

EPOKA Library System Requirements Specification

Version 1.0

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**Software Modelling and Design**

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# **Executive Summary**

## Project Overview

To facilitate and enhance a better access to the education system, an efficient solution is to digitalize the University’s Library in order to bring it closer to all the students as well as to provide better management features to the librarians and administrators of the library. Our work consists of taking all the necessary steps that will result in the creation and maintenance of the finished product: the library web application for Epoka University. As mentioned above this system will be available to three levels of users: the university’s students, the librarians and the administrators.

The account of the administrator will be provided using the backend of the web application development, meaning that the moment this application is deployed, the administrator will be able to access his/her account to which he/she can make modifications, such as changing the password. The supply of the books and their entry in the system will be an available feature for the administrator. Therefore, he/she will be able to enter the information about any new books, such as their title, authors, genres, description, cover page and the number of copies of that particular book that are in stock. In addition to that, the administrator will also be able to update the information provided for each book, such as when errors in their registration are made or when he/she changes the number of copies. This user category is also provided with a feature of deleting books. The administrator can find the entered books in the main page of his/her account. He/she will be able to access statistics of the books that are borrowed and which ones are requested the most in the library. The administrator account will be provided with a feature of receiving messages that come as feedback from students. An important functionality of the administrator will the ability to register librarians, using the Epoka university email of the person they are registering.

Librarians will be able to approve the registration made by the administrator, by clicking approve or reject in the email automatically sent when the administrator is attempting to make the registration. The home page of the librarian account will also contain all the available books. In addition to that he/she will manage the orders made by students: approving orders which sets their status as ‘approved’, changing their status as ‘borrowed’ when the book has been picked up by the student, changing their status as ‘returned’ when the book is returned, and contacting the student when the return date is surpassed.

This web app will also provide useful features for all students, including but not limited to viewing the available books along with information and descriptions for each of them, ordering them for pickup, personalizing their account by adding books to favorites, as well as giving feedback or requests. In order to register, students are only required to create an account using their Epoka email.

The product of this ongoing process of communication, design and implementation will bring down barriers in the accessibility of education and information, helping students find the needed books without having to check the entire physical library. Furthermore, it will also help administrators keep track of the books, and librarians keep track of orders, making sure that the return deadline is respected.

## Purpose and Scope of this Specification

The main purpose of our project is to create, develop, and implement a modern and comprehensive electronic library in our university that will provide all the students, and every faculty member with seamless access to a wide range of books, where they will be able to have their own personal account, mark their favorite books, order electronically hard copies of the books, and send feedback based on their personal experience. The project aims to enhance the overall learning experience at the university and make the process of finding books and ordering them easier for both students and the Epoka library staff.

The scope of the Epoka electronic library project includes the following:

- Development and implementation of the electronic system for the Epoka University library: The process of developing a software to adapt to specific needs of the university community includes the selection of the appropriate software as well as the customization and integration of software with different problem solutions to produce a user-friendly platform as efficiently as possible.

- Access and authentication: The Epoka electronic library system will provide secure and authenticated access to a wide range of electronic resources and will ensure that only authorized users can access the system.

- Books management and organization: The electronic library of our university will ensure that the books are easy to find electronically and can be ordered to access them physically.

- Search tools: The electronic library system will provide advanced search to allow its users easy access to books.

- User account management: The system will allow the students to create and manage their own accounts.

- Accessibility: The Epoka electronic library system will be easily accessible to all users, including those with disabilities.

Our purpose as aspiring Software Engineers is to leave a mark on our university by providing a comprehensive and user-friendly platform for them, supporting learning activities, and enhancing the overall quality of study and experience of the university community.

# **Product/Service Description**

Our team is dedicated to improving access to education by digitalizing the Epoka University library. We have designed a web application that brings the library closer to the students and provides efficient management features for its librarians and administrators. The system will allow administrators to manage the books by adding, modifying or deleting information for each book. On the other hand, librarians will manage the orders and feedback sent from the students. Students will be able to view the available books, order them for pickup, personalize their account by adding books to favorites and provide feedback or requests. The system will provide a better communication between users, which will enhance the learning experience of the students. The system will be available only for active undergraduate and graduate students of Epoka University.

