Jibrarian - FIIT STU VAVA Project

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Contents

1 Vision

The Jibrarian is a library book reservation software solution designed for the needs of FIIT STU library. The main aim of this application is to improve the experience of borrowing books. Instead of going to the library you can check available books and reserve them from the comfort of your home. You can also keep track of the time when you should return your borrowed books. This application will also simplify work for librarians. It will make their job easier by showing them the state of all books owned by the library.

2 5W Model

Who will use the app

The application will be used by FIIT STU library to digitize reservation and borrowing of books for readers and administration of books inventory. It will be used by library members, librarians working for FIIT STU library and by the library administrators.

What is this app

The application will be used by FIIT STU library to digitize reservation and borrowing of books for readers and administration of books inventory. It will be used by library members, librarians working for FIIT STU library and by the library administrators.

Where will it be used

This application will be a desktop app, which means that the user uses it through a computer or laptop. Library members, who want to reserve a book, will instead of actually having to go to the library, just open the application in the comfort of their home, work, cafe or other place. Librarians and administrators will use this app in their work station inside the library.

When will it be used

A library member can use this when he wants to reserve a book from the STU FIIT library, but because of his unfavorable personal or work conditions, he cannot go there. The application will allow him to reserve it whenever he wishes to.

Why use it

Bunch of libraries still use papers as the main system to keep track of their books. This can lead to huge amounts of errors and books that are lost forever . By using this app, FIIT STU will no longer encounter these errors in administration of books inventory. And library members will want to use this app to discover new books from the library's catalog and to reserve them in advance.

How much will the application cost

Application development will be open-source. The project will be divided between five people, where there will be an architect, a tester and three programmers. The development of the software will take roughly two months. During this time, the team will be paid the Slovakian average for the given positions (referenced from the Platy na pozíciách - Platy.sk). The total price of the project is €34,000 +- 20

How will the application be used

A reader registers to the application with email and password, thus he/she becomes officially a member of the library. After logging into the application, the member gets access to the whole library catalog, from which he/she can discover books and reserve them. Furthermore a member can see which books are reserved for him/her and until when they are reserved or until when does he she have them borrowed. Thanks to the design of the applications, librarians have increased clarity in reservations and administration of the library's book catalog. Librarians will use this app to manage the state of the library's catalog. Finally, library administrators can add new accounts for librarians and also remove them if they want.

3 Usage scenario

FIIT STU library is a moderately sized library in the building of FIIT STU. There are 4 librarians, who have the whole library catalog under their responsibility, and there are 2 administrators, who make sure that all systems used to operate this library are running as they should. Nevertheless they still use pen and paper as the main system to keep track of their books. This leads to huge amounts of errors and books that are lost forever. Over time this can lead to a big amount of money lost, that could be used otherwise. Also, this is a big inconvenience for the potential readers, because they are unable to see if the book is actually in the library or not. Therefore, the interest of readers falls off. Thus, the library decided to digitize processes surrounding reserving, borrowing and administration of its catalog.

4 Know your users

Library Member

Lara has always been a curious person, that's why she would often look for answers in books. Lara is a library member, which allows her to borrow books and other materials from the library's collection. The Jibrarian app allows her to discover new books and to reserve them in only a few steps, which means she uses the app for a very short period. She uses the app whenever she wants to check if the book is available and of course to reserve it. She usually uses the app once a week. Lara can reserve her book anytime with the app directly in the library from one of the computers, or from her personal computer or laptop.

Librarian

Jana is a professional who works in a library as a librarian and is responsible for the management and organization of the library's collection of books, materials, and other resources. She uses the app to help her find and prepare reserved books and lend them to members, to make sure members are satisfied with the library and to see which books are borrowed and by whom. She uses the app on the computer most of her shift while working in the library. She works typically 4 times a week.

Administrator

John is a library staff member, and he is responsible for the management and organization of the library's systems. John's role as an admin typically includes managing library systems, supervising library staff, coordinating library programs and services, and ensuring the library runs smoothly and efficiently. He uses the app when he needs to create or remove an account for a librarian, and he uses the app typically once per week, for a few hours.

5 Users language

- **Borrowing**: The act of checking out or borrowing books, or other resources from the library's collection.
- **Catalog**: A searchable database that lists the library's collection of materials, including books, journals, and other resources.
- **Reservation**: A request placed by a user for a specific item that is currently available in the library's collection.
- **Renewal**: The process of extending the period for a borrowed item.

6 Most common tasks

Library member wants to

- Quickly reserve books from library
- Check their currently borrowed books and their return dates
- Check their currently reserved books and the reservation expiration dates

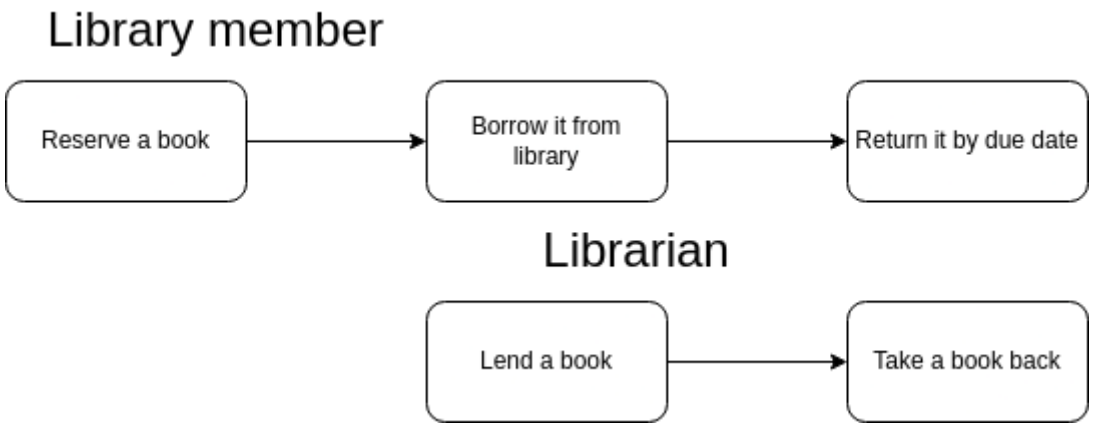
Librarian wants to

- See which books are borrowed and by whom
- Manage the books inventory in the library

