ADD Iteration 1:Reference Architecture and Overall System Structure

A. Step 1: Reviewing Inputs

<table>
<tr><td>Category</td><td>Details</td></tr>
<tr><td>Design purpose</td><td>This is a greenfield system of a mature domain. The design purpose is to create a university management system that upholds stakeholder requirements and upholds abstraction among them.</td></tr>
<tr><td>Primary Functional Requirements</td><td>UC-5,19,20,21,22,31</td></tr>
<tr><td>Quality Attribute Scenarios</td><td>
<table>
<tr><td>Scenario Id</td><td>Importance to Customer</td><td>Difficulty of implementation according to architect</td></tr>
<tr><td>QA-2</td><td>High</td><td>Medium</td></tr>
<tr><td>QA-3</td><td>High</td><td>High</td></tr>
<tr><td>QA-6</td><td>Medium</td><td>High</td></tr>
<tr><td>QA-8</td><td>Medium</td><td>Medium</td></tr>
</table>
</td></tr>
<tr><td>Constraints</td><td>All of the constraints discussed before are included as drivers</td></tr>
<tr><td>Architectural Concerns</td><td>All of the architectural concerns discussed previously are included as drivers</td></tr>
</table>

B. Step 2: Establish iteration goal by selecting drivers

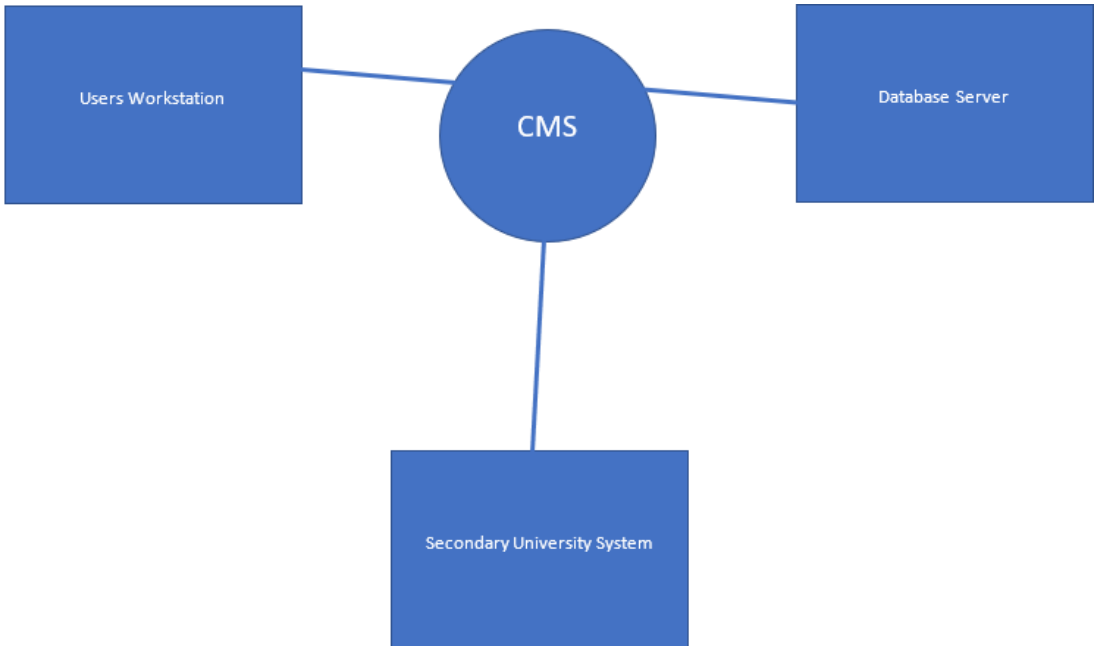
Iteration goal is to achieve CRN-1 (Establishing a overall initial system architecture) which would also be considered the first iteration of greenfield system

Inputs to be considered: all
Architect must be mindful of:

- QA-2, QA-3, QA-6, QA-8, CON- 7, CON-8, CON-12, CON-13, CON-19, CRN-4

C. Step 3: Choose one or more elements of the system to refine

This project would be considered a greenfield development effort, in which the element to refine is the FCAPS system and the refinement phase uses decomposition.