## Product Context

The Epoka University Library System will be a self-contained system and independent of other products. However, it will interface with other related systems such as the university’s student information system and database. It will be integrated with the student information system to ensure that only registered students can access the library system. It will also be integrated with the university’s authentication system to ensure secure access to the system. Our system will be designed to work smoothly with these other systems, ensuring easy operation for the users. The application will be accessible from any device with internet access.

## User Characteristics

The application will be used by three types of users: students, librarians and administrators. The user profiles for each of them are: -University Students: The primary users of the library web application are university students from different faculties like Architecture and Engineering, Economics and Administrative Sciences, Law and Social Sciences and different academic levels, including both undergraduate and graduate students. They will use the application to access information on available books, order for pickup, personalize their account and give feedback or requests. Students are expected to have basic technical knowledge and experience in using web applications; however technical expertise is not a requirement to use the system. -Librarians: The librarians who will use the library web application are part of the existing staff or the University. They will manage the orders of the students and the feedback sent from them. They will also contact students who have not returned borrowed books according to the deadline. They will need approval from the administrators to gain access to the system. They are expected to have advanced technical knowledge and experience in library management. -Administrators: The administrators will be responsible for adding, modifying or deleting the information for each of the books. They will also register librarians, so only authorized staff can take this position within the system. Administrators are expected to have advanced technical knowledge and experience in database managements and library administration.

## Assumptions

• It’s important to have a reliable internet connection available for both students and staff to access the system.

• The hardware equipment, such as computers, laptops or mobile devices, should be able to access the web application.

• The users, including librarians and administrators, have basic computer skills and are familiar with the internet.

• The users should also have access to the necessary login credentials, such as usernames and passwords, to access the web application.

• The system should be developed using programming languages and frameworks that are compatible with the university’s existing IT infrastructure.

• The web application should be designed with responsive design principles to ensure that is can be accessed on different devices with various screen sizes and resolutions.

• The system must respect the data protection regulations and provide enough security measures to protect user data and prevent unauthorized access.

•It is assumed that every active student of the university possesses an active Epoka account.

•It is assumed that the online library system will represent the actual physical books with high accuracy and real-time updates.

## Constraints

There are several factors that will limit the design options for the digitalized library system for Epoka University.

**Parallel Operation with an old system**:

This will be Epoka University’s first library system so our system will not be operating with an old system. However, our system may need to operate in parallel with other systems Epoka has. This may require our system to interface with the other systems.

**Audit Functions**:

Another constraint is the need to track user activity and maintain the integrity of the system. This will affect how data is collected, stored and analyzed.

**Access, management and security**:

The system will need to have access controls and security measures in place, to protect the data and ensure that only the authorized users can access the system. Since our product will be a web application, each user needs to have access to the internet. These constrains will affect the design of the authentication and authorization mechanisms, as well as the encryption and algorithms used to secure the data.

**Criticality of the application**:

The criticality of the web application will constrain the design options in terms of reliability, fault tolerance and disaster recovery. For example, the system is somehow critical to the functioning of the university, and it may need to have redundant servers and backup systems in place to ensure continuity of service.

**System resource constraints:**

Since the Epoka University library system will be a web application, disk space or other hardware resources may not be a significant constraint. However, there may be other resource constraints that need to be considered, such as the amount of memory and processing power required to handle user requests and to ensure that the system runs smoothly. The design of the system architecture and algorithms will need to take these constrains into account to optimize the use of resources and ensure efficient performance.

**Other design constraints:**

There may be other design constrains imposed by the university, such as programming language or framework preferences. These constrains will affect the choice of technologies and tools used to develop the system. We will be using HTML, CSS, JavaScript and PHP to develop the library web application. In addition, to connect the PHP server with the database, which will be built using MySQL, we will also use JDBC. These choices of technologies and tools are influenced by the university’s preferences.

## Dependencies

• The system may require accurate and up-to-date data from the university’s existing library.

• The system may need to be integrated with other university’s systems, such as the student information system or learning management system, to ensure seamless access to library resources and services.

• The development of the system may rely on specific technologies or tools, such as a particular programming language, database system or web framework.

