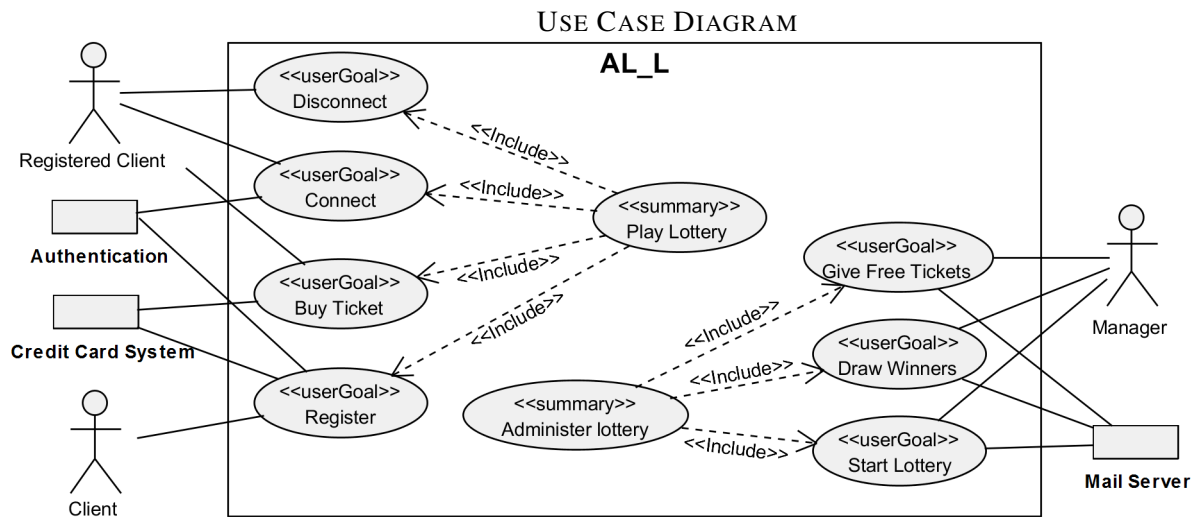# AL_L: Complete Requirements Specification Disciplined Use Cases and Screen Mockups

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USE CASE DIAGRAM

GLOSSARY

Data

(**1) *free ticket law*: an operation that given a natural number *K*, a list of client identifications, and a set of integer numbers *IS* returns *K* pairs, consisting of a client identification and of a number in *IS*; it will be used to determine which tickets will be given away and to which clients

(**2) *winning order*: a total order on the integer numbers; it will be used to determine the winning tickets of a lottery (they will be those whose numbers are the first three after having ordered all the ticket numbers using this order)

(**3) *credit card data*: information characterizing a credit card (issuer, number, expiration date)

(**4) *client info*: information about a registered client (email, credit card data, numbers of the bought tickets)

(**5) *password*: more than 8 characters containing at least a special character

(**6) *email*: valid email address (RFC 5322 compliant)

System attributes

(**7) *Current Lottery Dimension*: a positive natural number representing the dimension of the current lottery (i.e., how many tickets it has)

(**8) *Current Free Ticket Law* and *Current Winning Order*: those relative to the current lottery

(**9) *Running*: a boolean, true if a lottery is currently running

(**10) *Available tickets*: set of integer numbers, the numbers of the tickets of the current lottery still not assigned to some client

(**11) *Registered Clients*: information about the registered clients

(**12) *Connected Clients*: the emails of the registered clients currently connected.

USE CASE DESCRIPTIONS

Use Case Register
Level: User Goal
Priority: 1
Frequency: Periodically
Goal: A client wants to register to AL_L to be able to play in the lotteries
Primary Actor: Client
Secondary Actors: Credit Card Service, Authentication

Main Success Scenario:

1. Client asks AL_L to be registered, giving an *email* (**6) and some *credit card data* (**3).
2. If no one among the *Registered Clients* (**11) is using the given email,
   and the *credit card data* are well-formed (**3), then AL_L asks
   Credit Card Service to check them.
3. Credit Card Service informs AL_L that the submitted credit card is valid.
4. AL_L asks Authentication to register the client giving his/hers email.
5. Authentication confirms the registration and gives to AL_L the client password (**5).
6. AL_L informs Client that (s)he has been registered and gives hers/his password.
   The information about Client (hers/his email, credit card data) (**4) is
   added to the *Registered Clients* (**11). The use case ends with success.

Extensions:
2a.1 If the credit card date are ill-formed (**3), then AL_L informs Client
      that the registration has failed. The use case ends with failure.

2b.1 If someone among the *Registered Clients* is using the given email, AL_L
      informs Client that the registration has failed. The use case ends with failure.

3a.1 Credit Card Service informs that the submitted credit card is invalid.
3a.2 AL_L informs Client that the registration has failed. The use case
      ends with failure.

