging on the first time.
ManageUserAccountForm	Boundary	The ManageUserAccountForm is used for adding and deleting user accounts. I would divide the ManageUserAccountForm into two sections. The first section is used for adding new users and the second one is used for deleting user accounts.
ManageUserAccountController	Control	A control class to manage the entire process for adding or deleting user accounts.
WebServerLogArchive	Entity	WebServerLogArchive class is used for log files generations. These log files can help tracks the users who have visited iTravel Web site.
WebServerMaintenanceForm	Boundary	WebServerMaintenanceForm is used to set the required criteria for generating the WebServer log, and also help display a log portion for system performance analysis.
WebServerMaintenanceController	Control	A control class to manage the application logic for WebServer maintenance process.
DBServerLogArchive	Entity	The Network administrator examines the Database server logs to ensure that there is no hardware or software-related problems.
DBBackupPlan	Entity	This class helps Network administrators back up databases daily and also to ensure that data that pertains to flights that have departed is periodically archived
DBMaintenanceForm	Boundary	The DBMaintenanceForm is used for two tasks: Identify and set the required criteria for scheduling database maintenance tasks so that the process of backing up databases is automated , and to examine the DB log files on a periodic basis to track all activities on the database and identify any errors that the DB might encounter.

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DBMaintenanceController	Control	DBMaintenanceController manages the entire process of database administration. This include, schedule database maintenance tasks, backup the iTravel database, export and import to databases.
ApplicationServerLogArchive	Entity	The Network administrator examines the application server logs to ensure that there is no hardware or software-related problems.
ApplicationServerMaintenance Form	Boundary	The ApplicationServerMaintenanceForm is used to provide the Network administrator the ability to update the application server with the latest patches and software available.
ApplicationServerMaintenance Controller	Control	ApplicationServerMaintenanceController manages system update process, fixing bugs, and analysis application server logs.
NetworkUsageAnalysis	Entity	This class will hold the Network Administrator recommendation if there is demand for the infrastructure changes. This class is associated to sample (or snapshot) of the network usage log that support this recommendation.
AnalysisLogSample	Entity	This class hold a sample (or snapshot) of the network usage log that support the Network Administrator claim (stored in NetworkUsageAnalysis class) for software or hardware upgrade.
NetworkUsageAnalysisForm	Boundary	NetworkUsageAnalysisForm help the Network administrator to identify the report criteria for generating specific system performance statics.
AnalyzeNetwork UsageController	Control	A control class to manage and control the application logic for generating and printing the hardware status reports.
FlightStatusEnquiryForm	Boundary	FlightStatusEnquiryForm is used for retrieving the status of flights. The status of flights is queried from the flightStatus class by using the date, class, and flight number.
FlightStatusEnquiryController	Control	FlightStatusEnquiryController manage the entire process for flight status enquiry.
TicketStatusEnquiryForm	Boundary	TicketStatusEnquiryForm is used for retrieving the status of tickets. The status of tickets is retrieved from the Reservation class by using the ticket number
TicketStatusEnquiryController	Control	TicketStatusEnquiryController manage the entire process for ticket status enquiry.
TicketConfirmationForm	Boundary	TicketConfirmationForm requires the ticket number to confirm the reservation of a passenger before the departure of a flight. When the passenger/line-of-business executive confirms the status of a passenger, the status attribute is updated in the Reservations class.
TicketConfirmationController	Control	TicketConfirmationController manage the entire process for confirming a ticket.

