17/11/2020

World phenomena:

someone wants/needs to go to the supermarket
order in which a person does the grocery shopping
person gets to/approaches the supermarket by car/bike/on foot, …
a person decides to buy an item
a person pays at the check-out
a person exits without buying (contained in the next one)
a person enters/exits in/from the supermarket (maybe Shared: our system sees people exiting and controls entrance flow)

Shared phenomena:

available slots for shopping (World controlled: it depends on people deciding to go or not to the shopping centre)
person books a visit (World controlled)
person gets a ticket (World controlled)
person cancels his booked visit (World controlled)
person cancels his booked ticket (World controlled)
a person waits to be called for his turn (Machine controlled)
a person knows approximate time to spend in the supermarket (World controlled)
a person knows approximate categories of items to buy (World controlled)
a person is notified for entrance (Machine controlled)
a person buys a ticket / books a visit but doesn't go to the grocery shop (World controlled)
a person buys a ticket / books a visit at a certain date/time but doesn't respect the scheduled date/time (World controlled)
a customer is notified to leave from home (Machine controlled)
a customer receives a suggestion to book a visit in its habitual day of the week and time, if any slot is available (Machine controlled)
a customer receives a suggestion to book a visit in a different shop if the one selected hasn't available slots in the selected date/time (Machine controlled)
a customer receives a suggestion to book a visit in a different date/time in the same shop if the one selected is not available (Machine controlled)
a customer receives a suggestion to get a ticket in a different shop if the one selected hasn't available slots (Machine controlled)

GOALS:

avoid physical lining up *(maybe this is a sub-goal of the following one)*
grant social distance outside shopping centre
manage entrances in the shopping centre **(?)**
avoid having crowds inside (avoid too many people inside the shopping centre)
enter in the supermarket respecting safety rules
respect security rules imposed by government (probably too general: it implies all the others)

DOMAIN ASSUMPTIONS:

1. GPS provides the exact location with an error of 10 metres at most
2. people inside the supermarket respect social distance as imposed by safety rules of the country/region
3. a ticket is associated to only one person
4. a visit is associated to only one person
5. only one person enters the shop for every ticket/visit
6. the supermarket has a maximum capacity for people inside
7. a very little part of customers uses ticket machines for reservations, because mobile application and call center guarantee a more comfortable service accessible to almost everyone (people with a smartphone use the application, people without it can call and book)

REQUIREMENTS:

1. the system allows users to book one or more visits
    A. the system allows users to book one visit with a ticket machine only if no slots for tickets are available for that supermarket in the current day **(dividerlo, non fare più sub-requirement ma 3 separati, specificando meglio questo)**
    B. the system allows users to book one or more visits with the mobile application
    C. the system allows users to book a visit calling the call center
2. the system does not allow a person to enter if shopping centre's maximum capacity has been reached
3. the system does not allow for entrance a person who has not booked a visit or got a ticket
4. a user application is associated to a profile (personal profile)
5. the system allows “ticket-machine” application to get a ticket
6. the system allows a user application to get a ticket only when no other ticket is “pending” (booked but not called yet) for that profile
7. the system sends a notification two minutes before entrance (only in case of user application and call center reservation)
8. the system allows a customer to have the possibility to enter only when it is his turn and for the next ten minutes
9. the system allows the user to book slots for shopping for the next month from current date and time
10. the system registers time spent inside the supermarket for every customer
11. the system allows to insert a list of items (that user would like to buy) when booking a visit
12. the system is able to build statistics (time spent in the supermarket, items/categories of items purchased)
13. the system generates a unique code for entrance associated to every ticket/visit
    a. the system generates a unique QR code associated to every ticket/visit booked from user application
    b. the system generates a unique QR code associated to every ticket/visit booked from a ticket machine
    c. the system generates a unique numeric code associated to every ticket/visit booked calling the call center
14. the system, in case of mobile application, sends notifications basing on user's

actual position and time remaining before his turn

15. the system generates a unique numeric code for the position in the waiting “queue” associated to every ticket/visit booked from a ticket machine
16. the system allows users to get information about estimated time before being called
17. the mobile application enables 100% screen brightness when a QR code is displayed
18. call centers are open in the supermarket’s opening hours
19. the system allows users to get a ticket reservation calling the call center
20. people without user application can monitor entrances and estimated time (for their turn) through displays
21. the system manages available slots depending on statistics built on specific user’s habits (usual time spent in the supermarket, items/categories of items purchased)
22. the system tracks user habits in order to detect its habitual shop and date/time of visit, in order to provide booking suggestions in advance if any slot is available

Time: 2h30:

1h World and Shared phenomena
30min goals
30min domain assumptions
30min requirements

Andrea and Roberto

18/11/2020

SCENARIOS

- **Delete a ticket reservation**
  Alessandro, because of a sanitary emergency in his country, would like to avoid waiting for his turn in the supermarket's proximity. He has a smartphone and, through CLup app, decides to get a ticket: the expected time before being called is 2 hours. But in the meanwhile, he receives an important job call: he will be busy for the next four hours, so he deletes his ticket reservation through the application; the system notifies him that this operation went fine.

