Main document changes and comments

Page 1: Style Definition	Marco Petri	03/11/2020 10:13:00

TOC 1: Tab stops: 14 cm, Left + Not at 14.5 cm

Page 1: Style Definition	Marco Petri	03/11/2020 10:13:00

TOC 2: Tab stops: 14 cm, Left + Not at 14.5 cm

Page 1: Style Definition	Marco Petri	03/11/2020 10:13:00

TOC 3: Tab stops: 14 cm, Left + Not at 14.5 cm

Page 1: Formatted	Marco Petri	29/10/2020 21:00:00

Italian (Italy)

Page 1: Formatted	Marco Petri	29/10/2020 21:00:00

Italian (Italy)

Page 1: Formatted	Marco Petri	29/10/2020 21:00:00

Italian (Italy)

Page 1: Formatted	Marco Petri	29/10/2020 21:00:00

Italian (Italy)

Page 1: Formatted	Marco Petri	29/10/2020 21:00:00

Italian (Italy)

Page 1: Formatted	Marco Petri	29/10/2020 21:00:00

No underline, Font color: Auto, Italian (Italy)

Page 1: Formatted	Marco Petri	29/10/2020 21:00:00

Italian (Italy)

Page 1: Formatted	Marco Petri	29/10/2020 21:00:00

Italian (Italy)

Page 1: Formatted	Marco Petri	29/10/2020 21:00:00

Italian (Italy)

