FAKULTA INFORMAČNÍCH TECHNOLOGIÍ ČVUT V PRAZE

Web Application for Toolsharing System

Implementation Documentation

Authors:

Richard Šedivý
Galymzhan Dosmagambet
Tatiana Popova
Vladislav Tarasenko
Tomáš Bánhegyi

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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.

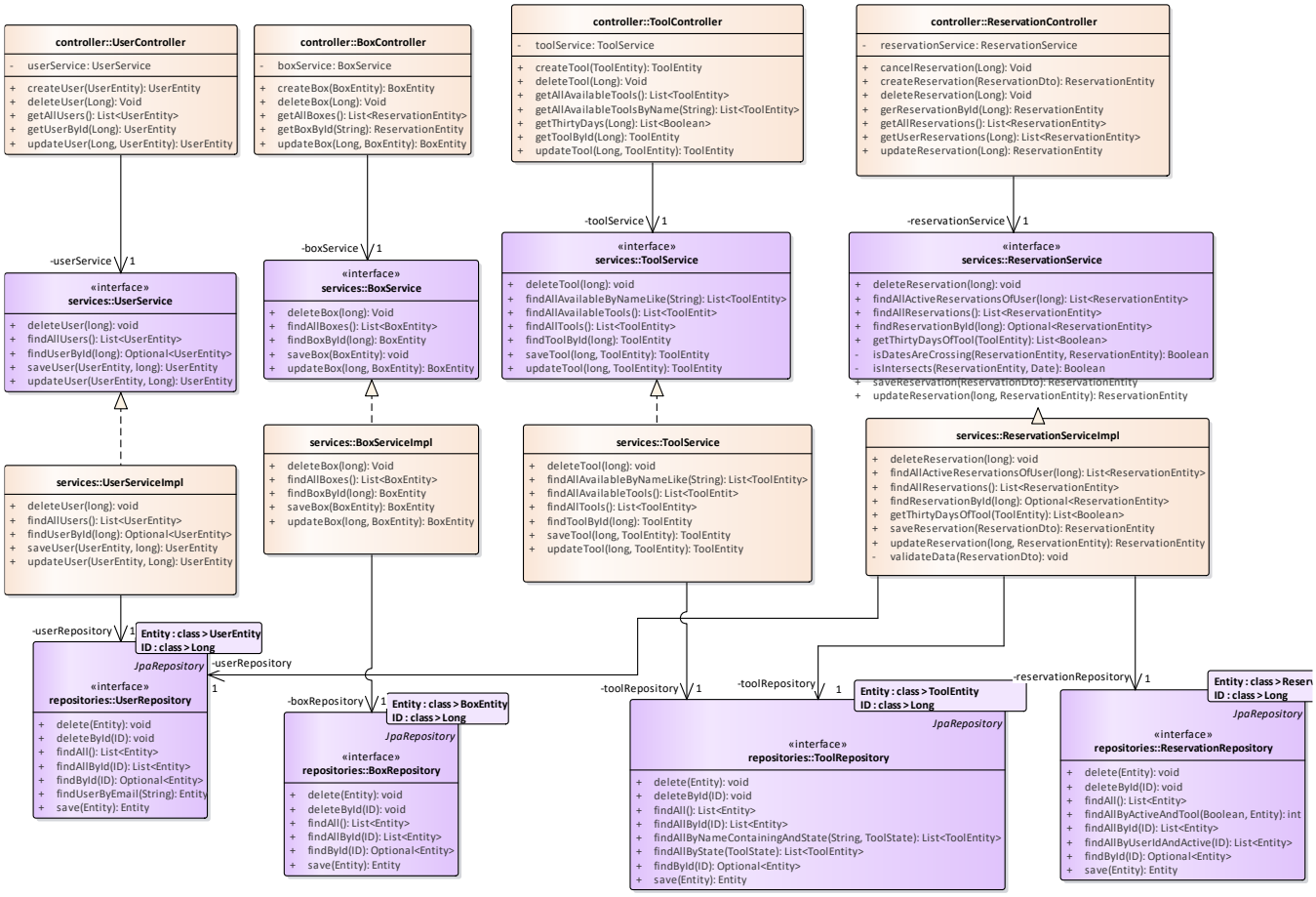
Used Technologies

Backend framework:

