Software Architecture and Quality

Assignment 2

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Part A: Documentation Beyond Views

S. No	Modules
1	Documentation RoadMap
2	View Overview
3	System Overview
4	Rationale
5	Module View
6	Component & Connector (C&C) View
7	Deployment view

1 Documentation RoadMap:

According to this document we have discussed and explains where each module is located and how the author makes it easy for the readers to find the information in the document. The paper contains two separated main sections called Part-A and Part-B. The sections consist of subsections, these sections are clearly explained for the reader may understand. The above table contains what detail of the document.

2.View overview:

In this section the view summary is discussed, and the views are mentioned, and the explanations are as below:

The model view contains several views, namely:

I. Generalization View
II. Decomposition View
III. Layered View/ Uses View

We have chosen a decomposition view, and the explanation is:

- The key reason for chosen the decomposition view is that it clearly demonstrates when improvements have been made to the software's architecture.
- The decomposition view is demonstrated in detail the arrangement of the modules and sub-modules.
- The view is primarily used to provide feedback for other device perspectives in which tasks can be easily identified by part-of-relation.
- This design can be used for demonstrating how system tasks are divided into modules and how they are decomposed into sub-components.
- The decomposition is often using the input for a system's work function views that maps parts of a software system into the organizing units and is responsible for their implementation and testing.

We have chosen Sanity-Check pattern, and the explanation is:

- The sanity check pattern is used by the Decomposition view so that the system is good if the method is not correct.
- The design pattern ensures that the system will not affect when the system is created by any deviations from the security threats or deviations.
- The sanity-check pattern is used for data integrity checks.
- The sanity-check pattern is used for monitoring input channels.
- The sanity-check pattern makes excellent architecture at a low cost.

The Component & Connector (C&C) view contains several views, namely:

I. Service-Oriented Architecture (SOA) View
II. Pipe-and-Filter View III. Shared-Data view

We have chosen a Service-Oriented Architecture (SOA) view, and the explanation is:

- This view is the best view for system-wide implementation that provides a good understanding of system architecture.
- This view is designed with an ESB registry that facilitates dynamic configuration. By disturbing components and systems, no new versions are needed.
- This view includes integrated modules made from different languages and technologies because this is our main objective of the learning platform to ensure that the learning platform achieves its business goals and has good architecture.
- The main properties of the Service-Oriented Architecture (SOA) view is performance, reliability, cost, and security, etc.
- The Service-Oriented Architecture (SOA) view will be developed in various platforms and languages.

The pattern instantiated by the Services-oriented architecture view would be the Homogeneous Redundancy Pattern, which is justified as following:

- Even if the system is failing, the pattern helps the software smoothly to operate.
- This contains fault protection during system performance and is a good model for a service-oriented view since there are many components and elements.
- Each design has a secondary support channel, which is quickly fully programmable and sequential when the main channel fails.

In the Allocation View there are two views, that is:

I. Implementation
View II. Deployment View

We have chosen a Deployment view, and the explanation is:

- The view concentrates on the C&C standard operating run-time constraints contact, to demonstrate exactly the issue of the architecture.
- From the allocation view, the deployment view is best used to provide the best view for security, performance, durability, and accessibility.
- The deployment view defines the geographical distribution of the architecture or the component structure of the program running.
- This view analyzing software, the view supports the cost estimate of the hardware.

The model instantiated by Deployment View is Double Programmable Redundancy. The reasons for the deployment view are as follows:

- The view has three copies of channels running simultaneously to reduce the chances of having a presence fault in the system.
- Even if the system has a fault the method will work, because it has different channels and if one of them fails, the system has a backup.

3. System Overview

In this task, we have attempted to apply architectural style and views for the definition of the structure. The problem description suggests that the **library management system** uses the Creative Learning Platform-CLI, a learning platform for students, staff and the administrator of the program are using. The existing platform users discussed various problems such as the lack of user registration assistance, book information, and so on. The student Library wishes to move to a new platform with all its previous functionality and only a limited number of additional needs. After analyzing the problems and examining how important software architecture is, we realize that the previous system has bad architecture design. We are needed to design the software architecture for the new system required by the Library. In order to make a good

architecture and a better working environment, we have derived views from Module C&C and Allocation perspectives.

The most important use cases are mentioned below

Use case number	Use cases
1	Library management (Register new user, edit user data, Update book records, Search book)
2	Database/ File Storage
3	Resource Management (Register book, Issue book, Update user records)
4	Feedback
5	Support

Justification of the Use Cases:

1) Library management: The functionality of this use case is to provide how new users register for the account in the library with user id and secure password after that registration administrator will checks the user details valid or not if its valid administrator will permit the library. Library management will provide books based on user search through the database from the library if the book is available the librarian stores the book details and issue to the user and update the book and user information to the library database.

2) Database/ File Storage: The functionality of this use case, Library provides the user or staff access to the library database based on registered details for example if the user needs to access the library, the first fall user enters the correct login details after they can access to the library. Librarian has special access to the database he can update, delete, create based on user transactions.

3) Resource Management: The purpose of this case is for the user to have the necessary requirements when studying the user may use a library other sub-utilization cases, and his registered library data are checked by the system. The other sub-use case which the user can use is data, where the user can create and retrieve his library data safely and it can only be accessed by the user. In this case, if students want to take a book can be registered here at the campus or anywhere else where the book is provided. The book is available here. Students from distances can sign their books online.

4) Feedback: This use case is used by the participating users to provide their suggestions to the library. The feedback includes several questions regarding the facilities. Forex the administrative uses the use case to provide users with the survey for reviews on services.

Users use this case to respond to the survey provided by the administrative library they will answer on the way in which how the library services provide to the users.

5) Support: This case shows support for actors facing issues on the website and the administrator will easily provide feedback. Students, teachers often use the website's case to consider any issues they face. The administrator uses the use case to show the website problems as quickly as possible, to address them.

Quality Attributes are Usability and Security:

The Scenarios for Security are:

Scenarios:

Scenario 1: User trying to access the library with the wrong details.

Scenario 2: users trying to download a book from the library database.

The scenarios for Usability are:

Scenarios:

Scenario 1: User trying to use the library website to register the book

Scenario 2: Librarian trying to use the website to update the user records in the database.

4. Rationale

Architectural Concerns:

Architectural Concern 1: The system needs to be used by the user staff/teachers even when the system is created/updated concurrently by the development team, or even when the system is not working.

Architectural Concern 2: The accessibility and reliability of the system are the concerns of the current system. All users need to easily understand the user interface and structure and database data need to be secured as the system handles valuable data and we can't lose data or dysfunctional data. The reliability of this system is our special concern since it is part of our design specification and it would be useless if the older system had these problems, and if the new system had the same problems.

Architectural Concern 3: With different users on the system the access level of information must be different, such as when a student can only view his book status or search books, while a librarian involved should be able to view and change the of student’s details.