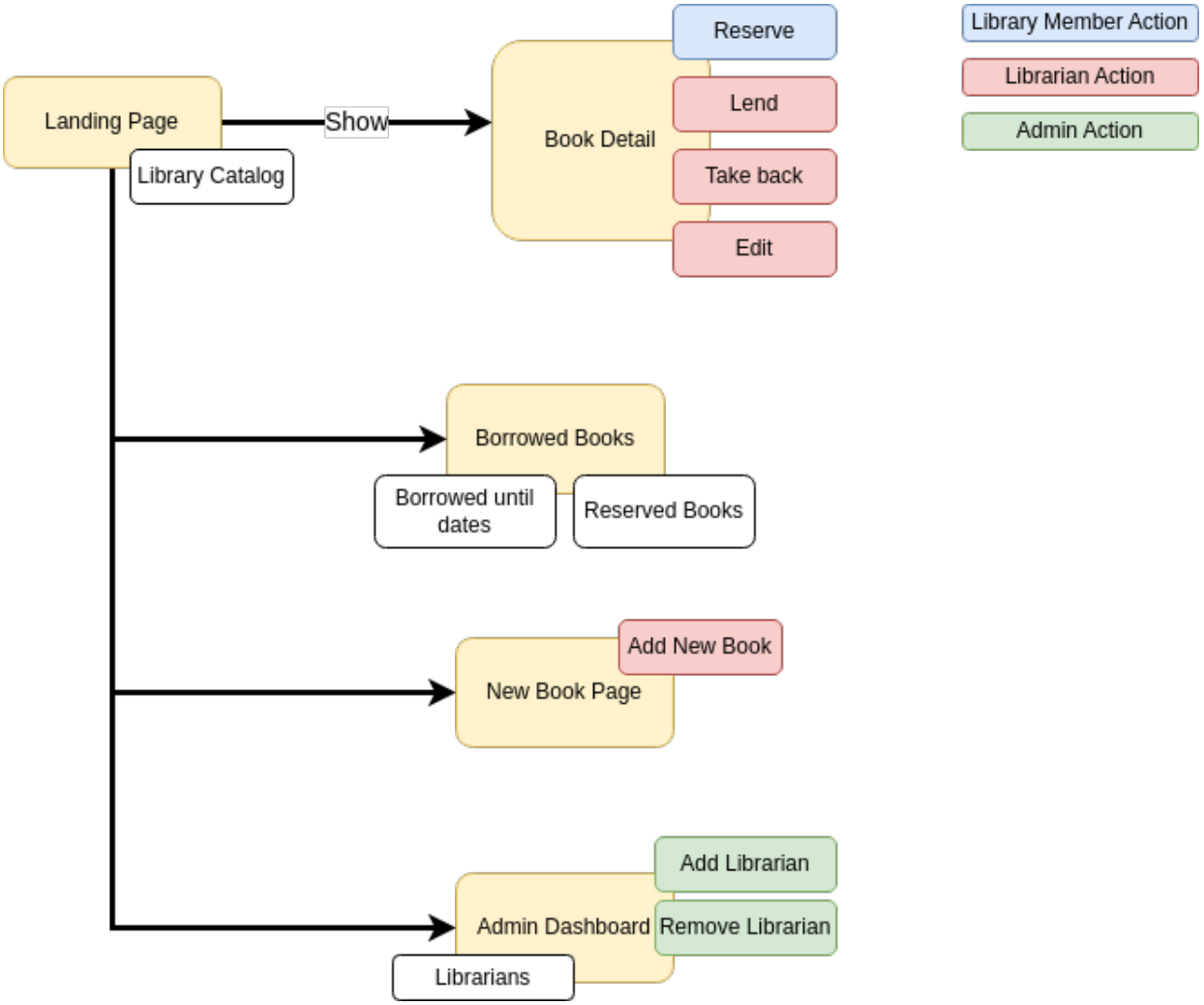
Administrator wants to

- Create and remove accounts for new librarians
- Create and remove accounts for new admins