- **Delete a visit reservation**
  Marta works from Monday to Friday as a teacher, so she usually goes to do the grocery shopping on Saturday afternoon. For this reason, she decides, using *CLup* mobile application, to book a visit to the supermarket for next Saturday, at 2pm. But as soon as she remembers that next Saturday she must pick her nephew up from school, she decides to delete her visit reservation (always with the app): the system notifies that this operation went fine, and the 2pm time slot for Saturday is now free for some other customer(s).

- **Entrance in the grocery**
  Matteo is waiting in his car just outside his favourite grocery. Using *CLup* app on his smartphone, he has already got a ticket and his turn is approaching: he knows it thanks to the notification, received a few minutes ago. When it is time to enter, a new notification arrives and Matteo opens the app: he sees the QR code for entrance and a message telling him that it is his turn; QR code will expire in 10 minutes, as shown by another message (in the upper part of the smartphone's screen).
  Matteo gets out of the car and enters the supermarket by showing his QR code to the scanner at the entrance: doors open and he can get into the grocery.

- **Suggest an alternative**
  Andrea would like to go to his usual grocery, Esselunga (very close to his house), tomorrow at 5pm. It is very important to go tomorrow, because he has almost nothing in the fridge and his wife is complaining a lot about this fact.
  Andrea uses *CLup* app on his smartphone to book a visit for tomorrow: he selects his usual supermarket, date and time for the visit. Unfortunately, a message tells him that there is no availability for his request; anyway, the system suggests him another date for his favourite Esselunga (in two days' time, always at 5pm) or another Esselunga shop (a little bit further from his house, but not very distant), available tomorrow at 5pm. Since it is very important for him to do the grocery shopping tomorrow, he accepts this latter advice: he books a visit for tomorrow at 5pm at the suggested Esselunga shop.

- **Get a ticket from call center**
  Francesco, a seventy five-year old man without a smartphone, before going to the grocery shop wants to be sure about the fact that there is availability for a ticket and does not want to wait outside the market if the estimated waiting time is too long. Thus, calling at the call center he can get the next ticket available (estimated time: 3 hours) with a certain reservation code and therefore he can avoid waiting

outside the shop and get tired from physical lining up. After having waited comfortably from home, Francesco approaches the market and arrives at the exact time previously indicated to him by phone. When it is time to enter an SMS is sent to him. Then he shows its code and enters into the grocery shop.

- **Get a ticket from ticket machine**
  Antonio, an eighty-year-old man without a smartphone, approaches a grocery shop on foot, with the intention to buy all necessary for next week. Given the current rules about safety distance, he knows that he must get a ticket (for entrance) at one of the ticket machines outside the supermarket: he selects "Ticket" option on the touchscreen (wearing disposable gloves available near the ticket machine itself) and a ticket with a QR code is printed, together with a 6-digits number identifying his turn; in addition, the screen shows a message telling him that the expected waiting time before his turn is 15 minutes. Antonio decides to walk around and comes back after 10 minutes; two (more) minutes later, his turn comes and the identification number appears on the waiting-screen at the top level of the queue. The man approaches the shop's entrance and shows his QR code (on paper) to the scanner positioned there: doors open and he can get into the supermarket.

- **Get a ticket from call center**
  Gabriele, a single forty eight-year old man, wants to go to the grocery shop, on the way home from work by car, to buy the necessary food for the next few days. When he tries to log in the CLup app, he notices that he has no mobile connection available at that moment. So, he decides to call at the call center in order to get a ticket and be able to buy something for the current day. The call center operator tells him that the next ticket available in the requested supermarket has an expected waiting time of 20 minutes. After Gabriele's confirmation, the operator tells him a numeric code that he will use for the entrance. Moreover the call center operator reminds Gabriele that he will be notified, with a SMS, at the moment he can access the shop. Therefore, Gabriele decides to approach the supermarket and waits for his turn on the car. At the moment he receives the SMS notification he approaches the entrance, shows its numeric code and enters the supermarket.

- **Book a visit from call center**
  Lucia is a seventy-year-old woman without a smartphone. On Wednesday, she decides to go to the grocery shop to buy food for the next few days and, given the current rules about safety distance, she knows that she must get a ticket (for entrance) at one of the ticket machines. She approaches the ticket machine, but she reads on its screen a message saying "Expected waiting time for tickets is: 4 hours". Of course, 4 hours are much more than what Lucia was expecting, so she decides to come back home and call the call center to book a visit for another day. On the phone, she establishes a reservation next Friday at 3p.m., with the call center operator which confirms her reservation telling her a numeric code that she will use to enter the market on Friday. Lucia will come to the supermarket on Friday.

- **Available slot suggestion**
  Marco is used to going to the grocery shop close to his house on Saturday afternoon; he always books a visit using *CLup* application on his smartphone, in order to avoid crowds and respect social distance. Due to his high number of

reservations in the last months, the system knows Marco's habits about grocery shopping: in fact, the man receives a notification on Monday about an available slot for next Saturday at 4pm. As soon as Marco sees the notification on his smartphone, he fills all requested data for the reservation and books the suggested visit for Saturday: in this way, his habits will continue to be respected also for this week.

- **Notification based on GPS position**
  Antonella has a very busy life, with two little children and a full-time job. Three days ago, she used *CLup* application for booking a visit to her usual supermarket: her turn is today at 4pm. However, her busy life has made her forget about the reservation, and at 3.30pm she is still totally unaware of it. But her smartphone has GPS services running, so at 3.32pm she receives a notification about the approaching turn: so, she immediately gets dressed and goes to the supermarket (approximate time from home to the shop is 10 minutes by car: this information is known by the system thanks to GPS position). She is able to get there at 3.55pm, totally in time for her turn.

