Hotel Revolution 2014s

Gianpaolo Branca, Simone Mosciatti, Giovanni Pelosi
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Abstract

The software aim to help the staff of an hotel to manage the rooms of the structure.

It will help to identify free rooms in a particular period of time thus helping to understand if it is possible to satisfy clients' requests.

Also it will keep count of how many days a particular client has been host of the structure helping the manager to bill accordingly.

1 Assigment 1

1.1 Name

Hotel Revolution 2014s

1.2 Team Member

Giovanni Pelosi, Sara Zanzottera, Gianpaolo Branca and Simone Mosciatti

1.3 Specification

The system will be a Back-Office information system. The system implement the functions of a Decision Support System, it will help decide what room offer to who.

1.4 Problem the software will solve

How to manage the booking of rooms in a big hotel, including the assigment of rooms to big groups or guest with particular request (smokers, pets, disabilities, etc...)

1.5 Requirements of the system

The system helps in a useful and friendly way the staff in the hotel managment.

- Will allow the reception to be quick and extremely precise in answering any inquiry from possible guests.

- Will let fast booking operation by the hotel staff.

- Will show all the possible options available for a guest.

- Will let the staff know who is guesting in a particular room.

- Will let the staff know how long a guest has been in the hotel.

- Will let the staff know which rooms will be free sooner.

- Will help to manage the revenue of the hotel, providing an interface that shows the distribution of the bookings during the years.

- Will provide two level of authentication, one from the staff and one from the manager, the manager will be able to access all the information while some sensitive information (revenue) won't be show to the staff.

1.6   User

The software will be used by the hotel staff, in particular by the receptionist and the manager.

The main user is know, and it will be possible to teach the staff how to use it.

Despite, the interface will be user friendly even for non-technical staff, so it will be simple for a new hire to learn quickly how to interact with the system.

The receptionist will, mainly, use the system to check the availability of the rooms in a specific period.

The manager will use the software to bill the client.

1.7   Note for development

Since the team is not extremely aware of the mechanics behind an hotel, we will ask to a real hotel staff feedback on the prototype of the software.

2 Assignment 2

2.1 The Client

The client of the project is a medium size hotel in China, the Jason Hotel.

2.2 The Client

The client of the project is a medium size hotel in China, the Jason Hotel.

2.3 The Task to be Undertaken

Our project aims to help hotel receptionists in their work, making easier and quicker for them to book rooms for the hotel's guests. The software will allow them to book a rooms in few clicks, to find out precisely and immediately which rooms are free and for how many days, the general availability of rooms in a certain period, the features of every room and so on. It will also help the hotel owner while billing the clients, calculating automatically the price of the stay and the total revenue of the hotel in a certain period.

We will develop our software on three sides: realizing a database containing the information about hotel's rooms and their availability, designing a graphical interface that will be user-friendly to minimize the training period of the staff and allow them to be comfortable with our software, and developing a software that will hold database's informations for the staff and help the owner to bill clients and to calculate the revenue of his hotel.

2.4 suggested deliverables

Not being expert on the main procedures about hotels organization, we believe that to realize this project a continuos and total collaboration among System Analysts, System Designers, System Developers and Final Users is crucial.

Management deliverables

Requirement Analysis

Our intention is to organize many meetings and a documentation about Requirement Analysis in way such to be sure:

1. to have a complete acquaintance of clients necessity and expectations

2. to improve the communication and cooperation level among developers, designers, managers and users

3. to give Final User the possibility to have a central role during the entire developing of the system and to choose, from time to time, the best solution

Design Document

We want to document and to maintain the presence of Final Users even in the design process of the system. By doing so, and by keeping in mind the Requirement Analysis, we want to come encounter to Final Users necessities. These documents will be held in refresh for all the Design process duration.

Source Code

Our intention is to document all the development of the code, not only at a technical level, comprehensible only to the programmers, but even at a more user friendly level. So, even Final Users will be able to keep under control the development of the system.

Technical deliverables

DataBase

We are going to use a Database Structure, divided in tables, to save the different informations like:

1. rooms booking

2. payments

3. general services

4. others

Interface

We will organize the system as mush user friendly as possible. We will implement the main functionalities directly on the home page. These are:

1. to add / cancel a reservation

2. to verify the availability of a room and its position inside the hotel

3. to verify payments

4. to control general services

- interactive Structure of the Hotel

According to clients necessity we will implement, on the home page, an interactive structure that represents the hotel. By doing so, Final user will immediately have a complete view of general situation, and the possibility to select a room to know its details.

Our project aims to help hotel receptionists in their work, making easier and quicker for them to book rooms for the hotel's guests.

The software will allow them to book a rooms in few clicks, to find out precisely and immediately which rooms are free and for how many days, the general availiability of rooms in a certain period, the features of every room and so on.

It will also help the hotel owner while billing the clients, calculating automatically the price of the stay and the total revenue of the hotel in a certain period.

2.5 Requirement Analysis

The system will meet the following requirements.

2.5.1 Interface

1. Booking Interface

   - Intuitive and user-friendly to provide a quick answer to the client for his request, and if possible, confirm with one click the booking.
   - Has a section where fill the date of check-in and check-out and show all the rooms free for that period. The system can show many type of rooms and prices.
   - Has some feature to satisfy other request, like guest disability, pet, child, smoker. For example, for a disable guest the system choose a room at the lower floor possible
   - Has a form for fill the guest information, like name, passport, e-mail. If the guest can't give all the information immediately can be filled later in the room section

2. Rooms interface

   - Has a section where see all the room, if they are free or occupied in the current day or a choosed period.

- Clicking on the room the user can see all the feature of the room, and also modify it if necessary, if it's booked or occupied the system show also all the guests data.
- The user can modify guests data, check-in/out time or delete the booking.
- A form can be filled with other particular requests, in case.

3. Guest Search Interface

- Has a form to fill with the name and will return all the available information about such guest.

4. Billing interface

- It can be opened only by the manager with a log-in page.
- It shows all the revenue of the hotels for a day, week, or month.
- In the main page it shows the bill for all the guest which check-out is the current day.

2.5.2 DataBase

- It must be pre-filled with the hotel map, with all the rooms.
- It has a first table for the rooms and some column to specify rooms occupation, type and feature.
- It has a second table for the guests information, linked with a 1-m relation with the room (a room can have many guests, but a guest can stay in only one room)
- It has a third table for the revenue of the hotel.
- (optional) all the important information can be encrypted

2.6 Suggested Deliverables

Not being expert on the main procedures about hotels organization, we believe that to realize this project a continuos and total collaboration among System Analysts, System Designers, System Developers and Final Users is crucial.