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Potential iTravel class diagrams (entity classes only)



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Revised iTravel class diagram

1. BusinessManager Class

Attribute name	Type	Brief Description
name	String	Business manager name
dateHired	Date	The date when the business manager is hired by iTravel

2. DecisionReport Class

Attribute name	Type	Brief Description
decisionNo	String	The decision number, a combination of character and numbers.
decisionDescription	String	The main decision
decisionDate	Date	The decision date
decisionReason	String	The reason for the decision

3. Flight Class

Attribute name	Type	Brief Description
flightNo	String	The flight number, a combination of character and numbers for example ITRAVEL0001.
origin	String	The source of the flight
destination	String	The destination of the flight
departureTime	Date	The departure date
arrivalTime	Date	The arrival date
launchDate	Date	The flight creation date

4. DeletedFlight Class

Attribute name	Type	Brief Description
<>See the association link<>		

5. AccountCreationRequest Class

Attribute name	Type	Brief Description
requestID	String	Request identity
requestDate	Date	The date of request
requestDescription	String	The request main description

6. UserRole Class

Attribute name	Type	Brief Description

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roleID	String	The role identification
roleName	String	The role name

7. NetworkAdministrator Class

Attribute name	Type	Brief Description
name	String	Business manager name
dateHired	Date	The date when the business manager is hired by iTravel

8. User Class

Attribute name	Type	Brief Description
name	String	The name of the user
email	String	The user email address

9. Passenger Class

Attribute name	Type	Brief Description
passwordChanged	Boolean	To identify whether the user changed his password or not.

10. FrequentFlier Class

Attribute name	Type	Brief Description
minTimeFlight	Integer	The minimum number of flights needed to discount eligibility
discountForFrequentFlight	Double	The discount given to those who satisfy the number of flights condition
minFareCollected	Double	The minimum dollar amount needed for the discount eligibility
discountForFarePaid	Double	The discount given to those who satisfy the fare collected condition
dateEnabled	Date	The starting date of the promotion
dateExpired	Date	The ending date for the promotion

11. PassengerFlightFrequency Class

Attribute name	Type	Brief Description
fareCollected	Double	The total amount of fare paid for the tickets to iTravel
totalTimesFlown	Integer	The total number of flight reserved by iTravel

12. LineOfBusinessExecutive Class

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Attribute name	Type	Brief Description
dateHired	Date	The date when the LOB is hired by iTravel
location	String	iTravel location - Corporate office, Regional office

13. Reservation Class

Attribute name	Type	Brief Description
ticketNo	String	The ticket numbers. May be generated automatically.
dateOfJourney	Date	The departure date
dateOfReservation	Date	The reservation date
fare	Integer	The reservation price (not necessarily to be the same as that in the flightSeat class)
status	String	e.g., OK, Waiting list, etc.
ticketConfirmed	Boolean	The confirmation status

14. FlightSeat Class

Attribute name	Type	Brief Description
seatClass	String	The flight class name
fare	Double	The flight class tariff

15. Aircraft Class

Attribute name	Type	Brief Description
name	String	The name of the airplane
specification	String	The detail description of the airplane

16. FlightStatus Class

Attribute name	Type	Brief Description
remainingSeats	Integer	Hold the remaining available seat for a particular seat class and particular flight. It may be negative value if there are any passengers in the waiting list.

17. WaitingList Class

Attribute name	Type	Brief Description
<>See the association link<>		

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18. Cancellation Class

Attribute name	Type	Brief Description
cancellationDate	Date	The cancellation date
reason	String	The reason of the cancellation, if any.

19. UserAccount Class

Attribute name	Type	Brief Description
userName	String	User account name
password	String	Encrypted user password

20. ApplicationServerLogArchive Class

Attribute name	Type	Brief Description
logTimeStamp	Date	The log timestamp
logText	String	The log description

21. WebServerLogArchive Class

Attribute name	Type	Brief Description
logTimeStamp	Date	The log timestamp
logText	String	The log description

22. DBServerLogArchive Class

Attribute name	Type	Brief Description
logTimeStamp	Date	The log timestamp
logText	String	The log description

