FAKULTA INFORMAČNÍCH TECHNOLOGIÍ ČVUT V PRAZE

Web Application for Toolsharing System

Design Documentation

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Obsah

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1. Architecture design

The system is split into two applications - one on the frontend and one on the backend. The backend application is designed as a three-tier architecture, with separate data, business and presentation layers. The frontend is two-tier, with a REST controller and UI layer. The two applications communicate between the backend presentation layer and the frontend REST controller using a REST API.

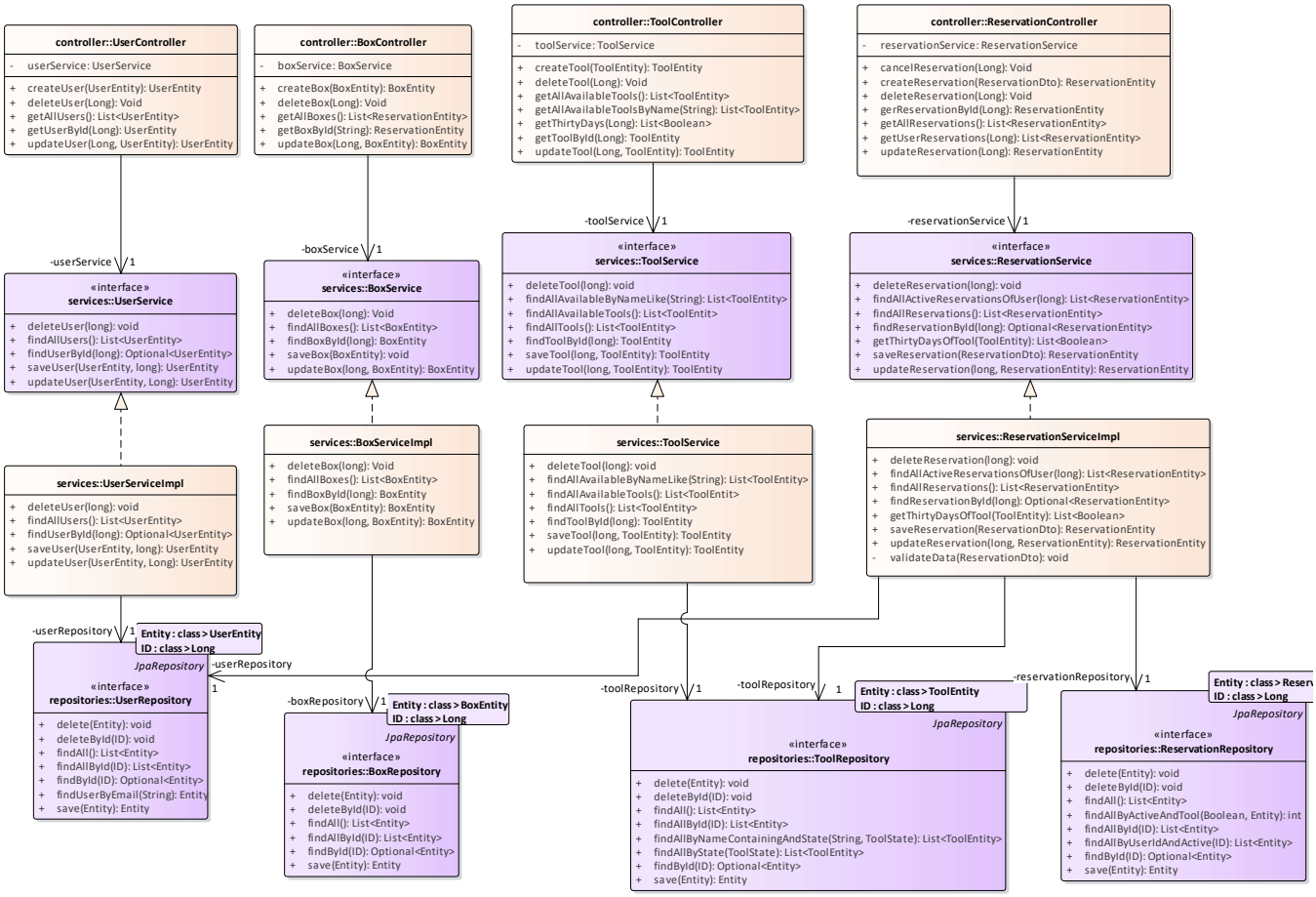
Used Technologies

Backend framework:

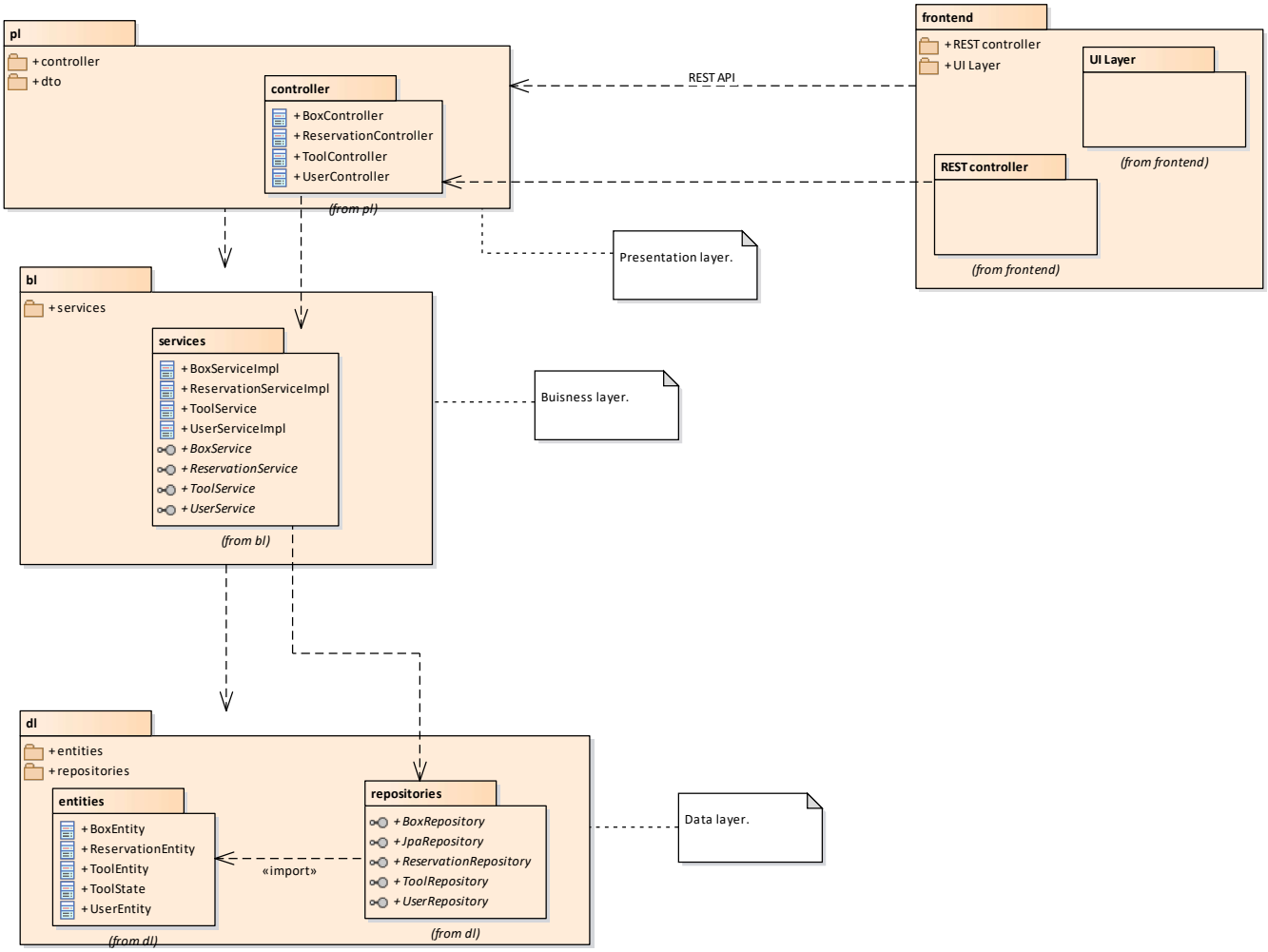
- Java Spring
- Hibernate
- JUnit 5

Frontend:

- jQuery + HTML5
- Bootstrap UI



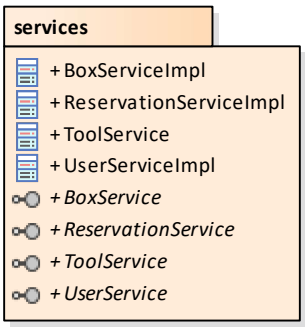
Obrázek 1 - Classes relations



Obrázek 2 - Design classes model

1.1 bl

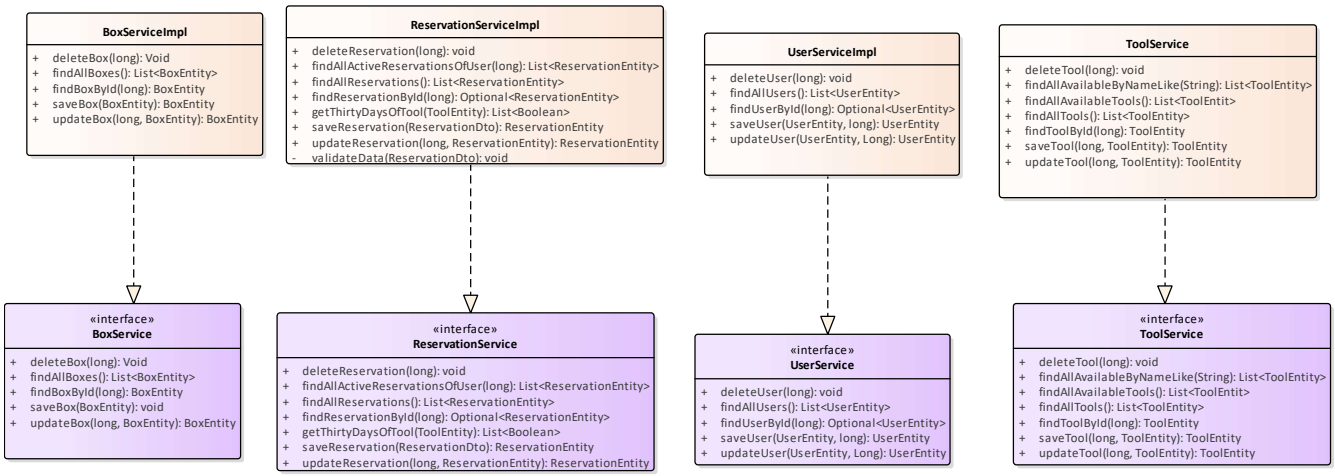
Business layer used to validate data from presentation layer and serve them to data layer. And ask data layer for any data that is requested by presentation layer.



Obrázek 3 - bl

1.1.1 services

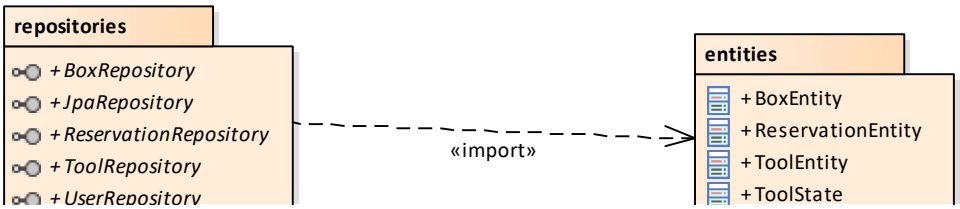
Services package contains all interfaces with their implementation used for validating data before sending them to data layer.



Obrázek 4 - services

1.2 dl

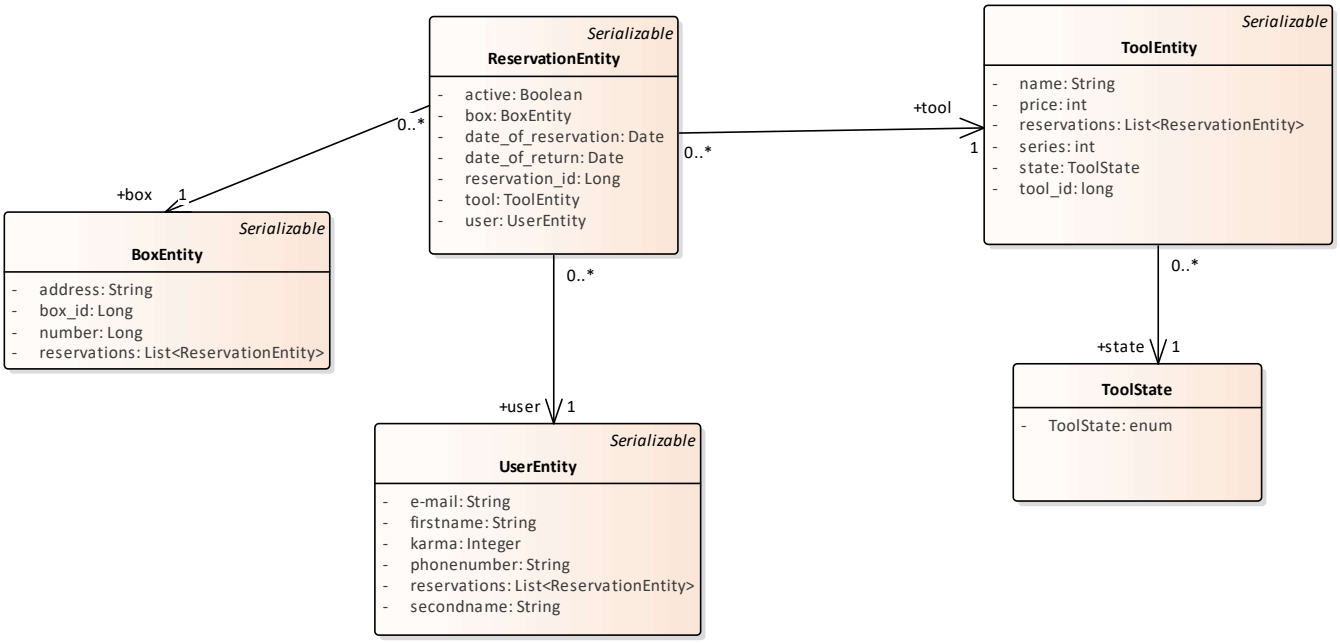
Data layer includes data persistence mechanism and repositories used for accessing the stored data without exposing the data storage mechanism.