D. Step 4: Choose one or more design concepts that satisfy the selected drivers

Reference Architectures	
Design decisions & location	Rationale
Rich Internet Applications	The Rich Internet Application allows a rich user interface within a browser that can also be simultaneously accessed by multiple users at the same time. It also supports the web capabilities specified in QA-2, while dissolving possible issues with CON-7. This will also be helpful in achieving deployment and updates without changing the users system in QA-1
ALTERNATIVES	
Alternative	Reason for discarding
Web Application	This system does not provide a rich user interface which is needed in QA-2 to provide a simple and useful UI.
Rich Client Application	This is oriented toward developing the application in a web browser isolated on the clients system and would cause a conflict with QA-1.
Mobile Application	A mobile application would only be applicable to mobile client users and the systems need to delve more into a desktop/laptop applications on the web
Deployment Patterns	
Four-Tier Deployment	The web server and application server are deployed in different tiers improving security.

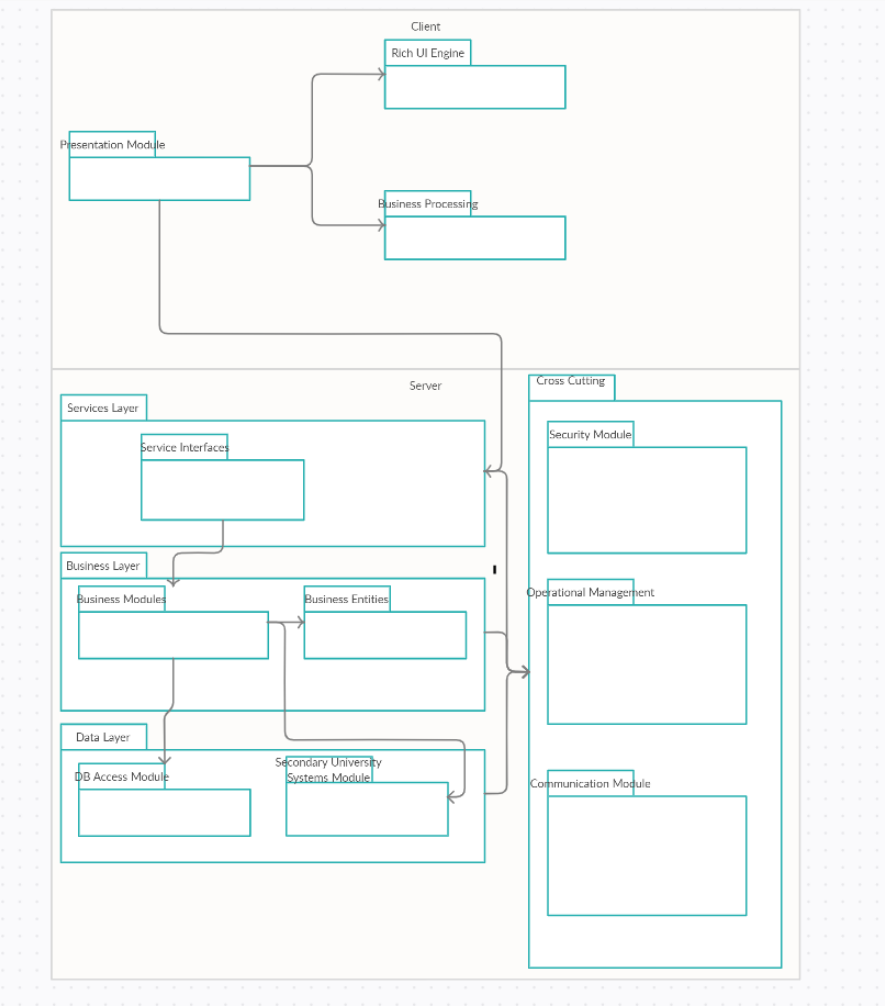
User Interface	
Build the user interface of the internet application using javascript, HTML, XML and other technologies	The rich internet application framework supports the use of javascript and XML which supports QA-2's requirements for web capabilities.
Deploy the application using asynchronous Javascript and XML	Access to the application is obtained by going to the specified url in a web browser (CON-7)

E. Step 5: Instantiate arch. elements, allocate responsibilities and define interfaces

Design Decision and Location	Rationale
Add local data into the rich Internet application	Upon the user having to submit or edit a document within the system they would likely require storage to read and write from. Communication and Processing is performed on the client side along with the Rich UI engine. While retrieving and sending data is performed on the data layer
Create a Module dedicated to the secondary university systems server in the data layer	Creating this module in the data layer allows for abstraction of the access to the secondary university systems which supports CON-4 and CON-18.