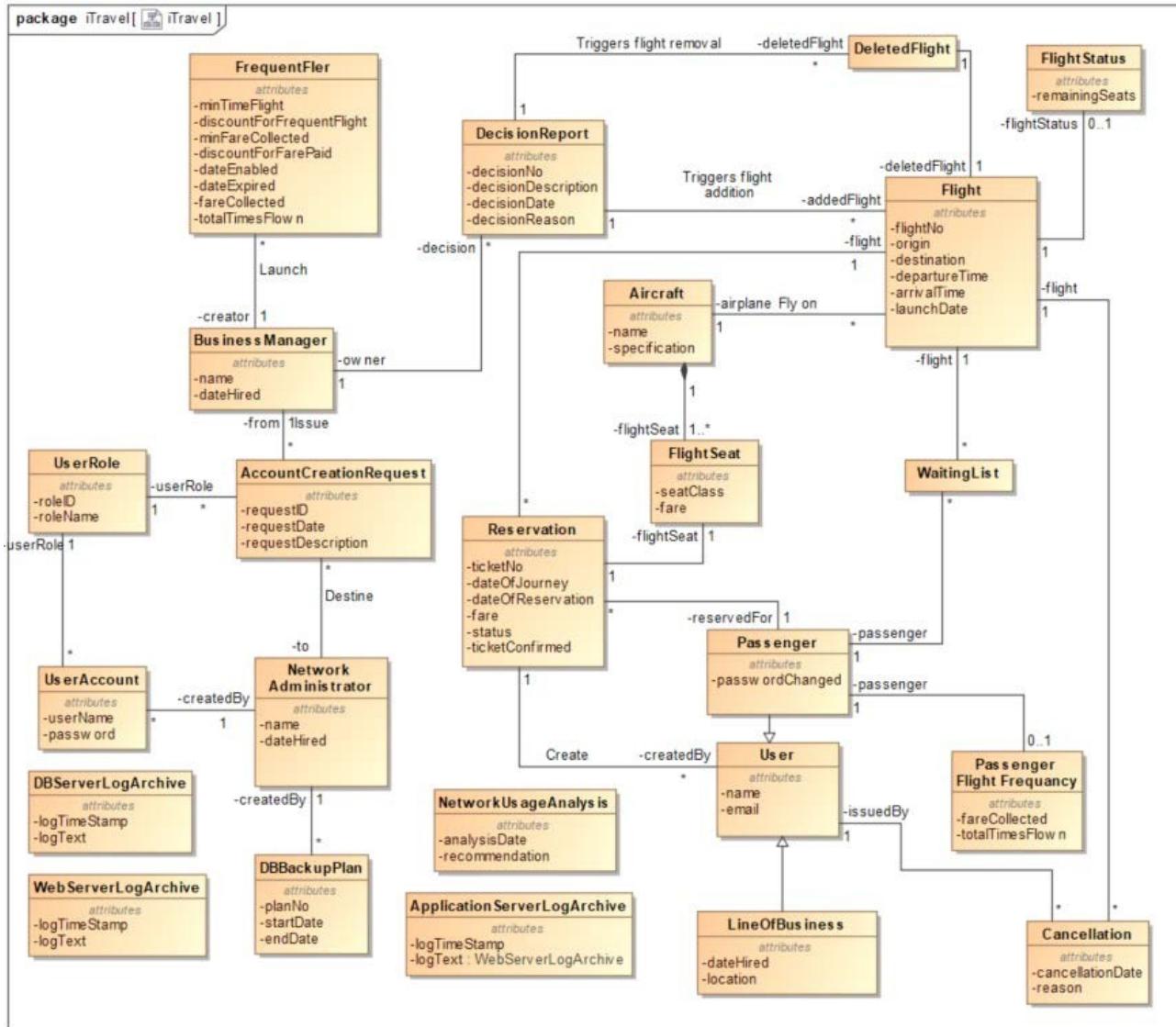
23. DBBackupPlan Class

Attribute name	Type	Brief Description
planNo	String	The backup plan identification
startDate	Date	The starting date
endDate	Date	The ending date