Obrázek 5 - dl

1.2.1 entities

Package containing the data structure of each of the entities.



Obrázek 6 - entities

1.2.1.1 Class ToolEntity

One specific instance of tool.

Název atributu	Datový typ	Popis
name	String	Tool brand name
price	int	
reservations	List<ReservationEntity>	
series	int	
state	ToolState	
tool_id	long	Tool identification number

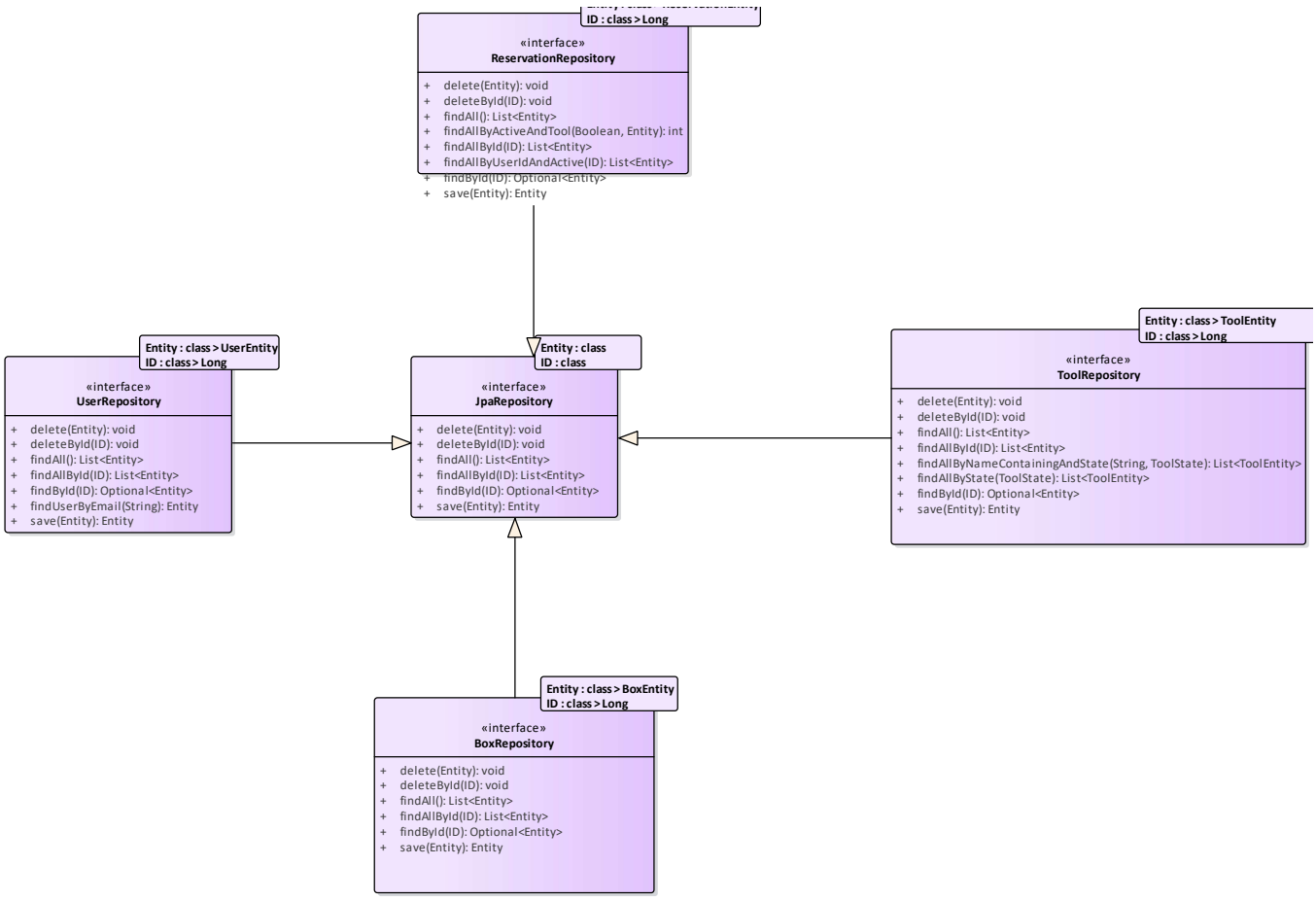
1.2.1.2 Class UserEntity

User which uses the system.

