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1. Abstract

The IBM Watson uses “natural language processing and machine learning” to reveal insights from large amounts of unstructured data [1]. We will use Watson to create a structured analysis of possible academic careers related to the CSSE majors at Penn State Behrend.

We seek to enable students to ask questions relating to these majors and to provide valuable feedback, promoting better decision making about academic and professional careers. Our tools will also assist advisors in preparing relevant and unique advice to each student seeking their guidance.

In this report, we arrange our goals as user and system requirements, showing the engineering process of this project. UML Diagrams are also provided for further detail and explanation of this process.

2. Report Revision History

2.1. Changes in Version 1.5

- ➔ Reformatted the document to look nicer
- ➔ Removed voice-to-text use cases, requirements, and sequence diagrams
- ➔ Modified Ask Question sequence diagram to not include voice-to-text reference
- ➔ Modified descriptions of all images
- ➔ Added more definitions to glossary
- ➔ Reworded the Abstract and Problem Statements
- ➔ Added more examples to the Exploratory Studies Techniques
- ➔ Added in more references
- ➔ Created in-text citations
- ➔ Added in picture for architectural design

2.2. Changes in Version 2.0

- ➔ Updated progress in Exploratory Studies
- ➔ Added in References
- ➔ Added in Unit Test Cases
- ➔ Added in Unit Test Execution Reports
- ➔ Added in UML Class Diagram in Structural Design
- ➔ Added in UML State Diagram in Behavioral Design
- ➔ Added steps for installing test framework
- ➔ Added steps for running test cases
- ➔ Added in challenges for system development
- ➔ Added alternative UI designs

2.3. Changes in Version 2.5

- ➔ Modified format of references
- ➔ Updated description of UML Diagram
- ➔ Added description of requirements trace table
- ➔ Modified abstract slightly
- ➔ Exploratory Studies expanded to explain purpose
- ➔ References mentioned in Exploratory Studies
- ➔ Implementation Alternatives & Decision Rationale expanded
- ➔ Architectural Design image discussed
- ➔ Relevant Packages/Products expanded

3. Problem Statement

3.1. Business Background

IBM Watson's services, provided by Bluemix's APIs and other services from 3rd parties or developers, can be utilized to conduct textual analysis and output a numerical scale of performance factor. Web Experience Management (WEM) can be trained to answer many open-ended questions. The question we are trying to answer is whether we can create a system to assist with the enrollment process, through use of Bluemix and WEM.

3.2. Needs

To increase the effectiveness of the IBM Watson services, a larger domain is needed. Additionally, students are often unsure of which fields would coincide with their interests and talents.

3.3. Objectives

The objective of this project is to increase Watson's domain to include Penn State Behrend's academic information related to the CSSE majors, such as recommended courses, FAQs, and advisor information. The project will enable students to make a better decision as to which careers they might be interested in pursuing and what each path would entail. It will also help advisors to accurately guide the students.

4. Requirements

4.1. User Requirements

Glossary of Relevant Domain Technology

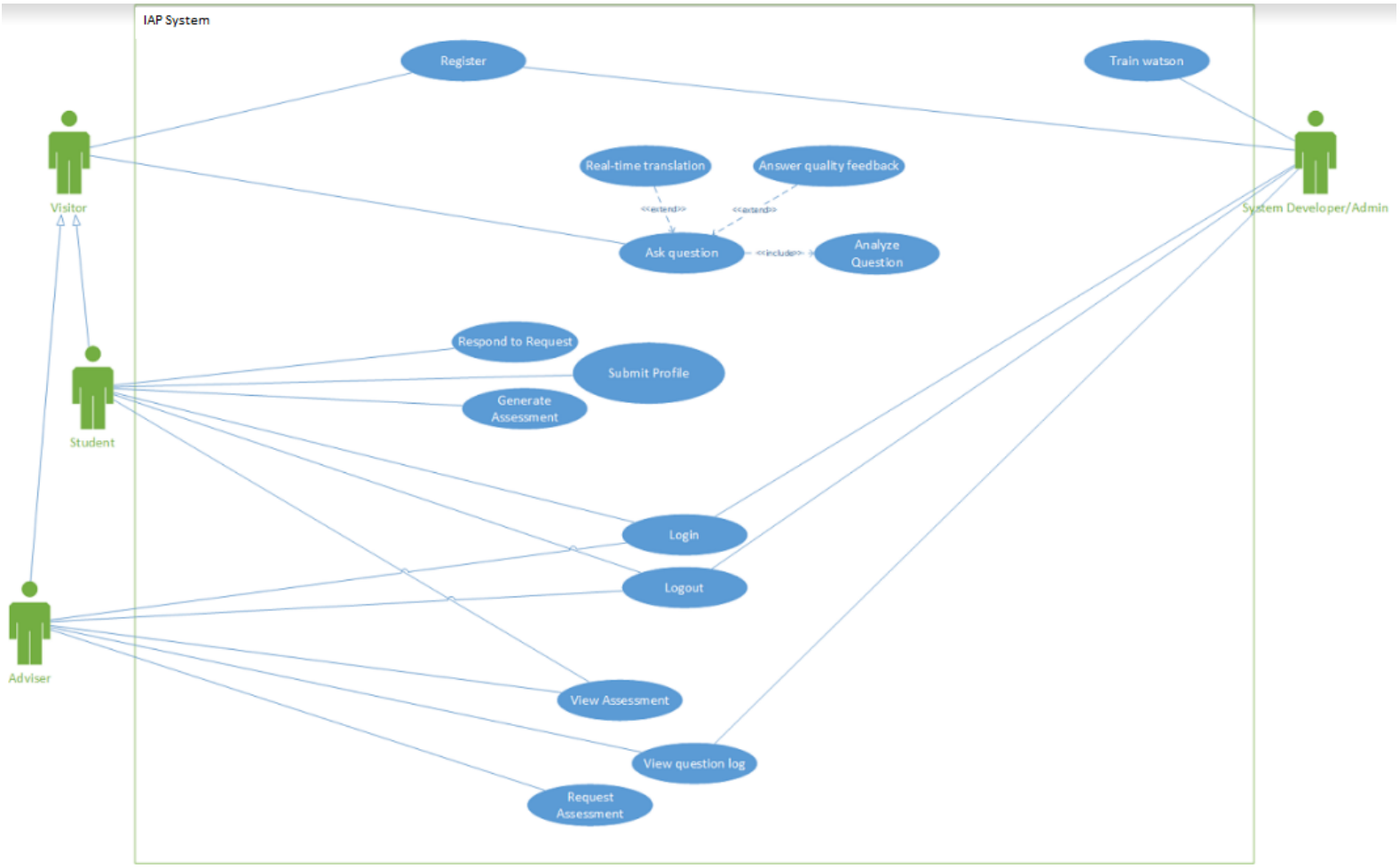
- **Watson** - An IBM supercomputer that combines artificial intelligence (AI) and sophisticated analytical software for optimal performance as a “question answering” machine.
- **Big Data Analysis** - The process of examining large datasets to uncover hidden patterns, unknown correlations, customer preferences
- **Textual Analysis** - A research method that requires the researcher to closely analyze the content of communication rather than the structure of the content.
- **Web Experience Management** - A process of managing the all-round experience of the web user across various touch points in the journey through an organization's web presence.
- **Use Case Diagram** - A representation of all of the functionalities the system is expected to have and what functionalities a specific user has access to.
- **Use Case** - Communication between a user and the system to perform a specific functionality that is represented in the Use Case Diagram.
- **Sequence Diagram** - A diagram that explains the expected flow of the system once the functionality has been implemented.
- **Data Crawling** - In this context, data crawling refers to the collection of specific data from our own resources, such as our database.
- **Natural Language Processing** - The field of study concerned with the interactions between computers and natural human languages.
- **Machine Learning** - A branch of artificial intelligence in which a computer generates rules underlying or based on raw data that has been fed into it.
- **Supervised Learning** - The machine learning task of inferring a function from labeled training data.
- **Unsupervised Learning** - A type of machine learning algorithm used to draw inferences from datasets consisting of input data without labeled responses.

User Groups

- Visitors
- Students
- Advisors
- System Developers

Functional Requirements

Project Scope



This is the Use Case Diagram of our system (Intelligent Academic Planner (IAP) System). Student and Advisor share the options that Visitor has (represented by the inheritance arrows). Each blue bubble represents a functionality that is present in the system, and will be gone into detail in each use case. The functionality of Real-time translation and Answer quality feedback are sometimes used in the Ask question functionality, and Analyze question is always used. This is represented by the "extend" arrows for situational functionality, and "include" arrows for full-time functionality done by the system.