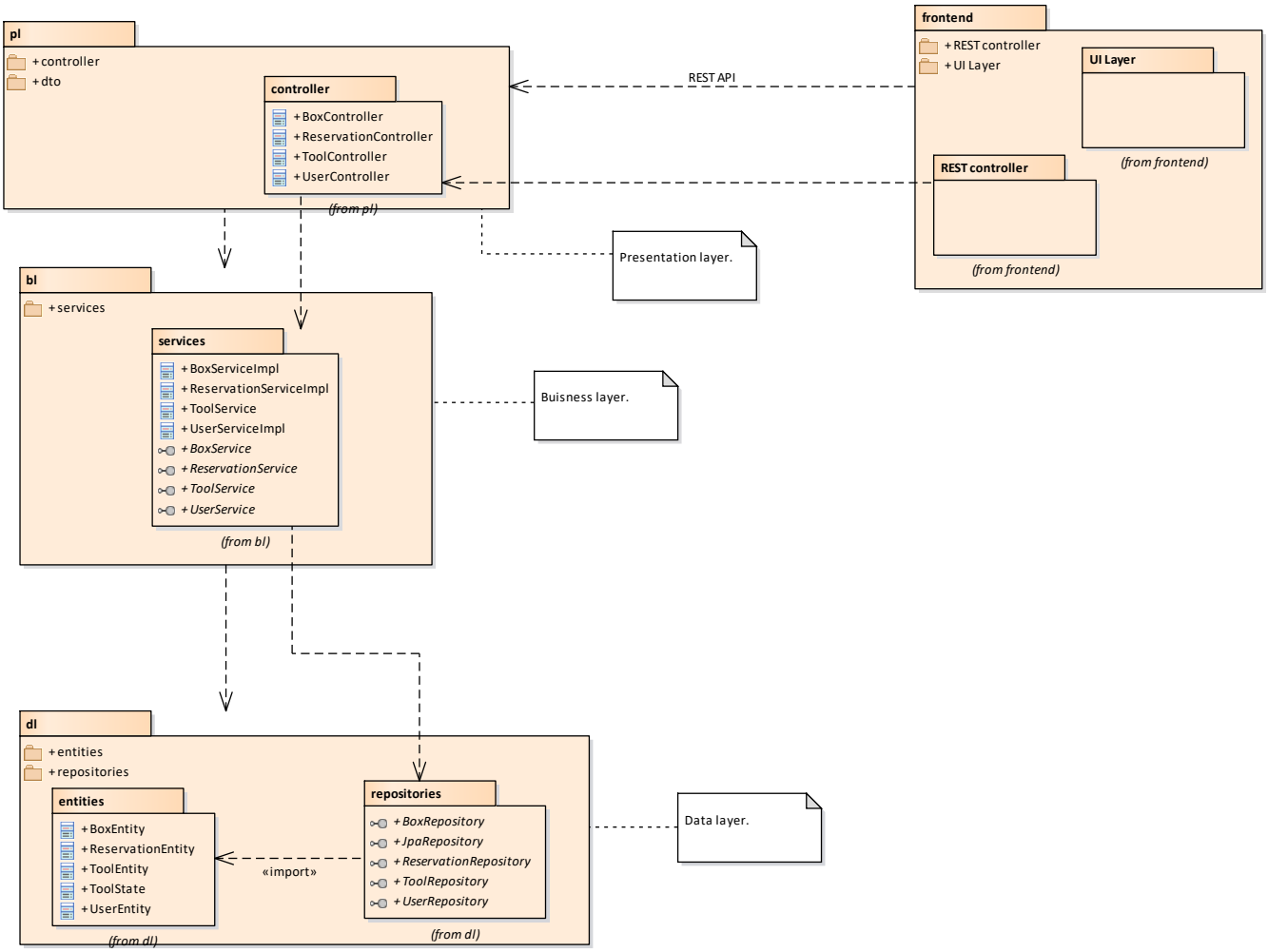
- Java Spring
- Hibernate
- JUnit 5

Frontend:

- jQuery + HTML5
- Bootstrap UI



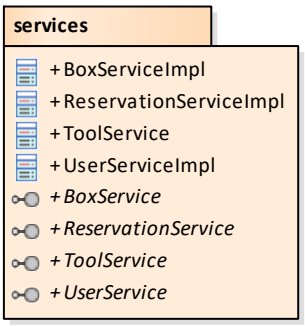
Obrázek 1 - Classes relations



Obrázek 2 - Design classes model

1.1 bl

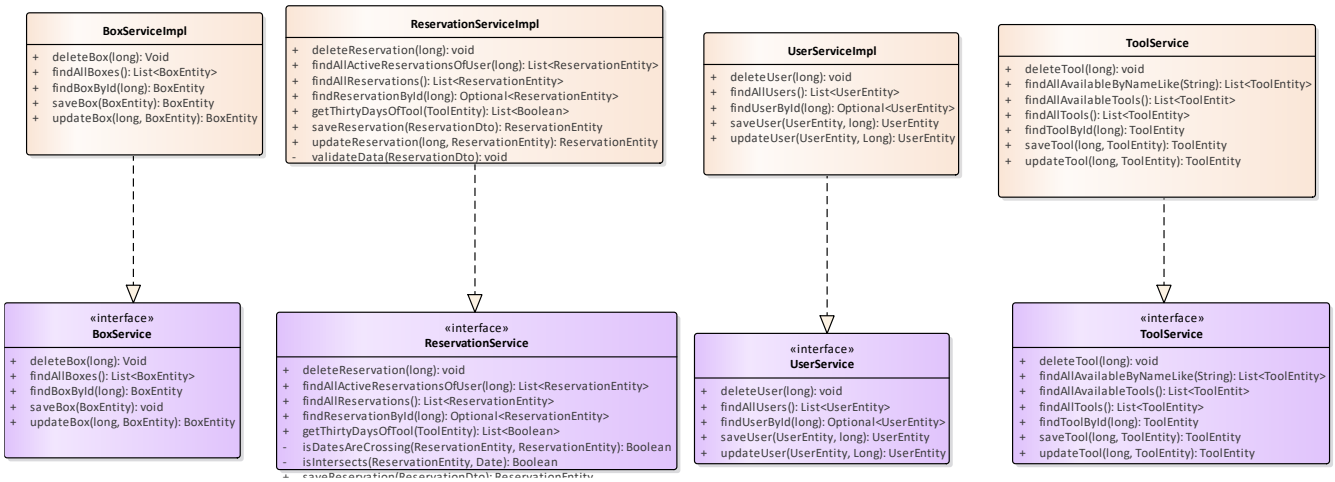
Business layer used to validate data from presentation layer and serve them to data layer. And ask data layer for any data that is requested by presentation layer.



Obrázek 3 - bl

1.1.1 services

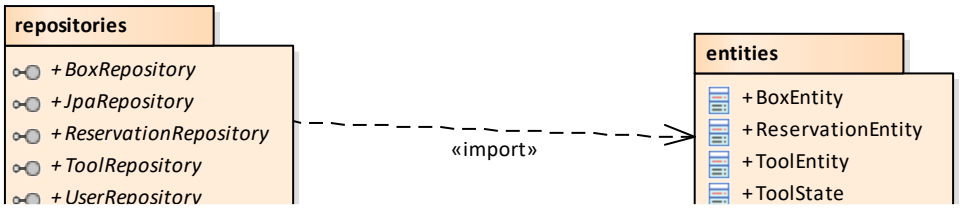
Services package contains all interfaces with their implementation used for validating data before sending them to data layer.