Název atributu	Datový typ	Popis
e-mail	String	
firstname	String	
karma	Integer	Karma is an attribute that increases or decreases based on the user's renting history. It increases for rents that proceed without problems, and decreases for late pickups or returns, or for damaging tools. High karma can lead to discounts on subscriptions, while low karma can lead to fines or bans.
phonenumber	String	
reservations	List<ReservationEntity>	
secondname	String	

1.2.2 repositories

Repositories package provides the methods for accessing the data from business layer.



Obrázek 7 - repositories

1.3 frontend

Frontend uses two packages, one for communication with presentation layer and second one to display the data recieved.

1.3.1 REST controller

This package is designed to communicate with the endpoints provided by the presentation layer.

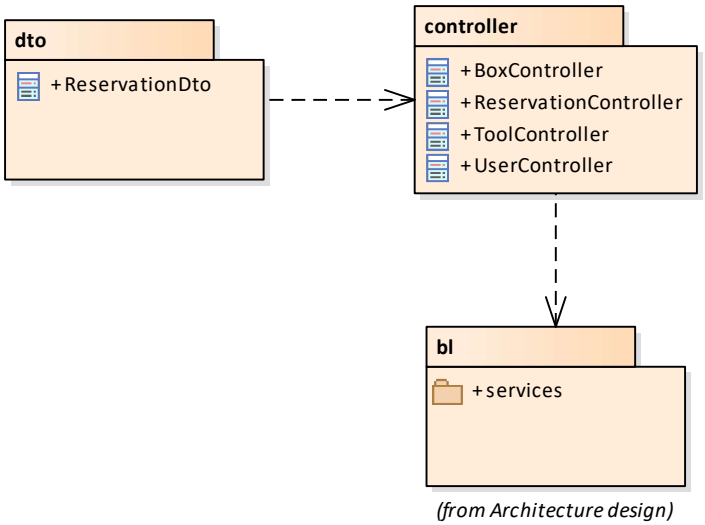
1.3.2 UI Layer

UI package is used for displaying the data retrieved by REST controller package.

1.4 pl

Presentation layer is layer that provides the frontend component with rest API endpoints. Using these endpoints will be the only way how to get necessary data from the business layer. At the same time the endpoints will be used to receive data from frontend and transform them to be processed by the business layer.

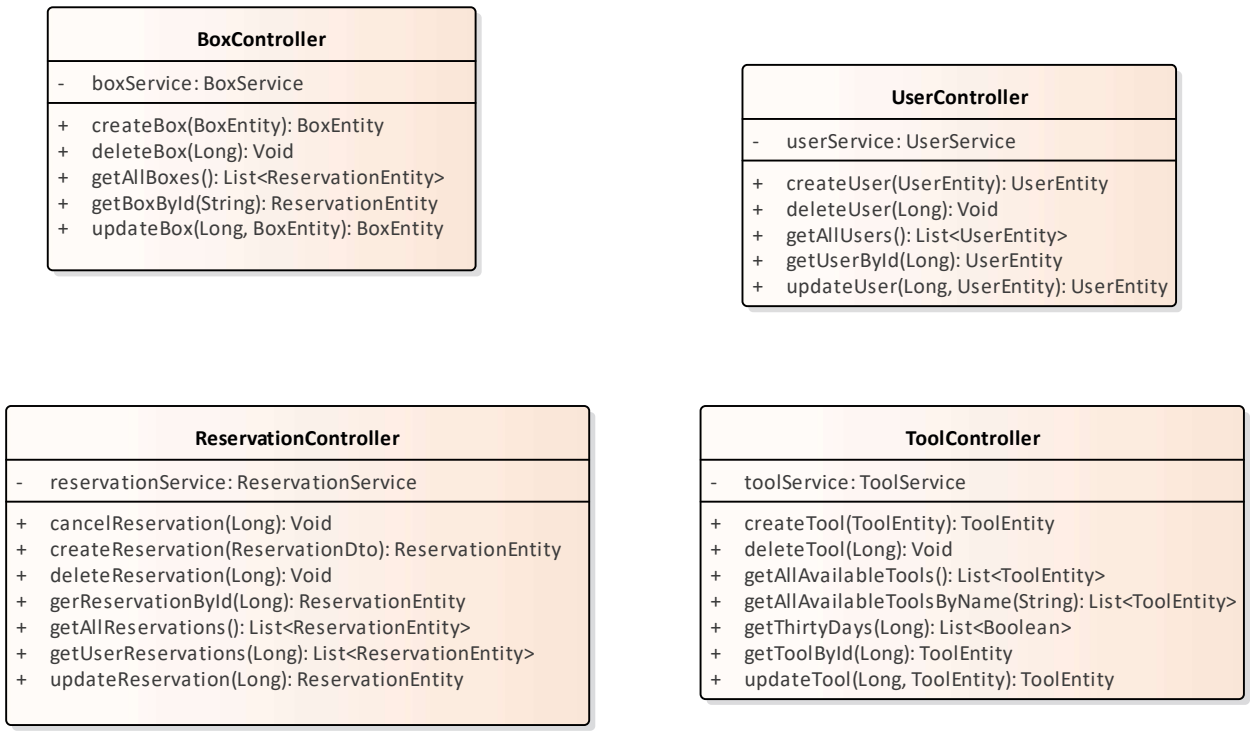
There is only one part of the presentation layer, called controller. All classes from this package are designed to communicate information from business layer to API and in the opposite way.