7 Main process



8 Navigation



9 Mockups

Library Member

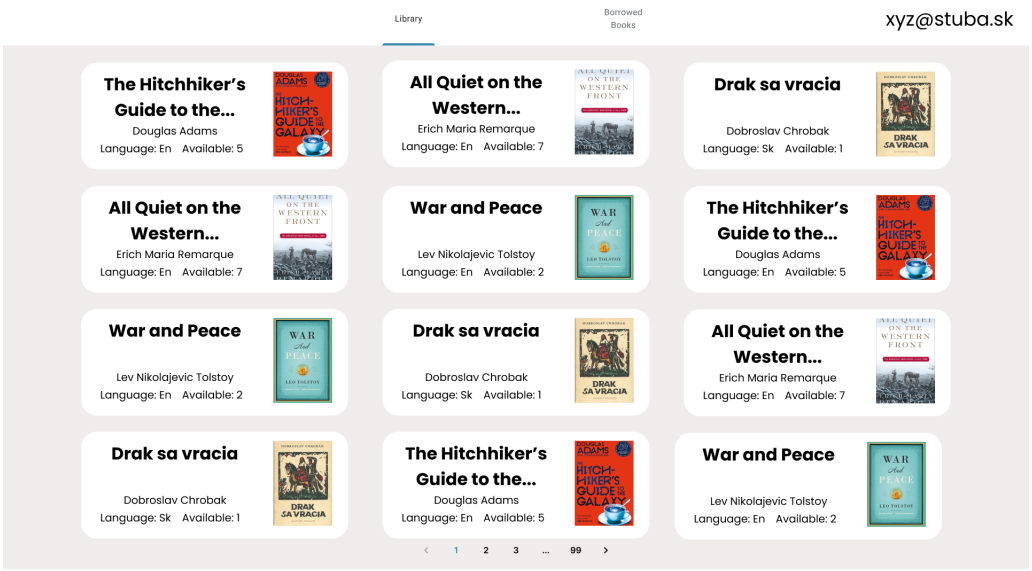


Figure 1: Landing page

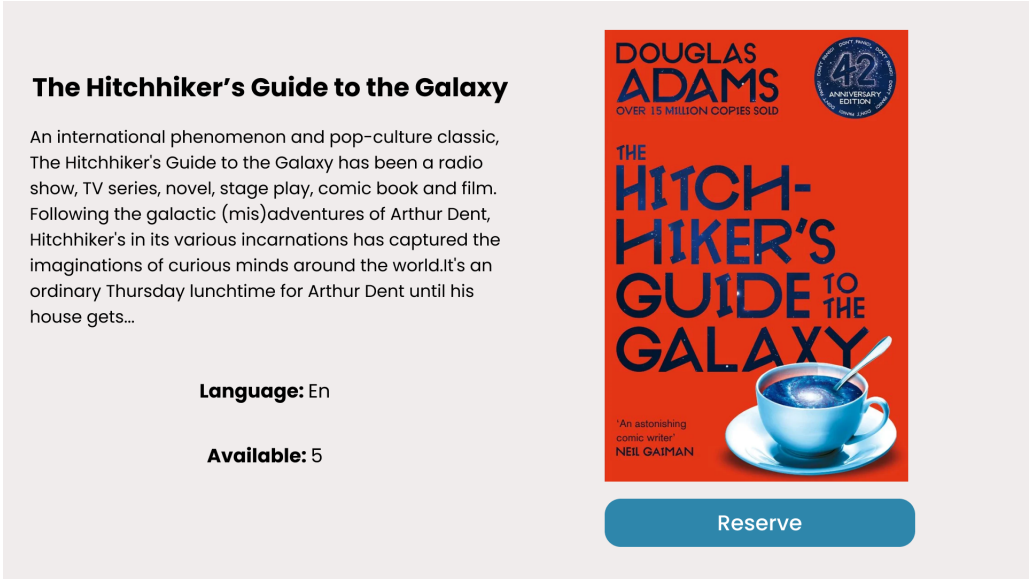


Figure 2: Book detail modal

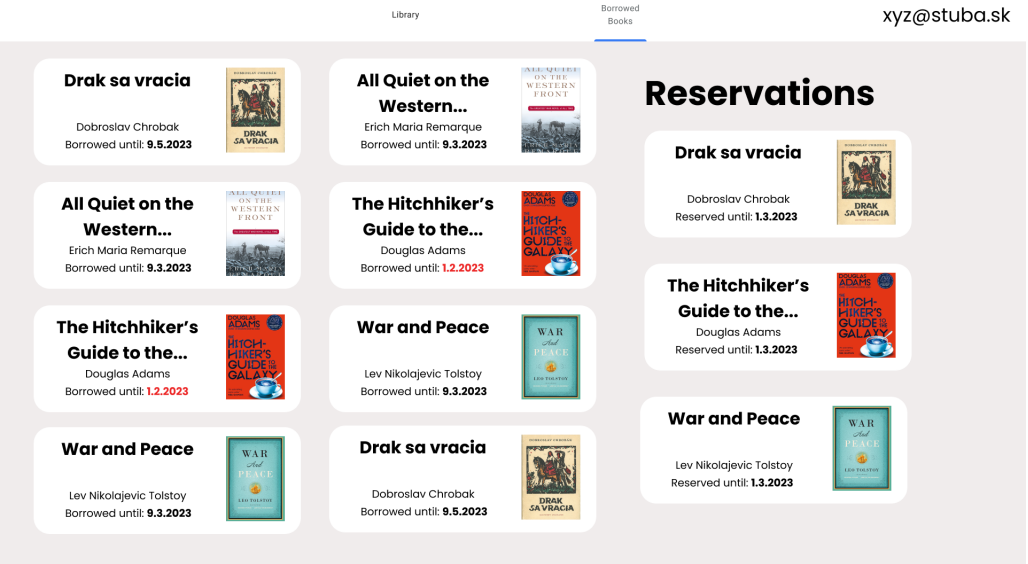


Figure 3: Borrowed books page

Librarian

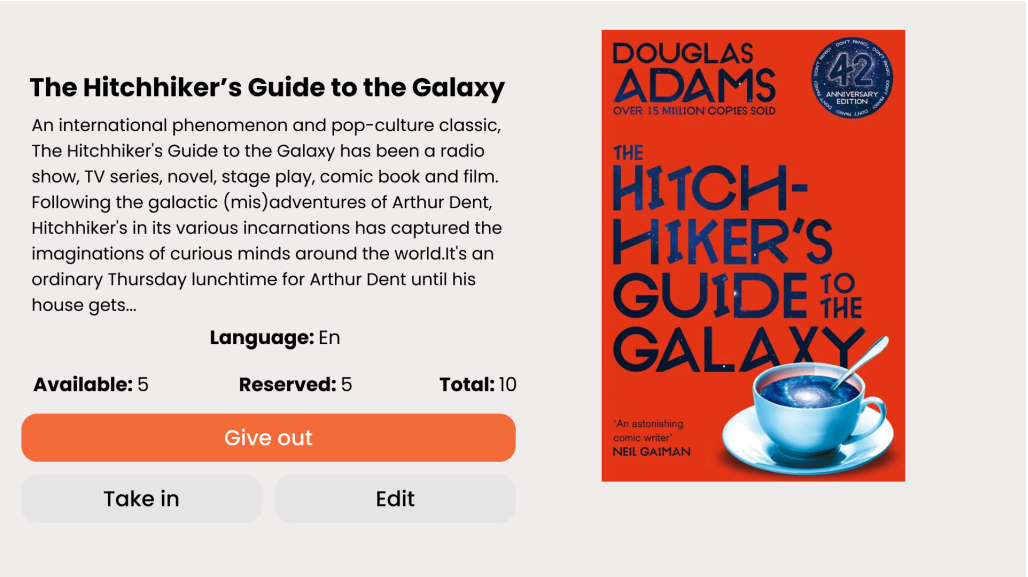


Figure 4: Book detail modal

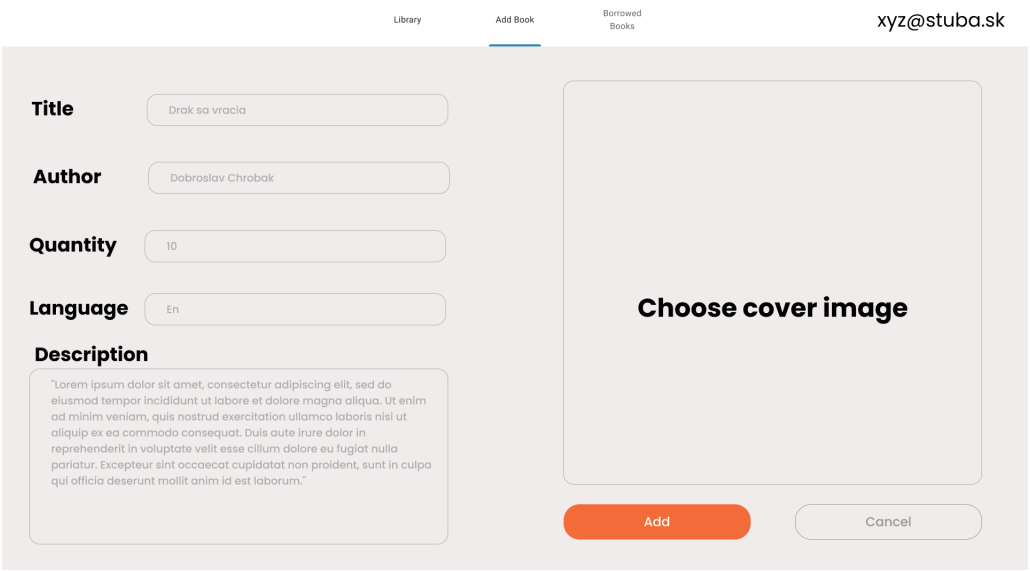


Figure 5: Add Book page

Administrator

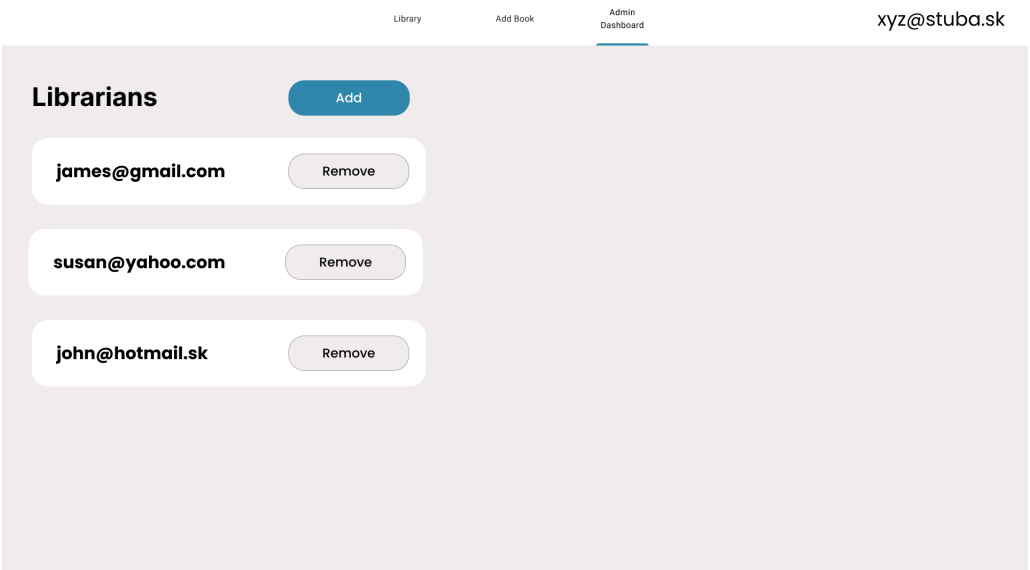


Figure 6: Admin dashboard

10 Non-functional requirements

1. Platforms: This application is made for desktop. It's developed in Java. Runnable on Windows and Arch Linux.
2. Usability: The application should be easy to interact with. It should have a nice clear layout, that for example even older people could use.
3. Scalability: application should be able to be used by several users at the same time without any performance loss.
4. Performance: this application should be able to run on even older hardware efficiently without using too many resources.

11 Team

11.1 RACI matrix

Project:	Jibrarian					
Date:	26.4.2023					
Person	**Lukáš Častven**	**Juraj Rabatin**	**Peter Bartoš**	**Oliver Hofer**	**Miroslav Todorović**	**Step**