Time: 1h30
Andrea and Roberto

19/11/2020

USE-CASES

1) Registration of mobile app user

ID	UC1
Name	Registration of mobile app user
Actors	Mobile app user*
Entry condition	● User has the internet connection available ● User has downloaded *CLup* app on his smartphone/tablet
Event flow	1. User unlocks his smartphone 2. User opens *CLup* app 3. User sees the home page of the app 4. User clicks on “Sign up” button 5. User inserts email, name and surname in appropriate fields 6. User chooses his password for the service, according to security standards 7. User accepts *CLup* “Terms and conditions” 8. User clicks on “Continue” button 9. User sees the page for registering his mobile phone number 10. User inserts his mobile phone number and clicks on “Send a SMS” button 11. The system sends a SMS to the specified phone number, containing a 8-digits code 12. User receives the SMS and fills the appropriate field in *CLup* page with the received code 13. User clicks on “Confirm” button 14. The system confirms registration with an email; in the meanwhile, the app goes back to the home page 15. User opens the email and validates his registration by opening the suggested link
Exit condition	● The user is now able to login and use the application services
Exceptions	1. User does not fill some of the mandatory fields in the first page (email, name, surname, password, “Terms and conditions” acceptance) 2. Password does not match security standards 3. Email is already registered in the system’s DB 4. User inputs a non-valid email address 5. Email does not exist 6. User is not the owner (or, in any case, has no visibility) of the specified email address 7. User does not fill some of the mandatory fields in

	the second page (mobile phone number, received code) 8. Mobile phone number is already registered in the system's DB 9. User inputs a code different from the one sent by the system 10. Mobile phone number does not exist 11. User is not the owner (or, in any case, has no visibility) of the specified mobile phone number In cases 1,2,3,4, the system does not let the "Continue" button to be pressed until all fields are correctly filled in. In cases 5, 6, the user never receives an email, so he will never be able to complete registration. In cases 7,8, the system does not let the "Confirm" button to be pressed until all fields are correctly filled in. In case 9, the user can ask for a new code with a click on the appropriate button. In cases 10,11, the user does never receive a SMS, so he will very likely not be able to proceed.

** until the end of UC1 specification, references to "mobile app user" will be made using the word "user"*

2) Login of mobile app user

ID	UC2
Name	Login of mobile app user
Actors	Mobile app user*
Entry condition	● User has the internet connection available ● User has downloaded *CLup* app on his smartphone/tablet ● User is registered to the service
Event flow	1. User unlocks his smartphone 2. User opens *CLup* app 3. User sees the home page of the app 4. User clicks on "Sign in" button 5. User inserts email and password in appropriate fields 6. User clicks on "Sign in" button

	7. The system checks for a matching with all registered users (with their passwords) in the DB 8. The system confirms login and shows the home page
Exit condition	● User is logged in ● User can use all *CLup* services
Exceptions	1. User does not fill some of the mandatory fields (email, password) 2. The system does not find a matching with registered users (and corresponding passwords) in the DB In case 1, the system does not let the "Confirm" button to be pressed until all fields are correctly filled in. In case 2, the system notifies an error message and goes back to the login page (where to insert again email and password).

** until the end of UC2 specification, references to "mobile app user" will be made using the word "user"*

3) Mobile app user gets a ticket

ID	UC3
Name	Mobile app user gets a ticket
Actors	Mobile app user*
Entry condition	● User has the internet connection available ● User has downloaded *CLup* app on his smartphone/tablet ● User is registered to the service ● User is logged in
Event flow	1. User unlocks his smartphone 2. User opens *CLup* app 3. User sees the home page of the app 4. User clicks on "Get a ticket" button 5. User selects a supermarket from the list, directly or after searching 6. User clicks "Confirm" button 7. The system notifies "Success" message and displays expected waiting time before being called
Exit condition	● User has a ticket reservation ● User sees the ticket in "All reservations" page of *CLup* application
Exceptions	1. No more tickets are available for current day and selected supermarket 2. User has already a "pending" (booked but not called

	yet) ticket reservation In case 1, refer to use-case 4) ^ In case 2, the system does not let the “Confirm” button to be pressed.

** until the end of UC3 specification, references to “mobile app user” will be made using the word “user”*

4) Mobile app user receives suggestions after failure in getting a ticket

ID	UC4
Name	Mobile app user receives suggestions after failure in getting a ticket
Actors	Mobile app user*
Entry condition	● User has the internet connection available ● User has downloaded *CLup* app on his smartphone/tablet ● User is registered to the service ● User is logged in
Event flow	1. User unlocks his smartphone 2. User opens *CLup* app 3. User sees the home page of the app 4. User clicks on “Get a ticket” button 5. User selects a supermarket from the list, directly or after searching 6. User clicks “Confirm” button 7. The system shows a message, telling the user about no availability for the current day and inviting him to book a visit 8. The system suggests to get a ticket for the closest supermarket (with respect to the selected one) still available for current day
Exit condition	● A suggestion is shown to the user
Exceptions	1. Some tickets are available for current day and selected supermarket 2. User has already a “pending” (booked but not called yet) ticket reservation In case 1, refer to use-case 3) ^ In case 2, the system does not let the “Confirm” button to be pressed.