Visitors are able to ask a question without having to register. However, since they are not registered and we therefore cannot store information about them, they do not have the ability to create profiles and therefore will not have their personality assessed. These functionalities belong solely to students who have registered. However, asking a question is fully available to anyone that uses the system.

User Scenarios

Project Name:	Intelligent Academic Planner
Use Case ID:	UC-001
Use Case Name:	Respond to Request
User Goal:	User approves of advisor viewing assessment
Scope:	IAP System
Level:	Primary task
Relevant User Reqs:	UF-E
Relevant System Reqs:	SF-E-05
Primary Actor:	Student
Precondition:	User has a request awaiting approval
Minimal Guarantee:	User's assessment are non-view-able
Success Guarantee:	User's assessment becomes view-able for advisor that requested
Trigger:	User requests to respond to request
Success Scenario:	Step Actions 1 The user requests to respond to request 2 The system asks for user's response 3 The user responds
Extensions:	Branching Scenarios
3A	Condition: If request is declined
	Step Actions 1 The system sends notification to advisor 2 Exit out of functionality
3B	Condition: If request is accepted
	Step Actions 1 The system sends notification to advisor 2 The system allows advisor to view assessment of student
Acknowledgment: Generated from the CapStone process management system ©2015	

UC-001: *This use case explains the communication between the user and system to perform the functionality of responding to a request. Only students have access to this functionality, and it is performed when a student receives a request from an Advisor. This allows the user to either accept or deny an advisor's request for their assessment.*

Project Name:	Intelligent Academic Planner
Use Case ID:	UC-004
Use Case Name:	Register
User Goal:	To be recognized by the system.
Scope:	IAP System
Level:	Primary task
Relevant User Reqs:	UF-F
Relevant System Reqs:	SF-F-01
Primary Actor:	Visitor, System Devleoper
Precondition:	User is viewing program
Minimal Guarantee:	User is not recognized by system
Success Guarantee:	User is recognized by system
Trigger:	User requests to register
Success Scenario:	Step Actions 1 The user requests to register 2 The system asks for registration information 3 The user inputs registration information 4 The system validates information 5 The system accepts user registration
Extensions:	Branching Scenarios
4A	Condition: Information is invalid
	Step Actions 1 The system notifies user of invalid information 2 Return to step 2
Acknowledgment: Generated from the CapStone process management system ©2015	

UC-004: *This use case explains the communication between the user and system to perform the functionality of registering. Anyone that accesses the program has access to this functionality. It is triggered when the user requests to register. This allows the user to login.*

Project Name:	Intelligent Academic Planner
Use Case ID:	UC-005
Use Case Name:	View assessment
User Goal:	User is able to view assessment
Scope:	IAP System
Level:	Subfunction
Relevant User Reqs:	UF-E
Relevant System Reqs:	SF-E-03
Primary Actor:	student, advisor
Precondition:	The user is logged in
Minimal Guarantee:	System does not display student's assessment
Success Guarantee:	system display student's assessment
Trigger:	User requests to view assessments
Success Scenario:	Step Actions 1 The user requests to view assessments 2 The system displays assessments that can be viewed
Extensions:	Branching Scenarios
Acknowledgment: Generated from the CapStone process management system ©2015	

UC-005: *This use case explains the communication between the user and the system to perform the functionality of viewing an assessment. This function is only available to logged in users, specifically students and advisors, and is performed when the user requests to view an assessment on their profile. This allows the user to view an assessment that they have generated.*

Project Name:	Intelligent Academic Planner
Use Case ID:	UC-006
Use Case Name:	View question log
User Goal:	User is able to view the question log
Scope:	IAP System
Level:	Primary task
Relevant User Reqs:	UF-G
Relevant System Reqs:	SF-G-01
Primary Actor:	Adviser, System Developer
Precondition:	User is logged in
Minimal Guarantee:	System does not display question log
Success Guarantee:	System displays question log
Trigger:	User requests to view question log
Success Scenario:	Step Actions 1 The user requests to view question log 2 The system asks for filter information 3 The user enters filter information 4 The system displays all questions based on filter information
Extensions:	Branching Scenarios
Acknowledgment: Generated from the CapStone process management system ©2015	

UC-006: *This use case explains the communication between user and system to perform the functionality of viewing the question log. This functionality is only available to advisors and system developers. It is triggered when the user requests to view the question log. This allows the user to view a list of question that have been asked.*

Project Name:	Intelligent Academic Planner
Use Case ID:	UC-007
Use Case Name:	Train Watson
User Goal:	User be able to train watson with new questions that user asked but hasn't been answered
Scope:	IAP System
Level:	Primary task
Relevant User Reqs:	UF-H
Relevant System Reqs:	SF-A-01
Primary Actor:	System Developer
Precondition:	User is logged in
Minimal Guarantee:	Watson is not further trained
Success Guarantee:	Watson is further trained
Trigger:	User requests to train Watson
Success Scenario:	Step / Actions 1 The user request system export new questions 2 The system export new question list as a text file 3 The user request system export incorrect answered questions 4 The system export downvotes answered questions 5 The user request view answer quality 6 The system display the statistical analysis of the answer for each of the questions 7 The user request view the feedback of answer from user 8 The system display the most up voted help feedback for the answer 9 The user request the analysis of a specific question 10 The system display analysis of a question by keyterm
Extensions:	Branching Scenarios
1A	**Condition:** User request system export all new questions from last time export
	Step / Actions 1 The system export question list that is new from last time
1B	**Condition:** User request system export all new questions by major
	Step / Actions
1C	**Condition:** User request system export all new questions other condition
	Step / Actions 1 The system export top 10 unanswered FAQ 2 The system export top 10% unanswered FAQ
Acknowledgment: Generated from the CapStone process management system ©2015	

UC-007: *This use case explains the communication between user and system to perform the functionality of training Watson. This functionality is only available to the system developer and is performed when the user requests to train Watson. This allows the user to view data to assist with the training of Watson in the future.*

Project Name:	Intelligent Academic Planner
Use Case ID:	UC-009
Use Case Name:	Real-time translation
User Goal:	User is able to see input/output in english
Scope:	IAP System
Level:	Subfunction
Relevant User Reqs:	UF-C
Relevant System Reqs:	SF-C-02
Primary Actor:	Visitor, Student, Advisor
Precondition:	User is asking a question
Minimal Guarantee:	Input/output is not translated
Success Guarantee:	System displays translated text
Trigger:	User requests translation
Success Scenario:	Step Actions 1 The user input non-english input 2 The system determines what language is being used 3 The system translates text to english 4 The system displays english answer
Extensions:	Branching Scenarios
Acknowledgment: Generated from the CapStone process management system ©2015	

UC-009: *This use case explains the communication between user and system to perform the functionality of real-time translation. This functionality is available to all users and is performed when the user requests a translation of their question. This allows the user to translate text from well-known languages to english. This is called occasionally when the user asks a question, and is present in the Ask Question use case.*

Project Name:	Intelligent Academic Planner
Use Case ID:	UC-010
Use Case Name:	Answer quality feedback
User Goal:	User is able to provide feedback on question response.
Scope:	IAP System
Level:	Primary task
Relevant User Reqs:	UF-H
Relevant System Reqs:	SF-H-01
Primary Actor:	Visitor, Student, Advisor
Precondition:	User is asking a question
Minimal Guarantee:	Feedback is not stored
Success Guarantee:	Feedback is stored
Trigger:	User requests to submit feedback
Success Scenario:	Step Actions 1 The user requests to submit feedback 2 The system allows user to enter feedback 3 The user submits feedback 4 The system stores feedback
Extensions:	Branching Scenarios
Acknowledgment: Generated from the CapStone process management system ©2015	

UC-010: *This use case explains the communication between user and system to perform the functionality of sending answer quality feedback. This functionality is available to all users and is performed when the user requests to submit feedback on their response. This allows the user to submit feedback on the response to their question. This is called occasionally when the user asks a question, and is present in the Ask Question use case.*