• Certain features or modules may need to be developed back-to-back and may depend on the completion of other project milestones or components, such as the design of the user interface.

# **Requirements**

## Functional Requirements

| **Req#** | **Requirement** | **Comments** | **Priority** | **Date Reviewed** | **SME Reviewed / Approved** |
| --- | --- | --- | --- | --- | --- |
| BR\_01 | The system shall allow the registration of either Epoka University students, librarians and library administrator. | The users if the Epoka Library System will be either students, librarians or administrators. | 1 | 06/04/23 | Anita Mjeshtri |
| BR\_02 | The system shall provide different graphical user interfaces for each of these three types of users. | Each type of user will be provided with different features, therefore it is necessary to have a different GUI. | 1 | 06/04/23 | Anita Mjeshtri |
| BR\_03 | The student user shall be able to register by providing a valid Epoka email address, first name, last name, password and phone number. | The email address will be checked if valid, based on the specifications of Epoka Email for students, consisting of the first letter of the first name, the last name and enrollment year. | 1 | 06/04/23 | Anita Mjeshtri |
| BR\_04 | If the status of the student becomes passive from the university, his status in the library system will also change to passive. | When a student is transferred, or he/she finished his/her studies the status is changed to passive. | 2 | 06/04/23 | Anita Mjeshtri |
| BR\_05 | The student user shall be able to verify his/her registration by receiving a special code in their email. | To ensure that the email entered for registration actually belongs to the user, the code will be sent by email and entered on the website by the student registering. | 1 | 06/04/23 | Anita Mjeshtri |
| BR\_06 | The student user shall be able to log in to his/her account by providing the correct information: Epoka email and password. | To access his/her account the user should input a valid email address that matches with the entered password for that address. | 1 | 06/04/23 | Anita Mjeshtri |
| BR\_07 | The system shall grant student users the information: including title, author, genre, picture of the cover and the number of books in stock, for all the books offered by the EPOKA University Library, in the home page. | The home page will contain all the available books along with the information about each of them. | 1 | 06/04/23 | Anita Mjeshtri |
| BR\_08 | The student user shall be able to click on the desired book, to get more information about the book, including the information mentioned above as well as a short description. | The students can view the information about all the books available in the library. | 2 | 06/04/23 | Anita Mjeshtri |
| BR\_09 | The student user shall be able to order a book, that he will get to pick up within the specified time frame. | Student users can order a book, whose status will be 'ordered' until the student picks it up, in this case its status will change to 'borrowed'. | 1 | 06/04/23 | Anita Mjeshtri |
| BR\_10 | When a book is ordered by a student, its stock number shall decrease. | Each time a book is ordered by a student user its stock will decrease, until it reaches 0. In this case the book can still be viewed but not ordered. | 1 | 06/04/23 | Anita Mjeshtri |
| BR\_11 | The student user should be able to save books as favorites. | Students can save books as favorites that will be added to their personal favorites page(even when the stock of the book is 0) that is unique for each student. | 1 | 06/04/23 | Anita Mjeshtri |
| BR\_12 | The student user should be able to filter the books by the desired genres and authors that are available. | Student users can choose to view only the books of a certain genre or of a certain author. | 2 | 06/04/23 | Anita Mjeshtri |
| BR\_13 | The student user shall be able to search for a specific book title. | The student can search for the desired book by book title. | 2 | 06/04/23 | Anita Mjeshtri |
| BR\_14 | The student user should be able to give feedback or send a message about suggestions or requests. | Students can send suggestions or feedback about the books and the service. | 3 | 06/04/23 | Anita Mjeshtri |
| BR\_15 | The feedback sent by users should appear on the account of the librarian and administrator. | The messages sent by student users can be read by both the librarian and the manager. | 3 | 06/04/23 | Anita Mjeshtri |
| BR\_16 | The student user can view his/her profile. | Student users can view the information they have entered: email, password, first name, last name and phone number. | 2 | 06/04/23 | Anita Mjeshtri |