Use Case Connect
Level: User Goal
Priority: 1
Frequency: Frequently
Goal: A registered client wants to connect herself/himself to AL_L to be able to play in the lottery.
Primary Actor: Registered Client
Secondary Actor: Authentication
Precondition: The email of Registered Client does not belong to *Connected Clients* (**12).
**Main Success Scenario:**

1. Registered Client asks AL_L to be connected giving hers/his *email* (**6) and *password* (**5).
2. AL_L asks Authentication to validate such *email* and *password*.
3. Authentication informs AL_L that they are valid.
4. AL_L informs Registered Client that s(he) has been connected, and hers/his email is added to *Connected Clients*. The use case ends with success.


Extensions:
3a.1 Authentication informs AL_L that they are not valid.
3a.2 AL_L informs Registered Client that the connection has failed. The use case ends with failure.

Use Case Disconnect
Level: User Goal
Priority: 1
Frequency: Frequently
Goal: A connected client want to disconnect herself/himself
from AL_L.
Primary Actor: Registered Client
Precondition: The Registered Client email belongs to *Connected Clients* (**12).
Main Success Scenario:

1. Registered Client asks AL_L to be disconnected.
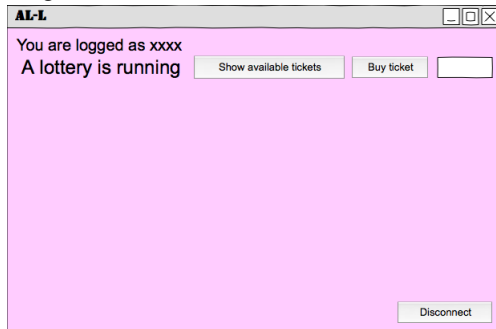
2. AL_L informs Registered Client that the connection has ended, and the
email of Registered Client is removed by *Connected Clients*. The use case
ends with success.
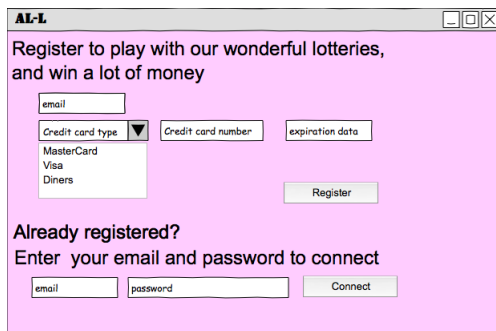
Use Case Buy Ticket
Level: User Goal
Priority: 1
Frequency: Frequently
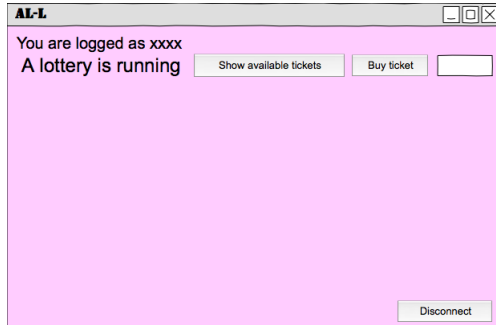**Goal:** A connected client wants to buy a ticket by choosing
its number.
Primary Actor: Registered Client
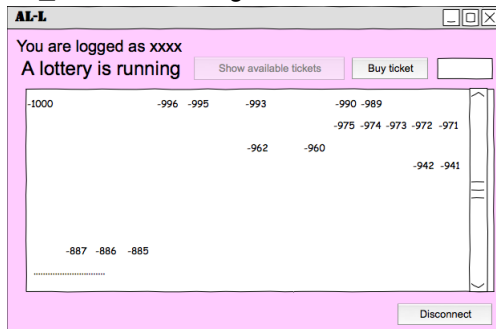**Secondary Actor:** Credit Card Service
Precondition: The Registered Client email belongs to *Connected Clients* (**12).
**Main Success Scenario:**

1. Registered Client asks AL_L which are the available tickets.

2. AL_L shows to Registered Client the *Available tickets* (**10).

3. Registered Client asks to buy the ticket with number N.
4. If N belongs to *Available tickets*, then AL_L asks Credit Card Service to charge 100 Euro to the credit card of the Registered Client recovered using *Registered Clients* (**11).
5. Credit Card Service communicates to AL_L that the amount has been charged.
6. AL_L confirms to Registered Client that has got the ticket with number N, N is not any more among the *Available tickets* (**10), and it is recorded in *Registered Clients* (**11) that N is assigned to Registered Client. The use case ends with success.
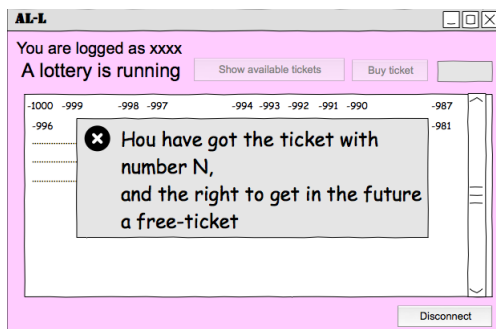
Extensions:

4a.1   If N does not belong to *Available tickets*, then AL_L communicates to the Registered Client that ticket N is not available. The use case ends with failure.