Obrázek 8 - pl

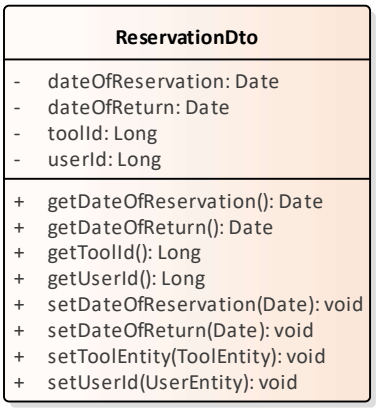
1.4.1 controller

This package is used for transformation of user data to data that could be processed by business layer using the methods provided by business layer.



Obrázek 9 - controller

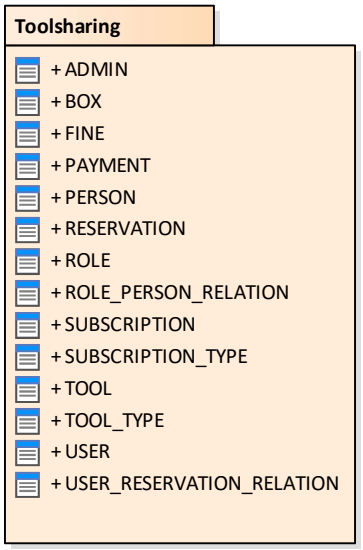
1.4.2 dto



Obrázek 10 - dto

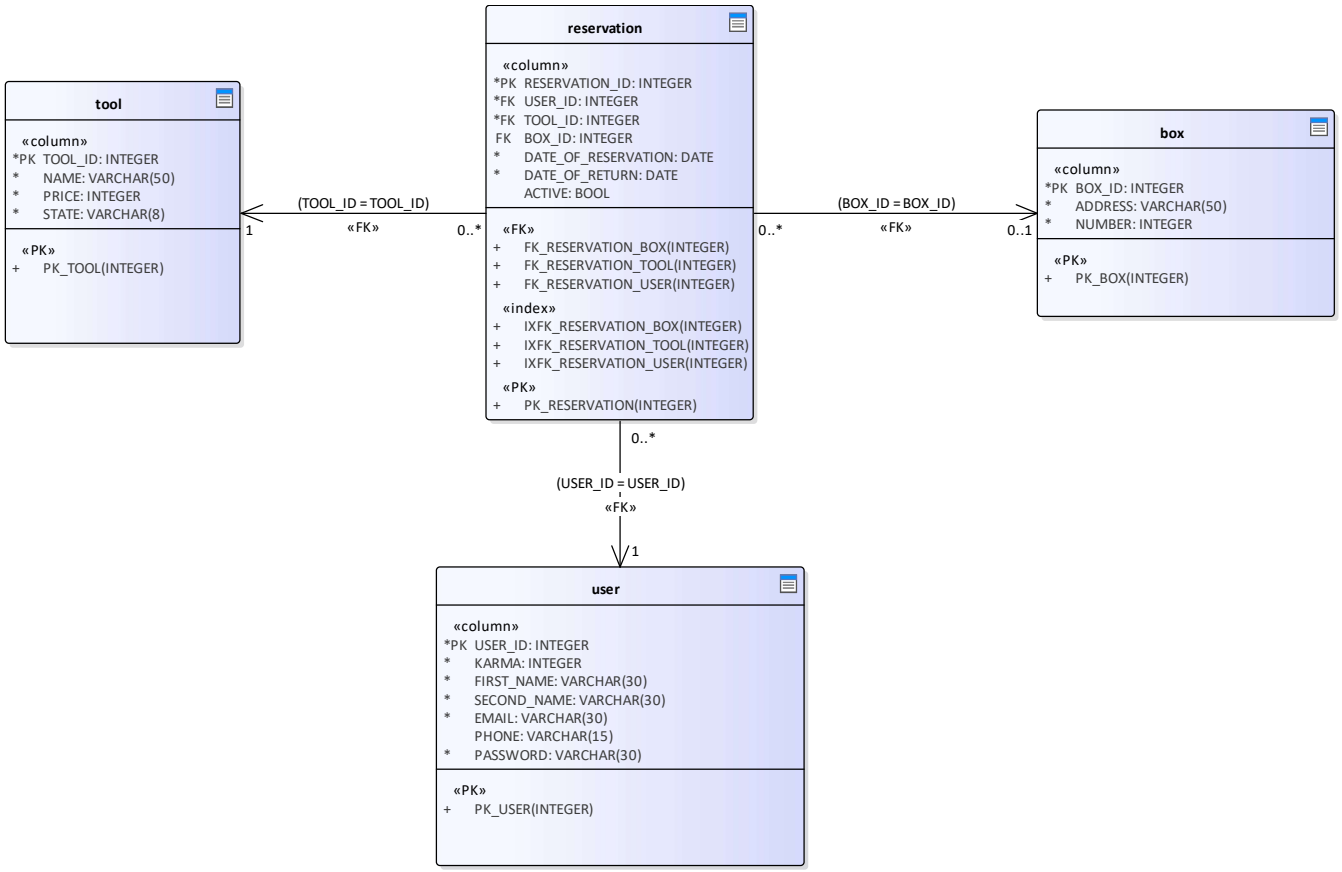
2. Relational data model

We chose to save the data in relational database described in this chapter. As data storage we will be using the MySQL database.



Obrázek 11 - Database Model

2.1 Implemented Database