| BR\_17 | The student user can modify his/her name, last name, password, phone number and profile picture in the profile page. | Users can change their name, last name, phone number, password and modify the default profile picture. | 2 | 06/04/23 | Anita Mjeshtri |
| BR\_18 | The main administrator shall be registered from the server side, when the web application is made available. | To ensure that the library is administrated by the competent person, his account will be the first one registered. | 1 | 06/04/23 | Anita Mjeshtri |
| BR\_19 | The library administrator shall be able to log in to his/her account by providing the correct information: Epoka email and password. | The administrator must enter the valid Epoka email and password to access his/her account. | 1 | 06/04/23 | Anita Mjeshtri |
| BR\_20 | The administrator shall be able to enter new books, along with the information about each of them (title, author, genre, description, cover page and stock). | The administrator enters the information about each new book he/she enters into the system | 1 | 06/04/23 | Anita Mjeshtri |
| BR\_21 | A list of all the available books shall be represented in the home page of the account of the library administrator. | The administrator can view all the books and their information. | 1 | 06/04/23 | Anita Mjeshtri |
| BR\_22 | The administrator shall register the librarians by inputting their information (Epoka email, password, first name, last name and phone number). | The administrator can enter the information about the librarian that will be entered in the system | 1 | 06/04/23 | Anita Mjeshtri |
| BR\_23 | The librarian can validate the information entered by the administrator, by receiving an email with this information. | To verify the account creation the librarian can check and verify it from his/her email account. | 1 | 06/04/23 | Anita Mjeshtri |
| BR\_24 | A messages section shall be provided to the library administrator to which the incoming feedback from student users shall be stored. | Library administrators can review the messages sent by the student users. | 3 | 06/04/23 | Anita Mjeshtri |
| BR\_25 | The administrator of the library shall be able to update the information about a book. | The administrator can modify the title, author, genre, stock, description and cover page of the book. | 2 | 06/04/23 | Anita Mjeshtri |
| BR\_26 | The administrator of the library shall be able to delete books. | The administrator can delete books when they are removed from the library. | 2 | 06/04/23 | Amara Çela |
| BR\_27 | Each student shall be able to see all the books in his/her area of study by selecting his/her specific field of study. | The student can choose any of the areas of study offered at Epoka University (Software Engineering, Law, Economics, Business Informatics etc.) and search for the list of books that they will study through all the years at Epoka University. | 3 | 06/04/23 | Amara Çela |
| BR\_28 | The student shall be notified one day before the deadline for returning the borrowed book. | A notification will be sent to the students one day before he/she has to return the book. | 2 | 06/04/23 | Amara Çela |
| BR\_29 | The student shall be able to see or edit his/her favorite book list. | The students can see all the books in the favorite section, but they also can remove a specific book from their favorites list by pressing a button. | 2 | 06/04/23 | Amara Çela |
| BR\_30 | The student shall be able to see or edit his/her ordered book list. | The students can see all the books in the order section, but they also can remove a specific book from their ordered list by pressing a button, when the book has not yet been picked up by him/her. | 1 | 06/04/23 | Amara Çela |
| BR\_31 | When a book is returned, its stock number shall increase. | When a book is returned, its stock number will be increased by the librarian. If the stock of a book was zero and that book was unavailable to order for other students, that specific book will now be available for anyone who wants to order it. | 1 | 06/04/23 | Amara Çela |
| BR\_32 | Each student shall manage his/her notification settings. | The student shall be able to manage if he/she wants to receive notifications from Epoka Library, such as the notification for the book returning. | 3 | 06/04/23 | Amara Çela |
| BR\_33 | Each student shall be able to deactivate his/her account for a specified period. | Students may choose to temporarily deactivate their account for a week or a month. | 3 | 06/04/23 | Amara Çela |
| BR\_34 | Each student shall be able to delete his/her account. | Students will be able to permanently delete their account and will be asked to enter their account password and to confirm the deletion of the account, while being aware that all the history of their account (favorite and ordered lists) will be deleted as well. | 2 | 06/04/23 | Amara Çela |