** until the end of UC4 specification, references to “mobile app user” will be made using the word “user”*

5) Mobile app user books a visit LOOK FOR NOTE #

ID	UC5
Name	Mobile app user books a visit
Actors	Mobile app user*
Entry condition	• User has the internet connection available • User has downloaded *CLup* app on his smartphone/tablet • User is registered to the service • User is logged in
Event flow	1. User unlocks his smartphone 2. User opens *CLup* app 3. User sees the home page of the app 4. User clicks on "Book a visit" button 5. User selects desired day on the appeared calendar, then the time for the visit 6. User selects a supermarket from the list, directly or after searching 7. User clicks "Confirm" button 8. The system notifies "Success" message
Exit condition	• User has a visit reservation • User sees booked visit in "All reservations" page of *CLup* application
Exceptions	1. No availability for selected supermarket, day and time 2. User has already a reservation for the selected day (in any grocery shop) In case 1, refer to use-case 6) ^ In case 2, the system does not let the "Confirm" button to be pressed and shows a proper message to the user.

** until the end of UC5 specification, references to "mobile app user" will be made using the word "user"*

6) Mobile app user receives suggestions after failure in booking a visit

ID	UC6
Name	Mobile app user receives suggestions after failure in booking a visit
Actors	Mobile app user*

Entry condition	● User has the internet connection available ● User has downloaded *CLup* app on his smartphone/tablet ● User is registered to the service ● User is logged in
Event flow	1. User unlocks his smartphone 2. User opens *CLup* app 3. User sees the home page of the app 4. User clicks on “Book a visit” button 5. User selects desired day on the appeared calendar, then the time for the visit 6. User selects a supermarket from the list, directly or after searching 7. User clicks “Confirm” button 8. The system shows a message telling the user about no availability for selected day, time and supermarket 9. The systems suggests the user available slots for: same supermarket, same day and different hour (±2 hours); same supermarket, same hour and different day (±2 days); same day, same hour, different supermarket (among the five closest to the selected one)
Exit condition	● User has a visit reservation ● User sees booked visit in “All reservations” page of *CLup* application
Exceptions	1. Availability for selected supermarket, day and time 2. User has already a reservation for the selected day (in any grocery shop) In case 1, refer to use-case 5) ^ In case 2, the system does not let the “Confirm” button to be pressed and shows a proper message to the user.

** until the end of UC6 specification, references to “mobile app user” will be made using the word “user”*

7) Mobile app user deletes a ticket reservation

ID	UC7
Name	Mobile app user deletes a ticket reservation
Actors	Mobile app user*
Entry condition	● User has the internet connection available ● User has downloaded *CLup* app on his smartphone/tablet

	● User is registered to the service ● User is logged in ● User has got a ticket for current day and his turn has not come yet
Event flow	1. User unlocks his smartphone 2. User opens *CLup* app 3. User sees the home page of the app 4. User clicks the button to see all his reservations in the home page of the application 5. User clicks the deletion button for the ticket he wants to delete 6. The system shows “Are you sure you want to delete your ticket?” message dialog 7. User clicks “Yes” button 8. The system notifies “Success” message
Exit condition	● User has no tickets for the current day ● User does not see any ticket in “All reservations” page of *CLup* application
Exceptions	

** until the end of UC7 specification, references to “mobile app user” will be made using the word “user”*

8) Mobile app user deletes a visit reservation

ID	UC8
Name	Mobile app user deletes a visit reservation
Actors	Mobile app user*
Entry condition	● User has the internet connection available ● User has downloaded *CLup* app on his smartphone/tablet ● User is registered to the service ● User is logged in ● User has booked a visit and his turn has not come yet
Event flow	1. User unlocks his smartphone 2. User opens *CLup* app 3. User sees the home page of the app 4. User clicks the button to see all his reservations in the home page of the application 5. User clicks the deletion button for the visit he wants to delete 6. The system shows “Are you sure you want to delete

	your visit?" message dialog 7. User clicks "Yes" button 8. The system notifies "Success" message
Exit condition	● User does not have the selected visit reservation anymore ● User does not see the selected visit in "All reservations" page of *CLup* application
Exceptions	

** until the end of UC8 specification, references to "mobile app user" will be made using the word "user"*

9) Call center user gets a ticket

ID	UC9
Name	Call center user gets a ticket
Actors	Call center user*
Entry condition	● User has a mobile device enabled to phone calls, with a SIM card ● User is in a place where there is signal ● User knows *CLup* call center telephone number ● Date and time correspond to one of *CLup* call center's opening hours
Event flow	1. User unlocks his mobile device 2. User opens the program/app to make phone calls 3. User dials *CLup* call center telephone number 4. The IVR system lists a set of options: "press 1 to get a ticket"; "press 2 to book a visit", "press 3 to delete a reservation", "press 0 to talk to an operator" 5. User presses 1 on the keypad 6. The IVR system proposes the following options: "after the beep sound, pronounce the name, the town and the street of the grocery shop (if there is only one shop in the selected town, street is optional)"; "press 0 to talk to an operator" 7. User hears a beep sound 8. User pronounces name, town and (optionally) street, as suggested by the IVR system 9. The system looks for the grocery shop which better fits the one pronounced by the user, and repeats it together with the expected waiting time (before the turn comes) 10. The IVR system proposes the following options: "press 1 to get the ticket"; "press 2 to pronounce