F. Step 6: Sketch views and revord design decisions

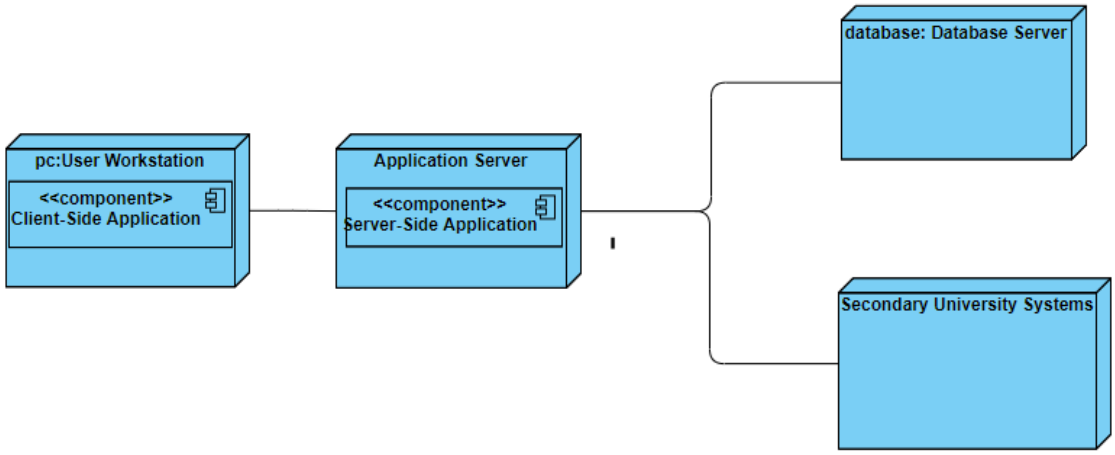
The following diagram shows the sketch of a module view of the reference architectures that were selected



Element	**Responsibility**
Presentation Module	This layer contains the modules that fetch data from the server and send it to the UI engine and business processing
Rich UI Engine	This is the module that uses javascript and XML to produce a rich User interface that is simple and aesthetically appealing
Business Processing	This module contains the logic for processing business information
Services Layer	This layer contains the modules that expose the services that are consumed by the client
Service Interfaces	This module has the functionality to expose services that are consumed by the user
Business Layer	This layer implements business logic operations that are performed on the server side
Business Modules	This module implements business operations that are performed on the server side
Business Entities	These entities make up the domain model

Data Layer	This layer contains modules that communicate with the database and secondary university systems
DB Access Module	This module contains functionalities that communicate with the database
Secondary University Systems Access Module	This module contains functionalities that communicate with the secondary sniversity systems.
Cross Cutting	This layer includes modules with functionality across layers such as security,logging and IO

The following deployment diagram sketches an allocation view that illustrates where the components associated with the modules in the previous diagram will be deployed.



The responsibilities of the elements are displayed here:

Element	**Responsibility**
User Workstation	The users pc which hosts the rich user interface and business processing
Application Server	The server that hosts the logic of the application and communicating with the database server and secondary university systems.
Database Server	The server that hosts the legacy relational database
Secondary University Systems	The external university systems that are monitored by the administrator.

The relationship between the elements is summarized in the following table:

Relationship	Description
Between app server and database server	Communication with the database will be done with standard HTTP protocol
Between app server and secondary university systems	Communication will be done with SNMP protocol

G. Step 7: Perform analysis of current design and review iteration

The following table summarize the design process using the Kanban board technique

Not Addressed	Partially Addressed	Completed Addressed	Design decisions made during the iteration
	UC-5		Selected reference architecture establishes the modules that will support this functionality
	UC-19		Selected reference architecture establishes the modules that will support this functionality
	UC-20		Selected reference architecture establishes the modules that will support this functionality
	UC-21		Selected reference architecture establishes the modules that will support this functionality
	UC-22		Selected reference architecture establishes the modules that will support this functionality
	UC-31		Selected reference architecture establishes the modules that will support this functionality
	QA-2		Selected reference architecture establishes the modules that will support this functionality
		QA-3	The selected architecture allows for accessibility through web browsers
	QA-6		Selected reference architecture establishes the modules that will support this functionality
	QA-8		Selected reference architecture establishes the modules that will support this functionality
CON-1-6			No decisions made
		CON-7	Selected reference architecture establishes the modules that

			will support this functionality
CON-8-11			No decisions made
	CON-12		Selected reference architecture establishes the modules that will support this functionality
CON-13			No decisions made
	CON-14		Selected reference architecture establishes the modules that will support this functionality
CON-15-19			No decisions made
CRN-1			No decisions made
	CRN-2		The design decisions have been established using the architecture modules
CRN-3			No decisions made
	CRN-4,5		Selected reference architecture establishes the modules that will support this functionality
	CRN-6		Utilizing the 4-tier deployment pattern we can rollback changes for emergency use
		CRN-7,8	Since the application is web oriented, it can developed using a variety of web frameworks