2.6.1 Management deliverables

Our intention is to organize many meetings and a documentation about Requirement Analysis in such a way to be sure:

1. To have a complete acquaintance of clients necessity and expectations.

2. To improve the communication and cooperation level among developers, designers, managers and users.

3. To give the final user the possibility to have a central role during the entire development of the system and to choose, from time to time, the best solution.

2.6.2 Design Document

We want to document and to maintain the presence of final users even in the design process of the system. By doing so, and by keeping in mind the Requirement Analysis, we want to meet the final users necessities. These documents will be updated for all the Design process duration.

2.6.3 Source Code

Our intention is to document all the development of the code, not only at a technical level, comprehensible only to the programmers, but even at a more user friendly level. So, even final users will be able to keep under control the development of the system.

2.7 Technical deliverables

2.7.1 DataBase

We are going to use a Database Structure, divided in tables, to save the different informations like:

1. Rooms

2. Guest

3. Payments

4. Others

2.7.2 Interface

We will organize the system as much user friendly as possible. We will implement the main functionalities directly on the home page. These are:

1. To add / cancel a reservation.

2. To verify the availability of a room.

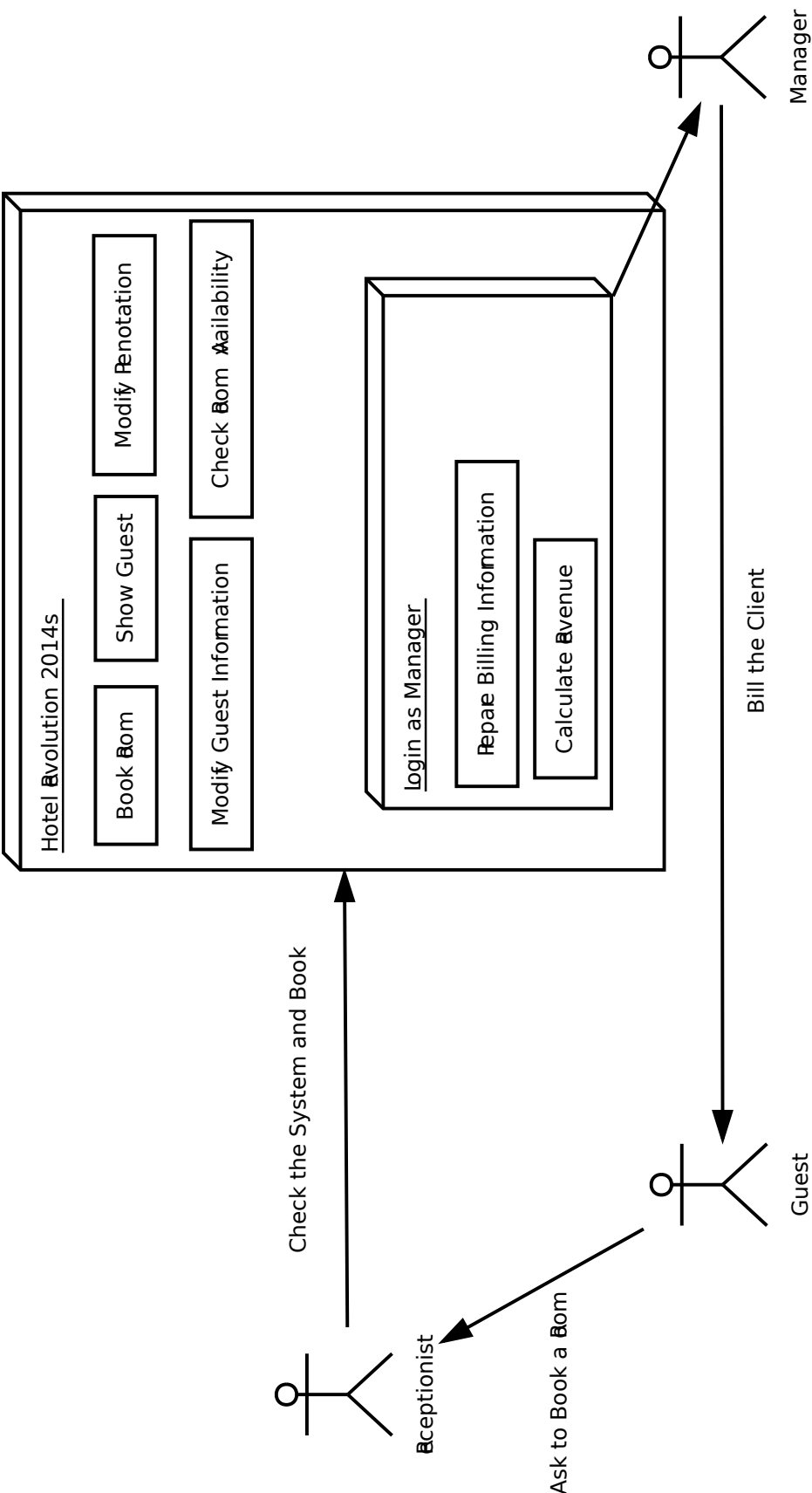3. To verify payments.

4. To control general services.

2.7.3 Interactive Structure of the Hotel

According to clients necessity we will implement, on the home page, an interactive structure that represents the hotel. By doing so, final user will immediately have a complete view of general situation, and the possibility to select a room to know its details.

2.8 Outline Plan (Principal activities and Milestones)

1. (Friday 09/26) Preliminary overview of the project.

2. (Friday 10/10) Detailed system analysis, this will include:

   - The task to be undertaken.
   - The use cases.
   - Detailed explanation of the features.
   - The client who required the software.

3. (Thursday 10/23) System required analysis, it will include:

   - The detailed data modelling.
   - The detailed data analysis.
   - The detailed process modeling.

4. (Friday 11/07) Final describtion of the project, it will include:

   - The detailed explaination of the application architecture.

- The detailed database design.
- The datailed input of the application.
- The detailed output of the application.
- The user interface design.

Hotel Evolution 2014s

- Book Room
- Show Guest
- Modify Renotation
- Modify Guest Information
- Check Room Availability

Login as Manager
- Repae Billing Information
- Calculate Revenue

Modify Renotation

Check the System and Book

Ask to Book a Room

Bill the Client

Receptionist

Guest

Manager

2.9   Functions Debscription

Book a Room:

Allows the receptionist to choose and book a room for a guest in a specified period, inserting all related data into the database.