Page 1: Deleted	Marco Petri	27/10/2020 16:58:00

0

Page 1: Inserted	Marco Petri	27/10/2020 16:58:00

1

Page i: Inserted	Marco Petri	03/11/2020 18:41:00

11

Page i: Deleted	Marco Petri	03/11/2020 18:41:00

10

| Page i: Inserted | Marco Petri | 03/11/2020 18:41:00 |

15

| Page i: Deleted | Marco Petri | 03/11/2020 18:41:00 |

11

| Page i: Inserted | Marco Petri | 03/11/2020 18:41:00 |

16

| Page i: Deleted | Marco Petri | 03/11/2020 18:41:00 |

12

| Page i: Inserted | Marco Petri | 03/11/2020 18:41:00 |

17

| Page i: Deleted | Marco Petri | 03/11/2020 18:41:00 |

13

| Page i: Inserted | Marco Petri | 03/11/2020 18:41:00 |

18

| Page i: Deleted | Marco Petri | 03/11/2020 18:41:00 |

14

| Page i: Inserted | Marco Petri | 03/11/2020 18:41:00 |

18

| Page i: Deleted | Marco Petri | 03/11/2020 18:41:00 |

14

| Page i: Inserted | Marco Petri | 03/11/2020 18:41:00 |

18

| Page i: Deleted | Marco Petri | 03/11/2020 18:41:00 |

14

| Page i: Inserted | Marco Petri | 03/11/2020 18:41:00 |

18

| Page i: Deleted | Marco Petri | 03/11/2020 18:41:00 |

14

| Page i: Inserted | Marco Petri | 03/11/2020 18:41:00 |

18

| Page i: Deleted | Marco Petri | 03/11/2020 18:41:00 |

14

| Page i: Inserted | Marco Petri | 03/11/2020 18:41:00 |

19

| Page i: Deleted | Marco Petri | 03/11/2020 18:41:00 |

15

| Page i: Inserted | Marco Petri | 03/11/2020 18:41:00 |

21

| Page i: Deleted | Marco Petri | 01/11/2020 19:41:00 |

16

| Page i: Inserted | Marco Petri | 03/11/2020 18:41:00 |

22

| Page i: Deleted | Marco Petri | 01/11/2020 19:41:00 |

17

| Page i: Inserted | Marco Petri | 03/11/2020 18:41:00 |

22

| Page i: Deleted | Marco Petri | 01/11/2020 19:41:00 |

17

| Page i: Inserted | Marco Petri | 03/11/2020 18:41:00 |

22

| Page i: Deleted | Marco Petri | 01/11/2020 19:41:00 |

17

| Page i: Inserted | Marco Petri | 03/11/2020 18:41:00 |

23

| Page i: Deleted | Marco Petri | 01/11/2020 19:41:00 |

18

| Page i: Inserted | Marco Petri | 03/11/2020 18:41:00 |

23

| Page i: Deleted | Marco Petri | 01/11/2020 19:41:00 |

18

| Page i: Inserted | Marco Petri | 03/11/2020 18:41:00 |

23

Page i: Deleted	Marco Petri	01/11/2020 19:41:00

18

Page i: Inserted	Marco Petri	03/11/2020 18:41:00

23

Page i: Deleted	Marco Petri	01/11/2020 19:41:00

18

Page i: Inserted	Marco Petri	03/11/2020 18:41:00

23

Page i: Deleted	Marco Petri	01/11/2020 19:41:00

18

Page i: Inserted	Marco Petri	03/11/2020 18:41:00

23

Page i: Deleted	Marco Petri	01/11/2020 19:41:00

18

Page i: Inserted	Marco Petri	03/11/2020 18:41:00

24

Page i: Deleted	Marco Petri	01/11/2020 19:41:00

19

Page i: Inserted	Marco Petri	03/11/2020 18:41:00

25

Page i: Deleted	Marco Petri	01/11/2020 19:41:00

20

Page i: Inserted	Marco Petri	03/11/2020 18:41:00

26

Page i: Deleted	Marco Petri	01/11/2020 19:41:00

21

Page 2: Commented [MP1]	Marco Petri	22/10/2020 17:35:00

To see

Page 2: Commented [MP2]	Marco Petri	22/10/2020 17:35:00

To see

Page 2: Commented [MP3]	Marco Petri	22/10/2020 17:40:00

Maybe a functionality

Page 2: Commented [MP4]	Marco Petri	22/10/2020 18:09:00

Maybe requirements

Page 3: Commented [MP5]	Marco Petri	20/10/2020 19:24:00

Find a synonim more appropriate to the context

Page 3: Deleted	Marco Petri	01/11/2020 20:40:00

goes out and

Page 3: Deleted	Marco Petri	01/11/2020 20:40:00

their

Page 3: Inserted	Marco Petri	01/11/2020 20:40:00

its

Page 4: Inserted	aa m	30/10/2020 10:45:00

Definitions:

- **Queue:** it is the queue that customers need to be in before entering a store
- **Ticket:** it can be digital or paper based. It contains a unique QR code used for verification and a number indicating the position at the queue
- **Ticket machine:** a machine that provides tickets
- **Queue display:** a screen displaying the number of the ticket whose holder is to be admitted into the store
- **Checkpoint:** a point at which ticket and temperature checks are performed
- **Checkpoint controller:** a worker who performs checkpoint checks
- **Category:** a set of products with similar charateristics

Sector: a store's well defined area where products of certain certain category are stored

Page 4: Formatted	aa m	30/10/2020 13:23:00

Font: Bold

Page 4: Formatted	aa m	30/10/2020 11:30:00

Font: Bold

Page 4: Formatted	aa m	30/10/2020 11:30:00

Font: Bold

Page 4: Formatted	Marco Petri	01/11/2020 19:39:00

English (United Kingdom)

Page 4: Formatted	Marco Petri	01/11/2020 19:39:00

English (United Kingdom)

Page 4: Formatted	Marco Petri	01/11/2020 19:39:00

English (United Kingdom)

Page 4: Formatted	Marco Petri	01/11/2020 19:39:00

English (United Kingdom)

Page 4: Formatted	aa m	30/10/2020 10:51:00

English (United Kingdom)

Page 4: Formatted	Marco Petri	01/11/2020 19:39:00

Font: Bold, English (United Kingdom)

Page 4: Formatted	Marco Petri	01/11/2020 19:39:00

English (United Kingdom)