Architectural Constraints:

Architectural Constraint 1: AWS Cloud Server: the application should not focus on on-site servers but accept and support the use of Cloud services

Architectural Constraint 2: Build a cloud storage database that will store all login details and access details of all users accessed only by the system administrator.

Architectural Constraint 3: Time constraint: As this is the most significant change, it should help minimal usage/workload if the teams run short on time.

Architectural Constraint 4: When the system is used, the application can assist and record logs/events.

Architectural Constraint 5: The software will work independently of the customer and support the web site, mobile devices, etc.

Part-B: View Documentation

5) Module View

1) Primary Presentation:

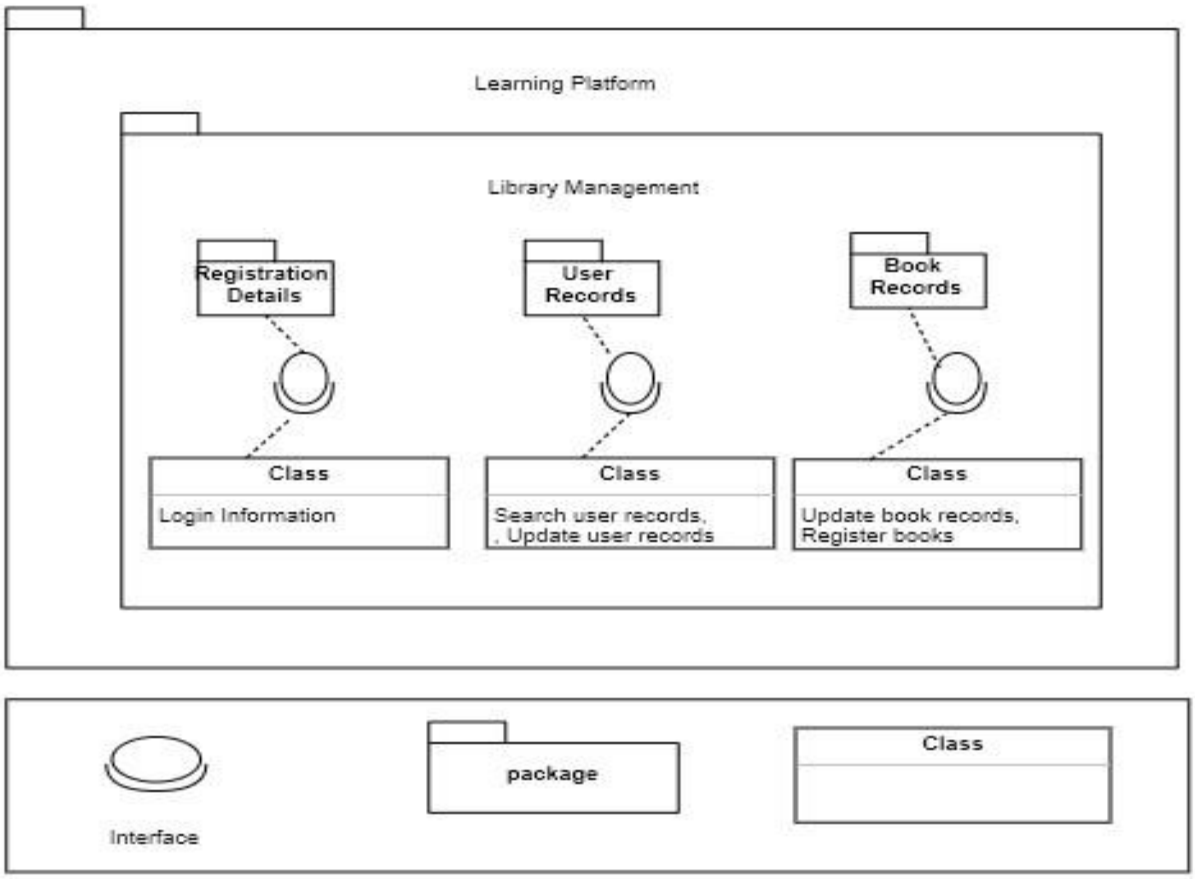

Figure 1

The above diagram defines the Decomposition Model View.

2) Element Catalog:

2a) Elements and their properties:

Elements and its properties are justified bellow

Element Name	Element Responsibility
Learning Platform	The aspect is important for the management of the website by the entire system.
New Registration	The new registration is a subclass in library management. The main responsibility of this component is to register the new users to the library.

Search user record	The search user record is a subclass in the library management system. The main responsibility of this component is to search user information from the library database.

Search book	The search book is a subclass in the library management system. The main responsibility of this component is a search book from a library database based on user requirements.
Update book details	The update book details are a subclass in the library management system The main responsibility of this component is updating the book details of the user from the library database.

2b) Relations and their properties: In this view, the relation form is part of it. With the exception of the main presentation, no improvements are made.

2c) Element interfaces: For example, if the user wants access to library data, the system acts as a guide for the user and displays the book details via the library management module. The book management module is used as a reference to the user.

When the user wants to access his library account, the database serves as an interface. For example, the data is stored in the database when the user tries to download the book r search for any book, and it behaves as a medium to provide the user with the file possibility. Likewise, the information is available when the user wants to access the database. The system responds with a reply to the user

2d) Element behavior:

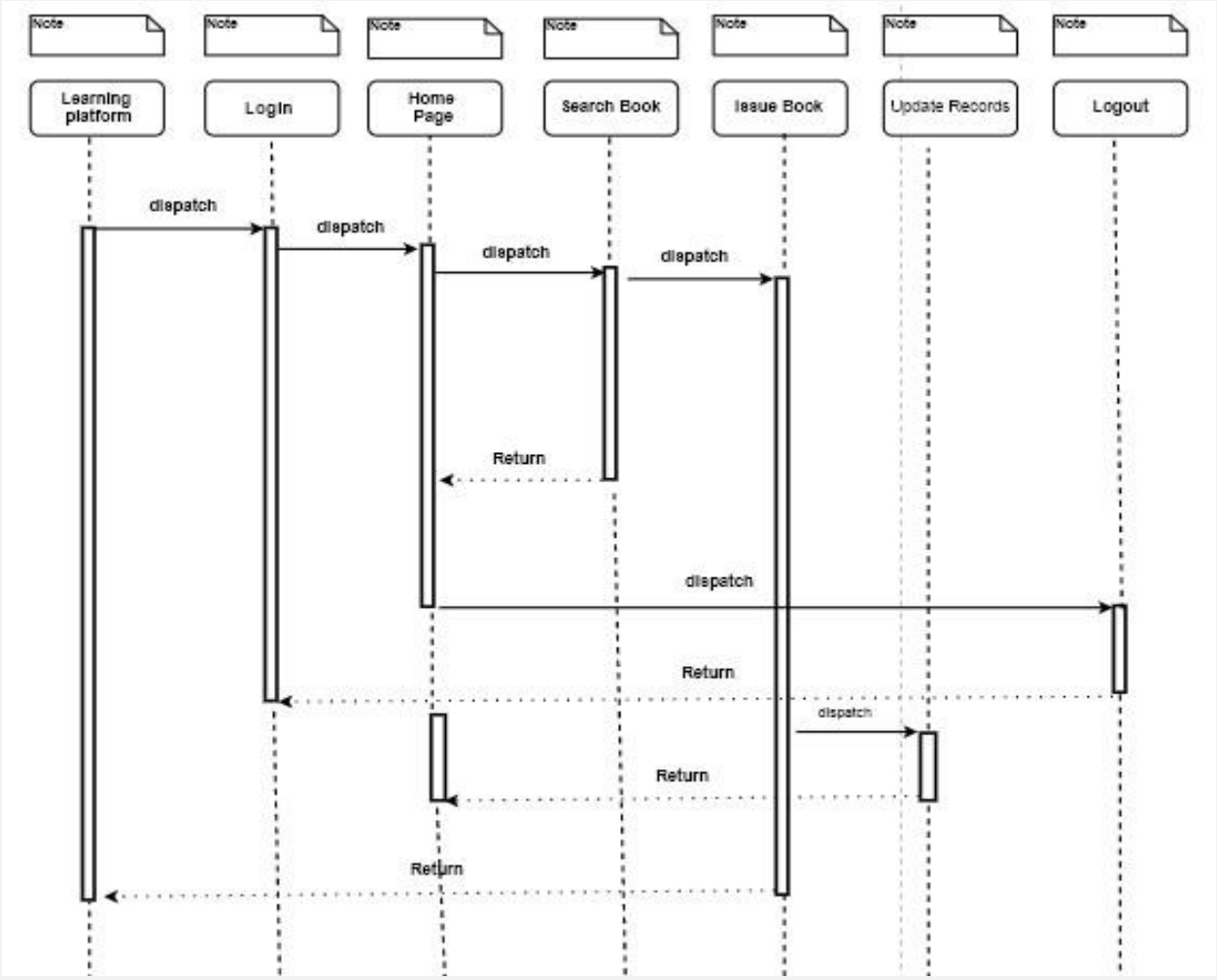

Figure 2

The acts of all three uses were described in the same sequence diagram as in the above sequence diagram. This figure shows the performance of the system elements.

Rationale:

We have chosen Sanity-Check pattern, and the explanation is:

- This pattern is used in the decomposing view to ensuring that the system performs well in situations where the system is not accurate.
- With great design, the sanity check pattern is simple.

- The architecture ensures that the system does not damage if changes or deviations from the security threats created by the system.

The reasons for our choice of decomposition view are by selecting good skills.

- They must always maintain that the system's infrastructure is at work and that it is in normal condition, even when a system repair happens. The program will manage the system's operations and interactions. Therefore, apart from the quality attributes provided, we believe that the system's accessibility is also very critical.
- If security threats occur, the application must recognize the causes, restrict access and respond to attacks with data encryption. The accounting to the system should be in place to ensure that we can recover quickly from the attacks and that the system is not damaged. Therefore, apart from the specified quality properties, device output should not be affected.
- The Decomposition View used in module View. The view of decomposition meets the above-mentioned quality attribute scenarios described through the highest level of decomposition view system.

6. Component & Connector (C&C) View:

1) Primary Presentation:

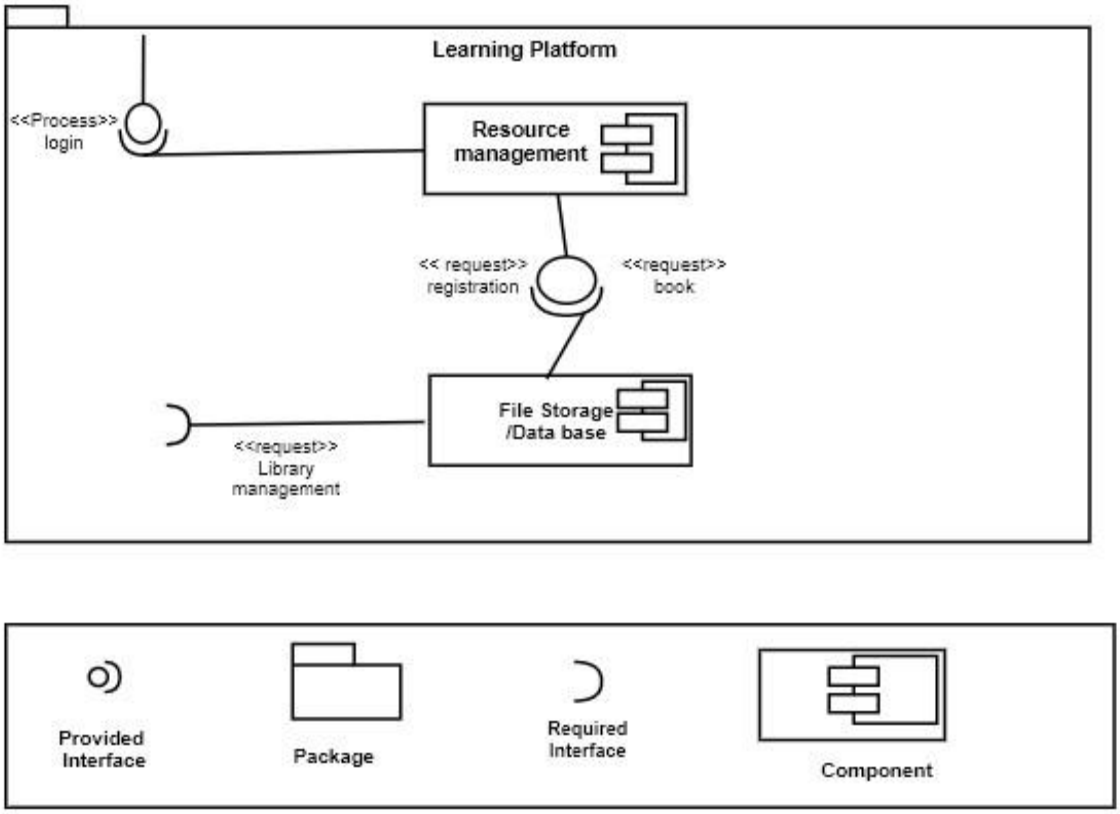

Figure 3

2) Element Catalog:

2a) Elements and their properties:

Elements and its properties are justified bellow

Element Name	Element Responsibility	Type
Learning Platform	The aspect is important for the management of the website by the entire system.	**Module**
Resource Mana ement	The element describes the system's working software when the users attempt to use the innovative development tool through	Component

	the interface to use their resource management tool. The users have a list of attributes in the variable and the learning platform's type of requests are method. The element receives the flow of data from the learning platform only after access is obtained by the users through there conditions.	
File Storage / Database	The background of the system is this component which stores user and employee information. It provides highly secure information for users such as user data and passwords. This feature is highly secure. After the correct authorization test and inspection traces are registered, users or employees are given access to their accounts to make it easier for the user to understand who last accessed the site and the location where it was accessed.	Component
Login	This element is used by users because everyone should have their own id and password login into the website.	Interface
Search Book	This feature is used to test the availability or not from the library database for the functionality of the search book. Availability or not depends on the user or employee entering title or author, then the system conducts a search through the library database if the book is available, the system displays the booking status.	Interface
Register Book		Interface

	Register books accessibility, who want the book they visit and register the book they want if it's available	

2b) Relations and their properties: In this view, the relationship type is derived from the ports/interface's relationship provided to the specific interfaces. As noted, the relationships are only to be defined in detail when the components are operating in the system over a network with the proper data flow. Apart from the primary display, there are no changes are made.