Role	**Lead / Architect**	**Developer**	**Developer**	**Developer / Tester**	**Developer**	
Architecture Design	A/R	I	I	I	I	1
UI design	A/R	I	I	I	I	1
Infrastructure Design	A/R	I	I	I	I	2
Infrastructure Implementation	A/R	I	I	I	I	2
User auth	C	I	A/R	I	I	2
Member flow	C	R	I	A	I	3
Librarian flow	C	I	I	A	R	3
Admin flow	C	I	I	A/R	I	3
Architecture Adherence	A/R	I	I	I	I	-
Documentation	A/R	R	R	R	R	-
Functionality Testing	C	C	C	A/R	C	-
Code Testing	A/C	R	R	R	R	-
Druhy zodpovedností: **A** – **A**pproved/Schvalovanie; **R** – Realizácia; **C** – **K**onzultácia; **I** - Informovanie						

11.2 Organization

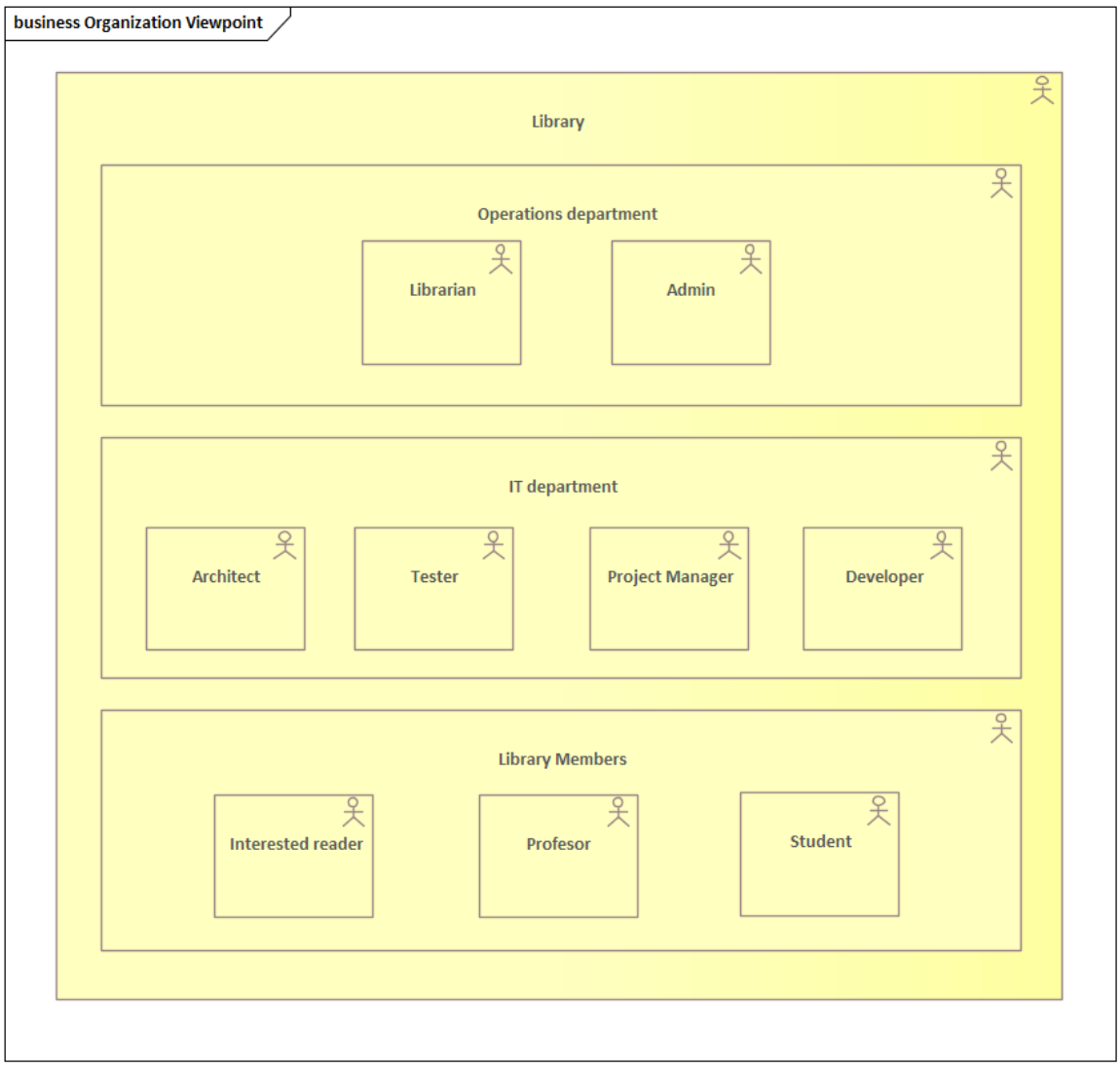
For tracking what needs to be done we used Jira. For communication we used Discord, on which we also had weekly meetings. And we hosted our code on Github Nesquiko/jibrarian [1]

Every week we had a meeting, which lasted on average one hour and thirty minutes. On this weekly meeting everybody reported what they have managed to do during the week, what issues they resolved, or what problem they have. At the end new task were assigned, current sprint was finished and new one was started with new tasks.