Show Guest:

Allows the receptionist to search in the database for a specified guest's data, in order to make a new reservation for the same guest.

Modify Reservation:

Allows the receptionist to modify reservation's data, for example change checkin-checkout dates, change the guest's name, change room etc.

Modify Guest's Information:

Allows the receptionist to modify guest's data, for example to update passport number or fix a mistake in name's spelling.

Check Rooms Availability:

Searches in the database which rooms are free in a specified period and shows the results to the receptionist.

Prepare Billing Informations:

Calculates the price of the stay using the reservation's data, allowing the hotel's owner to easily bill the clients.

Calculate Revenue:

Calculates the total revenue of the hotel in a specified period, summing up all the revenues from every single reservation made in that period of time.

Guest

◆**IDGuest**	**ID**
○Name	String
○Surname	String
○DocumentID	String
○Contact	String

Reservations

◆**IDReservation**	**ID**
○IDRoom	ID
○IDGuest	ID
○CheckIN	Date
○CheckOUT	Date

Rooms

◆**IDRoom**	**ID**
○RoomNumber	String
○PricePerNight	Int
○NumGuests	Int
○Smoker	Boolean
○WiFi	Boolean

User

◆**Name**	**String**
○Password	Hash
○Manager	Boolean

Guest **1,1** — **1,n** Reservations **0,1** — **n,1** Rooms
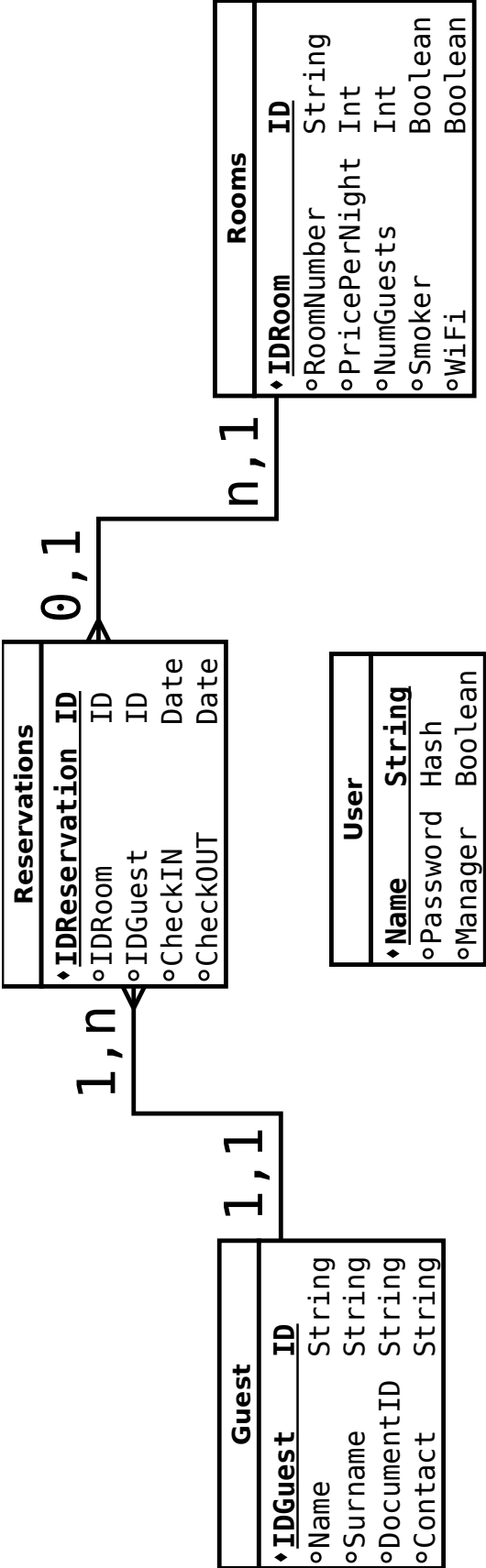
2.10   Data Model Table Attributes

- Guest
  The table contains the information about a single guest.

  GuestID:
     The ID for a single guest

  Name:
     The name of the guest

  Surname:
     The surname of the guest

  DocumentID:
     The ID of the document of the guest

  Contact:
     An email or a phone number to contact in case of problem

- Reservation
  The table is necessary to manage the many-to-many relationship between Guest and Rooms.

  IDRegistration:
     The ID of a single reservation

  IDRoom:
     The ID of the room the guest will use for this particolar reservation

  IDGuest:
     The ID of the guest whose prenotation is refered to

  CheckIN:
     The date when the guest will arrive

  CheckOUT:
     The date when the guest will leave

- Rooms
  The table contains the information about the rooms in the hotel.

  IDRoom:
     The ID of a room

RoomNumer:
> The number of the room in the structure

PricePerNight:
> How much cost the room for a single night

NumGuest:
> The maximun number of people that room can accomodate

Smoker:
> It is possible to smoke in the room ?

WiFi:
> The room has WiFi access ?

- User
  This table will keep the information about the users who can access and use the application.