| BR\_35 | Each student shall be able to find support in the “Help and Support” section. | Students should be able to find the frequently asked questions which may answer the question they may have. Otherwise, they can contact the librarian through the contact information provided for them. | 2 | 06/04/23 | Amara Çela |
| BR\_36 | The administrator shall be able to view or edit his/her profile. | The administrator can edit his/her name, surname, phone number, password. | 1 | 06/04/23 | Amara Çela |
| BR\_37 | The administrator should receive a confirmation email every time he/she tries to change his/her account password. | To change the password, the old password should be entered by the administrator and then an email confirmation about the password change will be sent to the administrator. | 2 | 06/04/23 | Amara Çela |
| BR\_38 | The administrator shall be able to view the statistics of the library. | The administrator can see the most ordered books from the students. | 1 | 06/04/23 | Amara Çela |
| BR\_39 | The administrator shall be able to discharge a librarian. | The administrator can remove a librarian from the system by deleting his/her account. | 2 | 06/04/23 | Amara Çela |
| BR\_40 | The librarian shall be able to view his/her profile. | The librarians can see their profile but cannot edit their personal information after they have confirmed it to the administrator. | 2 | 06/04/23 | Amara Çela |
| BR\_41 | The librarian shall be able to login into their account by entering their Epoka email and password. | The password is given to the librarian by the administrator who is the person who created his/her account. | 2 | 06/04/23 | Amara Çela |
| BR\_42 | When the librarian is trying to delete his/her account a permission request is sent to the administrator. | Since the account was initially created by the administrator and this post was granted to him/her by the administrator, they should first quit their post and then, after their request is approved, they may be granted permission to delete their account or their account may be deleted directly from the administrator. | 1 | 06/04/23 | Amara Çela |
| BR\_43 | The librarian shall be able to see the list of the books in the system. | The librarians can see all the books registered in the system with all their detailed information. | 1 | 06/04/23 | Amara Çela |
| BR\_44 | The librarians shall be able to confirm the returned book. | After a book is returned by a specific student, it is confirmed by the librarian and the stock number of that specific book is increased. The book is removed from the student’s ordered list. | 1 | 06/04/23 | Amara Çela |
| BR\_45 | The librarian shall be able to search books by their title or by their author. | Each librarian should be able to search for a specific book by the book name or its author. | 2 | 06/04/23 | Amara Çela |
| BR\_46 | The administrator shall be alerted when the stock number of a book falls below five. | An alert message should be displayed to the administrator whenever there are less than five copies of a book. | 2 | 06/04/23 | Amara Çela |
| BR\_47 | The student shall be able to order only one copy of the book at a time. | Students cannot order two copies of the same book. | 1 | 06/04/23 | Amara Çela |
| BR\_48 | Administrators shall be able to modify the information of the librarian account. | If the administrator considers a change in the librarian account as necessary, he/she can do it with the librarian consensus. If the librarian  would like to change something, they should ask the administrator to do it. | 2 | 06/04/23 | Amara Çela |
| BR\_49 | The librarian shall be notified when a student has not returned the borrowed book within his/her deadline. | A notification will be shown to the librarian when a specific student has not returned the book within the deadline and the librarian should contact the student. | 1 | 06/04/23 | Amara Çela |
| BR\_50 | Students with disabilities shall be able to use the library as any other student, without any difficulties. | Epoka Library System is being designed to be accessible to all Epoka students. Students with disabilities should be able to use features  such as screen reader compatibility, keyboard navigation or alternative text for images. | 1 | 06/04/23 | Amara Çela |
| BR\_51 | The Epoka electronic library shall be optimized for any device, allowing Epoka’s students to access electronic resources from their devices. | Students, administrators, librarians and anyone part of the Epoka University can access Epoka’s library electronically from any device | 1 | 06/04/23 | Amara Çela |