Project Name:	**Intelligent Academic Planner**
Use Case ID:	UC-011
Use Case Name:	Ask question
User Goal:	User is able to ask questions
Scope:	IAP System
Level:	Primary task
Relevant User Reqs:	UF-C
Relevant System Reqs:	SF-C-01,SF-C-02,SF-C-03,SF-C-04,SF-C-05
Primary Actor:	Visitor, Student, Advisor
Precondition:	User is viewing program
Minimal Guarantee:	Question is not logged
Success Guarantee:	Question is logged
Trigger:	The user requests to ask a question
Success Scenario:	**Step** **Actions** 1 The user requests to ask a question 2 The system requests user's question 3 The user enters question and requests answer 4 The system analyzes question <<Analyze Question>> 5 The system displays answer 6 The system logs question to question log 7 The system asks user if they would like to submit feedback on answer quality
Extensions:	**Branching Scenarios**
3A	**Condition:** If user requests translation
	Step **Actions** 1 The system translates text <<Realtime Translation>>
7A	**Condition:** If user requests to provide feedback
	Step **Actions** 1 The system requests feedback information <<Answer Quality Feedback>>
Acknowledgment: Generated from the CapStone process management system ©2015	

UC-011: *This use case explains the communication between user and system to perform the functionality of asking a question. This functionality is available to all users and is performed when the user requests to ask a question. This allows the user to submit a question and receive a response. This use case occasionally uses the functionality of Real-time Translation and Answer Quality Feedback use cases, and always uses the functionality of the Analyze Question use case.*

Project Name:	**Intelligent Academic Planner**
Use Case ID:	UC-012
Use Case Name:	Analyze Question
User Goal:	System determines answer for user
Scope:	IAP System
Level:	Primary task
Relevant User Reqs:	UF-C,UF-D
Relevant System Reqs:	SF-C-01,SF-C-03,SF-C-04,SF-C-05,SF-D-01
Primary Actor:	N/A
Precondition:	User asks a question
Minimal Guarantee:	Question is not analyzed
Success Guarantee:	Question is analyzed
Trigger:	User submits a question
Success Scenario:	**Step** **Actions** 1 The user submits a question 2 The system performs textual analysis on the question 3 The system determines if another question could be asked to clarify answer 4 The system displays answer
Extensions:	**Branching Scenarios**
1A	**Condition:** If another question could be asked
	Step **Actions** 1 The system asks user the question 2 The user responds to question 3 Return to step 2 in main scenario using response given
Acknowledgment: Generated from the CapStone process management system ©2015	

UC-012: *This use case explains the communication between user and system to perform the functionality of analyzing a question. This functionality is performed solely by the system. This allows the system to perform a textual analysis on the question that has been asked. This use case is always used in the Ask Question use case.*

Project Name:	Intelligent Academic Planner
Use Case ID:	UC-013
Use Case Name:	Submit Profile
User Goal:	User can create profile
Scope:	IAP System
Level:	Primary task
Relevant User Reqs:	UF-E
Relevant System Reqs:	SF-E-01,SF-E-02,SF-E-03,SF-E-04,SF-E-05
Primary Actor:	student
Precondition:	User is logged in
Minimal Guarantee:	Profile is not stored
Success Guarantee:	Profile is stored
Trigger:	User requests to update profile
Success Scenario:	Step Actions 1 The user requests to update profile 2 The system verify the profile 3 The system upload the profile to server
Extensions:	Branching Scenarios
2A	**Condition:** If system detect invalid format of the profile
	Step Actions 1 The system notify user of problem 2 Return to step 1
Acknowledgment: Generated from the CapStone process management system ©2015	

UC-013: *This use case explains the communication between user and system to perform the functionality of submitting a profile. This functionality is available only to students and is performed when the user requests to update their profile. This allows the user to update their profile information.*

Project Name:	Intelligent Academic Planner
Use Case ID:	UC-015
Use Case Name:	Generate Assessment
User Goal:	User receives assessment of profile information
Scope:	IAP System
Level:	Primary task
Relevant User Reqs:	UF-E
Relevant System Reqs:	SF-E-04,SF-E-05
Primary Actor:	Student
Precondition:	User has submitted information to profile
Minimal Guarantee:	No assessment generated
Success Guarantee:	System generate assessment and display to user
Trigger:	User requests to generate assessment
Success Scenario:	Step Actions 1 The user requests to generate assessment 2 The system analyzes profile and generates assessment 3 The system displays assessment
Extensions:	Branching Scenarios
3A	**Condition:** keep assessment on user's record
	Step Actions 1 The user request system save the assessment 2 The system upload assessment to server and relate to user account
3B	**Condition:** The user request assessment to be viewable by advisers
	Step Actions 1 The user request assessment to be viewable by advisers 2 The system mark user's assessment as public and save to user's account
Acknowledgment: Generated from the CapStone process management system ©2015	

UC-015: *This use case explains the communication between user and system to perform the functionality of generating an assessment. This functionality is available only to students and is performed when the user requests to generate an assessment. This allows the user to generate an assessment.*

Project Name:	**Intelligent Academic Planner**
Use Case ID:	UC-016
Use Case Name:	Login
User Goal:	User is able to log in
Scope:	IAP System
Level:	Primary task
Relevant User Reqs:	UF-A
Relevant System Reqs:	SF-A-01
Primary Actor:	Student, Advisor, System Devel
Precondition:	User is registered
Minimal Guarantee:	User is not logged in
Success Guarantee:	User is logged in
Trigger:	User requests to log in
Success Scenario:	**Step** **Actions** 1 The user request to login to the system 2 The system verifies user's login credential 3 The system logs in user
Extensions:	**Branching Scenarios**
2A	**Condition:** login credential doesn't match account info
	Step **Actions** 1 The system notifies user of problem 2 Return to step 1
Acknowledgment: Generated from the CapStone process management system ©2015	

UC-016: *This use case explains the communication between user and system to perform the functionality of logging in. This functionality is available only to registered users and is performed when the user requests to login. This allows the user to log in to their own session and view their personal information.*

Project Name:	**Intelligent Academic Planner**
Use Case ID:	UC-018
Use Case Name:	Logout
User Goal:	User is able to log out
Scope:	IAP System
Level:	Primary task
Relevant User Reqs:	UF-B
Relevant System Reqs:	SF-B-01
Primary Actor:	Student, Advisor, System Devel
Precondition:	User is logged in
Minimal Guarantee:	User is not logged out
Success Guarantee:	User is logged out
Trigger:	User requests to log out
Success Scenario:	**Step** **Actions** 1 The user requests to logout 2 The system verifies all information is saved 3 The system logs users out
Extensions:	**Branching Scenarios**
2A	**Condition:** If some information is unsaved
	Step **Actions** 1 The system checks if user still wants to log out 2 The user responds 3 BRANCH - If user responds no exit functionality. Else - Continue on.
Acknowledgment: Generated from the CapStone process management system ©2015	

UC-018: *This use case explains the communication between user and system to perform the functionality of logging out. This functionality is available only to logged in users and is performed when the user requests to log out. This logs the user out of their personal session.*

Project Name:	Intelligent Academic Planner
Use Case ID:	UC-019
Use Case Name:	Request Assessment
User Goal:	System notify student that an adviser wants to see his assessment
Scope:	IAP System
Level:	Primary task
Relevant User Reqs:	UF-E
Relevant System Reqs:	SF-E-05
Primary Actor:	Advisor
Precondition:	User is logged in
Minimal Guarantee:	No request is sent
Success Guarantee:	Request is sent
Trigger:	User requests to send request to student
Success Scenario:	Step Actions 1 The user requests to send request to student 2 The system asks for student information 3 The user inputs student information 4 The system validates student information 5 The system sends request to student
Extensions:	Branching Scenarios
4A	Condition: If invalid student information
	Step Actions 1 The system notifies user of problem 2 Return to step 2
Acknowledgment: Generated from the CapStone process management system ©2015	

UC-019: *This use case explains the communication between user and system to perform the functionality of requesting an assessment. This functionality is available only to advisors and is performed when the user requests to ask a student for their assessment. This allows the user to send a request to a student for their assessment.*

List of User Functional Requirements

Project Name:	Intelligent Academic Planner				
Requirement ID:	UF-A			Type: Functional / Non-Functional	
Creation:	Sep 20 2016 01:25 PM			User: ☒ / ☐	
Modification:	Oct 05 2016 01:50 AM			System: ☐ / ☐	
Description:	A user can log in.				
Priority:	Highest	✓ High	Medium	Low	Lowest
This Req. is Refined Into:	SF-A-01				
Justify why UF-A can be completely covered by SF-A-01	If a user can login within 5 seconds, they can log in properly.				
Traceability:	Use cases cf.	UC-016			
	Test cases cf.	Yet to be completed in test case worksheet!			
Acknowledgment	*Generated from the CapStone Process Management System ©2015*				