	another grocery shop"; "press 0 to talk to an operator" 11. User presses 1 on the keypad 12. The IVR system proposes the following options: "press 1 to confirm you would like to receive text messages for entrance to the phone number you are using for this call"; "press 2 to insert another phone number" 13. User presses 1 on the keypad 14. The IVR system confirms the ticket, repeats the expected waiting time and tells the code for entrance 15. The system ends the phone call 16. User receives a SMS confirming the ticket reservation, together with a code for entrance
Exit condition	● User has a ticket reservation ● User can see all the information about the ticket reservation (grocery shop, expected waiting time) in the received SMS
Exceptions	1. No more tickets are available for current day and selected supermarket 2. The phone call ends before the user explicits on which phone number he would like to receive text messages 3. User presses 0, in order to talk to an operator 4. The IVR system does not recognize the grocery shop pronounced by the user 5. User inputs a non-valid number, with respect to the options given by the IVR system (at any moment) In case 1, the IVR system tells the user about unavailability and proposes only to pronounce another grocery shop or to talk to an operator. In case 2, the procedure to get a ticket is not completed and the user does not have a ticket reservation. In case 3, the user is put on hold until the first free operator is able to talk to him. In case 4, the IVR system still proposes to pronounce another grocery shop or to talk to an operator, so the user can repeat. In case 5, the system waits until the first valid input has been written.

** until the end of UC9 specification, references to "call center user" will be made using the word "user"*

10) Call center user books a visit

ID	UC10
Name	Call center user books a visit
Actors	Call center user*
Entry condition	• User has a mobile device enabled to phone calls, with a SIM card • User is in a place where there is signal • User knows *CLup* call center telephone number • Date and time correspond to one of *CLup* call center's opening hours
Event flow	1. User unlocks his mobile device 2. User opens the program/app to make phone calls 3. User dials *CLup* call center telephone number 4. The IVR system lists a set of options: "press 1 to get a ticket"; "press 2 to book a visit", "press 3 to delete a reservation", "press 0 to talk to an operator" 5. User presses 2 on the keypad 6. The IVR system proposes the following options: "after the beep sound, pronounce the name, the town and the street of the grocery shop (if there is only one shop in the selected town, street is optional)"; "press 0 to talk to an operator" 7. User hears a beep sound 8. User pronounces name, town and (optionally) street, as suggested by the IVR system 9. The system looks for the grocery shop which better fits the one pronounced by the user, and repeats it 10. The IVR system proposes the following options: "press 1 to book a visit"; "press 2 to pronounce another grocery shop"; "press 0 to talk to an operator" 11. User presses 1 on the keypad 12. The IVR system proposes the following options: "if you want to complete the reservation soon, write with your keypad four digits, in order to specify the day and month of your visit (for example, if you would like to visit on the third of July, write zero three zero seven)"; "press # to talk to an operator" 13. User dials a four digits number on the keypad 14. The IVR system proposes the following options: "if you want to complete the reservation soon, write with your keypad four digits, in order to specify the exact hour of your visit (for example, if you would like to visit at half past nine, write zero nine three zero)"; "press # to talk to an operator" 15. User dials a four digits number on the keypad 16. The system looks for the closest earlier (in time,

	since supermarket is fixed) available time slot (<=) and the closest later (>) to the one selected by the user, and repeats them 17. The IVR system proposes to press 1 to book the closest earlier (<=) visit, to press 2 to book the closest later (>) visit, to press 3 to input another date, to press 4 to input another time (keeping the date fixed), to press 4 to select another grocery shop, to press 0 to talk to an operator 18. User presses 1 on the keypad 19. The IVR system proposes the following options: “press 1 to confirm you would like to receive text messages for entrance to the phone number you are using for this call”; “press 2 to insert another phone number” 20. User presses 1 on the keypad 21. The IVR system confirms the visit reservation, repeats date, time and tells the code for entrance 22. The system ends the phone call 23. User receives a SMS confirming the visit reservation, together with a code for entrance
Exit condition	● User has a visit reservation ● User can see all the information about the visit reservation (grocery shop, date, time) in the received SMS
Exceptions	1. The phone call ends before the user explicits on which phone number he would like to receive text messages 2. User presses the digit for talking to an operator 3. The IVR system does not recognize the grocery shop pronounced by the user 4. User inputs a non-valid number, with respect to the options given by the IVR system (at any moment) 5. User dials a number with less than four digits, when he is asked to specify date/hour for the visit 6. User dials a number with more than four digits, when he is asked to specify date/hour for the visit In case 1, the procedure to book a visit is not completed and the user does not have a visit reservation. In case 2, the user is put on hold until the first free operator is able to talk to him. In case 3, the IVR system still proposes to pronounce another grocery shop or to talk to an operator, so the user can repeat. In cases 4,5, the system waits until the first valid input has been written. In case 6, the system ignores all digits dialed after the required four and before the IVR has listed all the options of the following step.