## Non-Functional Requirements

### Product Requirements

#### **User Interface Requirements**

The user interface of this system is divided into five (5) main sections:

* Registration interface
* Home page interface (books)
* Student Interface
* Librarian interface
* Administrator interface

**Registration Interface:**

This section outlines the requirements for the registration interface of the Epoka University Library System.  The registration interface will consist of two main processes, "Log In" and "Sign Up".

The Sign-Up process can be completed only by students since the administrator must be registered when the system is deployed, and the librarians will be added manually by the administrator. The account creation process for the students will be completed using the email address provided by Epoka University.

The students must enter their first and last name, username, phone number, and password. Before clicking sign up the system prompts the students to verify their passwords.

The Log-In interface will consist of a user entering the email address provided by Epoka University, and then the password. The Log-In interface can be applied to all user types.

A "forgot password" functionality will assist users who may forget their password or lose access to their accounts. Clicking on it will help users reset their passwords and regain access to their accounts.

**Home Page interface:**

This interface will be accessed by every registered user. The purpose of this home page is to display all of the books registered in the Epoka university library. The data will be filtered and organized to be easily navigable and user-friendly.

Initially, the user can search directly for the book they’re looking for, or the user can even specify their major by choosing a study degree and the list of courses taken from the syllabus will show on the page. The user may select a course and every book from that course will appear. The “view as” button can allow the user to show the books as a list, as small icon books, or as large icon books. The “order by” button will order the books by the number of downloads, publication time, title, author name, etc. A book is shown by its cover and title. By clicking on it the user can get more information about the book size, number of pages, name of the author, publication year, and edition. Additionally, student users have more complex and special functionalities on the homepage, which will be furtherly mentioned in the “Student Interface” section.

**Student Interface:**

Except for basic functionalities like searching and viewing books, student users have other special functionalities, such that by hovering over the book, the system can assist students to add the book to their favorites or order it by clicking on two separate buttons. Adding a book to favorites will make it appear on the “Book collection”. Furthermore, ordering or reserving the book will facilitate the students with information like library availability (borrowed, available) of the book, time, and date when the student can reserve the book. The reservation of the book by a student will cause them to get the approval if the book is on stock, otherwise the button can appear disabled, or the book will not show up as available. After approval, the book will appear as reserved automatically. Then the student must go to the library and get the book. If a student user does not show up, the librarian will wait for them for 12 hours, and after that the librarian can either deny the request or notify the students by their phone number, however, it is not mandatory to do so.

The “Book collection” functionality provides the students to see the books that are added to their favorites, and the ordered books. The students can also make their “Book collection” private or public as they wish. One week before the students get daily notifications about their due date to submit the books.

Students can give feedback on the system or even report bugs and inconveniences. These messages can be read by the librarians and the administrator. Student users can view their profiles and edit personal data.

A green dot in a student’s profile indicates an active user in terms of accessibility, while a grey dot implies that this user has no longer access to the library.

**Librarian Interface:**

To gain access to their interface, librarians first have to approve the registration of their profile by the administrator.

The librarian will have access to the default homepage without any specific features like the student users.

The “Borrowers” functionality consists of listing the borrowers of the books based on left days in ascending or descending order. If there are students that don’t submit their books in time, their records will immediately turn red. Then, the librarian can choose to click on their profile and call them by the phone number shown in their profile, or even ignore the late submission for a few days if the book has a low demand.

When a student submits a book in the library, the librarian must make a book “returned”, so the in-library availability of the book will become “available” for students to view. On the other hand, when many students reserve a book, the system will automatically approve the request of the student who applied first.

**Administrator Interface:**

The Administrator Interface is a key component of the system, as it facilitates the manual registration of librarians and the management of book records. Upon deployment, developers will manually register the administrator. The administrator is responsible for adding librarians to the system, which can be accomplished by selecting the "Add Librarians" button located in the left pane of the interface. The librarian registration process mirrors that of student registration.

The administrator will also add books and edit them. On the bottom of the “Add Librarians”, There will be a “View Books” which when clicked will show all the books as a table. The table will have columns like title, author name, quantity or stock, date of publication, date of import in the system, status (borrowed, returned, available), number of pages, etc. The administrator can edit the information of the book, delete the book from the database as a record, or even add a new book.

The administrator can read the messages that students may send, like reports about bugs, suggestions, or complaints in terms of the library service. The bug reports will be communicated to the software developers by the administrator, while other notifications will be handled properly by the administrator and even by the librarians if needed.