Obrázek 4 - services

1.2 dl

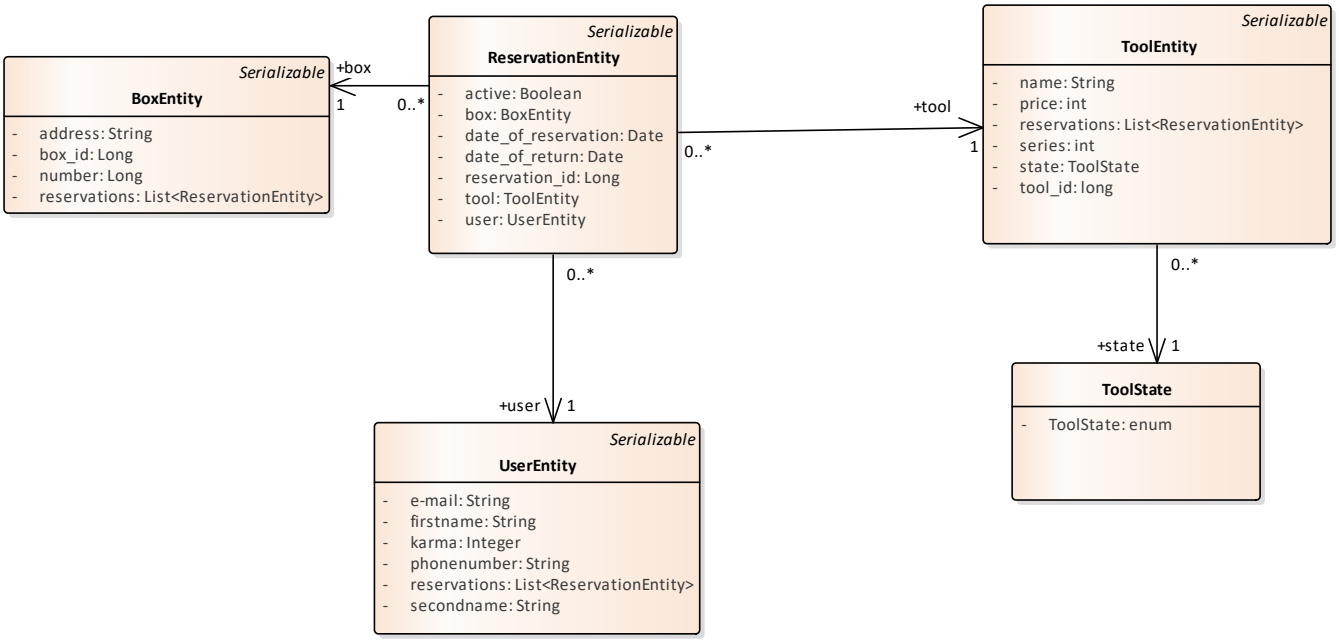
Data layer includes data persistence mechanism and repositories used for accessing the stored data without exposing the data storage mechanism.