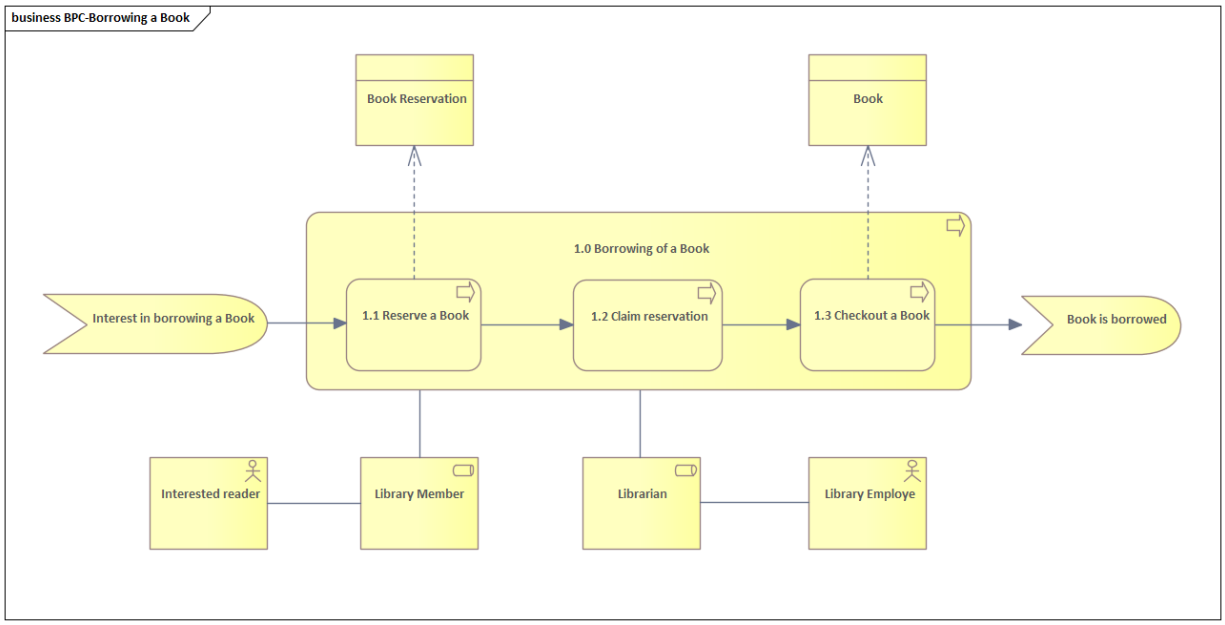
12 ArchiMate Diagrams

This section contains exported diagrams from *doc/eea/vava-jibrarian.qea* Enterprise Architect file. For better details, please open referenced file in Enterprise Architect.