Obrázek 12 – Implemented Database

2.1.1 box *«table»*

Location where the tool can be picked up.

Název atributu	Datový typ	Not null	Popis
BOX_ID	INTEGER	True	
ADDRESS	VARCHAR(50)	True	Adress of code lock box
NUMBER	INTEGER	True	Box identification number - printed on front of box

2.1.2 tool *«table»*

One specific instance of tool.

Název atributu	Datový typ	Not null	Popis
TOOL_ID	INTEGER	True	Tool identification number.
NAME	VARCHAR(50)	True	Tool brand name
PRICE	INTEGER	True	
STATE	VARCHAR(8)	True	

2.1.3 user *«table»*

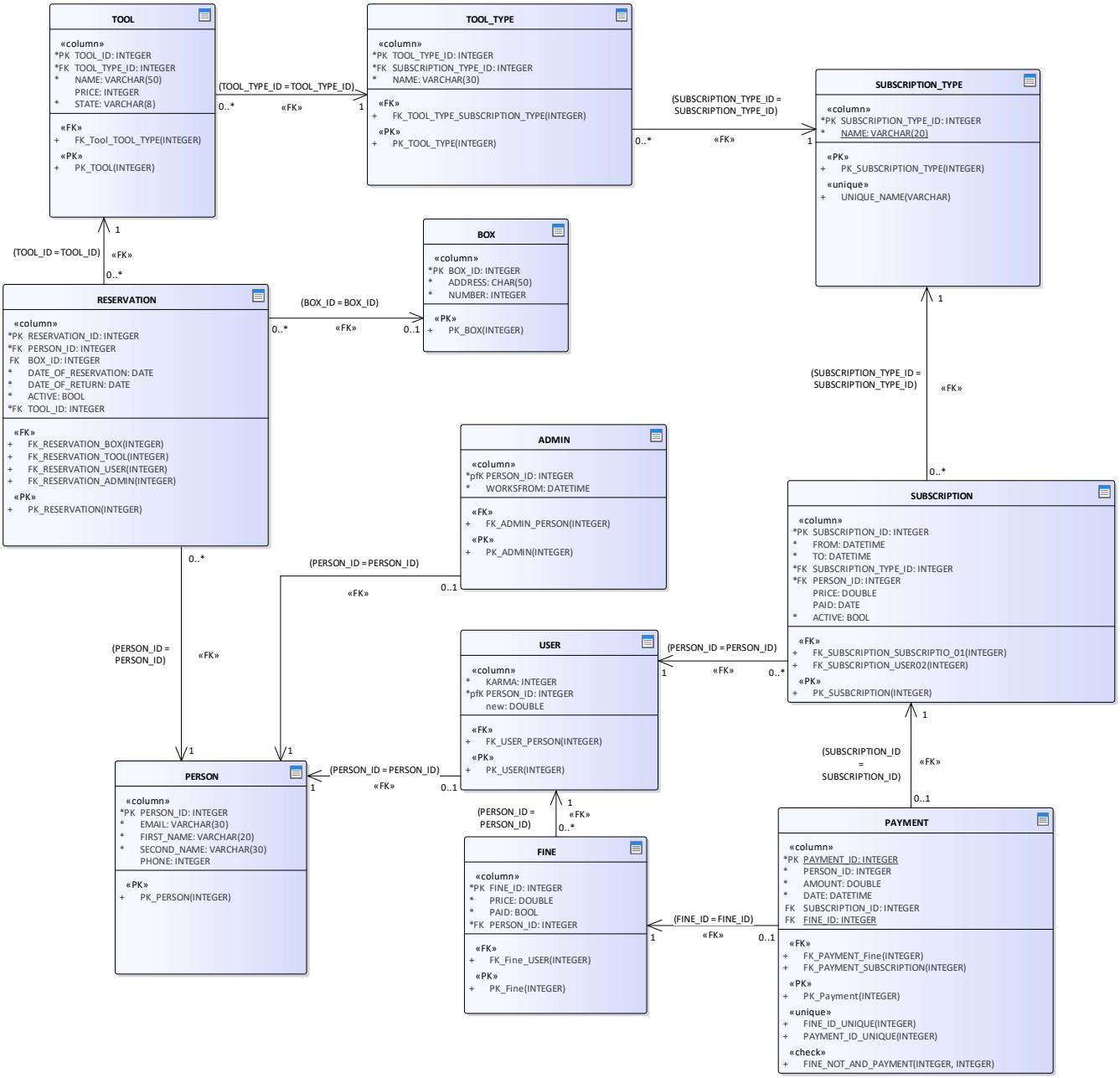
User which uses the system.

