

Model Driven Software Engineering

(COEN 6312)

Project Deliverable 3

Submitted to

Dr. Abdelwahab Hamou-Lhadj

Submitted by

Nareshkumar M. Sisodiya 27650817

Arjun Lokhande 27411111

Binu Basil John 27421753

Anant Mathur 27323670

Khushboo Handa 27323794

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# 1. Introduction

For any given software system to function efficiently, it is essential to visualize, design, construct and document it through a standardized procedure. UML or Unified Modeling Language achieves these goals by providing a graphical representation of the software system.

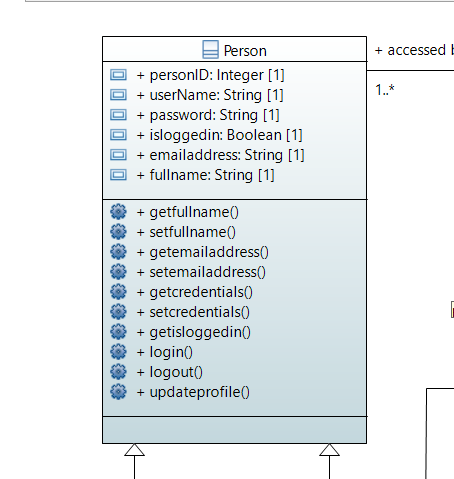
Flyair online reservation system has taken the initial steps of its formation through its standardized procedure in the previous deliverable, by defining the functional requirements of our system using Use Case Diagrams that provide interactions between the use cases and the actors of the system. It prioritises the simplicity of usage for the clients throughout the process of search and reservation of tickets. This is highly reflected in the entire system as well as its construction from its core. The main objective of this deliverable is to explore the detailed class diagram of the system with the classes, attributes and functions associated and list out the constraints that is applied to the same, using OCL.

The Class diagram is created after a close analysis of the system from the point of view of a customer and an administrator by outlining the possibilities and requirements during the entire flow of the system operation. The OCL constraints helped, to go further into the finer details of the system operation listing out the restrictions and conditions that should be implemented to get the smooth and accurate flow of the system. This required the vigorous effort and immense imagination of the entire team. Thus, the result is keeping all the possible situations in the flow of operation within the boundaries of the system design.

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# FlyAir (2).png2. Class Diagram Description

## 2.1 Person

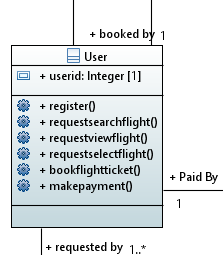


Person is the super class which is inherited by the administrator class and user class. Both Customers and Administrator are the primary actors of the system and they inherit the common attributes from the Person Class.

The attributes and methods of the class Person gives it versatility for different scenarios of the system flow.

* The attributes personID, username and password are the credential information that ensure security and uniqueness of the primary actors. The methods getcredentials() and setcredentials() are used to acquire  the credentials for individual users and administrator.
* Attribute isloggedin specifies the log in status of the actor in the system and method getisloggedin provide the corresponding information of the status.
* The methods login() and logout() allows the person to login or logout of the personal account.
* The attributes emailaddress and fullname are required for the personal information for the user account. The methods getfullname() and setfullname() corresponds to the attribute fullname and methods getemailaddress() and setemailaddress() corresponds to the attribute emailaddress.
* Method updateprofile() allows the person to update the information provided in the personal account.

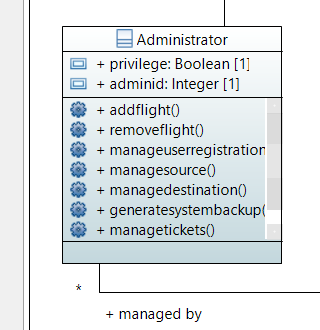
### 2.1.1 User



User Class is the inherited from class Person. User of the system relates to the customer of Flyair. Since Customer is a Primary actor of the system this class plays a vital role. All the attributes and methods of User class takes care of the functions performed by the customer of Flyair.

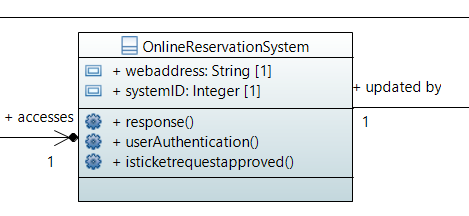
* The attribute userid gives a unique id number for the user.
* The method register() allows the user to register into the system to create personal account to proceed with the ticket reservation procedure.
* The methods requestsearchflight(), requestviewflight(), requestselectflight() allows to browse through the list of flights available to figure out if it meets the user’s specific journey requirements, without registering into the system.
* Method bookflightticket() let the user to book the ticket of particular choice, however it requires the user to register first.
* Method makepayement() directs the user to make payment for the tickets booked.

