Software Design and Architecture
SOFE 3650
Iteration 1

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Date: November 13th, 2022

ADD Step 1: The tables in step one shows inputs and identify which ones are classified as drivers

Design Purpose	The purpose of this design is to create a user friendly and highly secure Course management system.
Primary Functional Requirements	From the use cases for this system, the primary ones are determined to be: 1. UC-1 Because it directly supports the core business 2. UC -3 Because it directly supports the core business 3. UC-4 Because it directly supports the core business 4. UC-5 Because it directly supports the core business 5. UC-6 Because it directly supports the core business

Quality Attribute Scenario ID	Importance to the customer	Difficulty of implementation according to architect
QA-1	High	Medium
QA-2	High	High
QA-3	Medium	Medium
QA-4	High	High
QA-5	Medium	High

From the list all the scenarios are selected as drivers

Constraint	All constraints are included as a driver
Architectural Concerns	All concerns are included as a driver

Step 2

QA-1 Accessibility
QA-3 Convenient
QA-5 Resourceful
CON-1 : The system shall allow only students to change study information of others
CON-2: The System shall allow only the administration to manage courses.
CRN-2: The system shall have a single login to access all content may pose a concern as it is not fully secure if account information is leaked. Two-factor authentication is preferred.

CRN-3 : The System allows students to retrieve contact information of other students and lecturers of subscribed courses. This may cause an issue as not all students will want their information to be open to everyone.

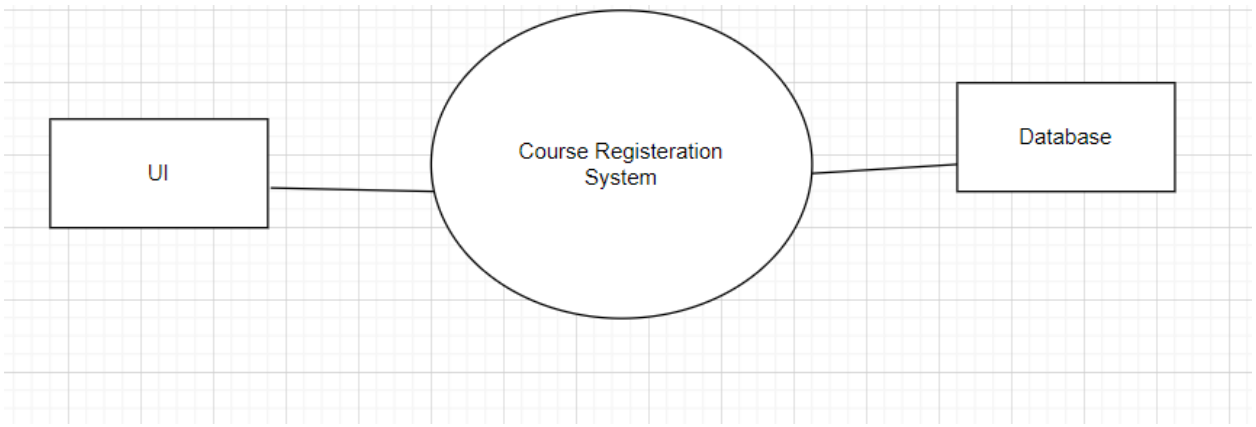


Figure showing the context diagram of the cash register system

Step 3:

The entire course registration management system should be refined through decomposition

Step 4:

This table contains the selection of design decisions

Design Decisions and Locations	**Rational**
Physically Structure the application using the three - tier-deployment pattern	This is required for the design because we need a web tier to make our system accessible to our users though the internet , then we need an application tier to get the result of our queries from the database and we need a database to store all the information. This supports UC-3, UC-5, and QA-3.
Logically Structure the user part of the system using Web application architecture	The web application refine architecture supports UC-2, UC-3 and Quality attributes QA-1,and QA-3, . This is because students and lecturers both can view the course information. Students can submit their assignments and see their grade information and students can also work with other students from anywhere, as long as they have an internet connection.
Logically structure the user part of the system using Mobile application refine architecture.	The mobile application architecture supports the UC-2, UC-3, UC-4 , UC-5 because students and lecturers could access the course registration system. On the system they can post assignments or add any information they want using their mobile devices, so it would be comfortable for them if they don't have access to their PC's. It also supports quality attributes QA-3 and QA-5 because lecturers can provide useful resources or assignments using their phone too.
Build user interface by modifying various reusable frameworks to make our system more secure and user Friendly.	This supports QA-2,QA-3 and QA-4 because developers can use frameworks they already have again and again and make them more secure. Along with this, they can add new features to them. This

	results in a more user friendly system.