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

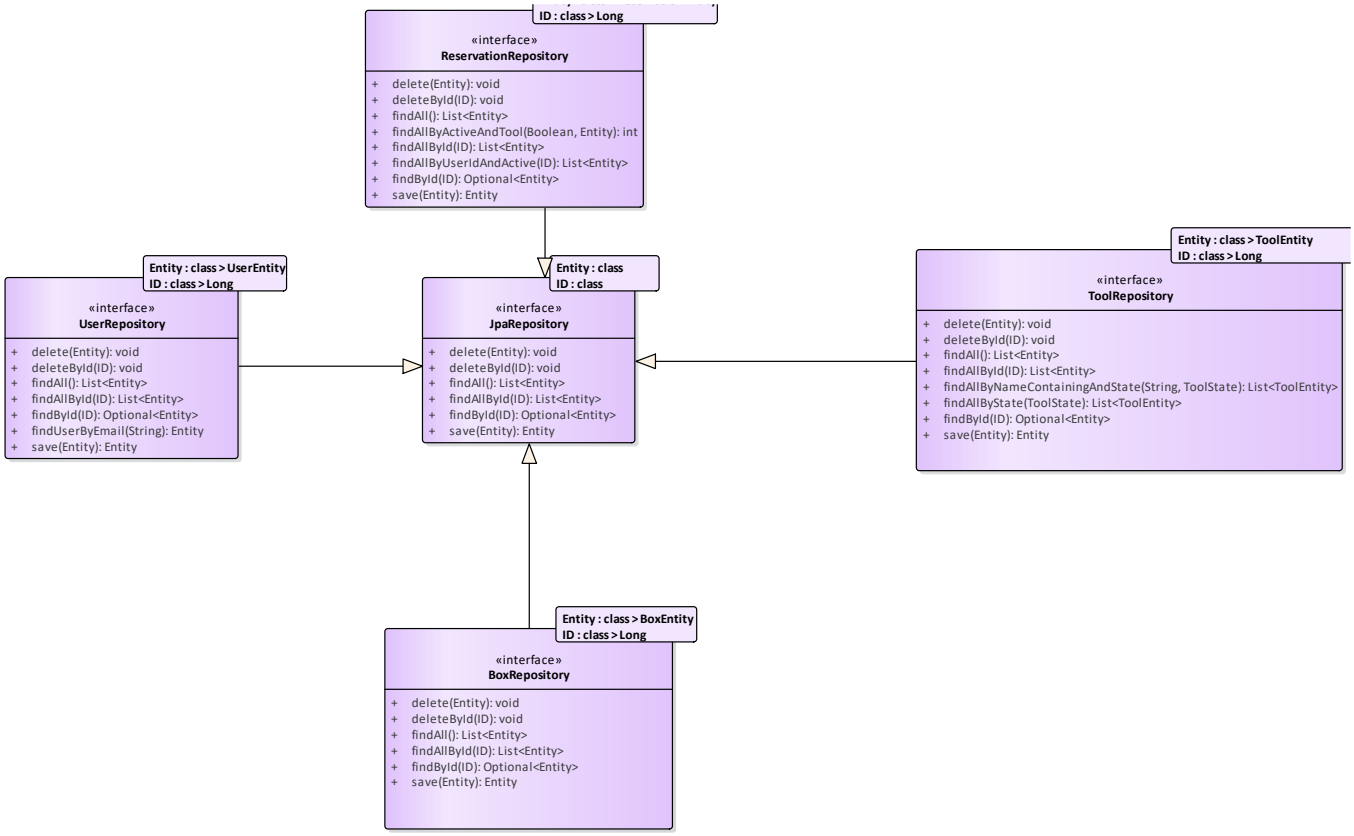
1.2.1.2 Class UserEntity

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

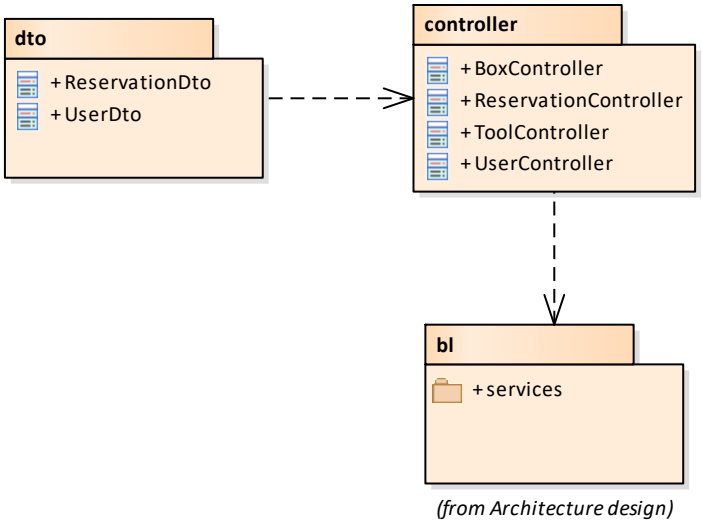
This package is designed to communicate with the endpoints provided by the presentation layer.

1.3.2 UI Layer

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

1.4 pl

