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LibEx - Library Information System

Architecture and Database

Project documentation for the purpose of BIE-SWI course.

Authors:
Alexis Desforges
Apichaya Snguanwongwan
Azamat Rashidov
Dilara Şentürk
Ignacio Cilleruelo Villegas
Kednipa Prasongsri

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1. Architecture

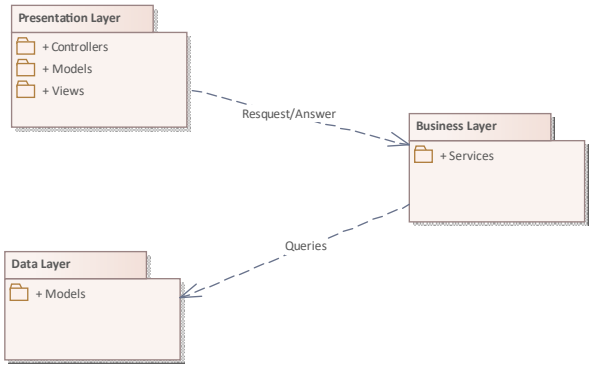

Figure 1 - Package Diagram

This is the diagram showing the main packages of the project.

1.1 Business Layer

The business layer connects the data layer and the presentation layer. It is responsible for some of the logic. It receives requests from the presentation layer and will make queries to the data layer in turn. The data received from the data layer is formatted and then sent to the presentation layer. New information can be received from the presentation layer and then formatted to be added to the data layer. It provides the API endpoints.

1.1.1 Services

Services are called by the presentation layer controllers and send an answer after executing some logic and possibly querying some information from the data layer.

1.2 Data Layer

The data layer stores all the information the web site needs in tables with models. The information is stored there safely and can be queried by the business layer.

1.2.1 Models

Data layer models define how the information is to be stored, which fields are mandatory and which aren't. Each element needs to be unique and accessible through a unique key set up when the element is created in the data layer.

1.3 Presentation Layer

This is the front of the app where the users will interact. It will show them the useful data and the users will be able to perform actions through the user interface.

1.3.1 Controllers

Controllers manage the logical parts of the presentation layer such as collecting actions made by the user through the UI and

sending/receiving information from the business layer. They can also handle some other logic such as input validation before communicating with the business layer.

1.3.2 Models

Models are where the templates for the data are stored. Each model will show the structure a data set needs to follow. It can be such as the required fields a property needs to have and de data type for each field.

1.3.3 Views

Views are what make up the UI. Each element of the web site has its own view.

