

# Hotel Management System

[https://andrew\\_it@bitbucket.org/andrew\\_it/hotel.git](https://andrew_it@bitbucket.org/andrew_it/hotel.git)

Ermak Andrey  
Innopolis, Russia  
79174358525@ya.ru

Khizilov Mikhail  
Innopolis, Russia  
email

## 1. TASKS

In this project we need to implement a hotel management system, like booking.com in mobile-friendly web interface.

In our project we have several features:

1. Mobile-friendly design
  2. Searching hotel by Country/City/Name in one field. Searching constrained by check-in and check-out date
  3. Advanced searching with some parameters, such as wi-fi, tv, bathroom etc.
  4. Registration hotels owners and users
  5. Hotel manager's features
    - (a) You can add, managed and delete your own hotel
    - (b) All hotels have own image
    - (c) Every hotel have rooms and receptionists to manage
    - (d) Receptionist can manage all booking in the hotel
  6. User's features
    - (a) You can change your profile
    - (b) You can booked and manage your bookings
4. hotel(hotel\_id, city, address, name, stars, description, img, owner\_id)
  5. room\_config(config\_id, single\_bed, double\_bed, sofa\_bed)
  6. customer(person\_id, first\_name, last\_name, phone\_number, payment\_info)
  7. admin(person\_id, first\_name, last\_name, phone\_number)
  8. receptionist(person\_id, first\_name, last\_name, phone\_number, salary)
  9. transaction(transaction\_id, customer\_id, payment\_method, amount)
  10. room\_option(option\_id, is\_bathroom, is\_tv, is\_wifi, is\_bathhub, is\_airconditioning)
  11. room(room\_id, hotel\_id, config\_id, option\_id, quantity, title, description, cost)
  12. booking(room\_id, customer\_id, transaction\_id, quantity, checkin\_date, checkout\_date)

There is cool feature in table "room\_config": this table consists of all combinations of (double bed, single bed, sofa) represented in any hotels in the site. In fact, there is very small table which can describe most of room configurations in all hotels at the site.

Table "room\_option" has the same feature, but there is a only boolean fields - this means the maximum size of table is  $2^x$ , where  $x$  - number of options.

There is several tables with same fields: "hotel\_admin", "customer", "admin", "receptionist". There is for physical independence.

## 2. SYSTEM DESIGN AND ARCHITECTURE

There is 12 tables in our project:

1. country(country, city)
2. sys\_user(user\_id, email, password, role)
3. hotel\_admin(user\_id, first\_name, last\_name, phone\_number)

## 3. THE APPLICATION

In our project we used the following stack of technologies:

1. PostgreSQL - one of the best relation databases
2. Flask - is a microframework for Python based on Werkzeug, Jinja 2 and good intentions.
3. Bootstrap - is the most popular HTML, CSS, and JS framework for developing responsive, mobile first projects on the web.

Flask consists of many parts, such as:

1. Flask-Bcrypt - library for creating and verifying passwords

2. Flask-Login – library for creating and storing session
3. Flask-WTF – library for usefull creation and and communication with html-pages

For connecting to database, we uses non-ORM library psycopg2

The SQL commands used to obtain the statistics This is SQL which show performance od DB:

```
SELECT blks_hit::float/(blks_read + blks_hit) as
cache_hit_ratio, numbackends
FROM pg_stat_database WHERE datname='hms'
```

There some SQL views:

```
CREATE VIEW vw_hotels AS
SELECT *
FROM hotel JOIN country USING (city);
```

```
CREATE VIEW vw_customers AS
SELECT person_id, first_name, last_name,
phone_number, payment_info, email
FROM sys_user JOIN customer ON (user_id=person_id);
```

```
CREATE VIEW vw_booked_rooms AS
SELECT room_id, hotel_id, title, r.config_id,
r.option_id, description, cost,
b.quantity, checkin_date, checkout_date,
single_bed, double_bed, sofa_bed,
is_bathroom, is_tv, is_wifi, is_bathhub,
is_airconditioning,
first_name, last_name, phone_number
FROM room r JOIN booking b USING (room_id)
JOIN room_config rc USING (config_id)
JOIN room_option ro USING (option_id)
JOIN customer c ON (c.person_id=b.customer_id);
```