#### **Usability**

Usability of the software refers to the extent to which the product can be used to efficiently achieve the goals of the intended audience. There are a couple of points that make up the usability of a software:

* Learnability: the software must be easy to learn by the three different types of users. The application will be easy to understand for all students, librarians, and the administrator of the library. There will be clear instructions to each command in the different views of the user interfaces.
* Accessibility: the software will have to be available remotely as each student may use it from their own devices. The application should be available for both pc and mobile use.
* Responsiveness: the software must be highly responsive. It must be able to successfully respond to the user’s requests in real time, therefore operating on and changing data in real time on both the student and librarian side.
* Flexibility: the program should be flexible enough to accommodate different user needs and preferences. It will allow customization on certain parts such as setting or changing passwords and adding available books to the database. The developers will also be able to maintain and update the program when needed.
* Effectiveness: The app must be simple and easy to use for both students and the librarians running it therefore making it very practical and effective. It will help digitize and modernize the process of borrowing books from the school library.
* Consistency: the application must use well known terminology, so users find it easy to understand and navigate through the system.
* Efficiency: the user should find it very easy to complete every task, with easy commands and instructions even if it is the first time the user is in contact with the application or they haven't used it in a while.
* The application should be very simple to use for all students. It will approximately only take a few minutes for a student to get up to speed with the app as it will be a very well-designed, intuitive application.
* As they are essentially administering the application, librarians and administrators may need a bit more time to become completely familiar with all of its capabilities. Although it will take some time to become familiar with the app, it should be noted that a week of use should be sufficient for librarians and administrators to become skilled in using it.

#### **Efficiency**

Efficiency of the software does not mean just making sure that the software completes all the tasks given to it. There are two main groups of requirements that determine how efficient a system is, performance and space requirements.

##### Performance Requirements

* Response time: the system should be able to respond to the user requests in real-time with no lag or delay.
* Throughput: the system should be able to handle a relatively high flow of data at a time as multiple students may be using the application all at once. The program should be able to respond to every single request as soon as the command is given without compromising its speed or performance.
* Compatibility: the application should be compatible with different hardware such as computers or mobiles as long as they have a connection to the internet as most functions will require it. Regardless of the device the application is being used on, the performance and functionality should not be affected.

##### Space Requirements

Our software is a web application which means users will not have to download anything

to their device. This means that there is no required space needed for the application and

the storage of the user's device will not be affected. They will simply have to search for the

application online on a search engine to use it.

#### **Dependability**

* The data of the books in the Homepage depends on the BookList database.
* Registering in the library using the Epoka Mail depends on the Epoka Account.
* When the student users search and click courses, the courses are depending on the syllabus provided by the department of the university.
* The approval of a reservation request made by a student depends on the time the request was submitted.
* The account will be considered active and passive based on the information from EIS platform of Epoka University.

**Availability**

* The application will be available only if the device has access to the internet.
* The application will be available to users in any time, however in the weekends, holidays, or out of the university season reserving the books will not be available. Other features like viewing the books or adding them to favorites will still work.
* The application will be available at any geographic location by any device and phone number, however, only accounts with Epoka university email addresses will be able to get registered.

**Reliability**

The software has to run correctly at all times, even at nights or weekends it should produce the expected outputs for the given inputs consistently. Since this software is going to be used by a large number of students, it must be powerful enough to withhold all the students interacting with it at a time, without crashing or slowing down. It is important that the list of books updates as the students place their requests in real time.

To make sure the system is reliable, it will undergo a lot of testing before it is publicly used and it will be continuously monitored when published. To ensure that the system meets the user expectations, it will also be updated and maintained regularly after publishing

**Monitoring**

After publishing the application, the developers will continue testing out the system along with students and librarians for the upcoming days to ensure that it withholds all of the user's operating on it at a time while looking for any bugs along the way.

The developers will be in direct contact with the administrator of the system who will report any bug or fault found in the system by any user and will act on it as soon as possible with as little downtime as possible.

The system will be able to run on its own without the need of the developers and will be easily operated by the administrator and librarians. Each student can create their own account in the application and can then use the application to borrow books from the

library without the need of a librarian or developer.

**Maintenance**

Specify attributes of the system that relate to ease of maintenance. These requirements may relate to modularity, complexity, or interface design. Requirements should not be placed here simply because they are thought to be good design practices.

**Integrity & Security**

The integrity of a software is critical for ensuring the reliability, security and trustworthiness of a software system. Therefore, the developers must take steps to maintain the software throughout its life cycle.