Page 4: Formatted	aa m	30/10/2020 11:00:00

English (United Kingdom)

Page 4: Formatted	Marco Petri	01/11/2020 19:39:00

Font: Bold, English (United Kingdom)

Page 4: Formatted	Marco Petri	01/11/2020 19:39:00

English (United Kingdom)

Page 4: Formatted	Marco Petri	01/11/2020 19:39:00

Font: Not Bold, English (United Kingdom)

Page 4: Formatted	Marco Petri	01/11/2020 19:39:00

English (United Kingdom)

Page 4: Formatted	aa m	30/10/2020 11:31:00

Font: Bold, English (United Kingdom)

Page 4: Formatted	Marco Petri	01/11/2020 19:39:00

Font: Bold, English (United Kingdom)

Page 4: Formatted	aa m	30/10/2020 10:45:00

List Paragraph, Bulleted + Level: 1 + Aligned at: 1.27 cm + Indent at: 1.9 cm

Page 4: Formatted	Marco Petri	01/11/2020 19:39:00

English (United Kingdom)

Page 5: Formatted	Marco Petri	03/11/2020 10:26:00

Heading 2, Space After: 0 pt, Line spacing: single

Page 5: Deleted	Marco Petri	03/11/2020 10:26:00

Page 5: Inserted	Marco Petri	03/11/2020 10:21:00

1.1

Page 5: Inserted	Marco Petri	03/11/2020 10:28:00

 EMBED Excel.Sheet.12

Page 5: Inserted	Marco Petri	03/11/2020 10:28:00

Version	Subversion	Notes
0 (Under development)	1	Initial draft about world phenomena, shared phenomena, machine phenomena, user characteristics and domain assumptions
	2	

Versions with early reasonings:

Normal, No bullets or numbering

Initial draft about world phenomena, shared phenomena, machine phenomena, user characteristics and domain assumptions,

In this section are first presented scenarios to provide examples and more details on the shared phenomena defined in the previous section. Secondly is provided the domain model.

Scenarios:

- An elderly woman, who does not have internet access from home, is running out of food and needs to go shopping for groceries. Once she arrives at her favourite store, she retrieves a ticket from the ticket machine by pushing a button. She observes the queue display waiting for her number to appear, while making sure she stays at safe distance from other people. Once her number appears she proceeds at the checkpoint to be controlled. She passes the controls, finishes shopping, and heads home.

- A family of three composed by a father, a mother and a 4 years old child needs to buy supplies for the whole family. The father logs in the application from his phone, and starts booking a ticket for their favourite store. Since they will go all together, he specifies that the ticket is for a group of three people. He then selects the store, the date and the time as it is suggested by the application. Since they already know what to buy, he inserts the categories of the items to buy. When it's time for them to head there, they receive a notification to remind them. They arrive to the store on time, and proceed at the checkpoint. The checkpoint controller performs the usual controls and lets them all in together since their ticket is for three people. They complete their purchases and head home.
- The manager of a small grocery shop wants to change the opening hours of his shop. He logs in his store's account on his pc, and he sets the new hours from the console. He then realizes that since he has recently reorganized dairy section, more people can safely be in there. He therefore also increases the maximum number of people in that section. He saves the changes and keeps on with his day.
- A worker of a bakery is tasked to be the checkpoint controller of his store. He needs to make sure that the customers respect the queue. To do so, he scans the QR code on every customer's ticket with his phone. A girl approaches and hands him her phone displaying the QR code. He scans it, his app confirms the code validity, and he lets the girl in. Then a woman approaches him with a paper ticket from the ticket machine. He scans it but this time the code is not valid, as that number is yet to be called. He tells the woman to wait for her number to be displayed on the queue display, and keeps on working.