2. Database

2.1 Class Diagram

2.1.1 MySQL

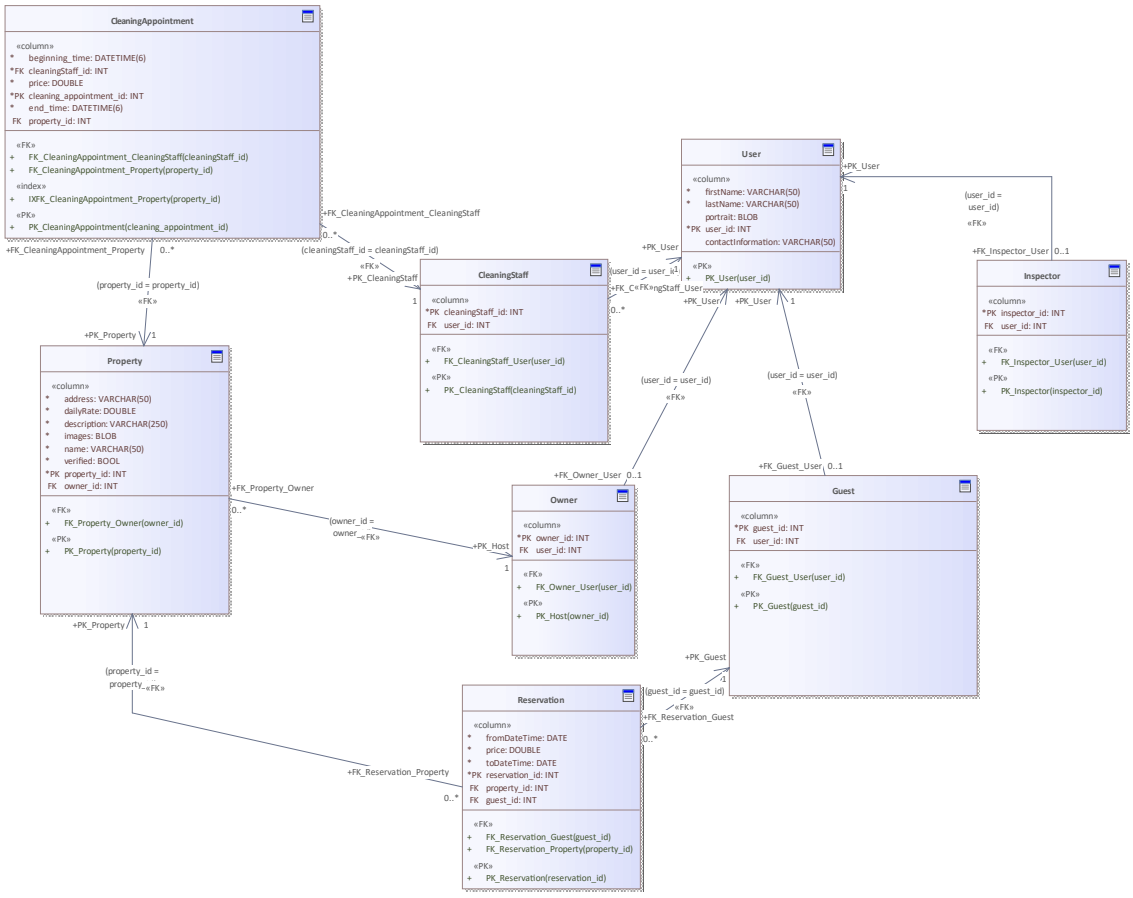

Figure 2 - UML Class Diagram

This diagram represents the UML class diagram with the database notation of the Hospitality Property Management System.

2.1.1.1 CleaningAppointment *«table»*

The CleaningAppointment table holds records of scheduled cleaning appointments. Each appointment entry includes the date and time of the appointment and its corresponding price. Additionally, it references a specific staff member from the CleaningStaff table who is assigned to carry out the cleaning.

Column name	Data type	Not null	Description
beginning_time	DATETIME(6)	True	This column refers to the beginning time that the cleaning staff will start working.
cleaningStaff_id	INT	True	This is the unique value for each cleaning staff member.
price	DOUBLE	True	The price for the cleaning assignment per time.
cleaning_appointment_id	INT	True	The unique value for the cleaning assignment that is given to the cleaning staff.
end_time	DATETIME(6)	True	This refers to the time that the work has be done.
property_id	INT	False	The unique identifier of each property on the system.

2.1.1.2 CleaningStaff *«table»*

The CleaningStaff table contains information about the staff members responsible for cleaning tasks. Each staff member's schedule is recorded in the calendar column.

Column name	Data type	Not null	Description
cleaningStaff_id	INT	True	This is the unique value for each cleaning staff member.
user_id	INT	False	The unique identifier for each specific user that are registered to the system.

2.1.1.3 Guest *«table»*

The Guest table holds records pertaining to guests or customers who engage with the system. Information stored includes guest ID, reservation ID and potentially other data such as booking history, or booking history.

Column name	Data type	Not null	Description
guest_id	INT	True	The identification id of the user who become a guest.
user_id	INT	False	The unique identifier for each specific user that are registered to the system.

2.1.1.4 Inspector *«table»*

The Inspector table is dedicated to storing information about property inspectors such as their ID.

Column name	Data type	Not null	Description
inspector_id	INT	True	The identification of each inspector who work on the platform in order to verify the users and properties.
user_id	INT	False	The unique identifier for each specific user that are registered to the system.

2.1.1.5 Owner *«table»*

The Owner table serves to capture information about property owners. Entries in this table contain data such as the Host ID.

Column name	Data type	Not null	Description
owner_id	INT	True	The identification id of the user who become a owner.
user_id	INT	False	The unique identifier for each specific user that are registered to the system.

2.1.1.6 Property *«table»*

The Property table maintains records of properties available for rental or cleaning services. Each property entry includes details such as its address, availability dates, daily rental rate, description, an image of the property, location ratings, property name, and a boolean value indicating whether the property has been verified.

Column name	Data type	Not null	Description
address	VARCHAR(50)	True	Address of the property location.
dailyRate	DOUBLE	True	Price per night
description	VARCHAR(250)	True	Detailed description of the property on the platform.
images	BLOB	True	Images of the property
name	VARCHAR(50)	True	Property's Name
verified	BOOL	True	Property's verification status
property_id	INT	True	The unique identification id for each specific property
owner_id	INT	False	The identification id of the user who become a owner.

2.1.1.7 Reservation *«table»*

The Reservation table keeps track of reservations made for properties. Each reservation entry contains the start and end dates and times of the reservation, as well as the corresponding price.

Column name	Data type	Not null	Description
fromDateTime	DATE	True	The date that the reservation starting from.
price	DOUBLE	True	Price per night
toDateTime	DATE	True	The end of the reservation
reservation_id	INT	True	The reservation code that are given to each reservation that are made.
property_id	INT	False	The unique identification id for each specific property.
guest_id	INT	False	

2.1.1.8 User *«table»*

The User table stores details about users within the system. Each user entry includes a unique identifier, their first and last names, contact information and optionally, a portrait image stored in binary format.