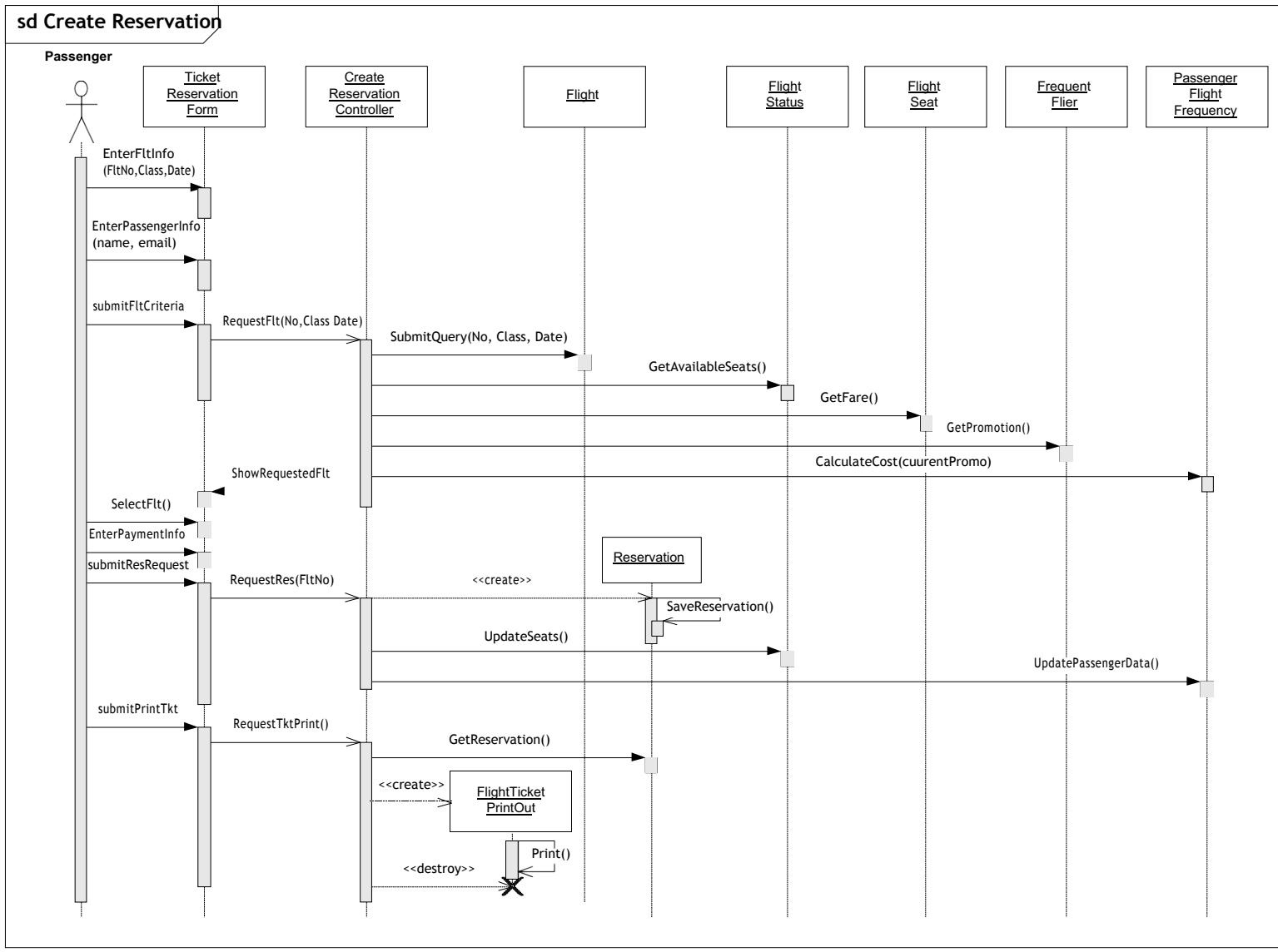
24. NetworkUsageAnalysis Class

Attribute name	Type	Brief Description
analysisDate	Date	Recommendation date
recommendation	String	Network Admin recommendation

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Potential iTravel Sequence diagram