Interfaces:

- **User Interfaces:**
  - **Customers web app:** offers all the ticket booking and related functionalities
  - **Store managers web app:** offers a console where the manager can set store's parameters like opening hours or sections
  - **Checkpoint controllers web app:** accesses the user camera and scans the ticket's QR code, showing on screen its validity
  - **Ticket machine UI:** very easy and basic UI with a button to print a ticket
  - **Queue display:** it display the queue number in very big font making it easy to read
- **Hardware interfaces:**
  - **Queue display:** any screen at the store's disposal
  - **Ticket machine:**
  - **Computers:**
  - **Mobile devices:**
- **Software interfaces:**
  - **Web app:** unique app for all users that offers different UIs and functionalities depending on the logged user type

Ticket machine software:
  -

Justified, Space After: 0 pt, Line spacing: Multiple 1.25 li

Justified, Space After: 0 pt, Line spacing: Multiple 1.25 li, Bulleted + Level: 1 + Aligned at: 0.63 cm + Indent at: 1.27 cm

Page 9: Formatted	Marco Petri	01/11/2020 19:53:00

Justified, Space After: 0 pt, Line spacing: Multiple 1.25 li

Page 9: Formatted	aa m	30/10/2020 13:18:00

Font: Bold

Page 9: Formatted	aa m	30/10/2020 13:17:00

Font: Bold

Page 9: Formatted	aa m	30/10/2020 13:17:00

Font: Bold

Page 9: Formatted	aa m	30/10/2020 13:17:00

Font: Bold

Page 10: Formatted	aa m	30/10/2020 13:18:00

Font: Bold

Page 10: Formatted	aa m	30/10/2020 13:18:00

Font: Bold

Page 10: Formatted	aa m	30/10/2020 12:01:00

Formatted

Page 10: Formatted	aa m	30/10/2020 13:19:00

Font: Bold

Page 10: Formatted	aa m	30/10/2020 13:19:00

Font: Bold

Page 10: Formatted	aa m	30/10/2020 13:19:00

Font: Bold

Page 10: Inserted	Marco Petri	01/11/2020 20:34:00

o

Figure 2.1

The application domain model is composed of different actors, the main actors are the customer, the QR code controller and the store. The first can visit a store multiple times both visiting it booking a visit either queuing online or physically. After the turn of the customer has been called it can enter the supermarket, however in order to be allowed to access it, it must show its QR code to the QR code controller. The QR code controller uses a QR Reader on a mobile device which gives it the information about the possibility of the customer to enter the supermarket. Every QR code is related to a visit of a customer to a supermarket and its code is unique and composed of a number and a date. Here we show a top-level class diagram of the application involving all actors which are recorded by the system.

Normal, Space After: 0 pt, Line spacing: single, No bullets or numbering

The system is composed of different actors as we can see in the class diagram. The behaviour of the system and its actors is expressed using UML State Diagrams as formalism to represent machines' states.
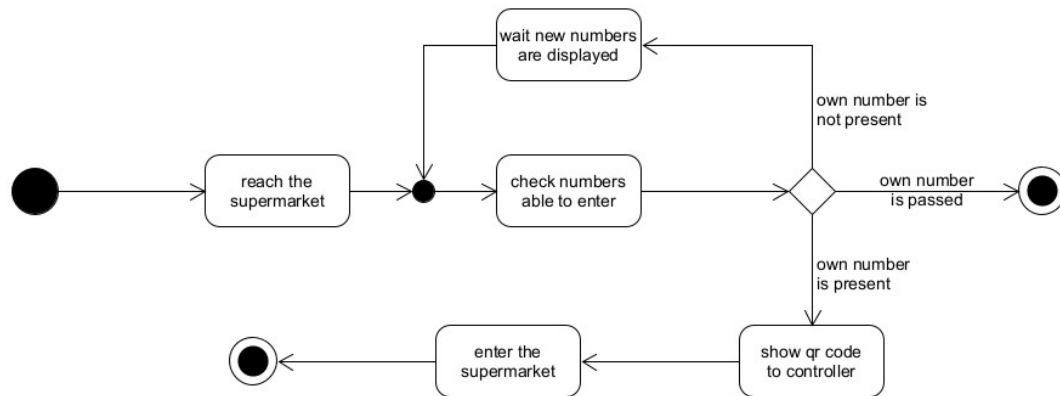
Figure 2.2