### 2.1.2 Administrator



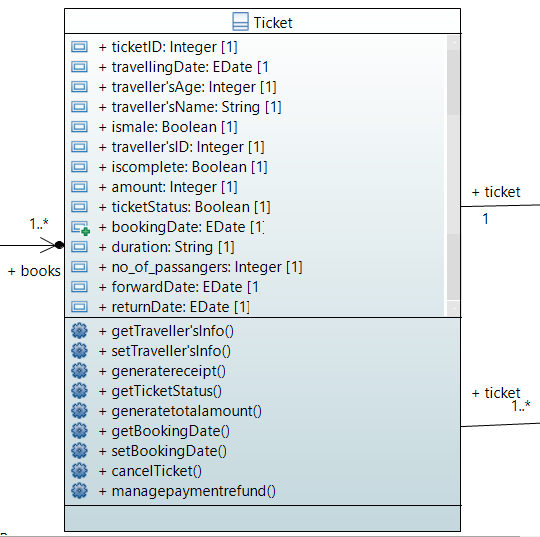
Admin class will define the role of an administrator in the system. This class will inherit the Person class. The primary task of Admin class is perform administrative functions in flight reservation system. Administrator will manage flight details, user registrations and routinely take system back-up. Admin class can manage overall system.

## 2.2 Online Air Reservation System

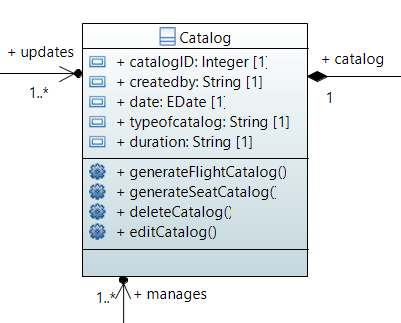


OnlineReservationSystem class plays a vital role in responding to the request initiated by the person. Also User authentication as well as approval of ticket request will be handled by this class.

## 2.3 Ticket

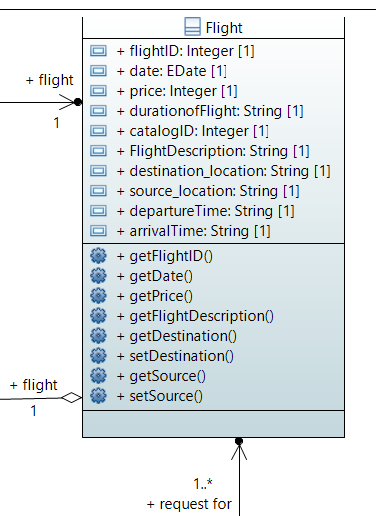


## 2.4 Catalog

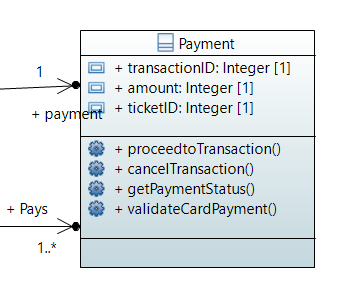


Catalog class holds all required data for flights and tickets. Upon receiving different combinations of requests, it can serve list of flight or list of available seats.

## 2.5 Flight



## 2.6 Payment



# 3. OCL Constraints

* Each person who logs in to the system to book a ticket must have an unique ID :

Context : Person

inv : self.allinstances()->forall(P1,P2:Person | P1 <> P2 implies P1.userID <> P2.userID);

* Each Ticket booked by the user for scheduled travel should have an unique ID :

Context : Ticket

inv : self.allinstances()->forall(T1,T2:Tickets | T1<>T2 implies T1.ticketID <> T2.ticketID);

* A logged in user planning a travel can book at most 10 tickets of the flight :

Context : User

inv : self.book->no\_of\_passengers <= 10;

* Source and Destination location of the flight cannot be the same :

Context : Flight

inv : self.destination\_location <> self.source\_location;

* User must provide Traveller's information while booking ticket :

Context : Ticket

int : self.travellersName->notEmpty() AND self.travellersAge->notEmpty() AND self.travellersID->notEmpty();

* The return journey date must be after the forward journey date :

Context : Ticket

inv : self.forwardDate < self.returnDate;