Column name	Data type	Not null	Description
firstName	VARCHAR(50)	True	User's firstname
lastName	VARCHAR(50)	True	User's Lastname
portrait	BLOB	False	User's portrait
user_id	INT	True	The unique identifier for each specific user that are registered to the system.
contactInformation	VARCHAR(50)	False	User's email

2.2 Model

2.2.1 DDL

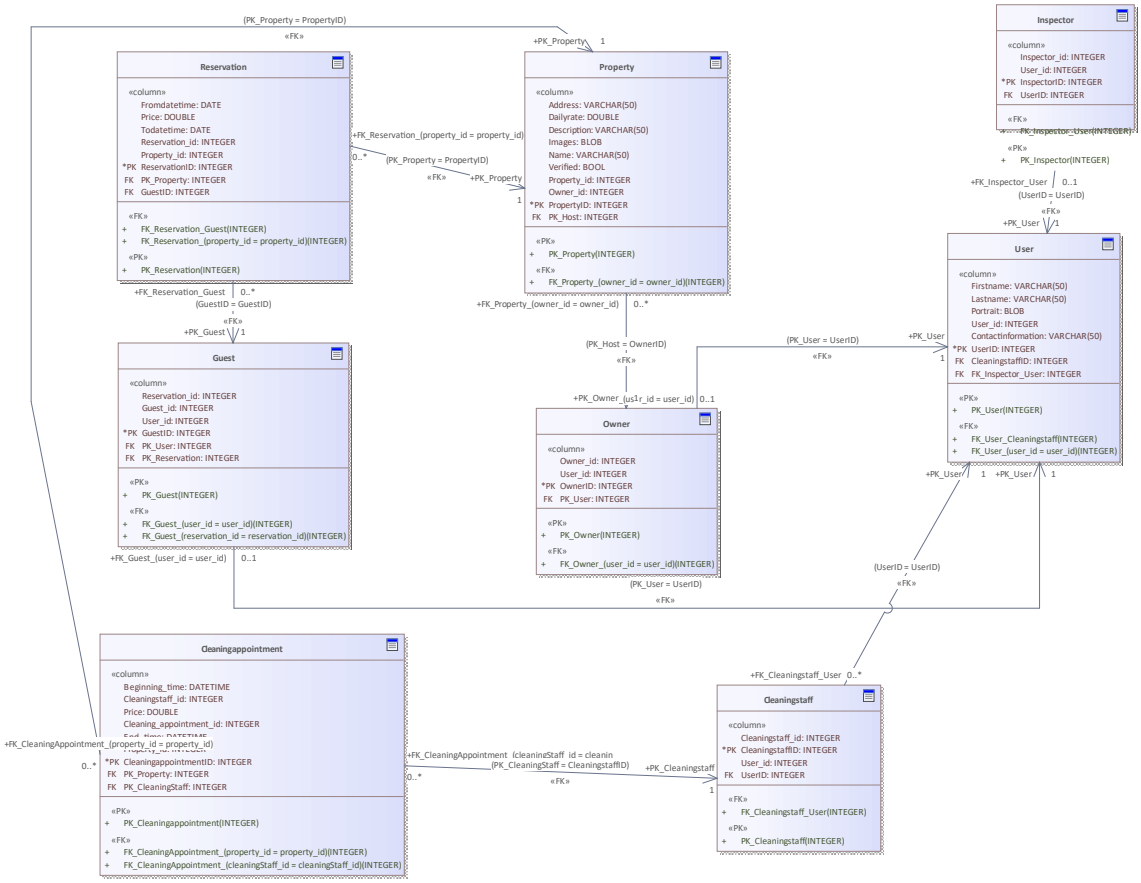

Figure 3 - DDL

This diagram is the database model, generated from the class diagram in order to present the tables, columns, default data types, etc.

2.2.1.1 Cleaningappointment *«table»*

The CleaningAppointment table holds records of scheduled cleaning appointments. Each appointment entry includes the date and time of the appointment and its corresponding price. Additionally, it references a specific staff member from the CleaningStaff table who is assigned to carry out the cleaning.

Column name	Data type	Not null	Description
Beginning_time	DATETIME	False	This column refers to the beginning time that the cleaning staff will start working.
Cleaningstaff_id	INTEGER	False	This is the unique value for each cleaning staff member.
Price	DOUBLE	False	The price for the cleaning assignment per time.
Cleaning_appointment_id	INTEGER	False	The unique value for the cleaning assignment that is given to the cleaning staff.
End_time	DATETIME	False	This refers to the time that the work has be done.
Property_id	INTEGER	False	The unique identifier of each property on the system.