Keep with next

English (United Kingdom)

Caption, Space After: 0 pt, Line spacing: single

Customers can arrive to the supermarket with three reasons: taking a ticket, arriving because of a booking or arriving because its digital turn is going to be called or has called. In this diagram (figure 2.2) is described customer's state diagram while arriving to the supermarket in order to enter it having a booking number or a queue number.
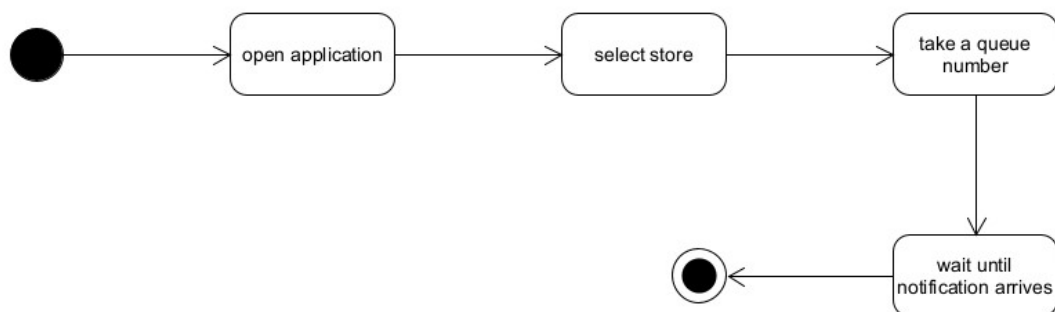

Figure 2.3

Customers can queue online in order to avoid doing a physical line. The customer's state diagram (figure 2.3) involved in the activity of taking a number in the digital queue is describe here above.
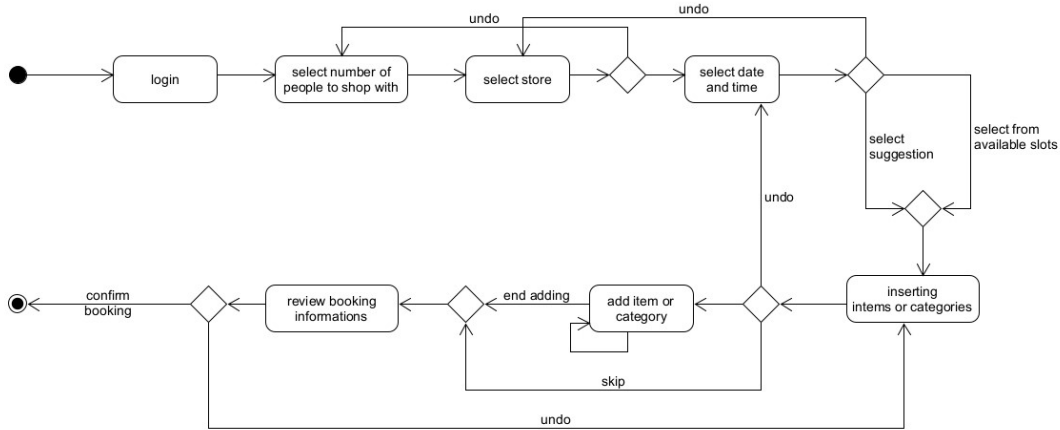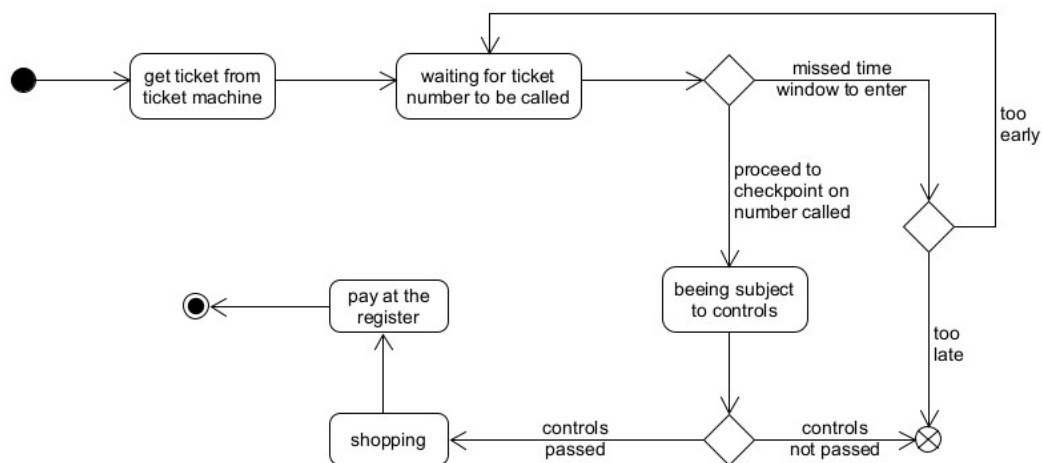
Figure 2.4