UF-A: *This user requirement requests that we include functionality in the system for users to log in. High priority was given to this requirement since making individual sessions is required to begin work on the profile.*

Project Name:	Intelligent Academic Planner				
Requirement ID:	UF-B				
Creation:	Sep 20 2016 04:17 PM				
Modification:	Oct 05 2016 01:50 AM				
Description:	A user can log out.				
Priority:	Highest	✓ High	Medium	Low	Lowest
This Req. is Refined Into:	SF-B-01				
Justify why UF-B can be completely covered by SF-B-01	If a user can log out within 5 seconds, they can log out properly				
Traceability:	Use cases cf.	UC-018			
	Test cases cf.	Yet to be completed in test case worksheet!			
Acknowledgment	*Generated from the CapStone Process Management System ©2015*				

Type	Functional	Non-Functional
User	☒	☐
System	☐	☐

UF-B: *This user requirement requests that we include functionality in the system for users to log out. High priority was given to this requirement since a user should be able to log out if they can login, and log in has High priority.*

Project Name:	Intelligent Academic Planner				
Requirement ID:	UF-C				
Creation:	Sep 20 2016 04:18 PM				
Modification:	Sep 20 2016 04:58 PM				
Description:	A user can ask the system questions.				
Priority:	✓ Highest	High	Medium	Low	Lowest
This Req. is Refined Into:	SF-C-01, SF-C-02, SF-C-03, SF-C-04, SF-C-05, SF-C-07				
Justify why UF-C can be completely covered by SF-C-01, SF-C-02, SF-C-03, SF-C-04, SF-C-05, SF-C-07	If the system is able to perform the functionality in SF-C-01 through SF-C-06 then a user will undoubtedly have been able to ask the system questions. The system would not be able to perform these functions without a user first asking it a question.				
Traceability:	Use cases cf.	UC-008, UC-009, UC-011, UC-012			
	Test cases cf.	Yet to be completed in test case worksheet!			
Acknowledgment	*Generated from the CapStone Process Management System ©2015*				

Type	Functional	Non-Functional
User	☒	☐
System	☐	☐

UF-C: *This user requirement requests that we include functionality in the system for users to ask the system questions. Highest priority was given to this requirement since our first priority is to allow Watson to answer questions both accurately and uniquely. In addition, since any user can ask a question, logging in and registering is not a requirement to begin work on this.*

Project Name:	Intelligent Academic Planner				
Requirement ID:	UF-D			Type / Functional / Non-Functional	
Creation:	Sep 23 2016 12:52 PM			User ☒ / ☐	
Modification:	Oct 05 2016 01:51 AM			System ☐ / ☐	
Description:	A user should receive multiple responses to a question.				
Priority:	Highest	High	Medium	✓ Low	Lowest
This Req. is Refined Into:	SF-D-01				
Justify why UF-D can be completely covered by SF-D-01	By requiring a minimum of 1 response to be given, it is a given that multiple responses are given to a question.				
Traceability:	Use cases cf.	UC-012			
	Test cases cf.	Yet to be completed in test case worksheet!			
Acknowledgment	*Generated from the CapStone Process Management System ©2015*				

UF-D: *This user requirement requests that we include functionality in the system for users to receive multiple responses to a question. This means that if the user asks a question that does not have a clear answer, Watson should ask a question to clarify what is being asked to make the answer clearer. Low priority was given to this requirement since it requires we first implement asking a question, which was given highest priority, and in some cases the second question may require personal information to ask, requiring the profile to be complete which is medium priority.*

Project Name:	Intelligent Academic Planner				
Requirement ID:	UF-E			Type / Functional / Non-Functional	
Creation:	Oct 04 2016 11:51 PM			User ☒ / ☐	
Modification:	Oct 05 2016 12:06 AM			System ☐ / ☐	
Description:	A user can create a profile				
Priority:	Highest	High	✓ Medium	Low	Lowest
This Req. is Refined Into:	SF-E-01, SF-E-02, SF-E-03, SF-E-04, SF-E-05				
Justify why UF-E can be completely covered by SF-E-01, SF-E-02, SF-E-03, SF-E-04, SF-E-05	All of the system requirements associated with this cover what can be put into their profile.				
Traceability:	Use cases cf.	UC-001, UC-005, UC-013, UC-015, UC-019			
	Test cases cf.	Yet to be completed in test case worksheet!			
Acknowledgment	*Generated from the CapStone Process Management System ©2015*				

UF-E: *This user requirement requests that we include functionality in the system for users to create a profile. Medium priority was given to this requirement since it requires we first implement registering, logging in, and logging out (all High priority) before we can set up user-specific profiles.*

Project Name:	**Intelligent Academic Planner**				
Requirement ID:	UF-F			**Type**	**Functional**	**Non-Functional**
Creation:	Oct 05 2016 12:15 AM			**User**	☒	☐
Modification:	Oct 05 2016 01:51 AM			**System**	☐	☐
Description:	A user can register				
Priority:	Highest	✓ High	Medium	Low	Lowest
This Req. is Refined Into:	SF-F-01				
Justify why UF-F can be completely covered by SF-F-01	If a user can register within 5 seconds, they can register properly.				
Traceability:	**Use cases cf.**	UC-004			
	Test cases cf.	Yet to be completed in test case worksheet!			
Acknowledgment	***Generated from the CapStone Process Management System ©2015***				

UF-F: *This user requirement requests that we include functionality in the system for users to register. High priority was given to this requirement since making individual sessions is required to begin work on the profile.*

Project Name:	**Intelligent Academic Planner**				
Requirement ID:	UF-G			**Type**	**Functional**	**Non-Functional**
Creation:	Oct 05 2016 12:36 AM			**User**	☒	☐
Modification:	Oct 05 2016 01:52 AM			**System**	☐	☐
Description:	A user can view a log of asked questions.				
Priority:	Highest	High	✓ Medium	Low	Lowest
This Req. is Refined Into:	SF-G-01				
Justify why UF-G can be completely covered by SF-G-01	If advisors and system developers can view the question log, then users can view the question log.				
Traceability:	**Use cases cf.**	UC-006			
	Test cases cf.	Yet to be completed in test case worksheet!			
Acknowledgment	***Generated from the CapStone Process Management System ©2015***				

UF-G: *This user requirement requests that we include functionality in the system for users to view a log of asked questions. Medium priority was given to this requirement because it can be easily implemented after completing the ask a question requirement, and because it will assist with increasing the accuracy of Watson.*

Project Name:	Intelligent Academic Planner				
Requirement ID:	UF-H			Type / Functional / Non-Functional	
Creation:	Oct 05 2016 02:12 AM			User: ☒ / ☐	
Modification:	Oct 05 2016 02:16 AM			System: ☐ / ☐	
Description:	A user can provide information to improve accuracy of the system.				
Priority:	Highest	High	✓ Medium	Low	Lowest
This Req. is Refined Into:	SF-H-01				
Justify why UF-H can be completely covered by SF-H-01	If answer quality feedback is submitted, accuracy of responses can be increased.				
Traceability:	Use cases cf.	UC-007, UC-010			
	Test cases cf.	Yet to be completed in test case worksheet!			
Acknowledgment	*Generated from the CapStone Process Management System ©2015*				

UF-H: *This user requirement requests that we include functionality in the system for users to improve the accuracy of the system by providing feedback. Medium priority was given to this requirement because it can be easily implemented after completing the ask a question requirement, and because it will assist with increasing the accuracy of Watson.*

Non-Functional Requirements

Product: Performance Requirements

Project Name:	Intelligent Academic Planner				
Requirement ID:	UP-03			Type / Functional / Non-Functional	
Creation:	Oct 05 2016 01:36 AM			User: ☐ / ☒	
Modification:	Oct 05 2016 01:54 AM			System: ☐ / ☐	
Description:	A user should receive a quick response after asking a question			Product (sub-type below)	
				Performance Requirements	
Priority:	Highest	High	Medium	✓ Low	Lowest
This Req. is Refined Into:	SP-03-01				
Justify why UP-03 can be completely covered by SP-03-01	By specifying performance requirements, it is ensured that the question will be answered in a quick manner.				
Traceability:	Use cases cf.	N/A			
	Test cases cf.	Yet to be completed in test case worksheet!			
Acknowledgment	*Generated from the CapStone Process Management System ©2015*				