Column name	Data type	Not null	Description
Cleaningappointment ID	INTEGER	True	The unique value for the cleaning assignment that is given to the cleaning staff.
PK_Property	INTEGER	False	Refers to the Primary key for property
PK_CleaningStaff	INTEGER	False	Refers to the primary key for cleaning staff

2.2.1.2 Cleaningstaff *«table»*

The CleaningStaff table contains information about the staff members responsible for cleaning tasks. Each staff member's schedule is recorded in the calendar column.

Column name	Data type	Not null	Description
Cleaningstaff_id	INTEGER	False	This is the unique value for each cleaning staff member.
CleaningstaffID	INTEGER	True	This is the unique value for each cleaning staff member.
User_id	INTEGER	False	The unique identifier for each specific user that are registered to the system.
UserID	INTEGER	False	

2.2.1.3 Guest *«table»*

The Guest table holds records pertaining to guests or customers who engage with the system. Information stored includes guest ID, reservation ID and potentially other data such as booking history, or booking history.

Column name	Data type	Not null	Description
Reservation_id	INTEGER	False	The reservation code that are given to each reservation that are made.
Guest_id	INTEGER	False	The identification id of the user who become a guest.
User_id	INTEGER	False	The unique identifier for each specific user that are registered to the system.
GuestID	INTEGER	True	The identification id of the user who become a guest.
PK_User	INTEGER	False	Refer to the Primary key of user
PK_Reservation	INTEGER	False	Refers to the primary key of the reservation

2.2.1.4 Inspector *«table»*

The Inspector table is dedicated to storing information about property inspectors such as their ID.

Column name	Data type	Not null	Description
Inspector_id	INTEGER	False	The identification of each inspector who work on the platform in order to verify the users and properties.
User_id	INTEGER	False	The unique identifier for each specific user that are registered to the system.
InspectorID	INTEGER	True	The identification of each inspector who work on the platform in order to verify the users and properties.
UserID	INTEGER	False	

2.2.1.5 Owner *«table»*

The Owner table serves to capture information about property owners. Entries in this table contain data such as the Host ID.

Column name	Data type	Not null	Description
Owner_id	INTEGER	False	The identification id of the user who become a owner.
User_id	INTEGER	False	The unique identifier for each specific user that are registered to the system.
OwnerID	INTEGER	True	The identification id of the user who become a owner.
PK_User	INTEGER	False	The primary key to the user table.

2.2.1.6 Property *«table»*

The Property table maintains records of properties available for rental or cleaning services. Each property entry includes details such as its address, availability dates, daily rental rate, description, an image of the property, location ratings, property name, and a boolean value indicating whether the property has been verified.

Column name	Data type	Not null	Description
Address	VARCHAR(50)	False	Address of the property location.
Dailyrate	DOUBLE	False	Price per night
Description	VARCHAR(50)	False	Detailed description of the property on the platform.
Images	BLOB	False	Images of the property
Name	VARCHAR(50)	False	Property's Name
Verified	BOOL	False	Property's verification status
Property_id	INTEGER	False	The unique identification id for each specific property
Owner_id	INTEGER	False	The identification id of the user who become a owner.
PropertyID	INTEGER	True	The unique identification id for each specific property
PK_Host	INTEGER	False	The primary key to Host table

2.2.1.7 Reservation *«table»*

The Reservation table keeps track of reservations made for properties. Each reservation entry contains the start and end dates and times of the reservation, as well as the corresponding price.

Column name	Data type	Not null	Description
Fromdatetime	DATE	False	The date that the reservation starting from.
Price	DOUBLE	False	Price per night
Todatetime	DATE	False	The end of the reservation
Reservation_id	INTEGER	False	The reservation code that are given to each reservation that are made.
Property_id	INTEGER	False	The unique identification id for each specific property.
ReservationID	INTEGER	True	The reservation code that are given to each reservation that are made.
PK_Property	INTEGER	False	The primary key to Property table
GuestID	INTEGER	False	

2.2.1.8 User *«table»*

The User table stores details about users within the system. Each user entry includes a unique identifier, their first and last names, contact information and optionally, a portrait image stored in binary format.

Column name	Data type	Not null	Description
Firstname	VARCHAR(50)	False	User's firstname
Lastname	VARCHAR(50)	False	User's lastname
Portrait	BLOB	False	user's portrait
User_id	INTEGER	False	The unique identifier for each specific user that are registered to the system.
Contactinformation	VARCHAR(50)	False	User's email
UserID	INTEGER	True	The unique identifier for each specific user that are registered to the system.
CleaningstaffID	INTEGER	False	Foreign key to the cleaning staff table
FK_Inspector_User	INTEGER	False	Foreign key to the Inspector's table

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