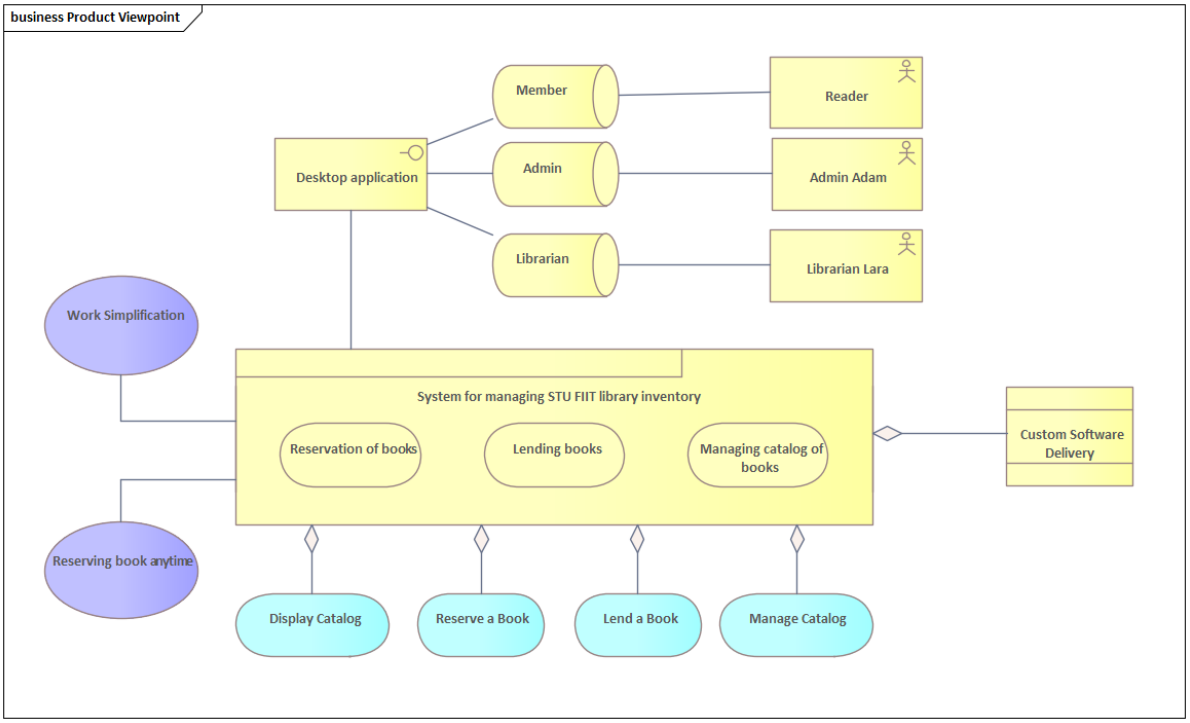
12.1 Organization Viewpoint



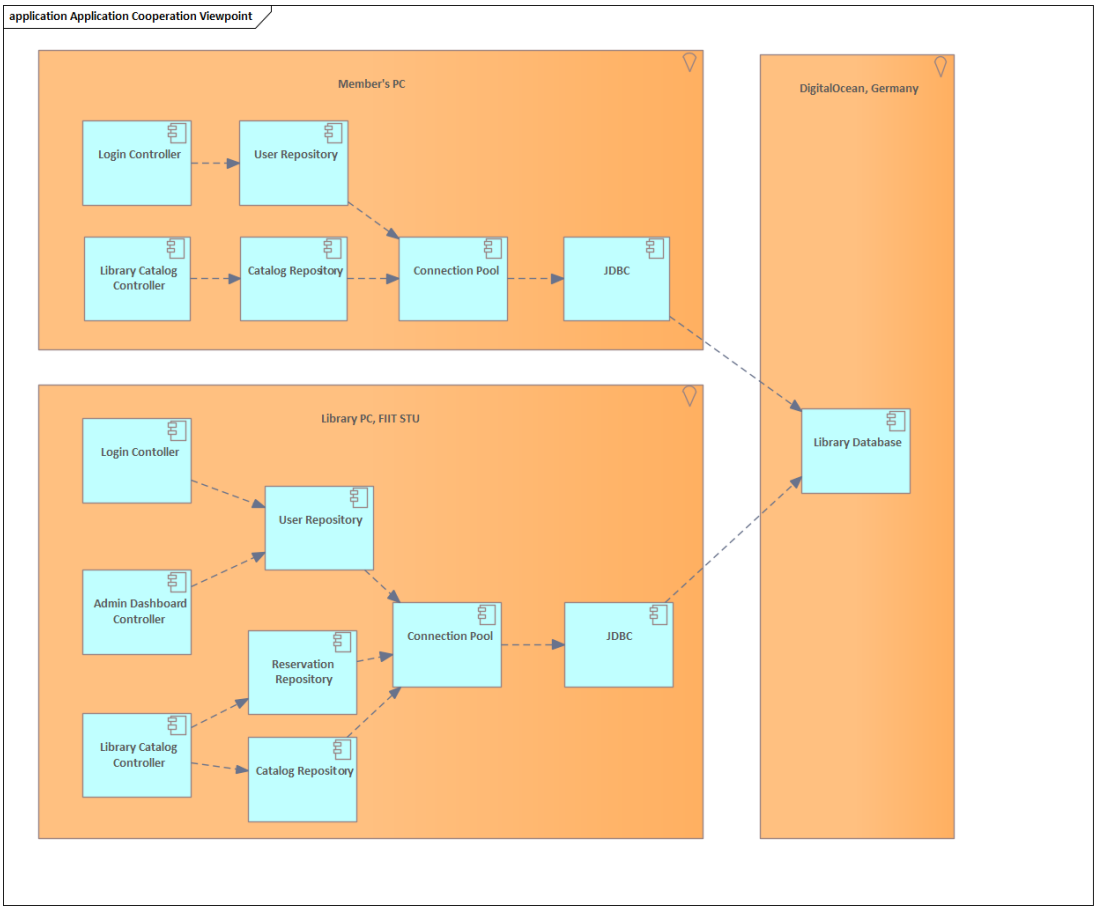
12.2 Business Process Cooperation



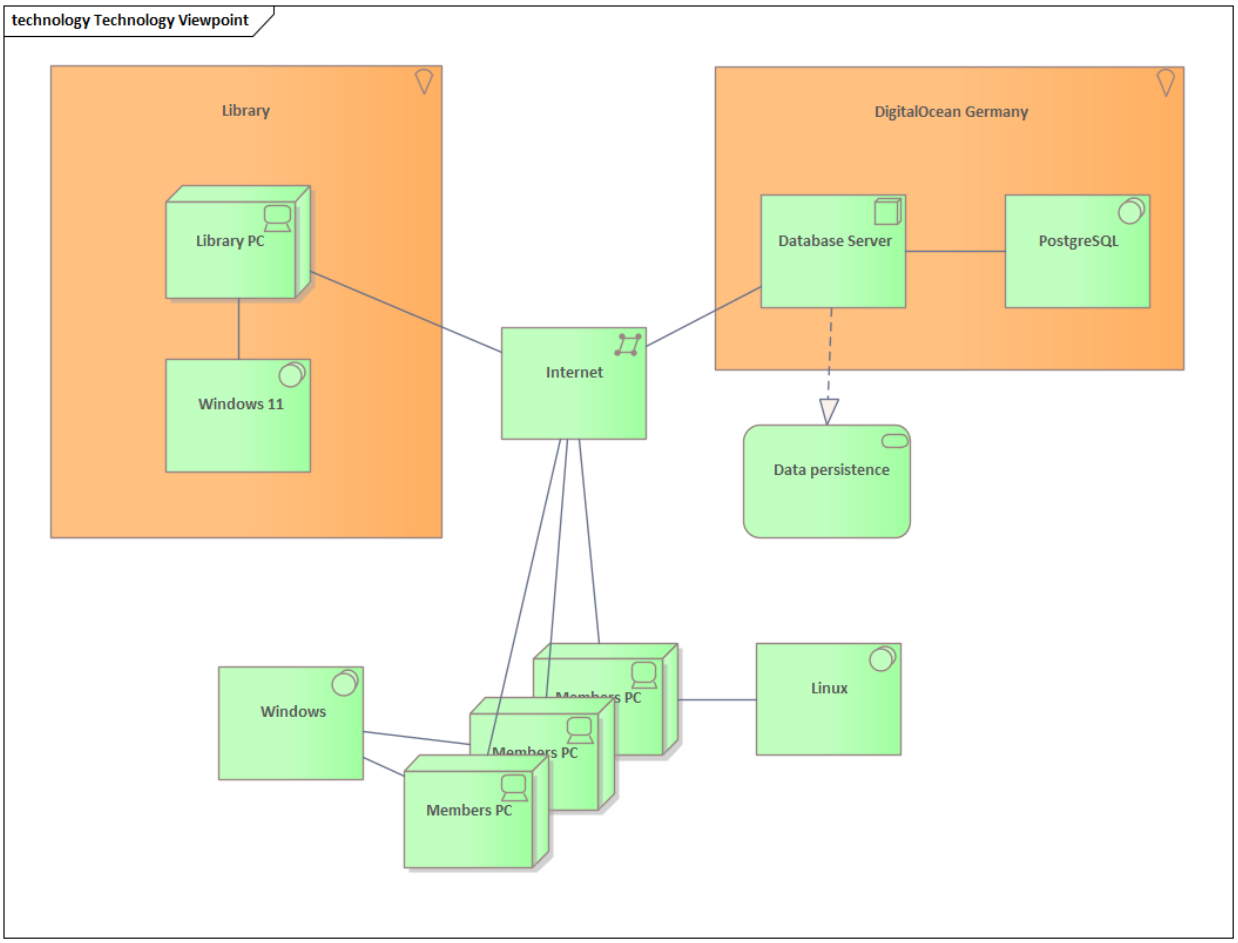
12.3 Product viewpoint



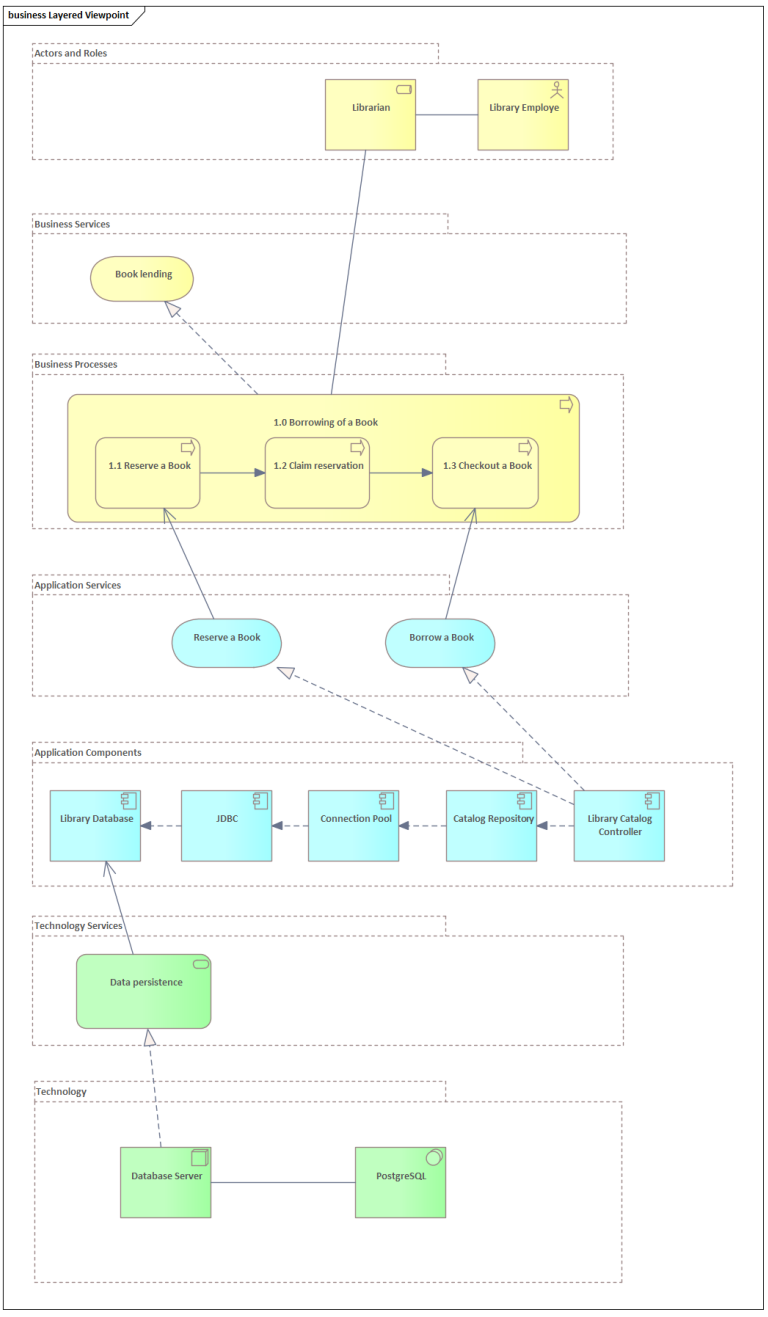
12.4 Application Cooperation Viewpoint



12.5 Technology Viewpoint



12.6 Layered Viewpoint