** until the end of UC10 specification, references to "call center user" will be made using the word "user"*

11) Call center user deletes a reservation

ID	UC11
Name	Call center user deletes a reservation
Actors	Call center user*
Entry condition	● User has a mobile device enabled to phone calls, with a SIM card ● User is in a place where there is signal ● User knows *CLup* call center telephone number ● Date and time correspond to one of *CLup* call center's opening hours ● User has got a ticket for current day / booked a visit and his turn has not come yet ● User has at his disposition the code associated to his reservation ● User has at his disposition the mobile device associated to his reservation
Event flow	1. User unlocks his mobile device 2. User opens the program/app to make phone calls 3. User dials *CLup* call center telephone number 4. The IVR system lists a set of options: "press 1 to get a ticket"; "press 2 to book a visit", "press 3 to delete a reservation", "press 0 to talk to an operator" 5. User presses 3 on the keypad 6. The IVR system proposes the following options: "if you want to delete your reservation soon, write with your keypad the code associated to it"; "press # to talk to an operator" 7. User dials the code on the keypad 8. The IVR system repeats the input code and all data connected to the reservation; then, it proposes the following options: "press 1 to delete your reservation"; "press 2 if you want to keep (not delete) this reservation, but you want to input another reservation code for deletion"; "press 0 to talk to an operator" 9. User presses 1 on the keypad 10. The system sends a SMS to the phone number connected to the reservation, then informs the user to input the security code just received; the option to talk to an operator is present, too 11. User receives a SMS with a security code for deletion

	12. User dials the security code 13. The system confirms deletion and ends the phone call 14. User receives a SMS confirming the reservation deletion
Exit condition	● User does not have the selected reservation anymore ● The code connected to the selected reservation is no more active
Exceptions	1. The phone call ends before the user dials the security code 2. User presses the digit for talking to an operator 3. User inputs a non-valid reservation code 4. User inputs a wrong security code 5. User inputs a non-valid number, with respect to the options given by the IVR system (at any moment) 6. User dials a number with less digits than expected, when he is asked to specify reservation/security code 7. User dials a number with more digits than expected, when he is asked to specify reservation/security code In case 1, the procedure to delete a reservation is not complete and ticket/visit is still valid for the user. In case 2, the user is put on hold until the first free operator is able to talk to him. In case 3, if the code is associated with an existing reservation, the IVR system proposes to delete it or to digit another code (so, a user who dialed in a wrong way can repeat his right code); if not, the system only proposes to input another code. In case 4, the system notifies the error and asks for a new security code, after sending another SMS. In cases 5,6, the system waits until the first valid input has been written. In case 7, the system ignores all digits dialed after the required ones and before the IVR has completed the sentence of the following step.

** until the end of UC11 specification, references to "call center user" will be made using the word "user"*

12) Ticket machine user gets a ticket

ID	UC12
Name	Ticket machine user gets a ticket
Actors	Ticket machine user*

Entry condition	• User is approaching the grocery shop during its opening hours
Event flow	1. User waits for its turn in order to use the ticket machine 2. User clicks on the “Get a Ticket” button 3. The ticket machine shows the expected waiting time before being called 4. User clicks on “Confirm” button 5. A paper with the QR code and a unique queue number gets printed
Exit condition	• User has a ticket reservation • User can wait for its queue number to show on the display, as its turn to enter begins
Exceptions	1. There are no tickets available for the current day In case 1, refer to use-case 13) ^

** until the end of UC12 specification, references to “ticket machine user” will be made using the word “user”*

NOTES

Add ticket machine use-cases and call-center use cases

° *the situation is completely described in another use-case, so read and refer only to it*

 # should we add to the event flow the possibilities users have to include the estimated time of his visit and the categories of product he’s going to buy?

Time: 1h30 19/11/2020
Andrea and Roberto

Time: 30min 20/11/2020
Andrea

Time: 30min 20/11/2020
Roberto

20/11/2020

PRODUCT FUNCTIONS

- **Get a ticket**
  Users who want to reserve a ticket for accessing the supermarket, without lining up physically, can get it using *CLup* service. The functionality of getting a ticket can be achieved in two ways: the first one is using a smartphone/tablet, the second one with a ticket machine (outside the grocery shop).
  Tickets correspond to "virtual" lining up: when someone gets a ticket, he becomes the last one to wait in the queue; when time slots finish for the current day (according to the supermarket's opening hours), no more tickets are assigned. A relevant aspect is that visits fill the same queue as tickets, but they can be reserved in advance (so, also some days/weeks before the date of the visit itself).
  Every customer can download *CLup* application on a mobile device; in order to get a ticket with the app, the guest needs to be registered and specify which grocery shop he wants to visit.
  In alternative, a person can go directly to the supermarket and get his ticket (if available for that day) using a ticket machine: in this case, there is no need to specify the grocery shop (implicit: it is the closest one), nor to be registered; tickets are printed on paper in the form of QR code, with the addition of a 6-digits number identifying the turn in the waiting queue.

- **Book a visit**
  Users, through *CLup* service, can book a visit for accessing the supermarket, avoiding physical lining up. The functionality of booking a visit can be achieved in two ways: the first one is using a smartphone/tablet, the second one with a ticket machine (outside the grocery shop).
  Every guest can download *CLup* mobile application; in order to book a visit with the app, he needs to be registered and specify which grocery shop he wants to visit, in which day and time. A user might also specify the approximate duration of his visit and the categories of items he is going to buy, in order to help the system to coordinate other customers' visits/entrances with tickets.
  Alternatively, a visit can be booked directly from outside the supermarket, using a ticket machine: in this case, there is no need to be registered, nor to specify the grocery shop; visit reservations are printed on paper in the form of QR code (with the addition of a reservation receipt containing all relevant information: supermarket, date, time).