  Name:
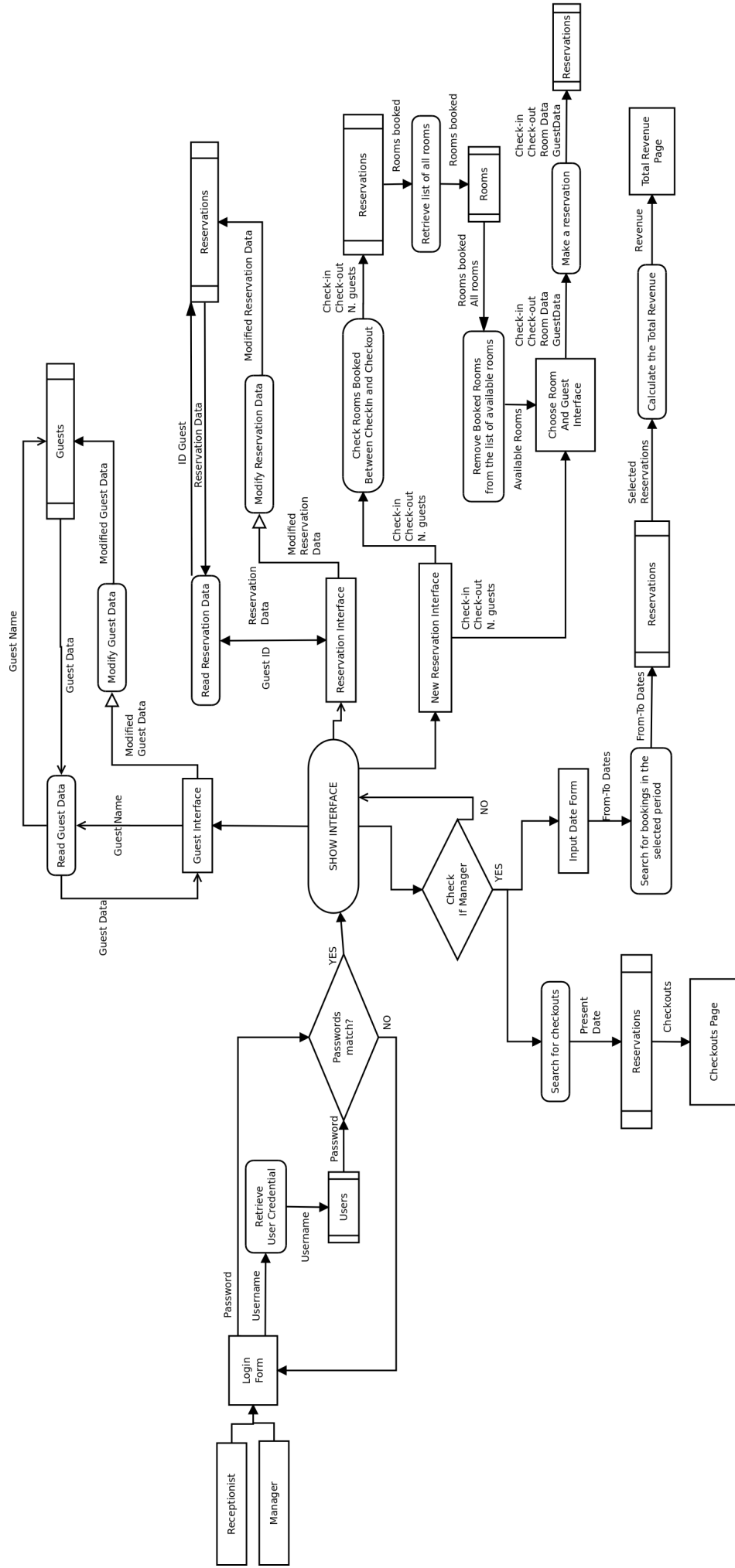 > Use as PrimaryKey, the username necessary to access at the application

  Password:
  > The hash of the password used to access the application

  Manager:
  > Is the user a manager ?

3 Assigment 3

3.1 Elementary Process

Login Form:
A form to login in the system interface

Retrive User Credential:
Retrive the user credential for the users database table

Users (database):
Where the user credential and information are stored

Password Match?:
Check if the user credential input match with the data in users database table

Guest Interface:
a page where the guest information are managed

Read Guest Data:
read all the information about the guest from the database

Modify Guest Data:
a function to modify all or a part of the information about a guest

Guest (database):
where all guest informations are stored

Reservation Interface:
a page where the reservation information are managed

Read Reservation Data:
read all the reservations data of a guest from the database

Modify Reservation Data:
a function to modify the reservation data

Reservations (database):
where all the reservations are stored

New Reservation Interface:
a page where the user can do a new reservation

Retrive List Of All Rooms:
get the list of all the hotel rooms

Remove Booked Rooms From The List of Available Rooms:
remove the booked rooms in the selected period from the list of the hotels rooms

Choose Room And Guest interface:
a page where the user can choose the room and input the guest information

Make A Reservation:
the reservation is done and stored in the database

Check If Manager:
check if the user is logged as manager

Search for Check-OUTs:
search all the check-out of today or a specific day

Check-OUTs Page:
a page where manager can see all the check-out

Input Date Form:
a form where input the date for the begin/end of a period

Search For Bookings In The Selected Period:
Search for all the booking made in the selected pariod

Calculate The Total Revenue:
Sum all the revenue from the booking of the period

Total Revenue Page:
show the total revenue in the selected period

3.2 Data Structures

username:
The indentifier used by the manager or receptionists to login

password:
The secret word used to verify the user's identity

Guest Name:
> Name of a guest searched in the database

Guest Data:
> All the information of a guest founded in the database

Modified Guest Data:
> Information modified by the user updating the guests data in the database

Reservation Guest:
> The name of the guest

Reservation Data:
> All the information of a reservation founded in the database

Modified Reservation data:
> Information modified by the user updating the reservation data in the database

Check In/ Check Out:
> The data of arriving and departuring of a guest used to check the avaliability of the rooms in that period

Rooms booked:
> all the rooms not available for the indicated period

Available rooms:
> All the rooms available for the indicated period

All room:
> The list of all the room in the Hotel

Room Data:
> All the information of a room founded in the database

Checkouts:
> The reservation founded that end today

From/to dates:
> a period selected by the manager to show the reveneues in that period

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- Book Room
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- Modify Guest Information
- Check Room Availability

Login as Manager

- Repae Billing Information
- Calculate Revenue

Manager

Guest

Receptionist

Bill the Client

Check the System and Book

Ask to Book a Room

Guest

◆**IDGuest**	**ID**
○Name	String
○Surname	String
○DocumentID	String
○Contact	String

Reservations

◆**IDReservation**	**ID**
○IDRoom	ID
○IDGuest	ID
○CheckIN	Date
○CheckOUT	Date

Rooms

◆**IDRoom**	**ID**
○RoomNumber	String
○PricePerNight	Int
○NumGuests	Int
○Smoker	Boolean
○WiFi	Boolean

User

◆**Name**	**String**
○Password	Hash
○Manager	Boolean

Guest 1,1 — 1,n Reservations 0,1 — n,1 Rooms

4 Assigment 4

4.1 Application Architecture

In the developing of the application our first focus was too keep the complexity as low as possible.

In the main interface, after the log in, the user has 3 simple main entry point:

- New Booking

- Reservations

- Guests

- Revenue Graph

4.1.1 New Booking

From this entry point the user is able to add a reservation in the database.