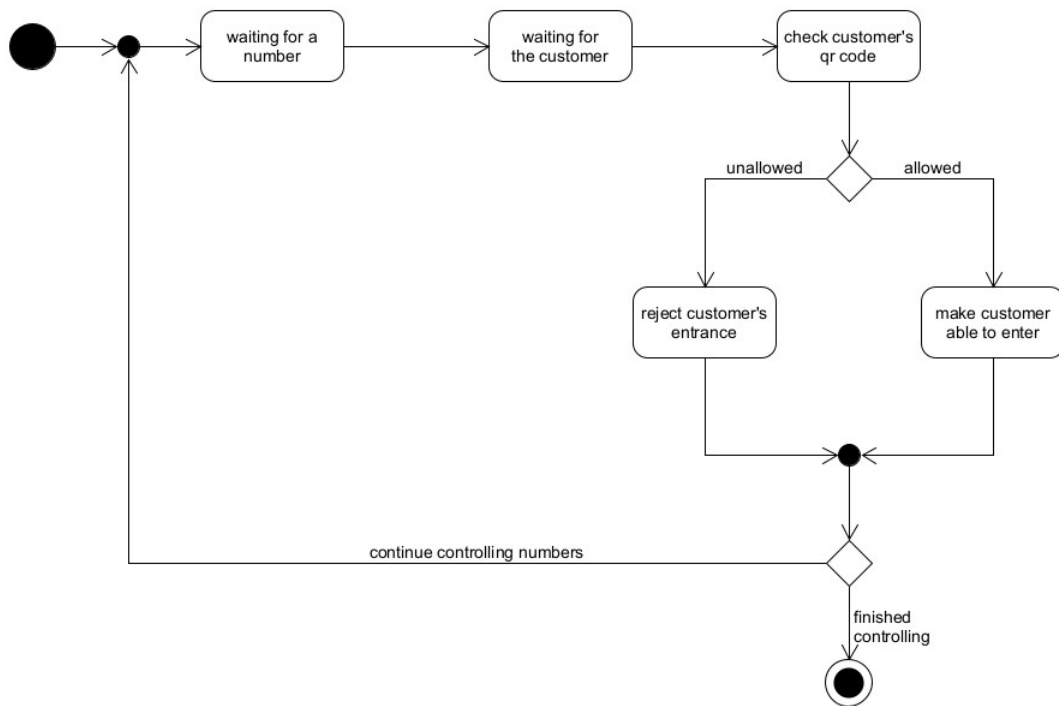Booking a visit

Figure 2.5

Ticket machine

Figure 2.6

Checkpoint controllers have the role of controlling every ticket of the customers which reach the supermarket and are intended to enter. Their state machine diagram (figure 2.6) says how they evolve while doing this specific activity. They control ticket until they have to do that.
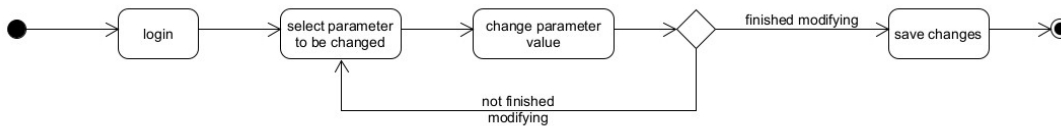