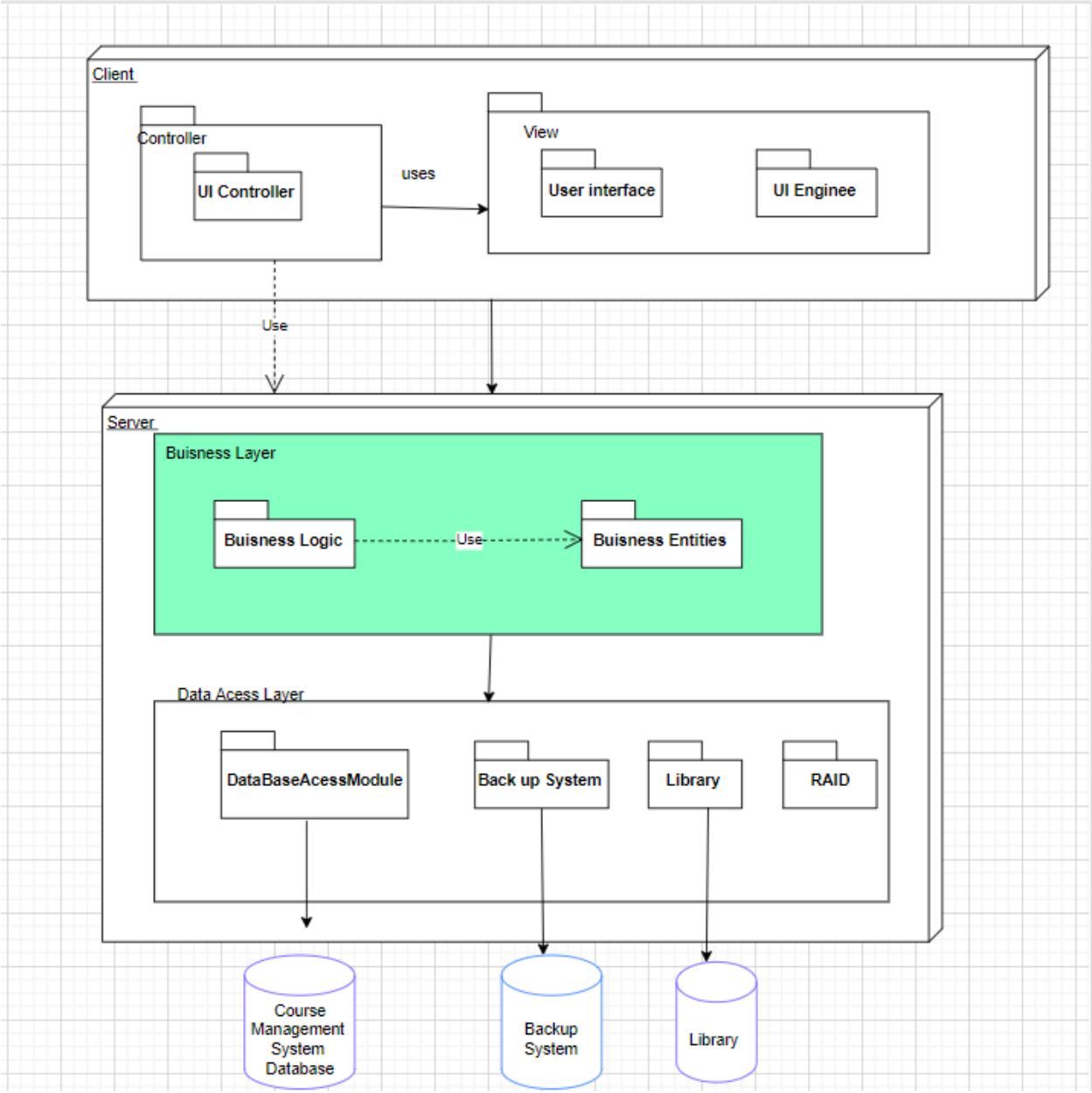
Step 5:

Initiate Architectural Elements,Allocate Responsibilities, and Define Interfaces

Design decision and Location	Rationale
Adaption of the RAID criteria.	RAID stands for Redundant Array of Inexpensive Disks; this is the process of placing several/multiple disks together into a singular array. With these disks working together, the speed of the system will be optimized; making a smoother interaction between students and teachers on the system(no lag). This can help with convenience which is QA-3
Add a large library of school content.	A large library should be added so that all the information is easily accessed in one place. This allows for the website to be even more resourceful. QA-5
Add a Backup System	In the case of downtime or any system failure, the Backup system would store all the student and course information. When the system is fixed and is online, users can retrieve the data from the back up system. It solves our CRN-1.

Step 6:

The diagram below represents the Rich Internet application Architecture, which has been modified according to the decisions made in step 5



The following table summarizes the responsibilities of each element:

Element	Responsibility
UI Controller	Controls the user interaction, the way user interacts with the system
User interface	Interface Through which user interacts with the system
UI Engine	Displays UI elements
Business Logic	It runs all business operations
Business Entities	These entities together make the whole system.
RAID	Optimize the speed of the system
Library	Has all the school resources labeled and organized in one place
Back Up system	Serves as a backup whenever the server goes down for maintenance

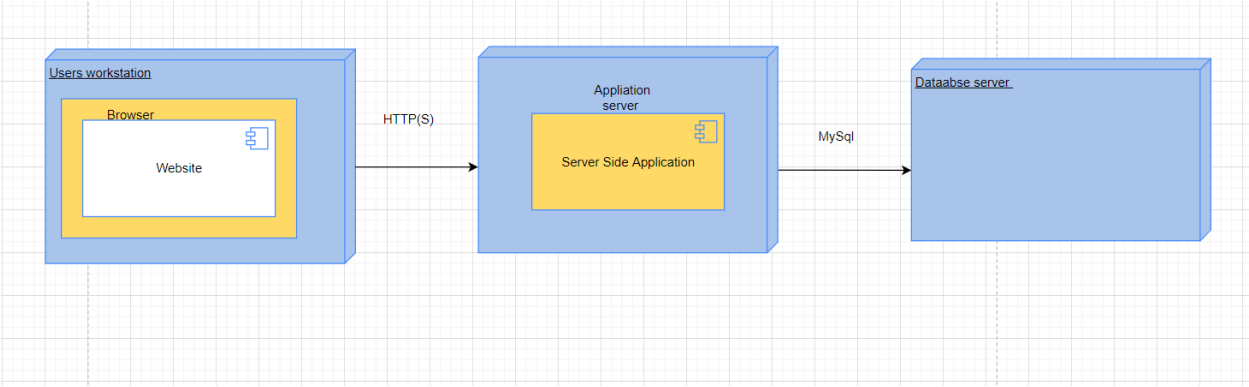
Database Access Module	**Serves as access point for course management**

This table shows the responsibility of each element displayed in in the Deployment Diagram:

Element	Responsibility
Users workstation	The users PC, through which it accesses the website of our system
Application server	This server provides the server side logic and web pages
Database Server	The server that gives access to the database

This table represents the relationships displayed in the Deployment model:

Relationship	Description
Between the server and Database Server	Communication between the server and Database server will be done using MySql
Between the Website and the server	Communication between the Website and server will be done using HTTP(S).



Deployment Diagram of course management system

Step 7:

Not Addressed	Partially Addressed	Completely Addressed	Design Decisions Made During the Iteration
	UC-1		Selected reference architecture establishes the modules that will support this functionality
	UC-3		Selected reference architecture establishes the modules that will support this functionality
	UC-4		Selected reference architecture establishes the modules that will support this functionality
	UC-5		Selected reference architecture establishes the modules that will support this functionality
	UC-6		Selected reference architecture establishes the modules that will

			support this functionality
		QA-1	The website has high accessibility and is able to be accessed by blind users.
	QA-3		The website is user friendly and already convenient to access. Currently in the process of implementing RAID.
	QA-5		Allowing information to be uploaded such as lectures allows for a large amount of resources. A fully complete database still needs to be implemented.
		CON-1	Students are only able to change study information. Not personal information.
		CON-2	Access to private on the website is already limited and only the administration has the power to manage courses.
			No relevant decisions made
CRN-3			No relevant decisions made