UP-03: *This user requirement requests that when we create the functionality for asking a question, the system should respond quickly. Low priority was given to this requirement because we are focusing first on implementing features and then focusing on quality and performance of the features.*

Product: Dependability/Reliability/Security

Project Name:	Intelligent Academic Planner				
Requirement ID:	UP-01			Type / Functional / Non-Functional	
Creation:	Oct 05 2016 12:10 AM			User ☐ ☒	
Modification:	Oct 05 2016 01:53 AM			System ☐ ☐	
Description:	A user's profile should be secure.			Product (sub-type below)	
				Dependability/Reliability/Security	
Priority:	Highest	✓ High	Medium	Low	Lowest
This Req. is Refined Into:	SP-01-01				
Justify why UP-01 can be completely covered by SP-01-01	Ensures only specific people can view a user's profile, making it secure.				
Traceability:	Use cases cf.	N/A			
	Test cases cf.	Yet to be completed in test case worksheet!			
Acknowledgment	*Generated from the CapStone Process Management System ©2015*				

UP-01: *This user requirement requests that when we create the functionality for creating a profile, the system should ensure that the profile is secure. High priority was given to this requirement because it should be done while creating the functionality of the profile and we were encouraged to keep security in mind.*

Organizational: Development Requirements

Project Name:	Intelligent Academic Planner				
Requirement ID:	UO-01			Type / Functional / Non-Functional	
Creation:	Sep 23 2016 12:42 PM			User ☐ ☒	
Modification:	Oct 05 2016 01:53 AM			System ☐ ☐	
Description:	A user's session should be managed.			Organizational (sub-type below)	
				Development Requirements	
Priority:	Highest	✓ High	Medium	Low	Lowest
This Req. is Refined Into:	SO-01-01				
Justify why UO-01 can be completely covered by SO-01-01	Ensures that a user can only be logged in for 1 hour, managing their session.				
Traceability:	Use cases cf.	N/A			
	Test cases cf.	Yet to be completed in test case worksheet!			
Acknowledgment	*Generated from the CapStone Process Management System ©2015*				

UO-01: *This user requirement requests that when we create the functionality for registering, logging in, and logging out, the system should ensure that the session is managed. High priority was given to this requirement because it should be done while creating the functionality of logging in, logging out, and registering.*

4.2. System Requirements

Functional Requirements

List of System Functional Requirements

Project Name:	Intelligent Academic Planner				
Requirement ID:	SF-A-01			Type: Functional / Non-Functional	
Creation:	Sep 23 2016 12:22 PM			User: ☐ / ☐	
Modification:	Oct 05 2016 01:41 AM			System: ☒ / ☐	
Description:	The system should log-in a user within 5 seconds.				
Priority:	Highest	High	Medium	✓ Low	Lowest
This Req. is Engineered From:	UF-A				
Justify why meeting SF-A-01 can contribute to the fulfilment of UF-A	Provides performance requirement for logging in.				
Traceability:	Use cases cf.	UC-007, UC-016			
	Test cases cf.	Yet to be completed in test case worksheet!			
Acknowledgment	*Generated from the CapStone Process Management System ©2015*				

SF-A-01: *This system requirement requests that when we create the functionality for logging in, the system should log the user in within 5 seconds. Low priority was given to this requirement because we are focusing first on implementing features and then focusing on quality and performance of the features.*

Project Name:	Intelligent Academic Planner				
Requirement ID:	SF-B-01			Type: Functional / Non-Functional	
Creation:	Sep 23 2016 12:32 PM			User: ☐ / ☐	
Modification:	Oct 05 2016 01:41 AM			System: ☒ / ☐	
Description:	The system should log-out a user within 5 seconds.				
Priority:	Highest	High	Medium	✓ Low	Lowest
This Req. is Engineered From:	UF-B				
Justify why meeting SF-B-01 can contribute to the fulfilment of UF-B	Explains performance requirement.				
Traceability:	Use cases cf.	UC-018			
	Test cases cf.	Yet to be completed in test case worksheet!			
Acknowledgment	*Generated from the CapStone Process Management System ©2015*				

SF-B-01: *This system requirement requests that when we create the functionality for logging out, the system should log the user out within 5 seconds. Low priority was given to this requirement because we are focusing first on implementing features and then focusing on quality and performance of the features.*

Project Name:	Intelligent Academic Planner				
Requirement ID:	SF-C-01			Type / Functional / Non-Functional	
Creation:	Sep 20 2016 04:22 PM			User ☐ / ☐	
Modification:	Oct 05 2016 01:42 AM			System ☒ / ☐	
Description:	The system should conduct textual analyses.				
Priority:	Highest	✓ High	Medium	Low	Lowest
This Req. is Engineered From:	UF-C				
Justify why meeting SF-C-01 can contribute to the fulfilment of UF-C	In order to provide an answer to questions asked, system must be able to perform this function.				
Traceability:	Use cases cf.	UC-011, UC-012			
	Test cases cf.	Yet to be completed in test case worksheet!			
Acknowledgment	*Generated from the CapStone Process Management System ©2015*				

SF-C-01: *This system requirement requests that when we create the functionality for asking a question, the system should conduct a textual analysis. High priority was given to this requirement because this is one of the key requirements we are focusing on.*

Project Name:	Intelligent Academic Planner				
Requirement ID:	SF-C-02			Type / Functional / Non-Functional	
Creation:	Oct 05 2016 01:59 AM			User ☐ / ☐	
Modification:	Oct 05 2016 02:00 AM			System ☒ / ☐	
Description:	The system should be able to handle input from multiple well-known languages.				
Priority:	Highest	High	Medium	Low	✓ Lowest
This Req. is Engineered From:	UF-C				
Justify why meeting SF-C-02 can contribute to the fulfilment of UF-C	Allows users to ask a question in a variety of ways.				
Traceability:	Use cases cf.	UC-009, UC-011			
	Test cases cf.	Yet to be completed in test case worksheet!			
Acknowledgment	*Generated from the CapStone Process Management System ©2015*				

SF-C-02: *This system requirement requests that when we create the functionality for asking a question, the system should be able to handle input from multiple well known languages. Lowest priority was given to this requirement because it is a bonus feature that we only intend to implement if time provides.*

Project Name:	Intelligent Academic Planner				
Requirement ID:	SF-C-03			Type: Functional / Non-Functional	
Creation:	Sep 20 2016 04:31 PM			User: ☐ / ☐	
Modification:	Oct 05 2016 01:44 AM			System: ☒ / ☐	
Description:	The system should recommend majors suitable for the user based on the personality assessment.				
Priority:	Highest	High	✓ Medium	Low	Lowest
This Req. is Engineered From:	UF-C				
Justify why meeting SF-C-03 can contribute to the fulfilment of UF-C	This allows questions to be answered more accurately.				
Traceability:	Use cases cf.	UC-011, UC-012			
	Test cases cf.	Yet to be completed in test case worksheet!			
Acknowledgment	*Generated from the CapStone Process Management System ©2015*				

SF-C-03: *This system requirement requests that when we create the functionality for asking a question, the system should be able to recommend majors suitable for the user based on their profile information. Medium priority was given to this requirement because it requires the profile to be complete.*

Project Name:	Intelligent Academic Planner				
Requirement ID:	SF-C-04			Type: Functional / Non-Functional	
Creation:	Sep 20 2016 04:34 PM			User: ☐ / ☐	
Modification:	Oct 05 2016 01:44 AM			System: ☒ / ☐	
Description:	The system should gather data unique to each user.				
Priority:	Highest	High	✓ Medium	Low	Lowest
This Req. is Engineered From:	UF-C				
Justify why meeting SF-C-04 can contribute to the fulfilment of UF-C	This allows questions to be answered more accurately.				
Traceability:	Use cases cf.	UC-011, UC-012			
	Test cases cf.	Yet to be completed in test case worksheet!			
Acknowledgment	*Generated from the CapStone Process Management System ©2015*				

SF-C-04: *This system requirement requests that when we create the functionality for asking a question, the system should be able to gather data unique to each user. Medium priority was given to this requirement because it requires register, logging in, and logging out to be complete.*