- **Delete a reservation**
  Users can delete reservations connected to a ticket or to a booked visit. In order to do so with the mobile application, the user should open the page regarding information about his tickets/visits and select the one he wants to delete.
  The equivalent operation can be performed for tickets or visits booked using a ticket machine: the customer should scan the printed QR code with the machine's scanner.

- ***CLup* suggestion mechanism**
  The system, for registered customers using the mobile application, is able to suggest time slots (for visits) based on specific users' habits. In particular, *CLup* stores all data about customers, days and time for visits, as well as most visited

supermarkets; analyzing this data, the application can send customized notifications when an attractive visit can be booked.
Other features for suggestions include giving alternatives after failures in getting a ticket or booking a visit (because no slots are available): for tickets, the system proposes to get one in the closest supermarket (with respect to the selected one) still available for current day; for visits, suggestion coincides with the proposal of a slot for a different hour/a different day/a close supermarket. These features are available only for customers using the mobile application.

- ***CLup* avoids people crowding inside the supermarket**
  The system can manage slots according to known (or inferred) duration of customers' visits and categories of items to buy. The general idea is that, knowing more information, *CLup* can more precisely stagger reservations in order to avoid crows inside the supermarket. Data is collected by the system; the user can specify it (approximate visit duration and categories of items) when booking a visit. This feature is customized for mobile application users; for customers without the app, estimations are performed (based on average data).

- ***CLup* sends notifications (based on GPS position)**
  The system, for registered customers using the mobile application and having an active GPS connection on their smartphones, is able to notify them when their reservation (ticket or visit) is approaching. In particular, *CLup* computes time to get to the supermarket from the user's actual position, and sends him a notification so that he can get on time to the grocery shop.
  If GPS connection is not active, the user still receives notifications about an approaching reservation, but only in predefined times.

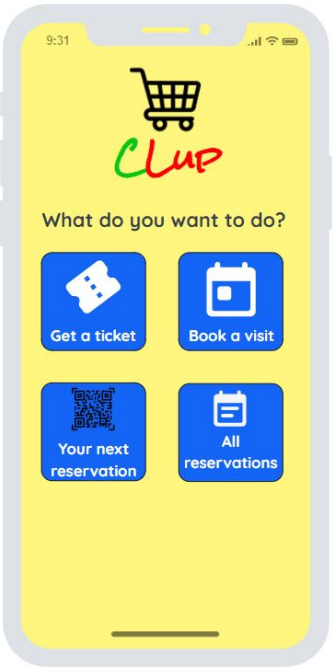
Which transportation means should be considered? Car, walking, …? Maybe ask the user (or calculate only car time, but in any case we have to specify).

Time: 1h30
Andrea and Roberto

21/11/2020

3.1.1 USER INTERFACES

3.1.1.1 CLup mobile application interface



- **Home page**

The home page of CLup application for logged users shows the following options:

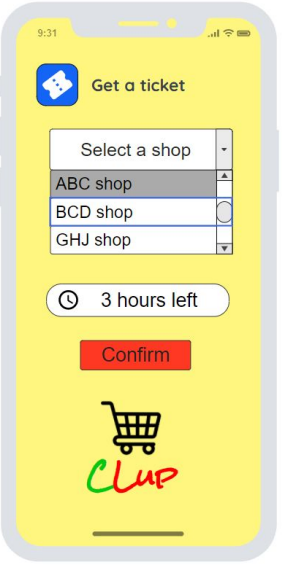
- get a ticket
- book a visit
- see list of reservations
- manage user (login/logout)

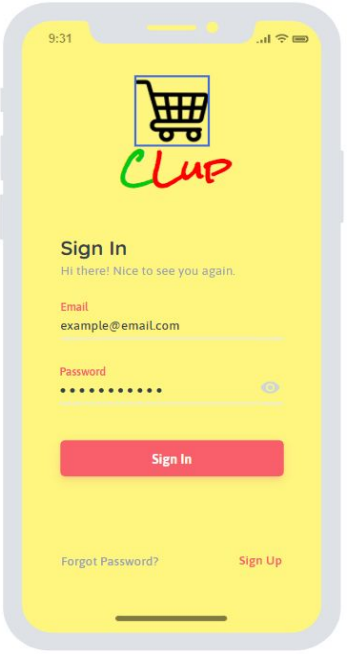
If a user is not logged, CLup shows only an option to sign in/ sign up.

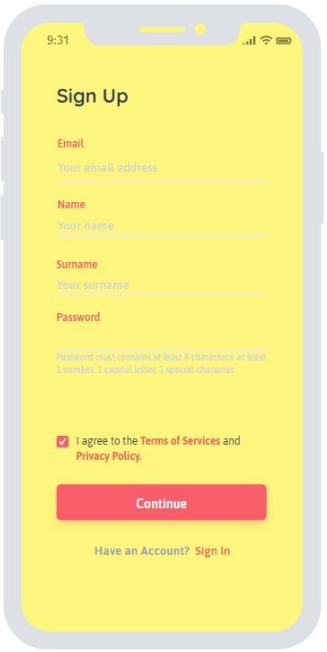
- **Get a ticket**

  This page allows users to choose the supermarket from a list (where customers can also search). Once the grocery store is chosen, users should only confirm to get the ticket reservation.