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Detailing the operations

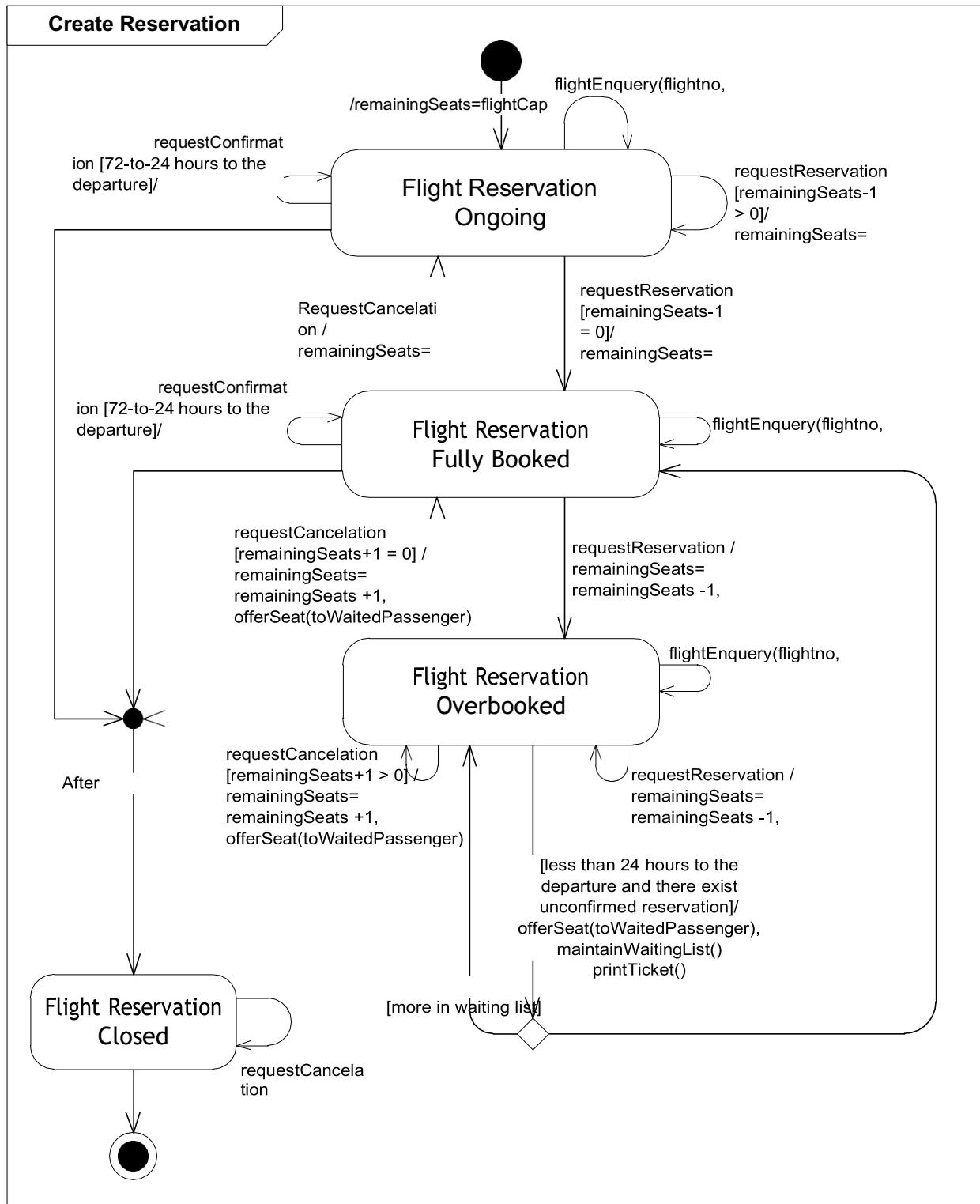
Class name	Receiving message (operation)	Brief Description
TicketReservationForm	EnterFltInfo (FltNo,Class,Date)	Validates and accepts the passenger input of the flight number, the class, and the date of journey.
	EnterPassengerInfo (name, email)	Accepts the passenger input of his/her name and email.
	submitFltCriteria	Recognizes the passenger action that request flight inquiry.
	ShowRequestedFlt	Displays the result of the query to the passenger.
	SelectFlt	Give the passenger a chance to select the flight and to proceed for the reservation process.
	EnterPaymentInfo	Activate the fields that accept the passenger payment information.
	submitResRequest	Recognizes the passenger action that request for flight reservation.
CreateReservationController	submitPrintTkt	Recognizes the passenger action that request printing a ticket. This function will be activated only after a successful flight reservation.
	RequestFlt (No,Class Date)	Responds to the passenger flight inquiry action and takes the flight no, class, and flight date as a parameters.
	RequestRes (FltNo)	Responds to the passenger action that request flight reservation. It takes flightNO as parameters.
Flight	RequestTktPrint	Responds to the passenger action that request printing a ticket.
	SubmitQuery (No, Class, Date)	Retrieve the flight information that match the given criteria.
FlightStatus	GetAvailableSeats	Return the value of the remainingSeat attribute.
	UpdateSeats	Update the value of the remaningSeat attribute based on whether the process is reservation or cancellation.
FlightSeat	GetFare	Return the register fare of the flight seat.
FrequentFlier	GetPromotion	Return the current promotion information
PassengerFlightFrequency	CalculateCost	Takes the current promotion information and calculate the discount percentage if the passenger is illegible.
	UpdatePassengerData	Update the collected points of the passenger whether it is total amount paid or number of flight. These points can be increased or decreased based on the usage of the promotion.