Project Name:	Intelligent Academic Planner				
Requirement ID:	SF-C-05			Type / Functional / Non-Functional	
Creation:	Sep 20 2016 04:35 PM			User ☐ / ☐	
Modification:	Oct 05 2016 01:44 AM			System ☒ / ☐	
Description:	The system should recommend courses based on the recommended majors.				
Priority:	Highest	High	✓ Medium	Low	Lowest
This Req. is Engineered From:	UF-C				
Justify why meeting SF-C-05 can contribute to the fulfilment of UF-C	This allows questions to be answered more accurately.				
Traceability:	Use cases cf.	UC-011, UC-012			
	Test cases cf.	Yet to be completed in test case worksheet!			
Acknowledgment	*Generated from the CapStone Process Management System ©2015*				

SF-C-05: *This system requirement requests that when we create the functionality for asking a question, the system should be able to recommend courses based on their recommend major. Medium priority was given to this requirement because it requires the profile to be complete and the system should already be able to recommend majors.*

Project Name:	Intelligent Academic Planner				
Requirement ID:	SF-D-01			Type / Functional / Non-Functional	
Creation:	Sep 23 2016 12:54 PM			User ☐ / ☐	
Modification:	Oct 05 2016 01:46 AM			System ☒ / ☐	
Description:	The system should show a minimum of 1 related search/question.				
Priority:	Highest	High	Medium	✓ Low	Lowest
This Req. is Engineered From:	UF-D				
Justify why meeting SF-D-01 can contribute to the fulfilment of UF-D	This allows responses to be structured and more accurate.				
Traceability:	Use cases cf.	UC-012			
	Test cases cf.	Yet to be completed in test case worksheet!			
Acknowledgment	*Generated from the CapStone Process Management System ©2015*				

SF-D-01: *This system requirement requests that when we create the functionality for responding with a question, the system should ask at least one question in response. Low priority was given to this requirement because creating the functionality for responding with a question is also Low priority.*

Project Name:	Intelligent Academic Planner				
Requirement ID:	SF-E-01			Type / Functional / Non-Functional	
Creation:	Oct 04 2016 11:56 PM			User ☐ ☐	
Modification:	Oct 05 2016 01:46 AM			System ☒ ☐	
Description:	The system should allow between 100 and 600 words to describe a user's academic and professional interests.				
Priority:	✓ Highest	High	Medium	Low	Lowest
This Req. is Engineered From:	UF-E				
Justify why meeting SF-E-01 can contribute to the fulfilment of UF-E	Allows user to enter information about themselves to their profile				
Traceability:	Use cases cf.	UC-013			
	Test cases cf.	Yet to be completed in test case worksheet!			
Acknowledgment	*Generated from the CapStone Process Management System ©2015*				

SF-E-01: *This system requirement requests that when we create the functionality for creating a profile, the system should allow the user to enter between 100 and 600 words of academic and professional interests. Highest priority was given to this requirement because this is what will be to determine questions and answers related to the user.*

Project Name:	Intelligent Academic Planner				
Requirement ID:	SF-E-02			Type / Functional / Non-Functional	
Creation:	Oct 04 2016 11:56 PM			User ☐ ☐	
Modification:	Oct 05 2016 01:47 AM			System ☒ ☐	
Description:	The system should allow a user to submit 100 words of self-description about their personality.				
Priority:	Highest	High	✓ Medium	Low	Lowest
This Req. is Engineered From:	UF-E				
Justify why meeting SF-E-02 can contribute to the fulfilment of UF-E	Allows user to enter personality information on their profile				
Traceability:	Use cases cf.	UC-013			
	Test cases cf.	Yet to be completed in test case worksheet!			
Acknowledgment	*Generated from the CapStone Process Management System ©2015*				

SF-E-02: *This system requirement requests that when we create the functionality for creating a profile, the system should allow the user to enter 100 words of self-description. Medium priority was given to this requirement because this will be used to determine question and answers, but will be taken into account after professional and academic interests.*

Project Name:	Intelligent Academic Planner				
Requirement ID:	SF-E-03				
Creation:	Oct 05 2016 12:00 AM				
Modification:	Oct 05 2016 01:47 AM				
Description:	The system should allow a user to view their personality assessments.				
Priority:	Highest	✓ High	Medium	Low	Lowest
This Req. is Engineered From:	UF-E				
Justify why meeting SF-E-03 can contribute to the fulfilment of UF-E	Allows a user to learn about themselves based on profile information.				
Traceability:	Use cases cf.	UC-005, UC-013			
	Test cases cf.	Yet to be completed in test case worksheet!			
Acknowledgment	*Generated from the CapStone Process Management System ©2015*				

Type	Functional	Non-Functional
User	☐	☐
System	☒	☐

SF-E-03: *This system requirement requests that when we create the functionality for creating a profile, the system should allow the user to view personality assessments. High priority was given to this requirement because this is one of the main resources advisors will use.*

Project Name:	Intelligent Academic Planner				
Requirement ID:	SF-E-04				
Creation:	Oct 05 2016 01:43 AM				
Modification:	Oct 05 2016 01:48 AM				
Description:	The system should create a personality assessment unique to each user based on the data gathered.				
Priority:	Highest	High	✓ Medium	Low	Lowest
This Req. is Engineered From:	UF-E				
Justify why meeting SF-E-04 can contribute to the fulfilment of UF-E	Allows user to view information about themselves on their profile that they did not input.				
Traceability:	Use cases cf.	UC-013, UC-015			
	Test cases cf.	Yet to be completed in test case worksheet!			
Acknowledgment	*Generated from the CapStone Process Management System ©2015*				

Type	Functional	Non-Functional
User	☐	☐
System	☒	☐

SF-E-04: *This system requirement requests that when we create the functionality for creating a profile, the system should allow the user to generate personality assessments. Medium priority was given to this requirement because it requires the 100 words of self-description to be complete.*

Project Name:	Intelligent Academic Planner				
Requirement ID:	SF-E-05			Type: Functional / Non-Functional	
Creation:	Oct 05 2016 01:45 AM			User: ☐ / ☐	
Modification:	Oct 05 2016 01:45 AM			System: ☒ / ☐	
Description:	The system should summarize this data to be used by an advisor directing the student.				
Priority:	Highest	High	✓ Medium	Low	Lowest
This Req. is Engineered From:	UF-E				
Justify why meeting SF-E-05 can contribute to the fulfilment of UF-E	Allows user to get assistance from advisors based on their profile.				
Traceability:	Use cases cf.	UC-001, UC-013, UC-015, UC-019			
	Test cases cf.	Yet to be completed in test case worksheet!			
Acknowledgment	*Generated from the CapStone Process Management System ©2015*				

SF-E-05: *This system requirement requests that when we create the functionality for creating a profile, the system should summarize data for advisors. Medium priority was given to this requirement because it requires the profile to be fully complete before a summarization can be created.*

Project Name:	Intelligent Academic Planner				
Requirement ID:	SF-F-01			Type: Functional / Non-Functional	
Creation:	Oct 05 2016 12:16 AM			User: ☐ / ☐	
Modification:	Oct 05 2016 01:49 AM			System: ☒ / ☐	
Description:	The system should register the user within 5 seconds.				
Priority:	Highest	High	✓ Medium	Low	Lowest
This Req. is Engineered From:	UF-F				
Justify why meeting SF-F-01 can contribute to the fulfilment of UF-F	Places a performance requirement on registration.				
Traceability:	Use cases cf.	UC-004			
	Test cases cf.	Yet to be completed in test case worksheet!			
Acknowledgment	*Generated from the CapStone Process Management System ©2015*				

SF-F-01: *This system requirement requests that when we create the functionality for registering, the system should register the user within 5 seconds. Medium priority was given to this requirement because we are focusing first on implementing features and then focusing on quality and performance of the features but this will be one of the first features users encounter, so it has a slightly higher priority than login and logout performance requirements.*