Název atributu	Datový typ	Not null	Popis

Název atributu	Datový typ	Not null	Popis
USER_ID	INTEGER	True	
KARMA	INTEGER	True	Karma is an attribute that increases or decreases based on the user's renting history. It increases for rents that proceed without problems, and decreases for late pickups or returns, or for damaging tools. High karma can lead to discounts on subscriptions, while low karma can lead to fines or bans.
FIRST_NAME	VARCHAR(30)	True	
SECOND_NAME	VARCHAR(30)	True	
EMAIL	VARCHAR(30)	True	
PHONE	VARCHAR(15)	False	
PASSWORD	VARCHAR(30)	True	

2.2 Toolsharing

Chapter consist of all relational tables used in our design.



Obrázek 13 - Relational Database Model

2.2.1 ADMIN *«table»*

Admin that moderates the system.

Název atributu	Datový typ	Not null	Popis
PERSON_ID	INTEGER	True	
WORKSFROM	DATETIME	True	Date when he started work from.

2.2.2 BOX *«table»*

Location where the tool can be picked up.

Název atributu	Datový typ	Not null	Popis
BOX_ID	INTEGER	True	
ADDRESS	CHAR(50)	True	Adress of code lock box
NUMBER	INTEGER	True	Box identification number - printed on front of box

2.2.3 PAYMENT *«table»*

Amount of money that some specific user should pay.

Název atributu	Datový typ	Not null	Popis
PAYMENT_ID	INTEGER	True	
PERSON_ID	INTEGER	True	
AMOUNT	DOUBLE	True	Payment amount to be billed to the user
DATE	DATETIME	True	Date when the payment should be payed.
SUBSCRIPTION_ID	INTEGER	False	
FINE_ID	INTEGER	False	

2.2.4 PERSON *«table»*

Person that used the system.

Název atributu	Datový typ	Not null	Popis
PERSON_ID	INTEGER	True	
EMAIL	VARCHAR(30)	True	Person's email, used for contacting in case of any changes.
FIRST_NAME	VARCHAR(20)	True	Given name
SECOND_NAME	VARCHAR(30)	True	Person's surname
PHONE	INTEGER	False	Person's phone number, used for contacting the person and stored for legal purposes.

2.2.5 ROLE *«table»*

DON'T REMEMBER

Název atributu	Datový typ	Not null	Popis
ROLE_ID	DECIMAL	True	
NAME	VARCHAR(50)	True	

2.2.6 TOOL *«table»*

One specific instance of tool.

Název atributu	Datový typ	Not null	Popis
TOOL_ID	INTEGER	True	Tool identification number.
TOOL_TYPE_ID	INTEGER	True	
NAME	VARCHAR(50)	True	Tool brand name
PRICE	INTEGER	False	
STATE	VARCHAR(8)	True	

2.2.7 TOOL_TYPE *«table»*

Type of tool.

Název atributu	Datový typ	Not null	Popis
TOOL_TYPE_ID	INTEGER	True	

Název atributu	Datový typ	Not null	Popis
SUBSCRIPTION_TYPE_ID	INTEGER	True	Which subscription level the user needs to be subscribed to to have access to this tool type. Expensive/premium tools will only be accessible to users with more expensive subscriptions.
NAME	VARCHAR(30)	True	General description of tool - e.g. "Screwdriver", "Soldering iron", "Hand drill". Does not refer to a specific tool by brand name

2.2.8 USER *«table»*

User which uses the system.

Název atributu	Datový typ	Not null	Popis
KARMA	INTEGER	True	Karma is an attribute that increases or decreases based on the user's renting history. It increases for rents that proceed without problems, and decreases for late pickups or returns, or for damaging tools. High karma can lead to discounts on subscriptions, while low karma can lead to fines or bans.
PERSON_ID	INTEGER	True	
new	DOUBLE	False	