Figure 2.7

Manager

Page 11: Formatted	Marco Petri	03/11/2020 18:33:00

Keep with next

Page 11: Formatted	Marco Petri	03/11/2020 18:37:00

English (United Kingdom)

Page 11: Formatted	Marco Petri	03/11/2020 18:33:00

Caption

Page 11: Formatted	Marco Petri	03/11/2020 18:37:00

English (United Kingdom)

Page 11: Formatted	Marco Petri	03/11/2020 18:37:00

English (United Kingdom)

Page 11: Formatted	Marco Petri	03/11/2020 18:37:00

English (United Kingdom)

Page 11: Formatted	Marco Petri	03/11/2020 18:34:00

Keep with next

Page 11: Formatted	Marco Petri	03/11/2020 18:34:00

Caption

Page 12: Formatted	Marco Petri	03/11/2020 18:34:00

Keep with next

Page 12: Formatted	Marco Petri	03/11/2020 18:34:00

Caption

Page 12: Formatted	Marco Petri	03/11/2020 18:34:00

Keep with next

Page 12: Formatted	Marco Petri	03/11/2020 18:38:00

English (United Kingdom)

Page 12: Formatted	Marco Petri	03/11/2020 18:34:00

Caption

Page 12: Formatted	Marco Petri	03/11/2020 18:38:00

English (United Kingdom)

Page 12: Formatted	Marco Petri	03/11/2020 18:38:00

English (United Kingdom)

Page 12: Formatted	Marco Petri	03/11/2020 18:38:00

English (United Kingdom)

Page 12: Formatted	Marco Petri	03/11/2020 18:34:00

Keep with next

The system will provide useful functionalities to both customers and store managers/employees.

The main customer-oriented functions are **remote queuing** and **booking a visit.**

The first functionality consists in letting the customer join a digital queue for a given store by providing the customer (upon request via their device) a valid e-ticket. Such ticket is the union of a waiting number plus a QR code aimed at proving the validity of the ticket itself. In order to obtain their ticket, customers will have to select a store from a digital map that displays all available stores within their surroundings. Before the number associated with their ticket is called by the store, customers will also be able to see an estimate of their waiting time, dynamically calculated by the system and displayed on their device. The system will also notify customers when they should leave from home to get to the store: such notification will be planned by the system based on an estimation of the time that a customer might take to arrive at the store. In addition to that, the backend will be in charge of avoiding an excessive number of people in the store. In order to do so the system will not call a new number unless there is a free spot in the store.

The latter function permits a customer to plan and book a visit in advance, opposed to the remote queuing function whose role is the management of short-time queues. Customers who select this option will have to specify a store for their purchases among the ones displayed in the same map as before. Then the system will display a time-table with all the available and occupied time slots in the store, for the user to choose the most suitable one. The system will also send the user a list of alternative solutions, both possible pre-defined time slots or alternative stores for their purchases. Regardless of the option that they choose, the system will send customers a QR code that shall be shown upon entering the store. Customers also have the option functionality of providing a list of items that they intend to buy, for more accurate estimations.

On the other hand, the system will also provide some key **configuration functionalities** to store managers. They will in fact be able to set some core parameters in order to regulate fluxes and clusters of people within their store: e.g. they will decide how many people are permitted to stay within one group, how many customers are allowed to stay in a given store section, the duration of time slots and so on. Furthermore, one or more among the store employees will have access to a **QR scanning functionality**, in order to scan the QR codes of employees to monitor their access. Scanning a QR code will establish whether it is valid or not and will automatically make it non-reusable.