There is one of biggest quiry of the application:

```
SELECT * FROM hotel h INNER JOIN country c
ON (h.city=c.city) AND
(lower(h.city) LIKE %(destination)s OR
lower(c.country) LIKE %(destination)s OR
lower(h.name) LIKE %(destination)s) AND
EXISTS(SELECT r.hotel_id FROM room r
INNER JOIN room_config rc ON
(r.config_id=rc.config_id) WHERE
r.quantity > (SELECT coalesce(MAX(b.quantity), 0)
FROM booking b WHERE r.room_id = b.room_id AND
NOT ((checkout)s <= b.checkin_date
OR (checkin)s >= b.checkout_date))
AND r.quantity >= %(quantity)s AND
(rc.single_bed + 2 * rc.double_bed +
rc.sofa_bed >= (sleeps)s)
```

### 3.1 Highlight specific novel ideas that your team has used in the application

There is some features in our project:

1. Tables "room\_config" and "room\_options"
2. There is the ability to insert the pictures to hotels
3. Python script for generating data
4. Mobile friendly

5. Managing and editing hotels
6. Template-based creating html-pages
7. The unified field of the login for all types of users
8. The unified field of the searching hotels
9. BCNF

#### 3.1.1 Tables "room\_config" and "room\_options"

This tables – is really cool idea, we don't write any options or config inside 'room' tuple - we only have two references to tables "room\_config" and "room\_options" which store all combination of options/config's in this site. This is allow to safe a lot of disk space, because we only store  $2^x$  combinations in "room\_options", where  $x$  - number of options and *single<sub>bed</sub>\*double<sub>bed</sub>\*sofa* combinations of configs instead millions redundant cells.

#### 3.1.2 There is the ability to insert the pictures to hotels

All hotels have custom image file, which you can upload on your hotel

#### 3.1.3 Python script for generating data

Specially for this project, we write python-script, which randomly generate data in \*.sql files.

#### 3.1.4 Mobile friendly

This is mobile friendly web-site, due using bootstrap framework

#### 3.1.5 Managing and editing hotels

If you hotel administrator, you able to manage and edit your hotel: you can create rooms, create and manage receptionists in your profile on site

#### 3.1.6 Template-based creating html-pages

There is great technology in Flask – templating, which help to dynamically create html-pages on server

## 3.2 Insights of your learning during the course of doing the project

#### 3.2.1 The unified field of the login for all types of users

There is very useful, when you don't need to search special login form for your case – sing-in and get your custom page!

#### 3.2.2 The unified field of the searching hotels

There is really great search-field: You can search by Country/City/NameOfHotel in only one field. You only need to fill check-in, check-out and searching field and push "Search", or You can additionally use advanced searching by options, config's and costs.

#### 3.2.3 BCNF

All talbe in BD is in BCNF relation

#### 3.2.4 Admin performace panel

The main admin of the site can see the performance of the site. Actually main admin can add the same admins with same access except access on deleting main admins

## 3.3 Screenshots of the application

BookYourHotel

Find your hotel

Destination/Hotel Name

Check-in

Check-out

Filter by:

☐ Bathroom

☐ TV

☐ Wi-Fi

☐ Bathtub

☐ Air-conditioner

Persons

1

Specify the price range:

₹<sub>min</sub>


0

₹<sub>max</sub>

0

BookYourHotel

Search results



Hotel

Russia, Innopolis, Universitetskaya street 1

★

Some descption

Reserve

Figure 1: (mobile)Searching and results

BookYourHotelAdmin panel

My account

Logged in successfully

Add admin

First Name:

Last Name:

Email:

Password:

Phone:

Add

Statistics

Hotels in system: 0

Users in system: 1

Numbackends: 3

IO performance: 0.998742207563258

Admins:


| First Name | Last Name | Email | Phone     |
|------------|-----------|-------|-----------|
| admin      | admin     | admin | 789783113 |

Figure 2: Admin panel

BookYourHotelHomeAdd your property

Sign inRegister

Search results




Hotel

Russia, Innopolis, Universitetskaya street 1

★

Some description

Reserve



Kazan grand

Russia, Kazan, Oktabya street 1

★★★★★

Most popular hotel bla-bla-bla.....