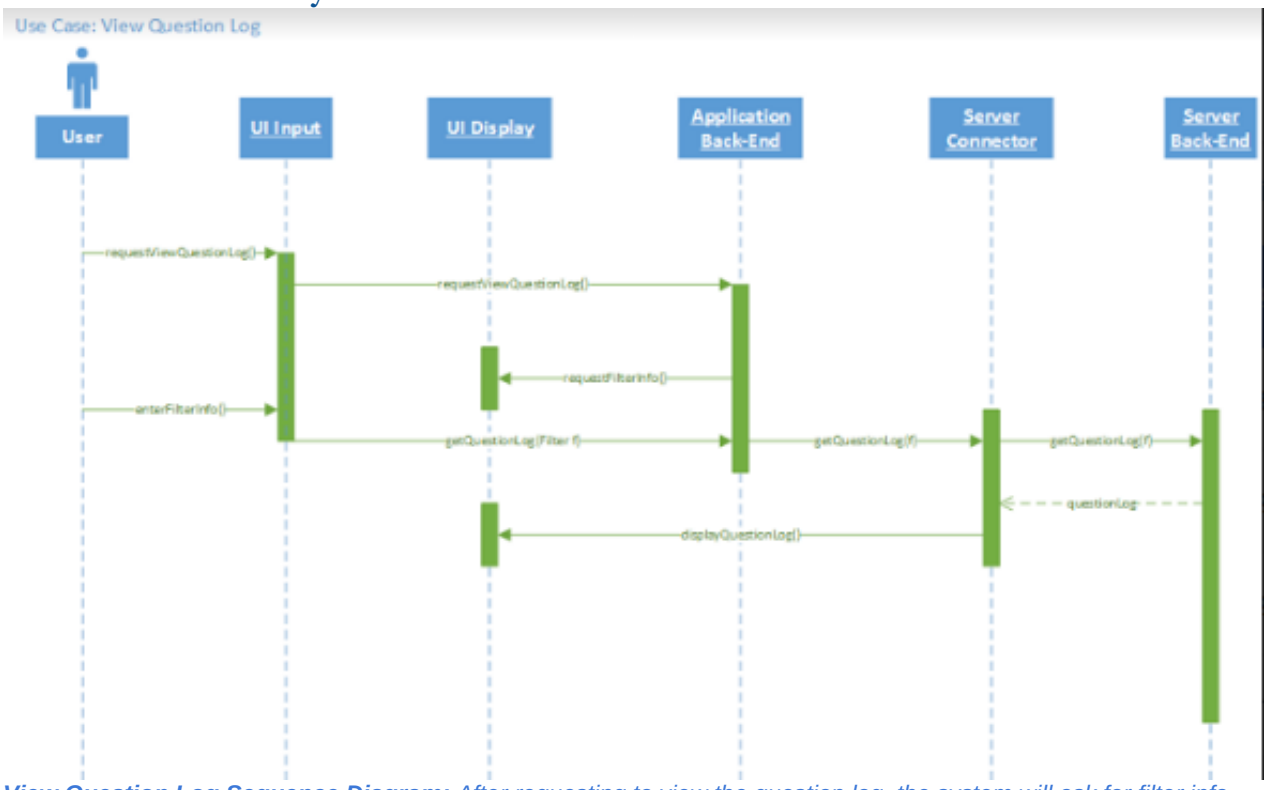
Project Name:	Intelligent Academic Planner				
Requirement ID:	SF-G-01			Type	Functional	Non-Functional
Creation:	Oct 05 2016 12:37 AM			User	☐	☐
Modification:	Oct 05 2016 12:37 AM			System	☒	☐
Description:	The system should only allow Advisors and System Developers to view the question log.				
Priority:	Highest	High	✓ Medium	Low	Lowest
This Req. is Engineered From:	UF-G				
Justify why meeting SF-G-01 can contribute to the fulfilment of UF-G	Adds security to the question log.				
Traceability:	Use cases cf.	UC-006			
	Test cases cf.	Yet to be completed in test case worksheet!			
Acknowledgment	*Generated from the CapStone Process Management System ©2015*				

SF-G-01: *This system requirement requests that when we create the functionality for viewing the question log, the system should only allow advisors and system developers to view it. Medium priority was given to this requirement because the functionality of the question log is also medium priority.*

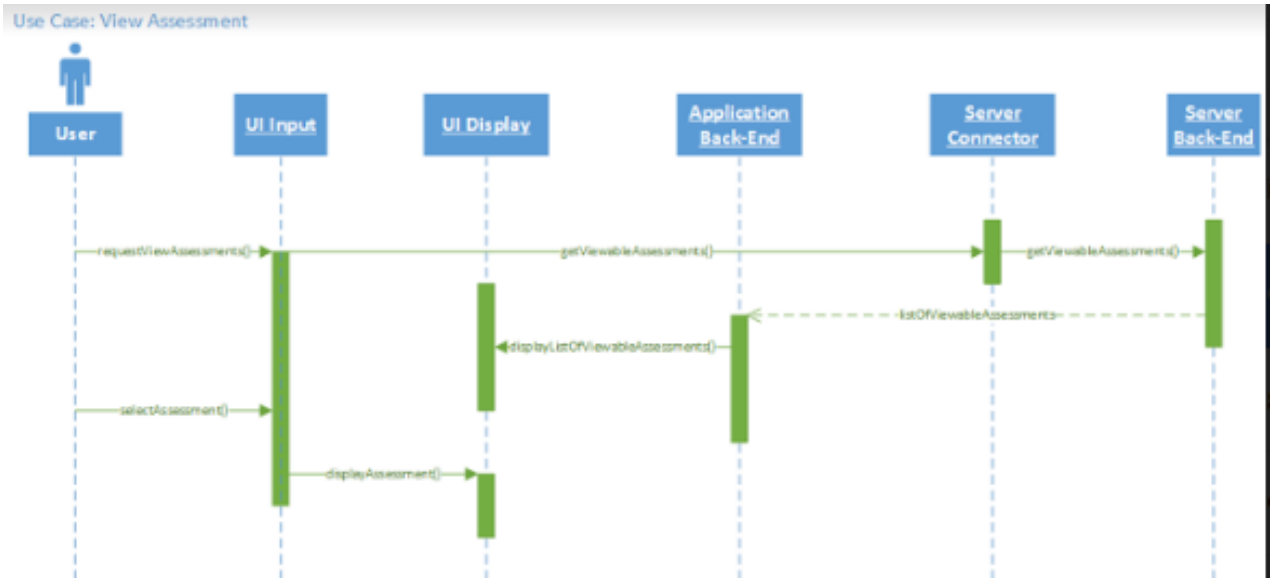
Project Name:	Intelligent Academic Planner				
Requirement ID:	SF-H-01			Type	Functional	Non-Functional
Creation:	Oct 05 2016 02:15 AM			User	☐	☐
Modification:	Oct 05 2016 02:15 AM			System	☒	☐
Description:	A user can provide answer quality feedback after asking a question.				
Priority:	Highest	High	✓ Medium	Low	Lowest
This Req. is Engineered From:	UF-H				
Justify why meeting SF-H-01 can contribute to the fulfilment of UF-H	Allows feedback to be submitted.				
Traceability:	Use cases cf.	UC-010			
	Test cases cf.	Yet to be completed in test case worksheet!			
Acknowledgment	*Generated from the CapStone Process Management System ©2015*				

SF-H-01: *This system requirement requests that when we create the functionality for providing feedback, the system should ask for the feedback after asking a question. Medium priority was given to this requirement because the functionality of providing feedback is also medium priority.*