* Users will only be able to access the given interfaces according to the group they belong to.
* Students and librarians will only be able to change their own accounts data and information.
* The administrator can grant a librarian access to use the system.
* Students will not have direct access to the book database and will not be able to change any data on it.
* Account passwords will have to follow certain rules to make them harder to guess.
* There is no sensitive personal data stored within a user's account.
* Several security measures will be implemented on the software and will be revised continuously.
* The code will be reviewed and examined for any errors or vulnerabilities that could compromise its integrity.

### Organizational Requirements

#### **Environmental Requirements**

* Internet Access: The web app requires a reliable and stable internet connection to function properly.
* Web Browsers: The web app should be compatible with all the popular web browsers.
* Devices: The web app should be accessible on all devices like laptops, desktops, mobile phones and tablets.
* Security: The app should ensure that sensitive user data is very well protected.
* Technical Support: Any glitches or bugs that affect the app’s functionality should be dealt with quickly.
* User-friendly Interface: The app should have user-friendly features and be fairly easy to navigate and use to encourage student engagement.

#### **3.2.2.2 Operational Requirements**

* **User Authentication:** Students should be allowed to create an account and log in with the university’s email to access the app.
* **Book List:** The web app should provide the list of books the library has and the details for each book.
* **Borrowing System:** The web app should have the borrowing system that allows the users to borrow the books they need.
* **Search and Filter:** Students should be able to search and filter the book list easily by title, author, publication date, availability status and so forth.
* **Notification System**: The app should notify the students about the status of their borrowed books, or the availability of the books they want.
* **User Feedback:** the app should allow the users to provide feedback on the overall user experience.

#### **Development Requirements**

The app will be accessed through internet connection such as Wi-Fi or mobile data. Other network issues will be handled by the system.

### External Requirements

#### **Regulatory Requirements**

Personal information such as names, surnames, and borrowing history should be gathered, processed, and kept in a safe and lawful manner. The app should also follow some security standards, such as SSL and two-factor authentication, to prevent unauthorized access or security breaches.

#### **Ethical Requirements**

1. Request Permission Only When We Need It:

It is very easy to go overboard with sending access requests to the users. We might think it is easier to get those permissions out of the, but the user does not feel the same way. They feel uncomfortable.

2. Stop Promoting the Quantity of Engagement:

There’s a reason some apps are so engaging and addictive, and we will promote the opposite of that. We will advise our users to use the app only when needed.

3. Never Use Dark Patterns:  
Dark patterns are a type of design trick, and they may take many different shapes. For instance:

●  Asking ambiguous or perplexing questions in an effort to sway users' responses in favor.

●  Ads that look like ordinary content.

●  Automatically starting a subscription without reminding users the trial is about to expire.

#### **Legislative Requirements**

* **Copyright Laws:** The app should comply with copyright laws and policies, such as fair use guidelines and the Copyright Act.
* **Protection of Personal Information Laws:** The app should follow all the best practices regarding data protection and privacy. It should ensure the security of the data and protect the confidentiality of the records.
* **User Compliance:** When the students use the app, they must confirm their acceptance of the terms of use and privacy policies. If they do not agree with one or many of these terms, they are free to not use our application.

##### Accounting Requirements

Due to the nature of our web app, no accounting requirements will be implemented.

##### Security Requirements

* **Authentication:** The web app should require users to authenticate themselves before any access permission is given.
* **Authorization:** The web app should provide authorization on the users based on their roles and privileges. For example, students should only be allowed to order books and view their history, while librarians have additional privileges.
* **Encryption:** All sensitive data transmitted between the users’ devices and the app should be encrypted following a protocol like HTTPS.
* **Secure Passwords:** Password should be hashed and salted according to the industry standards.
* **Session Management:** The users should be logged out after a period of inactivity.
* **Regular Updates:** The app should regularly be updated to fix bugs and patch security flaws.

## Domain Requirements

We will use the top-level domain that educational institutions use, .edu domain. To be more specific the domain will be .epoka.edu.al. Because the library will be part of Epoka University and will be used only by Epoka students, we are qualified to use that domain ending.