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Reservation	SaveReservation	Save the reservation transaction, generate a ticket number and update all associated objects.
	GetReservation	Retrieve the reservation transaction information based on the given criteria.
FlightTicketPrintOut	Print	Print the ticket information based on a predefined layout.

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Reservation State Chart Diagram



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The process for developing the state chart model is started by listing all the states that might be considered for the flight reservation life cycle. As we know the state of a class is determined by the values of its attributes, so by listing the list of class reservation attributes will help as determine and list the different state of this class.

Attributes for Reservation class (includes primary and non-primary data types)

- ticketNo
- dateOfJourney
- dateOfReservation
- fare
- statusticketConfirmed

- createdBy of type User
- reservedTo of type Passenger (with attribute: passwordChanged)
- flight of type Flight: (with attribute: flightNo, origin, destination, departureTime, arrivalTime, launchDate)
- seat of type FlightSeat: (with attribute: seatClass, fare)
- FlightStatus: remainingSeats

These attributes lead us to number of different states, however not all states are relevant to the Flight reservation life cycle. For example, the attribute passwordChanged implies a state showing whether a passenger changed his/her password or not. This state is related to create user account life cycle that shows what will happen when a passenger login into iTravel system in general and hence it is irrelevant to flight reservation life cycle.

The following states are identified as it is the most related state describing the flight reservation life cycle.

(1) Flight Reservation opened and ongoing (state)

[TIP]: We have asked to imagine what will happen when a Passenger makes a flight reservation. I.e., we need to determine the EVENTS that might rise during this life cycle. For example, these events include: Flight status inquiry, Reservation request, Cancelation request, Confirmation request, Print ticket request, etc.

Based on these events we need to determine whether any of these events cause a transition to move from this state to another state.

Note that, since we are restricted to demonstrate a single passenger booking a flight, we do not need to consider the mutual exclusion states that represent more than one passenger booking reservation at the same time.

(2) Flight Reservation Fully Booked (state)

This state represents the system when there are no more seats available in the flight and this can be determined by the value of the attribute remainingSeat.

Apply the same Tip in (1).

(3) Flight Reservation Overbooked (state)

This state represents the system when there is number of reservation request greater than the flight capacity. Apply the same Tip in (1).

(4) Flight Reservation closed (state)

This state represents the stage of the flight reservation cycle when the flight is departed, i.e., no more reservation request can be accepted.

Apply the same Tip in (1).