We provide a simple and clear way to input the date periond in which book the reservation.
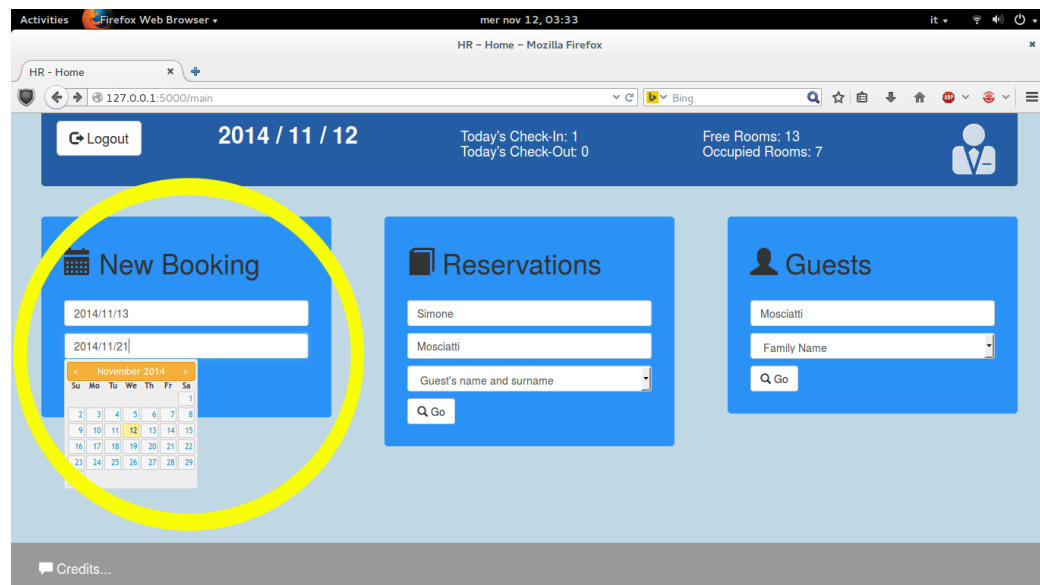
At this point is possible to select which room associate with the guest and input the various guest information.

The user is the redirect to a confirmation page where is possible to confirm the prenotation or to reject it and make other changes.
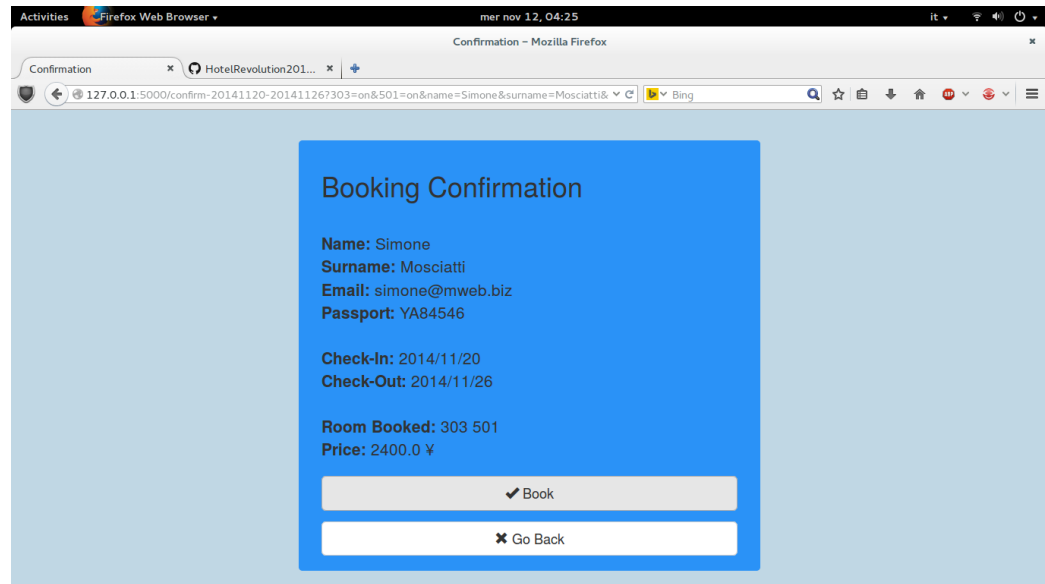
If the user reject the prenotation he will get back to the previous page.

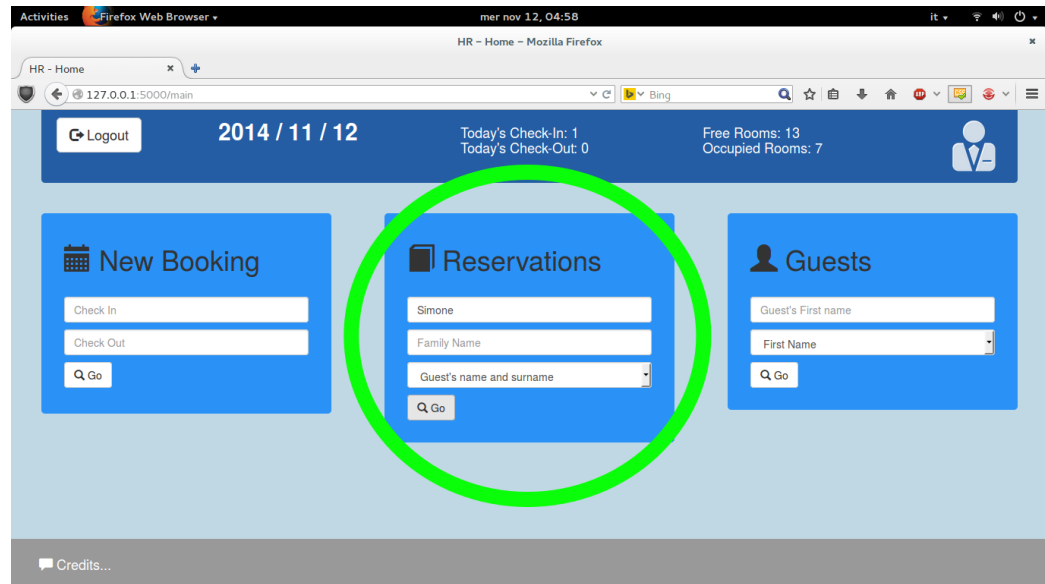Otherwise will be showed a small table with all the last detail of the prenotation, including the reservation ID.
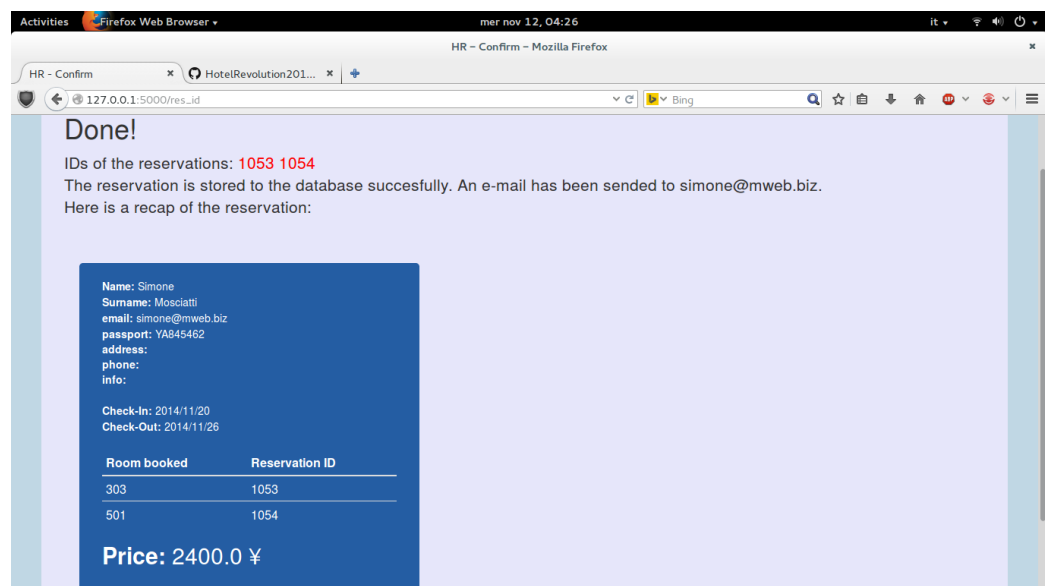
4.1.2 Reservations

