**1.INTRODUCTION**

**1.1**  **Purpose**

The purpose of the document is to provide a description of CLup application. The idea of developing this application starts from the need to manage the shopping during coronavirus emergency, with the aim to avoid lines in front of stores which creates crowds.

The application is meant to be used by shop managers to regulate the influx of people in the buildings, also through the scanning of QR codes at the entrance, saving the customers from having to stand outside of stores with other people.

The application is also meant to be used by the customers to avoid having to line up outside the building, through a system that gives them the position in a queue through the retrievement of a number. In this way, they should wait until their number is called, or close to being called, to approach the store. For an effective success of the application, the system should provide the customers a reasonably precise estimation of the waiting time

People who do not have access to the required technologies, can hand out tickets on the spot.

CLup provides also the possibility to “book” a visit: either customer can indicate the approximate expected duration of the visit, or in case of long-term customers, this time could be calculated by the system through the analysis of their previous visits.

In addition, to allow more people in the store, or in general, to manage in a better way the affluence of people, the users can indicate the categories of items they intend to buy.

**1.2**  **Scope**

The scope of the application is to allow store managers to regulate the number of people in the building, in order to prevent situations of gathering, that can be dangerous during the period of coronavirus emergency.

On the other side, the application allows customers to do the shopping in a safer way both avoiding them queuing in front of the building with other people and letting them do the shopping (CAMBIAAA) keeping distances from the other customers. Specifically, according to the international rules, the distance between two people must be at least one meter. For this purpose, CLup is able to organize the entrances and the bookings according to the capacity of the building, which is provided by the shop manager during its registration.

To do the shopping, the customer already registered must login the application to take the “ticket” obtaining a position in the queue and the estimation of the waiting time.

In order to make the lining up mechanism effective, either the customer activates the localization, and the system calculates the time needed to get to the shop, or the customer estimates by himself/herself the time required from the place he/she is.

The users can also exploit the advanced functionality of “booking a visit”, indicating an approximate duration of the visit they intend to do. The system can infer this time for long-term customers by analyzing their previous visits.

The customers have also the possibility to indicate which kind of items they think they will buy, to allow the system to better organize the entrances by predicting which spaces will be fully occupied in the store and those who have not reached their maximum capacity.

CLup is very simple to use because it includes all demographics, and to take into account visits from people who cannot use the application, the system provides the fallback option of handing out tickets on the spot.

**1.2.1 World phenomena**

-store managers divide shops in departments

-store managers organize the buildings in order to avoid gathering due to coronavirus pandemic

-user want to do shopping

-users (may????) have a smartphone

-people maintain a one-meter distance between each other

-shops put totem at their entrance to allow people to take tickets on the spot

-people arrive in front of the shop without queuing

**1.2.2 Shared phenomena**

-user takes the ticket online

-user takes the ticket on the spot

-user books a visit

-user observes when it is its turn

-system assign a position in the queue for each customer

-System analyze the previous visits of long-terms customers

-application provides the user the estimation of the waiting time

-shops have a maximum capacity

-the application sends a notification to the user when he/she has to leave to arrive in time at the shop

- user provides to the application the estimated time necessary to reach the shop

- the application uses users GPS to provide the estimated time necessary to teach the shop

-user provides information to the system about the categories of items he/she wants to by

- ????????user scan the QR code at the entrance of the shop

**1.2.3 Goals**

-allow people also to take the ticket on the spot

-contrast coronavirus pandemic expansion

-allow people to maintain distance rules while they do shopping

-allow store managers to organize in a more efficient way the store

-allow people to avoid lines in front of the shop

**1.3 Definitions, Acronyms, Abbreviations**

**1.3.1 Definitions**

* **Customer**: who signs in the application with the aim to do the shopping.
* **Store Manager**: who provides the application the information about the store and has the purpose of organizing it according to the new rules introduced in order to contrast the coronavirus pandemic.
* **User**: who signs in the application and uses the available services for him/her purposes. The user can be a customer or a store manager.
* **Demographic**: particular sector of population (children, seniors, adults, …)
* **Ticket**: the number received corresponding to the position in the queue.

**1.3.2 Acronym**

**QR Code:**

**GPS:** Global Positioning System

**RASD**: Requirement Analysis and Specification Document

**API:** Application Programming Interface

**UI:** user interface

**GDPR:** General Data Protection Regulation

**1.3.3 Abbreviations**

* **WPn**: World Phenomenon number n
* **SPn**: Shared Phenomenon number n
* **Gn**: goal number n
* **AF**: advanced function
* **Rn**: requirement number n
* **Dn**: domain assumptions number n

**1.4 Revision History**

**1.5 Reference Documents**

* Specification Document: **“**R&DD Assignment A.Y. 2020-2021.pdf”
* IEEE Std 830-1998 IEEE Recommended Practice for Software Requirements Specifications
* Available slides on beep

**1.6 Document Structure**

* **Chapter 1:** it describes what the scope of the software is, identifying the product, the application domain and the boundaries between the application domain and the external environment.

It sets the goals and explains what is included in the following sections, to guide the readers in the reading process.

**2. Overall description**

**2.1 Product Prospective**

**2.1.1 UML Description**

The UML below shows the requirements, the interfaces of the machine and the interaction between the machine and the world.

It does not contain all the classes useful to describe the complete architecture of the system, it only contains the most significant

CLup is going to be used as a mobile application, and for this reason both the customers and the shop managers will download it on their devices to exploit the services provided by the application.

For this scope they need to be registered and based on their role, different kind of information are requested to them.

·       The shop manager registers his/her shop giving information about:

-        The name and address of the shop (mandatory)

-        Some pictures and additional information of the shop (optional)

-        The departments present in the building with the related capacity and the categories of items that can be find inside

-        The position of the totem where people can take the ticket if they don’t have access to the application

·       The customers have to provide personal information and, if they accept, also their localization.

The UML highlights both the basic service of taking a ticket online in order to do shopping in a safer way and the advanced functionality of booking a visit for the following days.

RICOPIARE DISEGNO UML DA FOGLIO

The customer, already registered and logged in to CLup, decides to take a ticket on a selected shop.

First of all, the application asks the user if he/she wants to give his/her position either through the GPS or writing his/her actual address (providing the city, the street and the number).

In this case, the application computes the necessary time for moving from the provided position to the one of the chosen shop and shows that to the customer. To allow him/her to arrive on time, CLup also sends periodic notifications to him/her.

Otherwise, the customer must estimate by himself/herself the time required to reach the destination.

Then, the system assigns the ticket to the user and generates a QR code used to monitor the entrances and the exits of him/her from/to the store.

When the customer enters the shop and leaves it scans the QR code at the entrance/exit of the building-----à IN CASO METTI ANCHE NELLO SCOPE

The ticket, with the related user, is saved in a schedule that contains all the tickets of the current day and of the following ones (obtained by “book a visit” functionality).

The ticket contains the date and the waiting time, which is computed by the system by using the schedule and, in order to be more precise, by analyzing the data of the long-term customersù

In fact, for each customer, the system saves the duration of his/her permanence in the shop and, in case of long-term customers, it computes the average of that durations and use it for the waiting time estimation. (asterisco a fine pagine)The duration is calculated through the difference between the exit time and the entry time obtained by the QR code.

The customer who wants to exploit the advanced functionality “book a visit” for the following days, can select the option once logged in to the application and if he/she wants, he/she can provide the category of items he/she has intention to buy and an approximate expected duration of the visit. Alternatively, for long term customers, the system can compute the duration by analyzing the data of their previous visits.

Instead, for new customers who do not provide the duration of the visit, the system uses the average duration of the visits of all the other users.