5a.1   Credit Card Service communicates to AL_L that the amount cannot be charged.

5a.2   AL_L informs Registered Client that the ticket price cannot be charged. The use case ends with failure.

Use Case Give Free Tickets
Level: User Goal
Priority: 3
Frequency: Periodically
Goal: Manager wants to give away some tickets to help
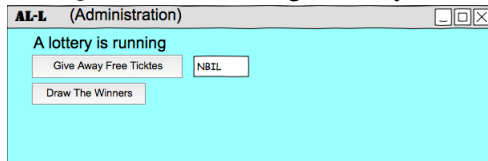 finish the current lottery.
Primary Actor: Manager
**Secondary Actor:** Mail Server
Precondition: The set of the *Available tickets* (**10) is not empty and its
  size is less than the *Current Lottery Dimension* (**7).
Main Success Scenario:
1. Manager asks AL_L to give away NBIL free tickets.

2. If NBIL is less or equal than the size of *Available tickets* (**10), there are
   at least NBIL clients that have bought a ticket in the current lottery, and
   Current Winning Order applied to NBIL, *Available tickets* and
   Registered Clients returns $(email_1, nbil_1), \ldots, (email_{NBIL}, nbil_{NBIL})$, then
   AL_L asks Mail Server to send an email to $email_1, \ldots, email_{NBIL}$ informing
   them that they have received the free tickets $nbil_1, \ldots, nbil_{NBIL}$ respectively;
   and such tickets are assigned to such clients by updating *Registered Clients*.
3. AL_L informs Manager that the NBIL tickets have been given away. The
   use case ends with success.
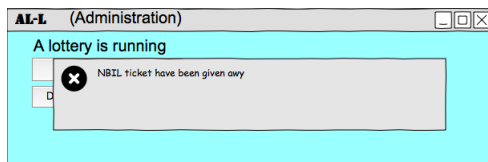
Extensions:
2a.1 If NBIL greater than the size of *Available tickets* (**10) or there are not
      NBIL clients that have bought a ticket in the current lottery, then AL_L
      informs Manager that it is not possible to give away NBIL tickets. The
      use case ends with failure.
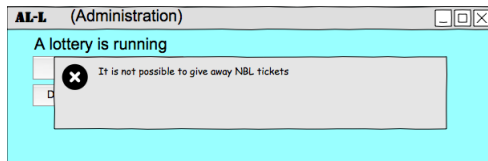
Use Case Draw Winners
Level: User Goal
Priority: 1
Frequency: Periodically
Goal: When *Available tickets* is empty the Manager draws
the winners of the current lottery.
Primary Actor: Manager
Secondary Actor: Mail Server
Precondition: *Running* is true (**9) and *Available tickets* (**10) is empty.
Postcondition: *Running* is false.
Main Success Scenario:
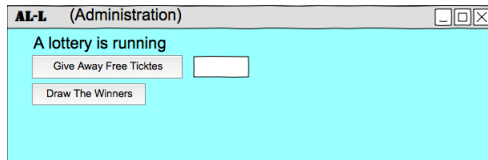
1. The Manager asks AL_L to draw the winners.
2. If em_1, em_2 and em_3 are the emails recovered by *Registered Clients* of the clients that bought the three tickets whose numbers are the three highest with respect to *Current Winning Order*, then AL_L asks Mail Server to send an email to em_1, em_2 and em_3 informing them that they won.
3. AL_L asks Mail Server to send an email to all registered clients determined by *Registered Clients* informing them that the winners of the current lottery have been drawn.
4. AL_L informs the Manager that the winners have been drawn and that the current lottery is terminated. The use case ends with success.
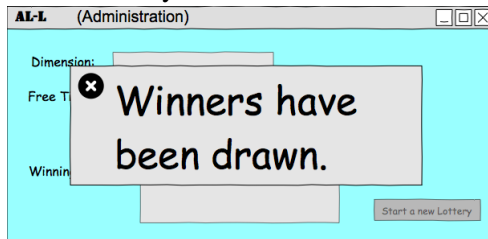
Use Case Start Lottery
Level: User Goal
Priority: 1
Frequency: Periodically
Goal: The Manager wants to start a new lottery
Primary Actor: Manager
Secondary Actor: Mail Server
Precondition: *Running* is true (**9)
Postcondition: *Running* is false.
Main Success Scenario:
1. The Manager asks AL_L to start a new lottery, and gives its dimension, its free ticket law (**1) and its winning order (**2).
2. AL_L asks Mail Server to send an email to all *Registered Clients* (**11) informing them that a new lottery has started. *Running* (**9) will become true, and *Current Lottery Dimension* (**7), *Current Free Ticket Law* and *Current Winning Order* (**8) are updated with the received data. The use case ends with success.