  A message shows expected time before being called at the selected grocery shop (if already selected), too.

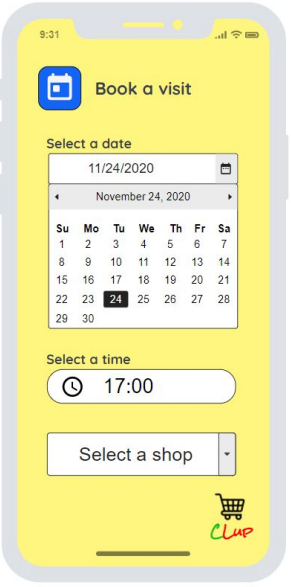






- **Sign up/sign in**

This page allows users to register to the system or log in (if already registered). The user interface allows to insert the email and password; in case of sign up, also name and surname must be added.
Also fidelity card? It can be useful only if you integrate CLup data with data acquired at the check-out: in this way, you have categories of items purchased by the user. But you we do this, we must specify this part



- **Book a visit**

The page allows users to choose the supermarket from a list (where customers can also search), the day and the time for the visit from a calendar. In addition, there are two optional fields for the duration of the visit and the categories of items to buy: both duration and categories should be chosen from a predefinite list.

- **See reservation**

The page allows users to get information about estimated remaining time before the turn (in case of ticket) or day and time of the visit; there is an option for deleting the reservation, too.

Also an option for updating/adding duration and categories?

3.1.1.1 CLup ticket machine interface

- **Home page**
  The home page of CLup ticket machine system shows the following options:
  - get a ticket
  - book a visit [TODO: only if there is no tickets available]
  - delete a reservation

  Customers do not need to register or log in (in fact, there is no option for it).

- **Book a visit**
  The page allows users to select the day and the time for the visit from a calendar. In addition, there is an optional field for the duration of the visit (from a predefinite list).

3.1.2 HARDWARE INTERFACES

Users must have a mobile device (smartphone/tablet) equipped with a GPS system and mobile data (Internet connection).
Ticket machines are equipped with a touchscreen display, a QR code scanner and Internet access.
A QR code scanner is present at the grocery store's entrance: it is a scanner which can be activated through a movement sensor on the upper part of it. The scanner is connected with the supermarket's doors, which open when an active QR code has been scanned.
Screens for displaying turns outside the grocery store must be big enough so that reading from 15 metres distance is possible.

Same for QR code scanners at exit doors? We must decide whether to have them (maybe useful for some reasonments about crowded areas, based on known categories of items users buy), or rely only on numbers (and a person exits after he pays at the check-out: wait two minutes and call the next).

3.1.4 COMMUNICATION INTERFACES

HTTPS protocol is used to grant secure data transmission over the Internet.

3.3 PERFORMANCE REQUIREMENTS

The system should be able to answer a ticket/visit reservation request in less than 10 seconds. In case there is no availability for the requested reservation, it should provide appropriate suggestions in a reasonable time (together with the requested answer or at most 3 seconds later). Moreover, the system should delete a reservation (when requested) in less than 5 seconds.

CLup, after monitoring client's visit time and duration habits, should be able to mine them within 3 days.
The system should monitor GPS positions of users who have a reservation in the next hours, in order to be able to send notifications according to requirements.

3.4 DESIGN CONSTRAINTS

3.4.1 Standards compliance

There is no particular necessity to deviate from usual web-standards suggested by the World Wide Web Consortium (W3C); for this reason, the development of the system should follow W3C recommendations.
Any further compliance, if needed, will be specified during the design analysis.

3.4.2 Hardware limitations

The mobile application can be installed only on a smartphone/tablet equipped with a GPS system and the possibility to activate mobile data.

Time: 2h
Andrea and Roberto

3.5 SOFTWARE SYSTEM ATTRIBUTES

3.5.1 Reliability
Customers Line-up should be available 24/7 in order to book visits and manage reservations whenever users want. However, the crucial time in which the system should work coincides with supermarkets' opening hours: for this reason, 4-6 hours of maintenance do not represent a problem, if programmed outside opening hours.

3.5.2 Availability
CLup does not have a very critical nature (it is not connected with emergency situations); however, in case the system is down during opening hours, supermarket's business becomes much more complicated: entrances have to be managed directly from its employees and ticket reservations become impossible; the only thing employees could do is to guarantee the entrance to an appropriate number of people that are waiting outside, without realizing any other feature that the software system guarantees.
For these reasons, 95% availability of the system should be guaranteed.

3.5.3 Security
The system uses HTTPS for a secure communication between users and the server. Moreover, all passwords are encrypted and, in case of recovery, they are not sent in clear.
Possible additional choices will be discussed in the *Design Document*.

3.5.4 Maintainability
Code should follow good software engineering practices and be properly commented. In addition, the use of proper design patterns, as suggested in the *Design Document*, is mandatory.

3.5.5 Portability
Customers Line-up is a mobile application: to ensure an high grade of portability between Android and iOS an hybrid framework must be used to build the frontend.

Time: 1h
Andrea and Roberto

Time: 1h Roberto images

25/11 2h mapping goal-requirements-domain assumptions
Andrea, Cosimo and Roberto

26/11 2h UML class-diagram
Andrea, Cosimo and Roberto

28/11 2h review
Andrea, Cosimo and Roberto