2c) Element interfaces: The applications which are available externally in the view support this application since the request comes to admin which are under different elements that have an outside visible interface.

2d) Element behavior:

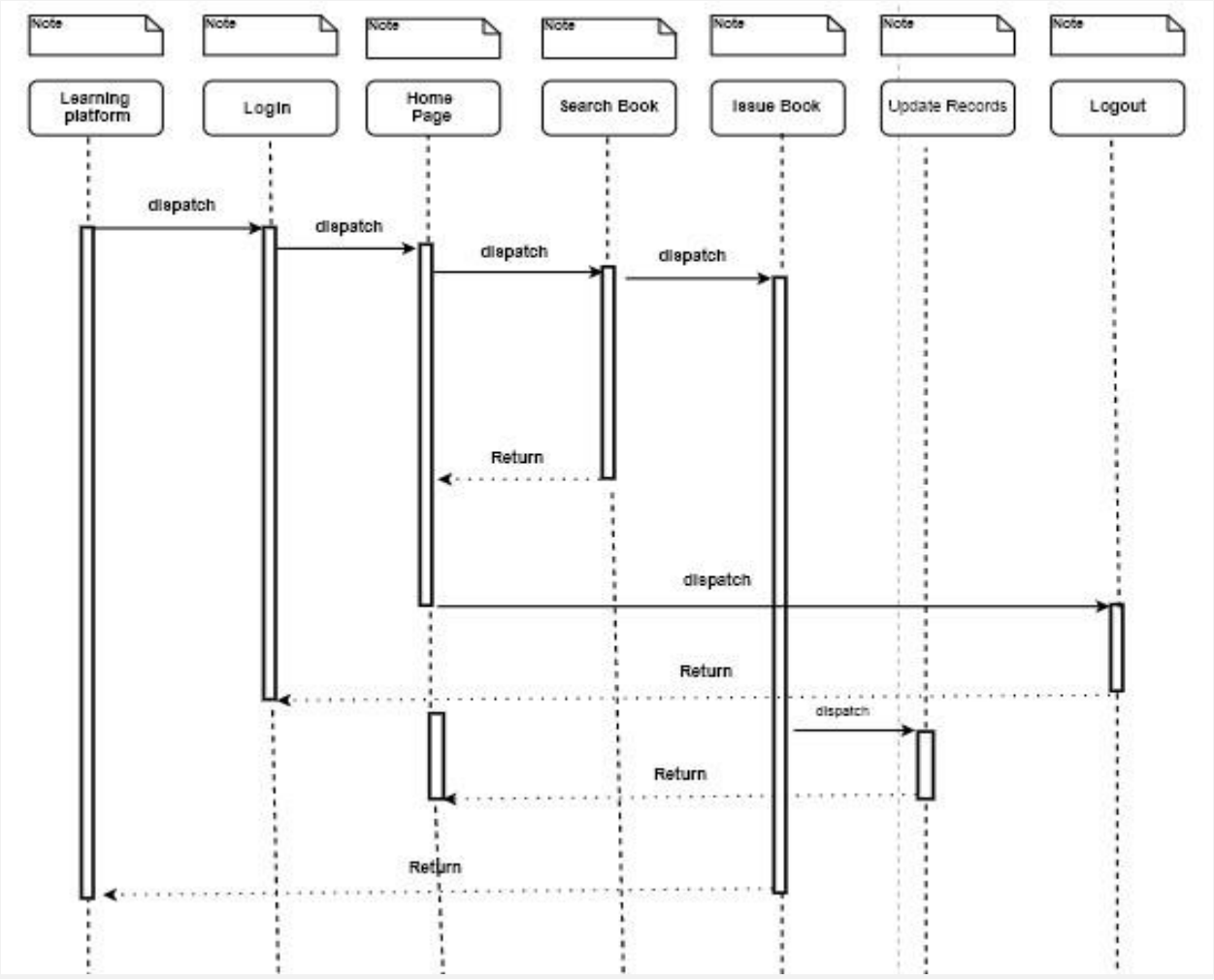

Figure 4

In the diagram above we have described the activity of all the components and their performance in the sequence diagram. The following figure shows the behavior.

Rationale:

The mode of instantiation of the view of service-oriented architecture is homogeneous redundancy patterns and is the rationale for using the method of homogeneous redundancy as follows:

- This protects against defects throughout the application performance, making it a better pattern for a service-oriented view, as it requires many connections and components.
- This pattern helps the system to work efficiently even when there is an existence of failure in the service-oriented view of the system briefly describes the value in different platforms using the program. For example, Web browsers, laptops, and mobile phones.
- Each design has a separate backup channel that acts sequentially when the primary channel fails and is easy to transfer.

The reasons for our choice of Service-oriented Architecture view are by selecting good skills.

- The view meets the need for interchangeability as the key requirement, because the system needs good support for equipment and will significantly reduce costs and resources for the library, moreover, making the business goals satisfactory.
- This view meets the system's protection as there are authentication channels in the system that make it safe and have a very small-scale threat of data loss.

The Service-Oriented Architecture View, used in Component & Connector (C&C), fulfills the above standard attribute scenarios and describes their behavior and interfaces.

7. Deployment view:

1) Primary Presentation:

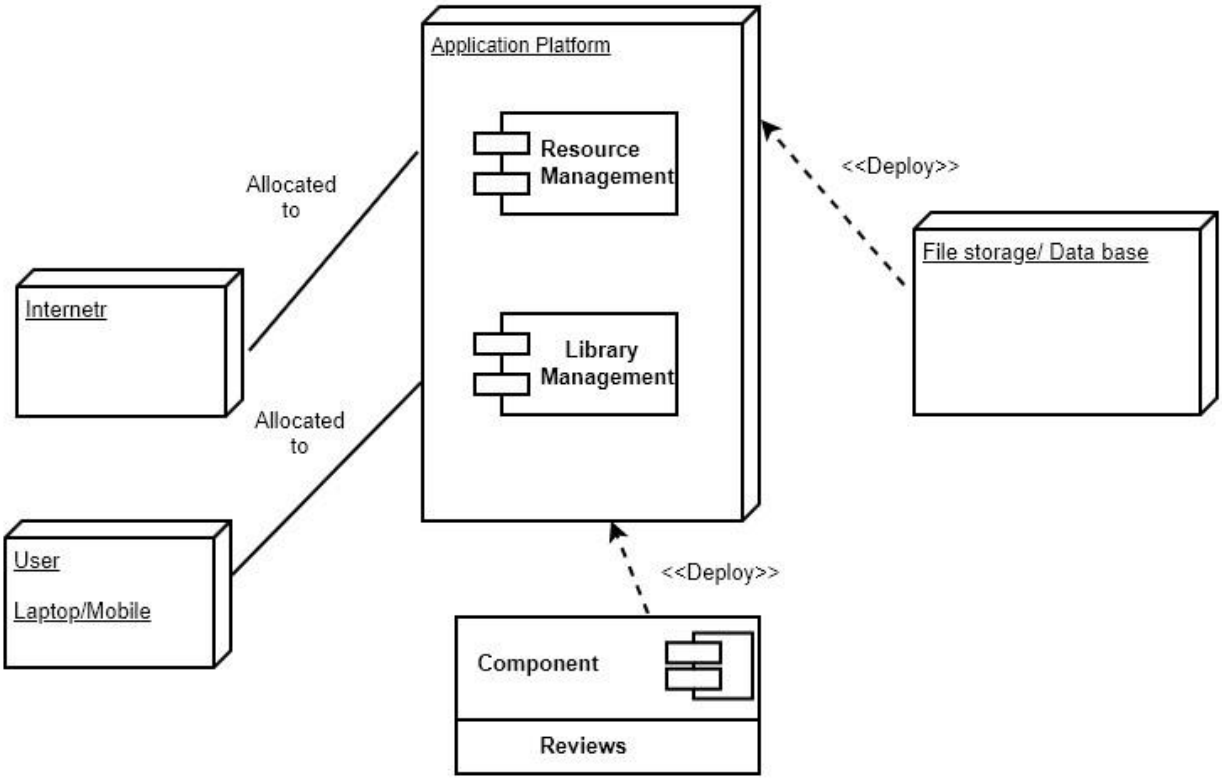

Figure 5

2) Element Catalog:

2a) Elements and their properties:

Elements and its properties are justified bellow

Element Type	Element Responsibility	Type
Learning platform	The aspect is important for the management of the website by the entire system.	**Module**
Resource Management	The aspect defines the operating software of the system as users	Component

	try and use their resource management tool through the creative development tool. There is a list of attributes in the variable and the type of requests of the learning platform is the method. The element only collects the data flow from the learning platform after users have access to it by conditions.	
File Storage	The background of the system is this component which stores user and employee information. It provides highly secure information for users such as user data and passwords. This feature is highly secure. After the correct authorization test and inspection traces are registered, users or employees are given access to their accounts to make it easier for the user to understand who last accessed the site and the location where it was accessed.	Component
Login	This element is used by users because everyone should have their own id and password login into the website.	Interface
Issue Book	The functionality of the Issue book, after searching functionality if the book is available then book issue to	Interface
	the user and update the record from the database.	

2b) Relations and their properties: In this view, the relationship type is determined by the interface connection of the corresponding connectors. As noted, the relationships are only to be explained in detail when the modules operate in the system over a platform with the proper data flow. Except for the primary display, there are no improvements made.

2c) Element interfaces: Support and running management are the implementations that are externally accessible to the view. This interface has external visibility since it has query logs generated between the admin user and the administrative component. The modules have links to the database in a sequence and other packages to the major component are connected to show their data stored.

Rationale: Triple-Modular Redundancy is the pattern that is instantiated by Deployment View. The explanation for this.

- The pattern is selected because it extracts the components from the view of the C&C and gives the deployment view of the implementation thus making it fault resistant and providing the user who uses it and the developer who understands the documents a good user experience.
- The pattern is clear and can be modified by communication between processes.

The reasons for our choice of Deployment view are by selecting good skills.

- The view is designed to provide the customer with a good user experience as the goal of the business was to deliver good productivity.
- Therefore, through the use of deployment view, modifiable is also accomplished as it increases unity between modules apart from the quality attributes listed above.

The deployment view satisfies the above Value attribute scenarios, which explain how they will be done. All the cases are mapped with the implementation view used in the Allocation view.

Part C: Assignment 1

Software Architecture and Quality

Assignment 1

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1 Introduction

In this assignment, we try to implement the architectural design for the given library management System description. It is interpreted from the problem statement that creative learning platform CLI, currently being used by the library management system is a

common learning platform used by the librarian, administrator, student, employees at university. The university was notified about various issues like lack of support for access the books, records, research papers among many others. The university is in plans to shift to a new platform keeping all the previous features intact and incorporating few specified requirements. It has been concluded in our analysis that the previous version must have had poor architectural design and for a better, robust and efficient system, software architecture is required.

I. Design purpose

II. Quality Attributes

III. Primary Functionality

IV. Architectural concerns

V. Constraints

2 Design purpose

Robust software architecture and design are necessary from the initial stages of software development to predict cost, quality, and timeline of the project. Software architecture can be stated as the key to ensuring the agility of a software system. Software architecture encompasses within itself several parts that play a key role in the project such as tools, technologies, and skills required to develop the current system. Although an efficient software Architecture alone can't guarantee project success, it can be stated that projects without efficient software architecture may have a tendency to fail most of the time. The demerits of poor software architectural design are aspects like the ability to modify, add or remove new features thereby increasing the load on the development team. Maintenance is also an issue with poor architectural design. Low usability, limited features are among the various features that are being faced by the university. Maintenance has also been a challenge. Problem statement conveys that the university is presently using CLP – Creative Learning platform to manage courses, feedback, grades, etc. CLP also lacks support for features such as grades reporting, scheduling, and management of resources (lecture rooms, labs, equipment) among others. Due to the lack of integration of all services into one platform, users use multiple applications which are resulting in the usage and maintainability being inefficient.

With the assumption that the primary cause of these difficulties is poor software architectural design can be made. Despite the face, the software architectural design has initial capital required, it can be seen that the benefits of a good design outweigh the initial costs in the long run.

3 Quality Attributes

Usability: In this, we can discuss different scenarios about stakeholders we can take some examples like the school management has usability problems as the present Library server is not centralized with all the key components. School management requires to use most of the applications to do the work required by the librarian and administrator. Here the blueprint of architecture design can be seen below. Architecture design is planned according to the user interaction with different user actions finally we have gone through the best user interface that interacts with each and every feature according to the user and end-user. The structure of each action can be shown below.

Components of usability in the Library management system

Student interaction with Server: the architecture is user-friendly. It is understood by every user and uses according to the required action. The end-user should be interacting with library management system architecture to communicate the requests with the server. The user interface is well designed to interact with each member according to the action required by the user. In this specific user has some rights to access the server. According to the user qualification, the rights are given in the access management system. In this architecture full access is given to administration and limited access to librarians and students.

Required Functionality: The required functionality is performing by the system. It userfriendly according to the required features that should be available in the library management system. According to the functionality written in code. The server acts according to the end-user, so each click plays a different action according to user rights.

Network Operations: The software must be designed to enable all the features needed by the end-user to the system. the interface is connected to all the features so the user can get the action based upon the click.