Finally, the system will provide general purpose functionalities to all of its users, such as **registering, login, account management …** Distinction will be made between regular customer accounts, employee accounts and store manager accounts. Each user will obviously have access to the functionalities of their role i.e. customer will only have access to customer-oriented functionalities.

1.1

Registration

+ Connection
+ Fill fields
+ Validation

Store manager sets parameters

+ Store managed logs in his system interface
+ Store manager may set:
    o Maximum number of customers for each sector of the store
    o Sets the duration of time slots
    o Sets the maximum duration for a visit
    o Sets the opening hours

User receives the notification of free slots

+ System sends a notification to the user periodically of a free slot

Take a ticket via internet

+ Select store
+ Ask ticket
+ Show waiting time

Notification to arrive

+   Send notification to arrive to the shop

Take a ticket personally

+   Go to the machine
+   Take the ticket

QR code validation

+   User get closer to QR controller
+   Show code
+   Use case: QR code controls validity

QR code controls validity

+   QR code controller scan QR with its machine
+   QR code controller verifies the validity

Book a visit

+   User chooses the preferred store
+   Use case: Selection of the time slot
+   Use case: Selection of duration for a visit
+   Use case: Selection of items for a visit

Selection of the time slot

+   User chooses the visit day
    o   If that day is full, other stores are suggested
+   User receives a list of available time slots
+   User receives a list of suggested time slots
+   User selects a time slot or ask for a suggestion

Selection of duration for a visit

+   If the user is a long term user may specify duration, instead it must

Selection of items for a visit

+   User can select exact items if present, if not it selects the category

Requirements and comments

Intelligent granularity: no category of things with milk, pasta category ok

requirement: chosen time slots must be consecutive

requirement: suggested time slots are distant from each other of K minutes

Page 20: Formatted	Marco Petri	29/10/2020 21:02:00
Normal

Page 25: Inserted	asus	02/11/2020 10:35:00
2

Page 25: Deleted	asus	02/11/2020 10:35:00
0

Page 25: Inserted	Marco Petri	03/11/2020 18:25:00
2

Page 25: Deleted	Marco Petri	03/11/2020 18:25:00
1

Header and footer changes

Page 1: Formatted	asus	02/11/2020 10:35:00
Italian (Italy)

Page 1: Formatted	asus	02/11/2020 10:35:00
Italian (Italy)

Page 1: Formatted	asus	02/11/2020 10:35:00
Italian (Italy)

Page 1: Formatted	asus	02/11/2020 10:35:00
Italian (Italy)

Page 1: Formatted	asus	02/11/2020 10:35:00
Italian (Italy)

Page 1: Formatted	asus	02/11/2020 10:35:00
Italian (Italy)

Page 1: Formatted	asus	02/11/2020 10:35:00
Italian (Italy)

Page 1: Formatted	asus	02/11/2020 10:35:00
Italian (Italy)

Page 1: Formatted	asus	02/11/2020 10:35:00

Italian (Italy)

Page 1: Formatted	asus	02/11/2020 10:35:00

Italian (Italy)

Page 1: Formatted	asus	02/11/2020 10:35:00

Italian (Italy)

Page 1: Formatted	asus	02/11/2020 10:35:00

Italian (Italy)

Page 1: Formatted	asus	02/11/2020 10:35:00

Italian (Italy)

Page 1: Inserted	Marco Petri	03/11/2020 18:41:00

Purpose

Page 1: Deleted	Marco Petri	03/11/2020 18:41:00

Software system attributes

Page 1: Inserted	Marco Petri	03/11/2020 18:41:00

Purpose

Page 1: Deleted	Marco Petri	03/11/2020 18:41:00

Software system attributes

Page 1: Formatted	asus	02/11/2020 10:35:00

Italian (Italy)

Text Box changes
Header and footer text box changes
Footnote changes
Endnote changes