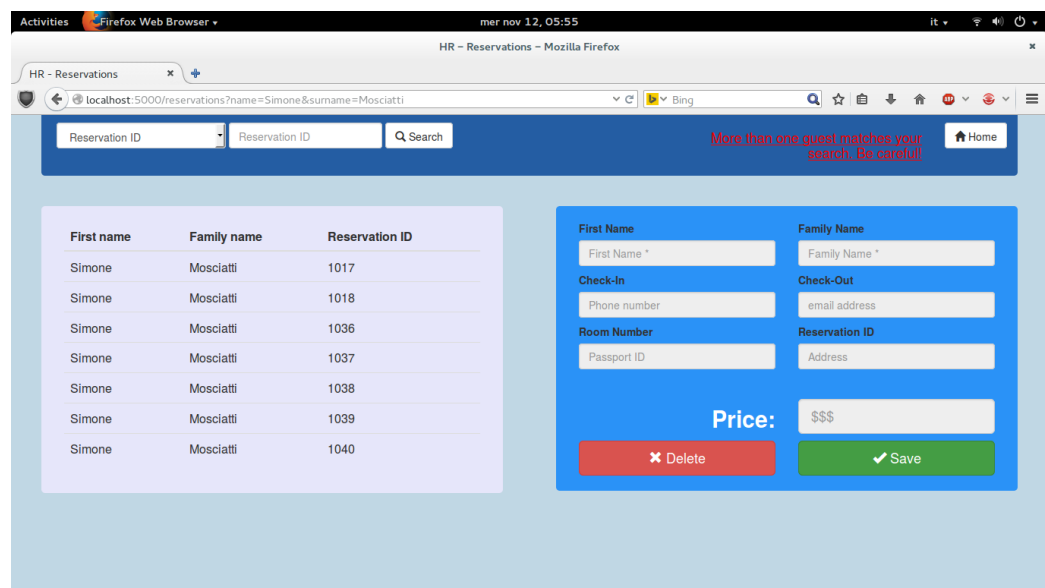This entry point enable the user to search for the reservation in the database.

It is possible to search the reservation by ID

or by the guest name and surname
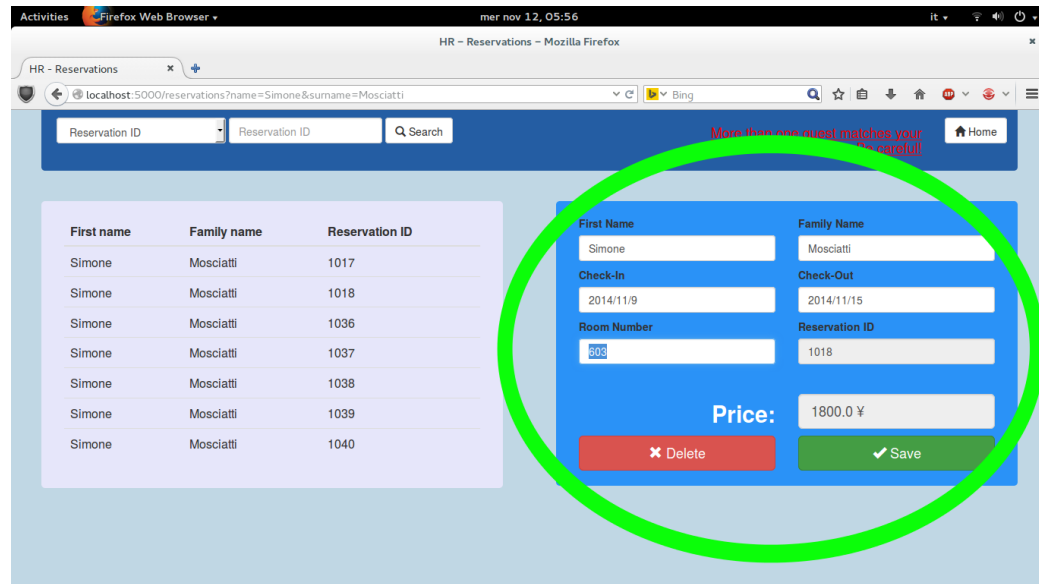
either research method bring to the same page