Reserve

Figure 3: Reserve hotel

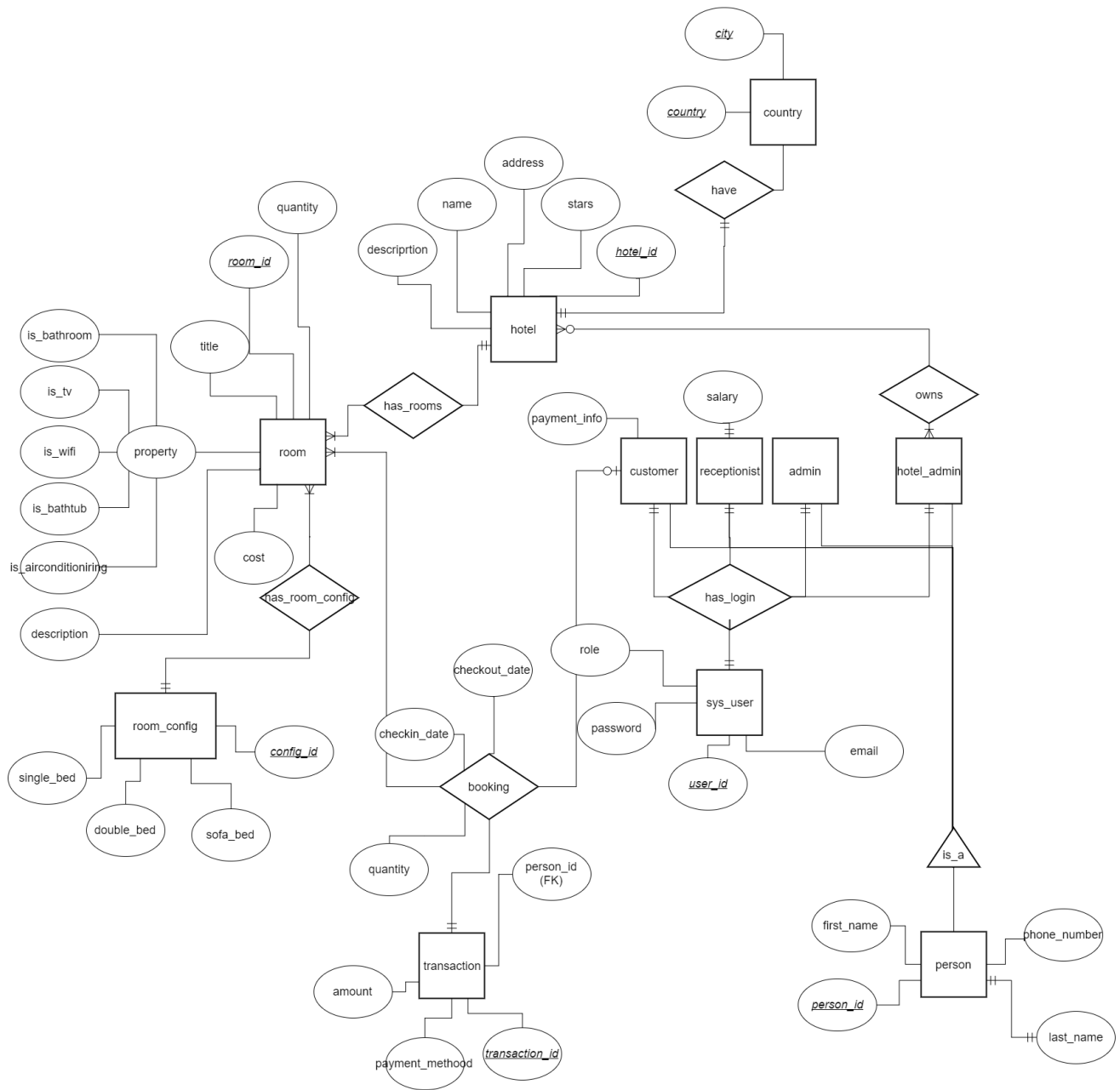


Figure 4: ER diagram