Response Time of system: The response time of the system should be user-friendly and guiding documents and guide the user about the features available in the library management system according to user rights. When the user interacts with the system on the background there are actions going on based on click. So, the user will get the answer based on click here time places a critical role. The server should send a response based on the user click. The data from the server should uses according to the page displays on the screen. Finally, the response from the system should be very high.

Scenarios

1. **Student search for the book User: Student**

Motivation: Students search for specific books on the server.

Artifact: Connect to the server.

Environment: The User interface.

Returns: When the user clicks on the search book it redirects to the content page so the user can

Search for books.

Measurements: When a user searches for the book. The page loads and redirect. The server may take less than 10 secs based upon internet speed.

2. Librarian tries to download the Ebook from the Library management system.

User: Librarian

Motivation: Click on

Artifact: Connect to the server

Environment: User interface

Returns: When the user clicks on eBook it redirects to the content page so the user can download

the book.

Measurements: Redirect and load the page you are looking for. But it takes less than 10sec.

Data Integrity: The integrity of data relates to software accuracy and quality throughout its lifecycle. Data integrity defines its state of our data. Information reliability is the data's ability to provide a detailed view. The integration of data is an essential aspect of the management of business data. It is a system that is extremely complex and requires multiple tasks.

Every time data is recorded if was monitored by cloud services and if any errors occur, we can solve it based on error. Data was back up in the server. Data from a server should be accurate and when the user interacts with the library management system there should be no errors with respect to protocols

Logical Integrity holds information intact as it is used in a relational database in various ways. User integrity contains the rules and restrictions that the client has developed to satisfy their specific needs. Server, referential, and credibility of the domain sometimes aren't enough to protect information. Domain integrity is a set of processes to determine that each piece of data in a domain is correct.

Scenarios

1. **Administrator stores the data in server.**

User: Administrator.

Motivation: Provide the updates data to the server.

Artifact: Users can retrieve the data and access anywhere based on user rights.

Environment: Server in the cloud.

Feedback: The data stores in the database can be accessed and modify it.

Measurements: Data can be accessed and modify by the administrator at any time. The user and employee can fetch the data when it updated. Sometimes a server may be down due to maintains.

2. **An employee needs to update user data on the server.**

User: Employee

Motivation: Employee login to his profile updates the information.

Artifact: Data repository and retrieval.

Environment: Server in the system.

Feedback: In the server verifies the employee is related to his database or not if the employee has rights so the server gives permission to an employee then login to his profile, he modifies the data then saves it. **Measurements:** When the server is in maintains employee can't access his profile.

Utility tree

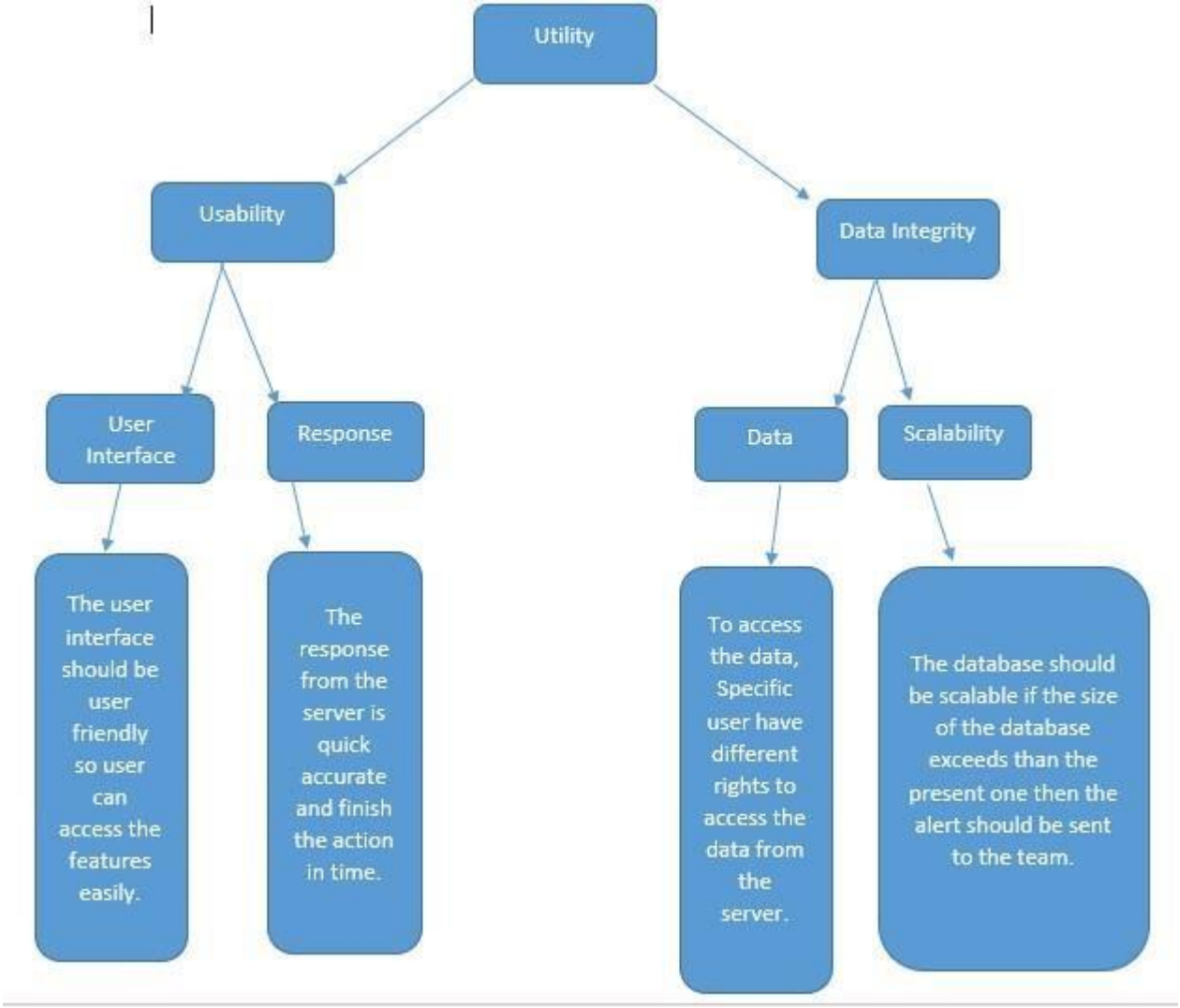

Figure 1

4 - Primary functionality:

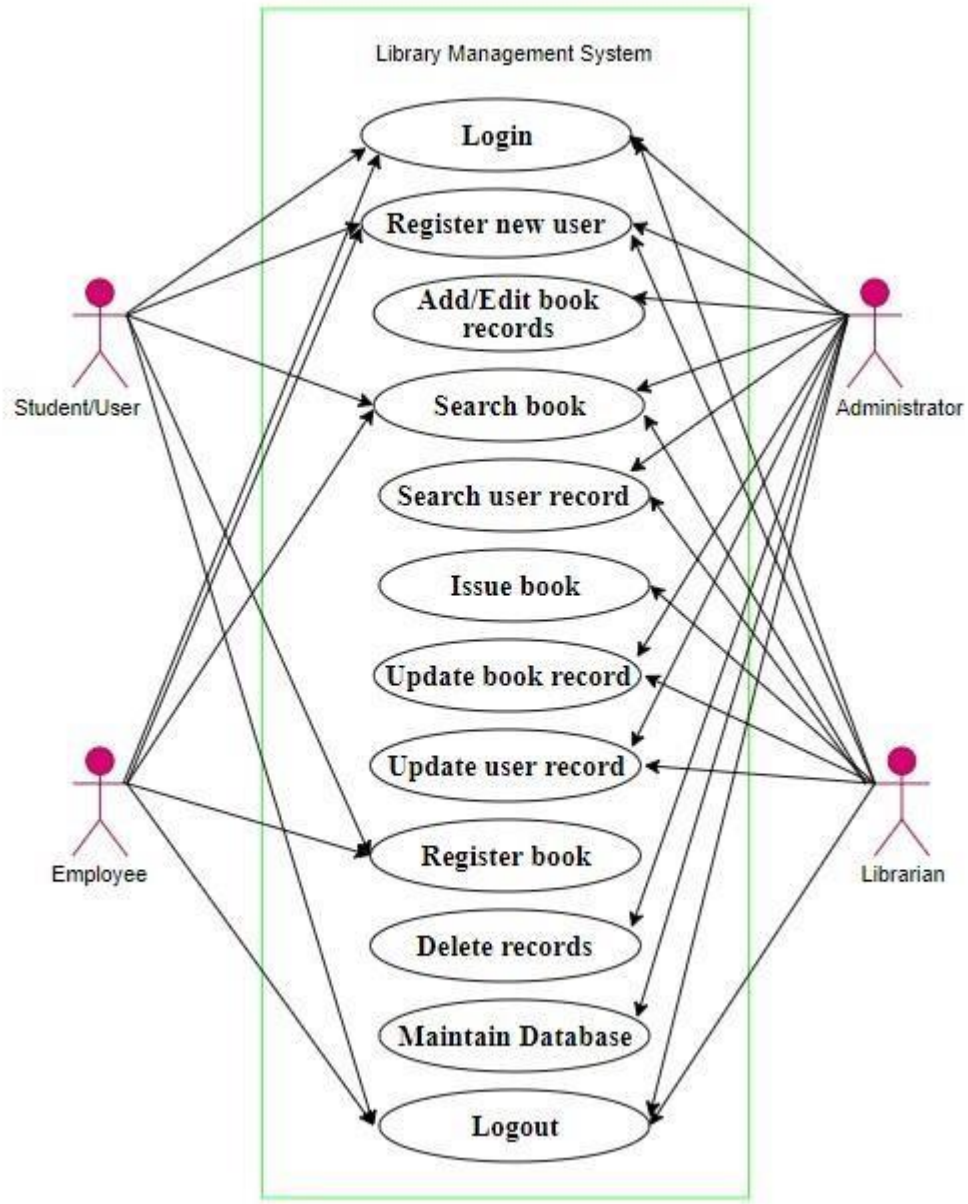

Figure2

Primary Functions:

Login: The first functionality of this login use case login is the enter the user of ID information to the system under the security process by student/Librarian/student information its commonly require the username or id and then the password system verify the enter details correct or wrong.

Student /User: This case is permeating by the student who wants to log in to the library before the user entered into the system about their required books.

Librarian: This case is permeating by the librarian to enter the correct information before the librarian entered into the system.

Employee: This case is permeating by the employee to enter the correct details before the employee entered into the system.

Administrator: This case is permeating by the administrator to enter the correct details before the administrator entered into the system.

- The user verification is provided when registering.
- The system only must allow the user to log in with a registered Id and password.
- After using the system, the user must be able to log out.

Register new user: The functionality of register new users is creating an account with a valid username and password.

Student /User: This case is permeating by user/student register for the account in the library with a valid id/username with a strong password.

Librarian: This case is permitting by the librarian after registered by the user if registered details are valid librarians can permit for the account.

Administrator: This case is permitting by an administrator to check any problems or errors with the registration phase case administrator resolve the problem.

- The system should be validating the registered details.
- Systems should be verified if the information is incorrect.

Add/Edit book records: The functionality of the Add/Edit use case depends on users, sometimes they are adding new books and sometimes they are returning the books and sometimes they are renunciation books from the library.

Librarian: This case is permeating by the librarian collecting and issue books to the users and Update the user database based on user activities.

Administrator: This case is permeating by the administrator checks if there is any problem related to the user records if is there any problem from this case administrator resolve the problem.

- The system should be entered details in the database.
- The system should be updated after any changes.

Search book: The functionality of the Search book is checking the availability or not from the library. Availability or not depends on user or employee enters title or author, then the

system performs a search through the library database if the book is available, the system shows the status of the book.

Student /User: This case user enters title or author, then the system performs a search through the library database if a book is found system shows the status of the book.

Librarian: This case librarian checks the book availability or not after the user entered their requirements if its available then issue books to the user.

Employee: This case the employee uses the name or author and then the system checks through the database from the library if it's found the system shows the status of the book.

Administrator: This case is permeating by the administrator checks if there is any problem related to search book if is there any problem from this case administrator resolve the problem.

- The system should check the process in the database according to the search type form.
- The system needs to be able to filter books with keywords.

Search user record: The functionality of the search user record, admin wants to view membership records of all users the system shows the records of all users that are a member of the library. Librarian: This case is permeating by the librarian who wants to see the registration of all users on the system that display the registrations of all the users in the library.

Administrator: This case is permeating by the administrative authority must check the registry of all users on the system, which shows all users registrations in the library. if there is any problem happened with the user records administrator resolve the problem.

- The system must show a valid user record.
- The system must remove invalid information.

Issue book: The functionality of the Issue book, after searching functionality if the book is available then book issue to the user and update the record from the database.

Librarian: This case is permeating by the librarian, after the searching process if the book is available, then the book issue to the user and updates the library records.

- The system should be updating the data from the database after the issue.
- The system must be restored after the issue.

Update book record: The functionality of the update book record, after the book issue to the user, update the book details into the library database.

Librarian: This case is permeating by the librarian, update the book information to the library database during the user's book issue.

Administrator: This case is permeating by the administrator, check the issues when the librarian updating the book records. if there is any problem happened with the updating book records the administrator can resolve the problems.

- The system should be verifying the book details.
- The system must be updated to enter the number of books from the user account.

Update user record: The functionality of the update user record, after the book issue to the user, update the user details into the library records.

Librarian: This case is permeating by the librarian, update the user information at the library database when the librarian issued the book.

Administrator: This case is permeating by the administrator, check the issues when the librarian updating the user records. if there is any problem that happened with updating user records the administrator can resolve the issues.