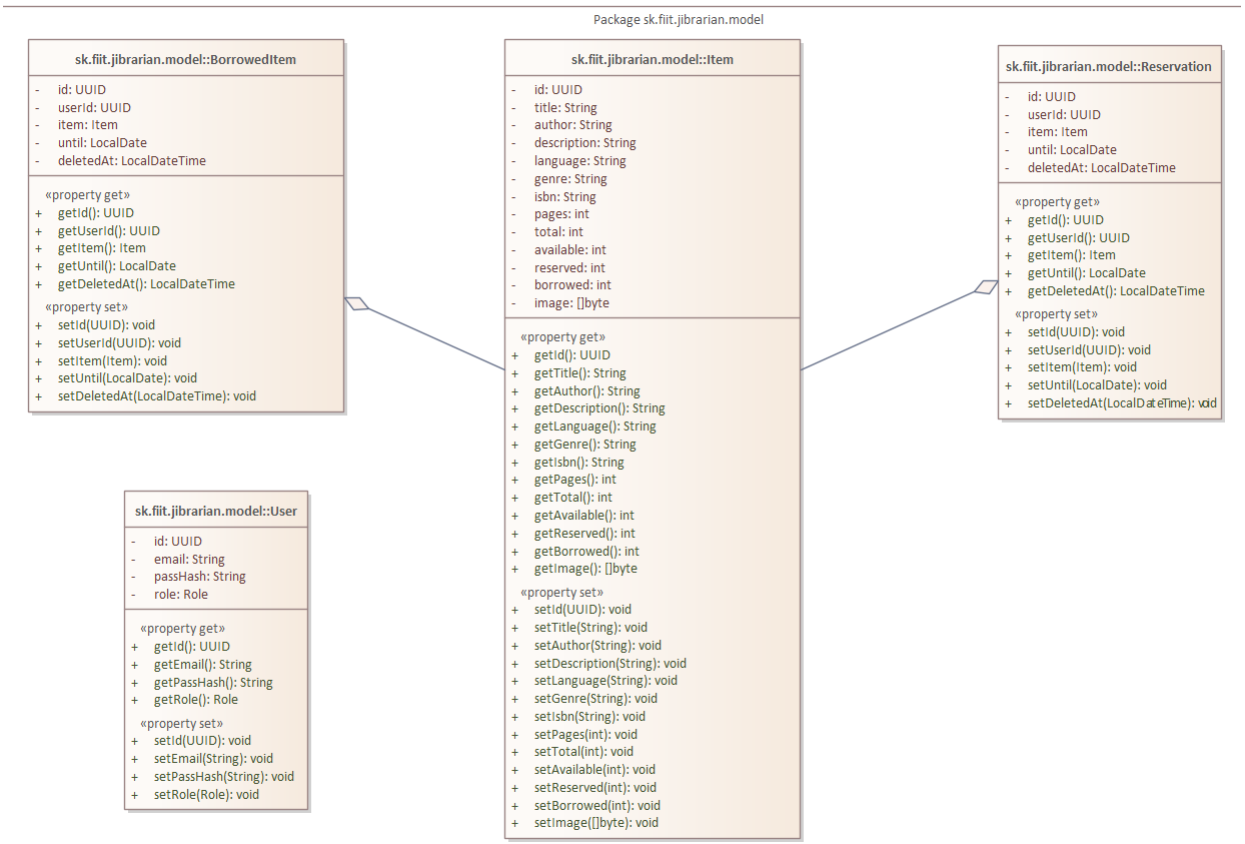


13 Class Diagram

Class diagram is too big to be included in this documentation (if included, it would be unreadable). In this section there are only parts of the whole class diagram. To view the whole class diagram, please open the *doc/eea/vava-jibrarian.qea* in Enterprise Architect and see the *Class Diagram* model.