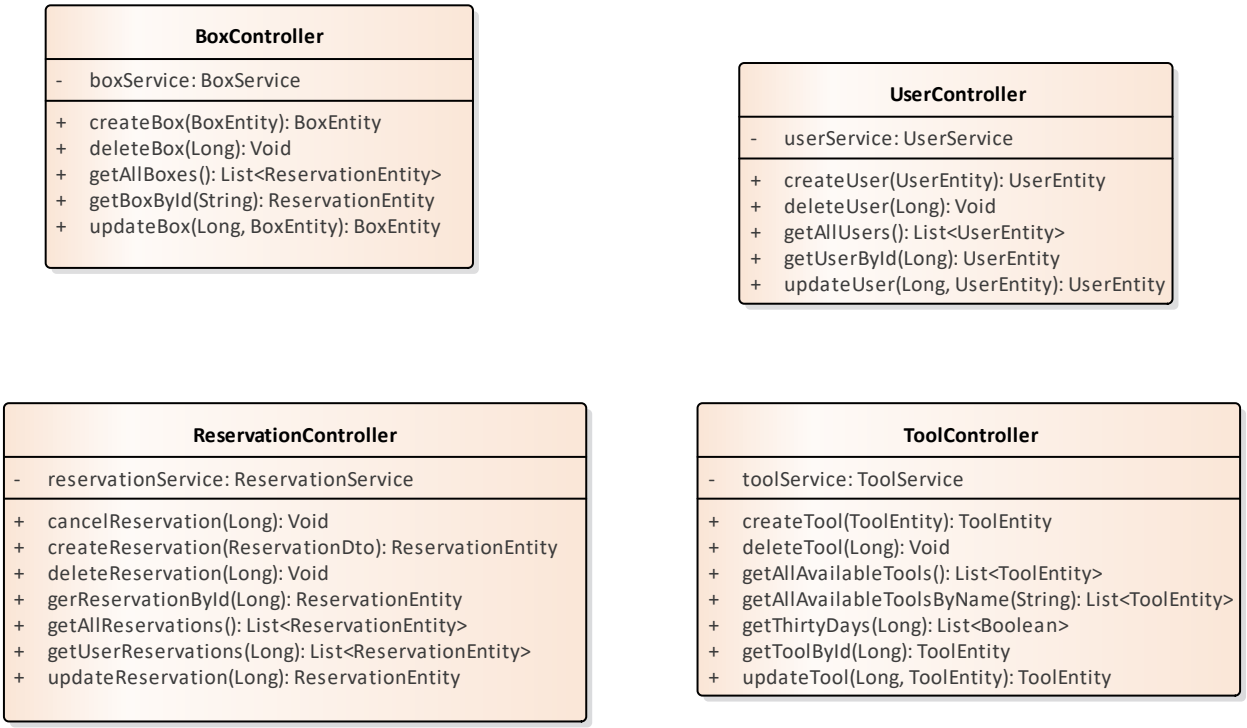
Presentation layer is layer that provides the frontend component with rest API endpoints. Using these endpoints will be the only way how to get necessary data from the business layer. At the same time the endpoints will be used to receive data from frontend and transform them to be processed by the business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