- The system should be verifying the user details.
- The system must be updated the user information from the user account.

Register book: The functionality of register book, who wants the book they visit the library and register the required book if it's available.

Student /User: This case user/student visits the library and reserve a book.

Employee: This case the employee visits the library and reserve a book.

- The system must not allow more than five books with the same library identification.
- The system should be checked the user details.

Delete records: The functionality of Delete record, who wants to exit from the library that records will be removed by admin.

Librarian: This case is permeating by the librarian who wants to leave the library that records will be deleted by the librarian.

Administrator: This case is permeating by the administrator, who would like to leave the library that the administrator will remove data from the database.

- The system must be updated to the library database after deleted records.

- The system must be checked user data after submitted books.

Maintain Database: The functionality of the Maintain database, the administrator would be maintaining the database he/she can solve any issues that occurred in the database.

Administrator: This case is permeating by the administrator, if there is any problem happened with the user records administrator can resolve the problem.

- The system must be updated the database after any changes.

Logout: The last functionality of this logout use case, to leave the website, etc. so that the next time you want to use it, you need to re-enter your personal information.

Student /User: This case is permeating by the students who want to logout into the library site after the user entered the system.

Librarian: This case is permeating by the librarian who wants to log out into the library site after the entered into the system.

Administrator: This case is permeating by the Administrator who wants to log out into the library site after the entered into the system.

Employee: This case is permeating by the employee who wants to log out into the library site after the entered into the system.

- The system should be allowed the user to logout with their registered Id and password. • After using the system, the user must be able to log out.

5 Architectural Concerns

We are designed this architecture based on specific concerns and this system architecture we can regenerate features efficiency to the system and also we can provide the security of the system and source code is developed by easily it will be understood by any users and it allows to attach more features in coming stages. These concerns are mainly divided into three types they are.

- General Concerns
- Specific Concerns
- Other Concerns

General Concerns

In this system efficiently used by the users/students, librarian, employees, administrators,

and system is simultaneously improved by the development group. the system functionality is explained in the below diagram. The (GUI) graphical user interface is easily understood by all users and employees and the database is designed with security.

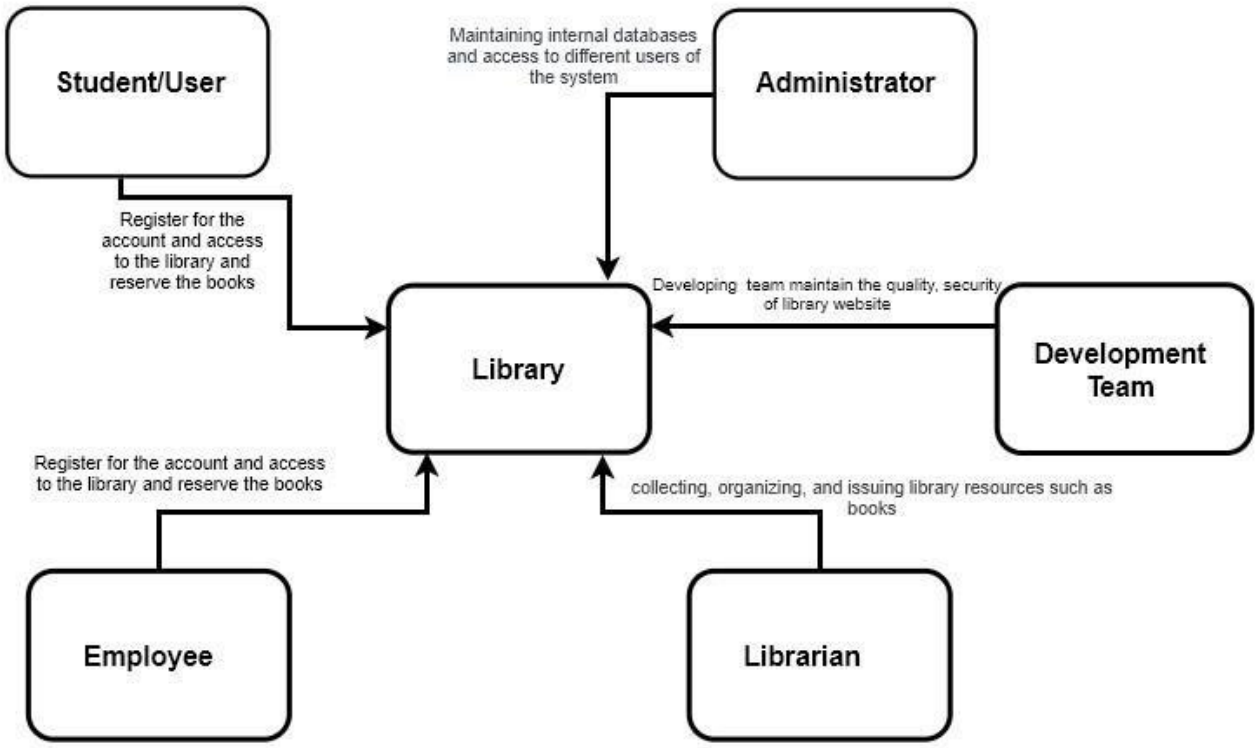

Figure 3

Specific Concerns

In this system usability and Data Integrity are considered the specific concerns and Our specific concern is usability because the old system has already had these structural problems and because of the same kind of problems with the new systems, no use of this kind of system.

Other Concerns

In this users and librarian, the administrator has some access limitations they are users can log in the website and reserve the books only and librarian can access the only issue and return the books only and administrator can access solve specific problems.

6 Constraints

Every software development project constraints are one of the parts of the architectural design system. Constraints play a very important role in the software development process. During the design, process constraints are represented to keep away from the problems or issues during the software development process.

Technical constraints: For this, we have selected a cloud server because we can store the data efficiently and it has high security. The software can be created without difficulty and it has largely salable, through this cloud server we get high-speed access to the database and we can store the data into different addresses.

Database: In this software project we need to create server storage for students/employees to store details of the student and employee account details. the database contains hug information about daily events like student registrations, issues or return of books details of every user. Every person has some access limitations to the database.

Team of Developers: For this project developers and testers are followed by agile methods this are used for software development system because every software project has occurred some modifications during the development process. For these, agile techniques are more desirable for changes in requirements.

Date of Delivery: Ever software project is delivered by the end of the deadline. Through the agile methodology, we can achieve the desired outcomes of the project. For this we can use Work Breakdown Structure through this we can deliver the product within time. For this, we need to estimate the effort need to full fill each activity and time.

7 Assumptions

In the process of designing the software architecture, after specific assumptions that were considered essential for the system were created.

- The system should be user-friendly.
- Users are accessed from different types of computers that should contain internet connection and internet browsing facilities.
- User should be searching for a book by its name or author and publication

- Provide security for user data.
- Provide mobile apps for users to access easily to the system.
- Users are using different types of platforms for accessing systems so provide access to any type of users.
- Provide good user interfaces for easy understanding.
- User is not allowed to enter book information.
- Convert the manual application into the web application.

References

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