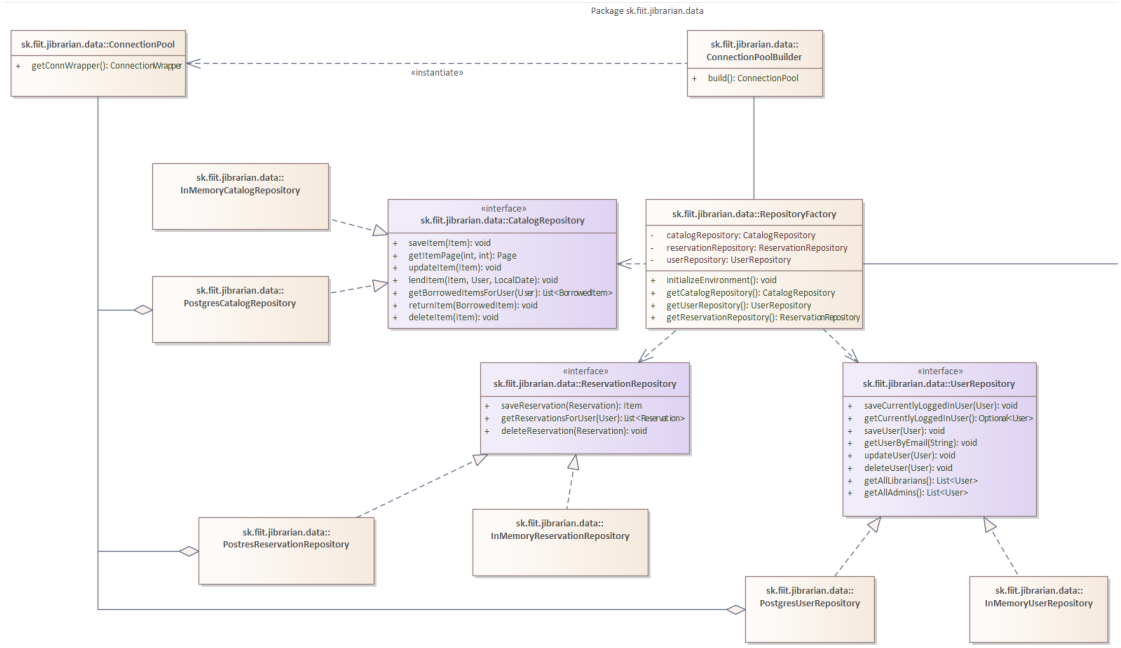
13.1 Package sk.fiit.jibrarian.model

This part shows main classes serving as a model for Jibrarian application.



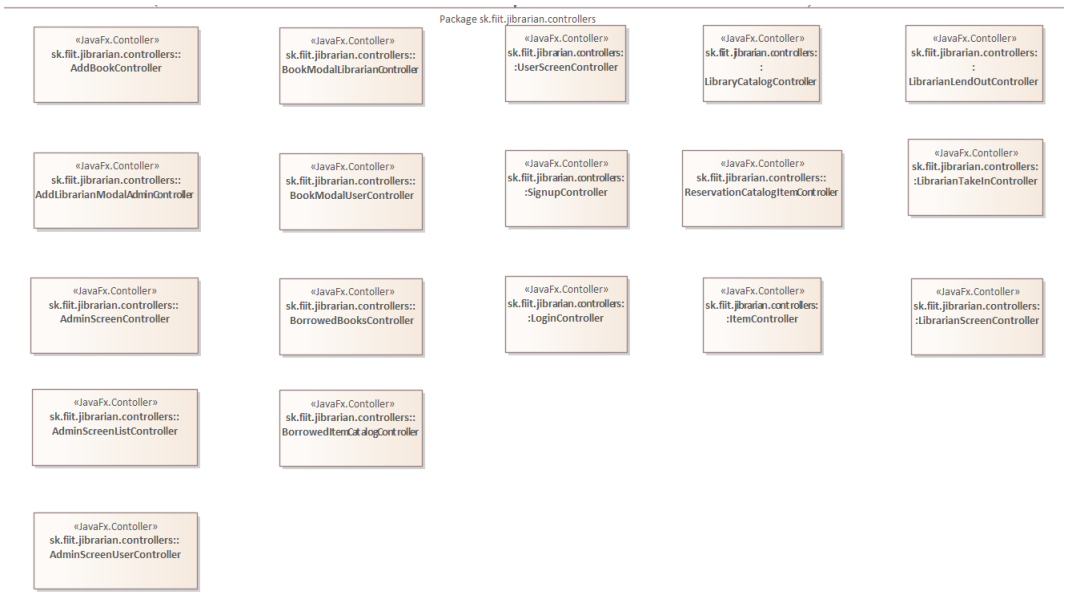
13.2 Package sk.fiit.jibrarian.data

This part of class diagram documents the class hierarchy of the **sk.fiit.jibrarian.data** package, which is responsible for reading and writing data of the application to either RAM or database (based on run environment).



13.3 Package sk.fiit.jibrarian.controllers

This part of class diagram shows all JavaFx controllers used in GUI part of Jibrarian.



14 Assignment requirements

List below documents how are different assignment requirements fulfilled

1. Collections: usage of List<T>and ArrayList<T>
2. Logging: logs containing information about user flow, data manipulation, exceptions and malfunctions
3. Localization: application can be run in English, or Slovak language
4. XML: logs are also stored into xml file
5. Regular Expressions: email validation is done with a regular expression
6. JDBC: application connects to a PostgreSQL DBMS and read/writes data to it
7. Validation: SQL injections are prevented with use of prepared statements
8. GUI: user interface is written in JavaFX
9. 3 types of users: application contains functionality for Library Members, Librarians and Admins
10. Encapsulation in all classes

15 Used technology

This application is written in Java 17 and uses Maven (version 3.8.7) build system for building and testing.

Dependencies

Dependencies listed below are taken from projects *pom.xml*.

- JavaFx
  - org.openjfx:javafx-controls:19.0.2.1
  - org.openjfx:javafx-fxml:19.0.2.1
- PostgreSQL driver: org.postgresql:postgresql:42.6.0
- JUnit
  - org.junit.jupiter:junit-jupiter:5.9.2
  - org.junit.jupiter:junit-jupiter-engine:5.9.2
- BCrypt: at.favre.lib:bcrypt:0.10.2

16 How to run

The easiest way to run the application is importing it into Intellij IDE, and using provided Maven run configurations. More can be read in *./doc/setup.md* and *./doc/run.md*

Provided jar file is a fat jar with all dependencies included.

17 What did we learn

At the start of this summer term, we had no clue about how projects are built in the real world. Until now we had little experience with building something in a team and a more real environment.

From organizational standpoint we have experienced on our own skin how hard it can be to organize a team of 5 programmers. We saw how valuable Jira is for tracking what needs to be done and how far have we come. Weekly meetings were really helpful to show the whole team how we are progressing together, who is working on what and for sharing newly learned knowledge. Also we learned importance of communication the hard way. We can't count how many times someone wrote a piece of code, which was reviewed and seemed fine, but introduced a bug in other part of code.

Other lesson we learned is that writing code isn't enough in the real world. Concepts as enterprise architecture and design are important and should be well thought out, because otherwise there will be problems when the code is already written, but doesn't do anything useful in context of a project.

Each of us learned new Java programming concepts, which can also be used in different languages. Such as logging and importance of what to log and not, how to customize software so it can be used in different locations. How does connecting and communicating with database work. How to program GUI in JavaFX and other smaller concepts, but still important.

Even though our project isn't the greatest application, isn't written in the best way possible, we still learned a lot and all five of us did everything we could to build Jibrarian to the best of our abilities.

We want to express our gratitude to our teacher Mr. Reiter, for teaching us a lot of important and useful things.

References

[1] "GitHub - Nesquiko/jibrarian — github.com." https://github.com/Nesquiko/jibrarian. [Accessed 26-Apr-2023].