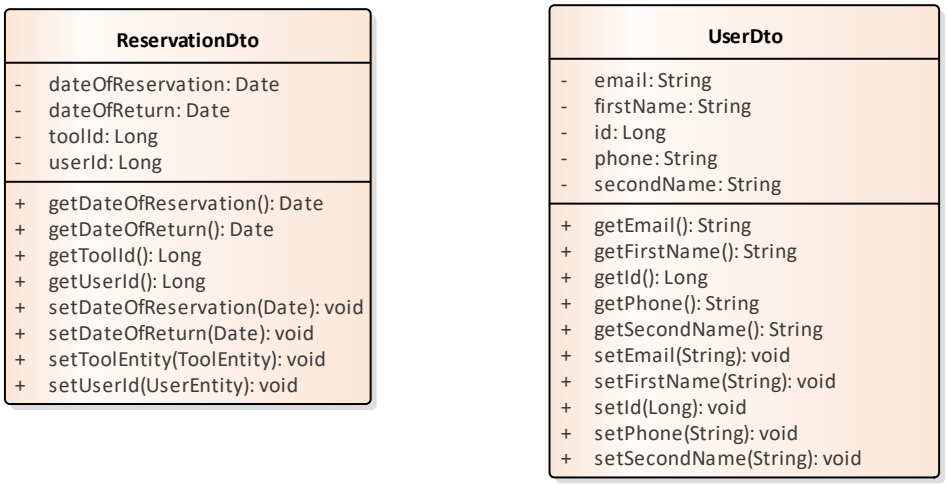
1.4.1 controller

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

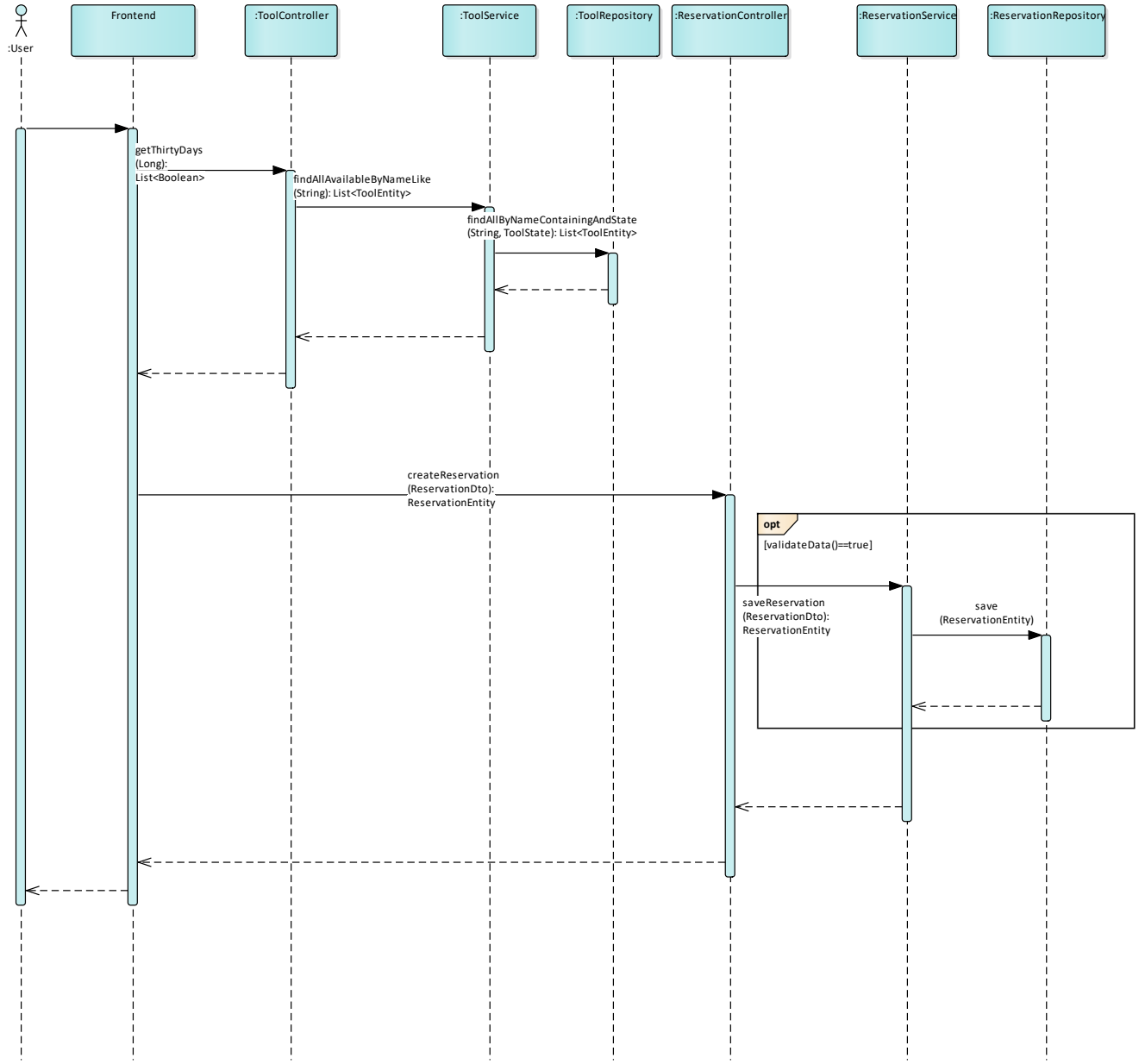
1.4.2 dto



Obrázek 10 - dto

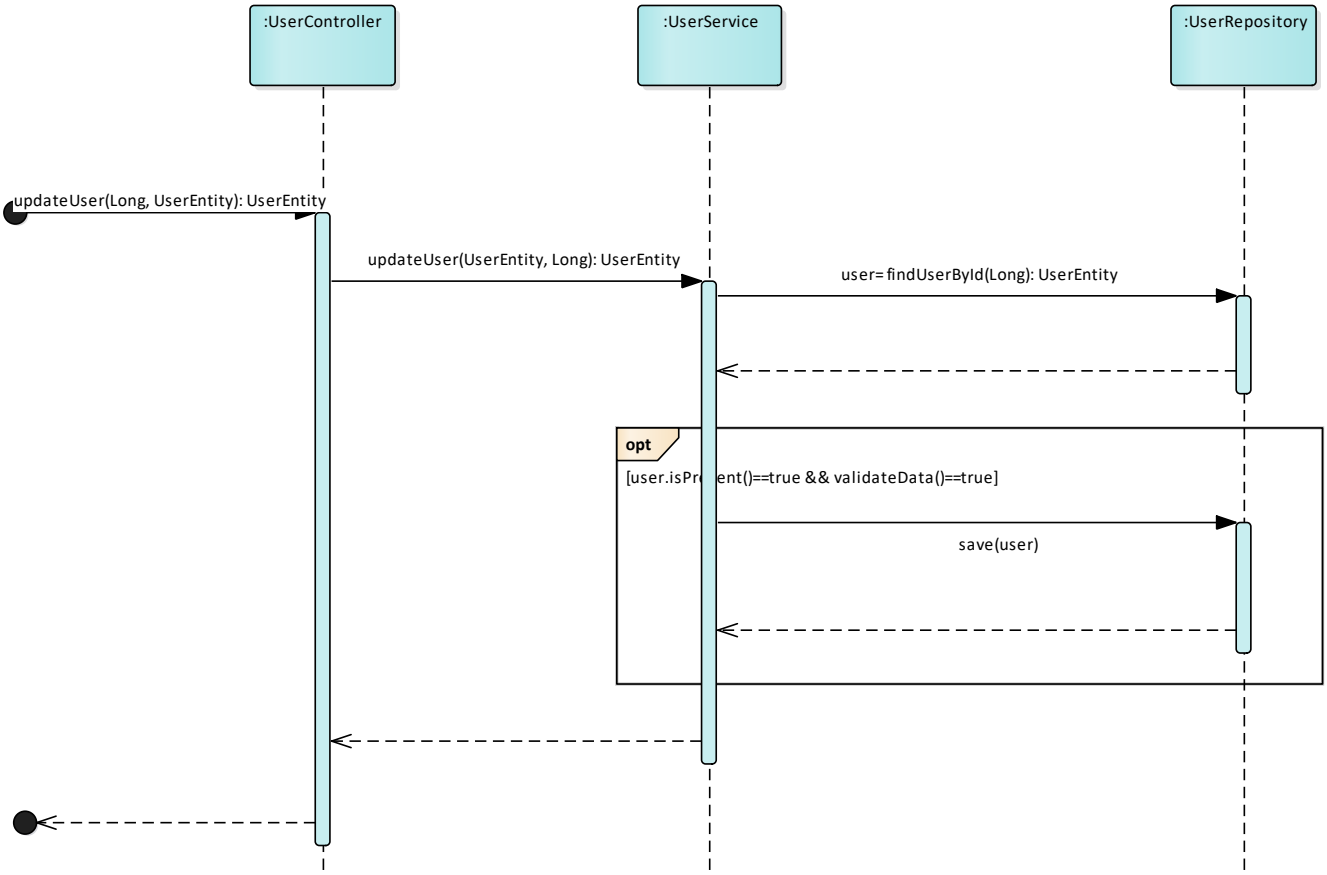