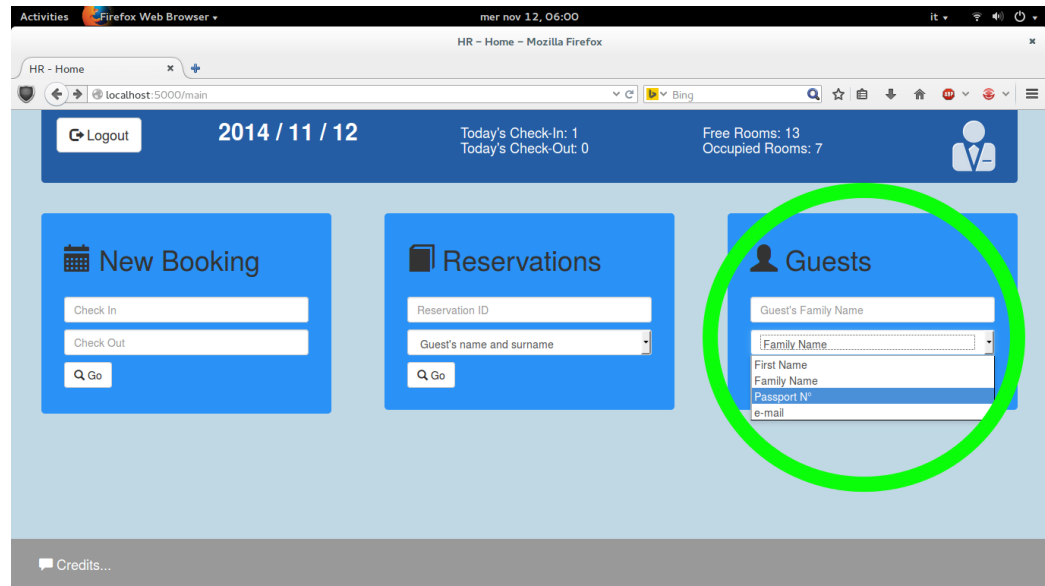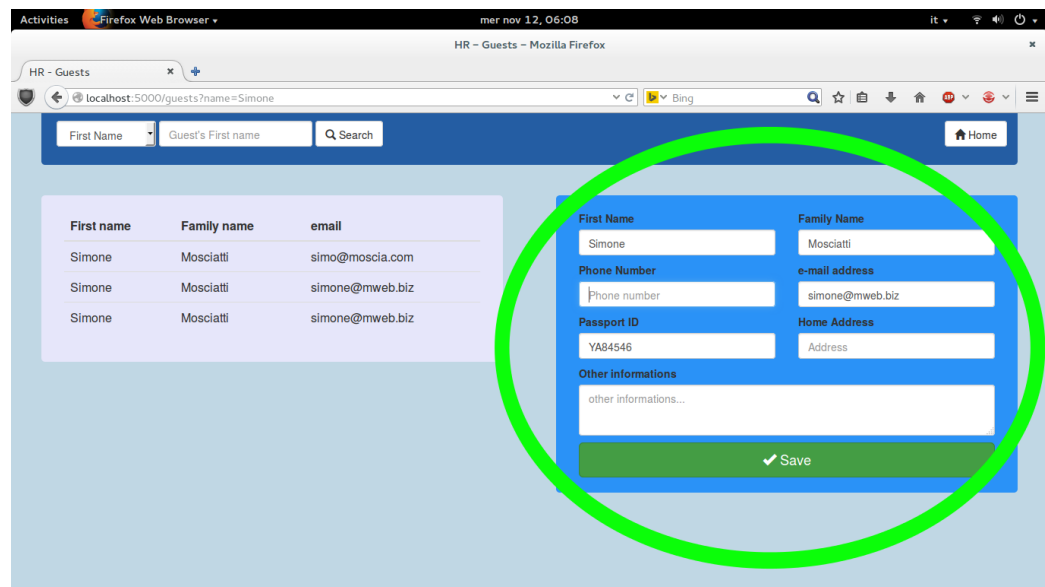where is possible to modify or delete a reservation.

4.1.3 Guests

This last entry point let the user to search for the guest in the database.
It is possible to search the guest via:

- First Name

- Family Name

- Passaport Number

- e-mail

After the search the user is able to modify the relevant information about the guest

4.1.4 Revenue Graph

Finally, the manager have access to the revenue graph that clearly show what are the revenue of the hotel.
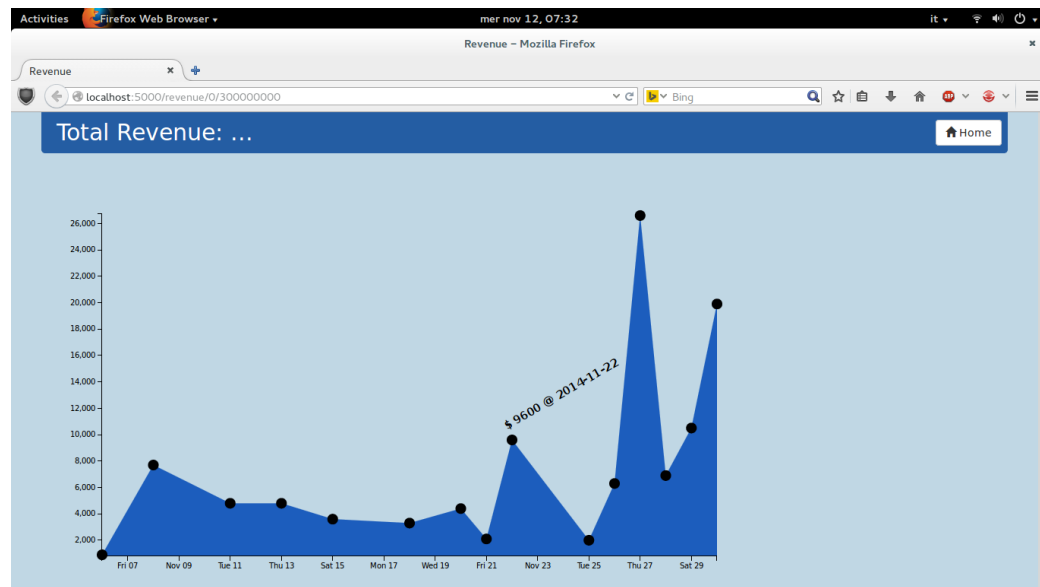
4.2 Input Design

Field Name	Input Type	Description
Login		
Username	text box	Username
Password	text box	Password, printed on screen like ' *** '
Log-in	button	log-in if the credential are correct
Main Page		
Log-out	button	log-out from the system and go back to the log-in
Manager	button	go to the manager page if the user is logged as manager
Credits	button	show in a pop-up the credits for Hotel-Revolution2014s
Check-in	datepicker	Check-in for the new reservation