2. Realization of use cases

2.1 Realization of UC 11



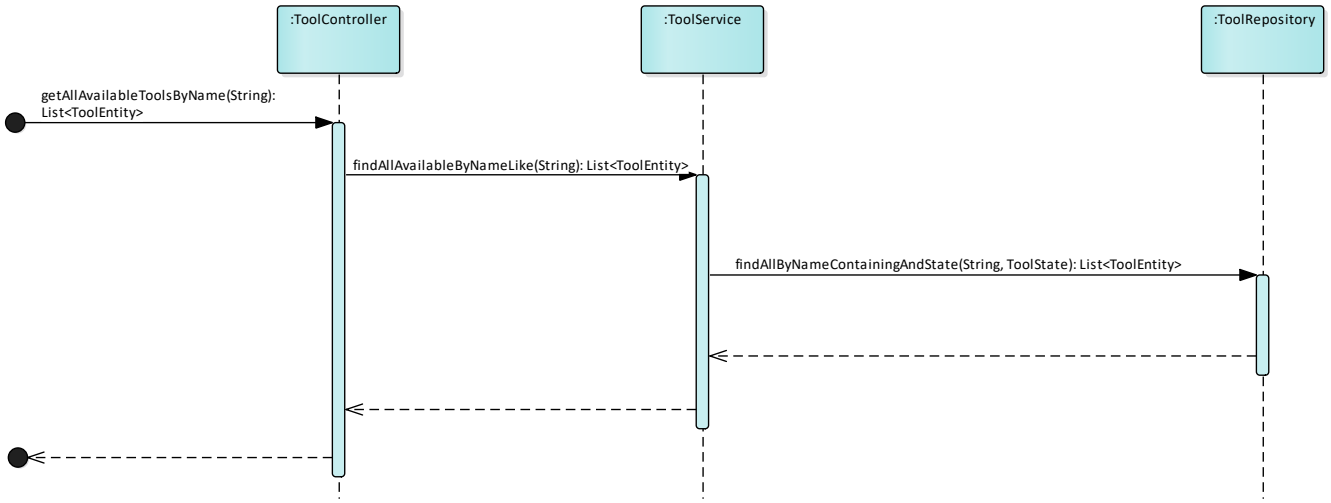
Obrázek 11 - Realization of UC 11

2.2 Realization of UC 19



Obrázek 12 - Realzation of UC 19

2.3 Realization UC 13



Obrázek 13 - Realization UC 13