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Check-out	datepicker	Check-out for the new reservation
Booking Search	button	Submit a query to search a room available in the specified period (between check-in and out date
Reservation ID	text box	Reservation ID
First Name	text box	Guest's name
Family Name	text box	Guest's surname
Res Dropdown	dropdown	Switch between Reservations search method: guest's data or reservation's data
Res Search	button	submit a query to search in the database the reservation the user is looking for with the previous data
Guest data	text box	Guest's data to search in the database, depending of the selected search method in the following dropdown
Guest Dropdown	dropdown	Switch between Guest search method: name, surname, passport, email
Guest Search	button	submit a query to search the guest in the database the user is looking for with the previous data
Reservations Page		
Reservation ID	text box	Reservation ID
First Name	text box	Guest's name
Family Name	text box	Guest's surname
Res Dropdown	dropdown	Switch between Reservations search method: guest's data or reservation's data
Res Search	button	Submit a query to search in the database the reservation the user is looking for with the previous data
Home	button	Go back to the main page
AutoFiller	javascript	when a row in the reservation's table is clicked, retrieve the data and fill all the text box
First Name	text box	Guest's name for the selected reservation, retrirved from the database

Family Name	text box	Guest's surname, as above
Check-in	text box	Check-in, as above
Check-out	text box	Check-out, as above
Room Number	text box	Room number, as above
Reservation ID	text box	Reservation Id, as above. Cannot be modified
Price	text box	Price of the selected reservation. Cannot be modified
Save	button	Save in the database the modified reservation's data

Guests Page		
Guest data	text box	Guest's data to search in the database, depending of the selected search method in the following dropdown
Guest Dropdown	dropdown	Switch between Guest search method: name, surname, passport, email
Guest Search	button	submit a query to search the guest in the database the user is looking for with the previous data
Home	button	Go back to the main page
AutoFiller	javascript	when a row in the guest's table is clicked, retrieve the data and fill all the text box
First Name	text box	Guest's name, retrivered from the database
Family Name	text box	Guest's surname, as above
email Address	text box	Guest's email, as above
Passport ID	text box	Guest's passport, as above
Address	text box	Guest's home address, as above
Phone	text box	Guest's phone number, as above
Info	text area	Guest's other info, as above
Save	button	Save in the database the modified guest's data

Booking Page		
Check-in	datepicker	Check-in for the new reservation
Check-out	datepicker	Check-out for the new reservation

Booking Search	button	Submit a query to search a room available in the written period (between check-in and out date
Home	button	Go back to the main page
Row-selector	checkbox	An hidden checkbox that highlight the row and select the room for the new reservation
First Name	text box	Guest's first name - required input. An error occured if not filled
Family Name	text box	Guest's family name - required input. An error occured if not filled
email Address	text box	Guest's email
Passport ID	text box	Guest's passport
Address	text box	Guest's home address
Phone	text box	Guest's phone number
Info	text area	If necessary, other guest's information can be written here
Confirmation Page		
Book	button	Store the recervation into the database
Go Back	button	If the reservation's data are not correct, go back to the booking page, where the user can modify the data
Manager Page		
Initial date	text box	The beginning date for calculate the revenue
Final date	text box	The ending date for calculate the revenue
Calculate	button	Calculate the revenue between the initial and final date
Home	button	Go back to the main page

4.3 Output Design

According to the Hotels needs, outputs must be:

- easy to read

- easy to use

So, to better meet the needs of the hotel we decide to use a tabular approach, and to organise the table in the best way possible. In order to have a quick but at the same time complete view, we decided to put only the necessary information inside the output tables. Even the columns of the tables, as you can see below, are organised in a way that consider the priority of the information required by the hotel staff.

	Distribution	Implementation Method
Confirm Reservation	Receptionist - Guest	Screen - Email - Phone
Revenue Graph	Manager	Screen - Multimedia
CheckOUT List	Manager	Screen
Reservation List	Manager	Screen
Guest List	Receptionist	Screen
Free Room List	Receptionist	Screen

4.3.1 Confirm Reservation

This Output is both internal and external. Internal because it is seen, on the screen, by the receptionist when he completes a reservation. External because it is sent by e-mail or by phone to the client. The Output design the same in both cases, and it groups the following information:

- the ID of the reservation for every room that has been booked by the client

- the Guest e-mail

- all the Guest Information (name, surname, passport, address, contact, notes)

- the ID of every booked Room

- the Total Price that the guest will have to pay (i.e. the sum of the bills of every booked room)

4.3.2 Revenue Graph

This Output is internal and visible only by the Manager. It prints on the screen a detailed report of the total hotels revenues given a particular period of time.

The Output presents:

- the total revenue of the hotel given a particular period of time and day-by-day revenues

- a view of the general trend of the hotel revenues

- a graph in which represented on the x-axis the days (of a specific period), and on the y-axis the total revenue of a particular day

4.3.3 CheckOUT List

This Output is a summary report, visible only by the manager, that presents a list of the checkOUT of a particular day. It prints for every room that has the checkOUT in that day the following information:

- he name of the guest who booked the room

- the checkIN date

- the number of days that the room has been booked

- the number of the room

- the ID of the reservation

- the total price that the guest has to pay

4.3.4 Reservation List

This Output is an internal, and it is the result of a search in the database of the reservations. The receptionist can search and than see all the information of a reservation of a client, giving in input or the ID of the reservation, or the ID of the guest or the Name and Surname of the guest. The Output prints on the screen the following informations:

- name and surname of the guest who booked the room

- checkIN and checkOUT dates

- room number of the booked room

- ID of the reservation

- total price that the client will have to pay

4.3.5   Guest List

This Output is internal and it is a detailed report of all informations of all guests. It prints the informations in a tabular form. Each line of the table represent a different guest:

- name and surname

- e-mail

- phone number

- passport number

- address

- note (any particular information that the guest wants the hotel to know)

4.3.6   Free Room List

This is an internal Output that prints on the screen all the free room in a particular period of time. It Prints the following informations for each free room:

- number of the room

- number of the beds of the room

- all the feature that are inside the room (i.e. smoker, wi-fi,)

- the total price of the room for the specified period of days

4.4   Technical Overview

The application's backend is been developed using python and the minimalist framework "Flask".

We valued a lot the simplicity of the system, so we used "SQLite" as persintent layer.

The application's frontend is been developed using HTML and CSS, the framework "Bootstrap" is been used.

The HTML engine "Jinja2" was used to dynamically produce the desired HTML from python's data structure.

Finally the graph is render client side using the javascript library "D3.js".