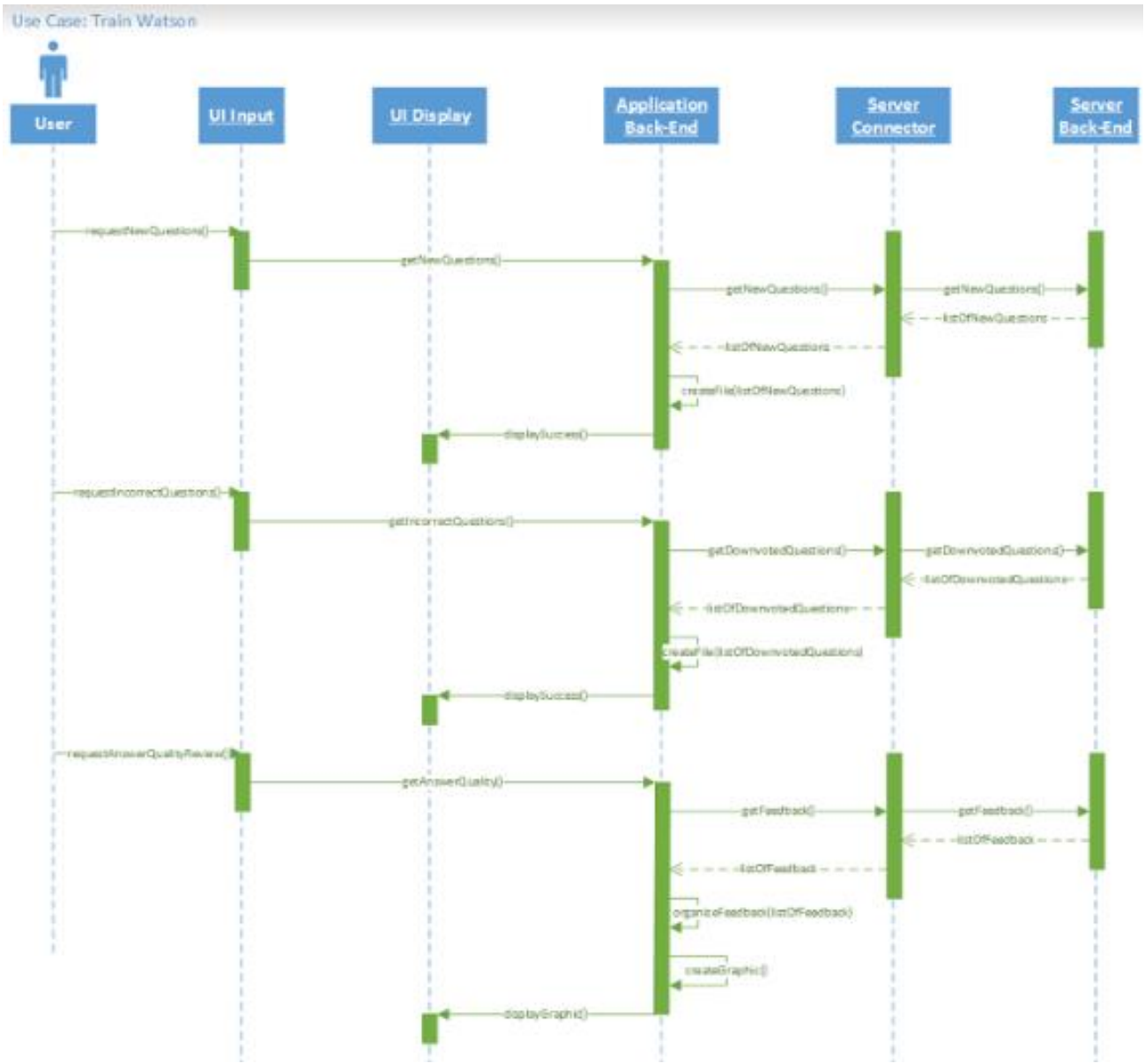
System Behavior



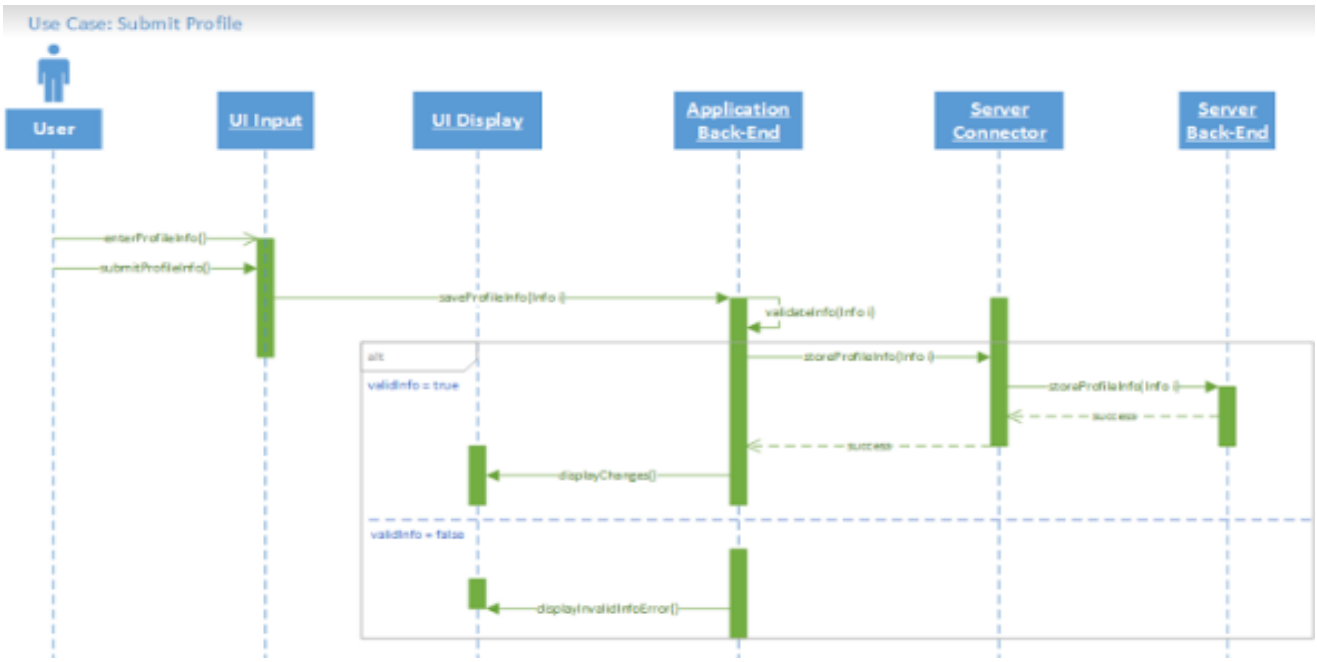
View Question Log Sequence Diagram: *After requesting to view the question log, the system will ask for filter info and then display the question log for viewing to the user after receiving the questions from the server's back-end.*



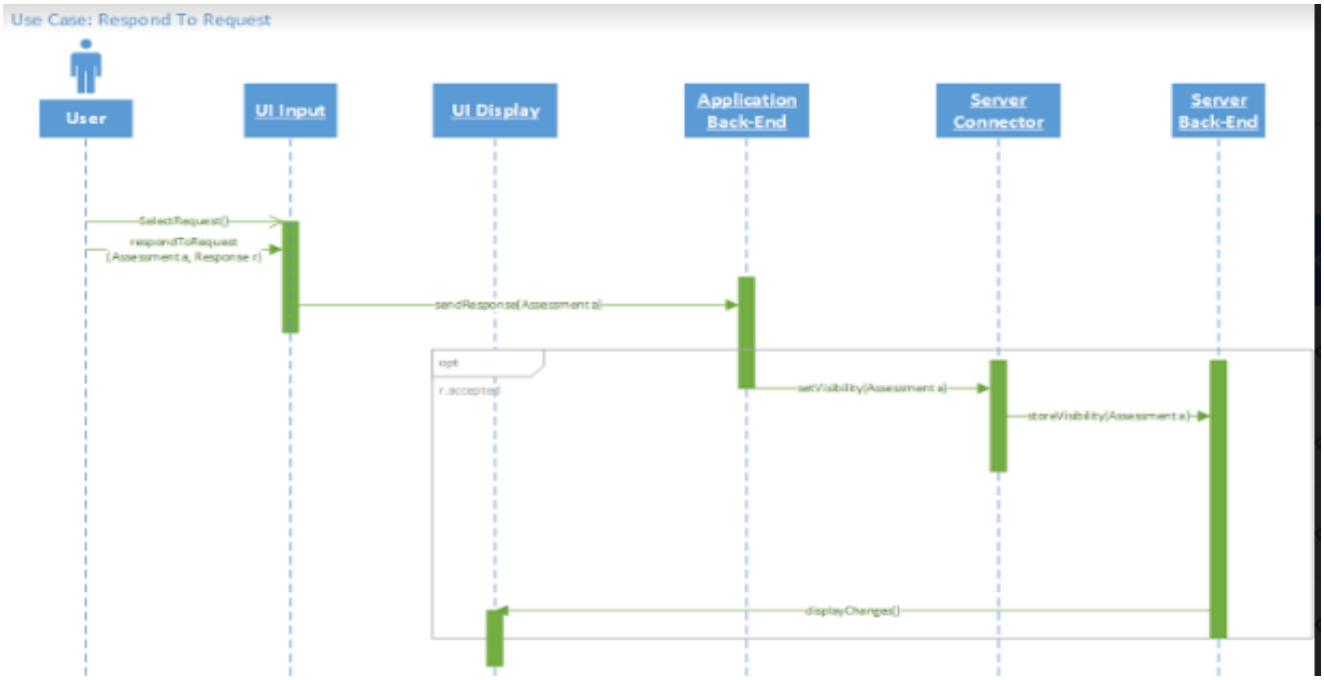
View Assessment Sequence Diagram: *After requesting to view an assessment, the system will display a list of viewable assessments. Once the user selects which assessment they wish to view, the system will display the assessment information on the screen.*



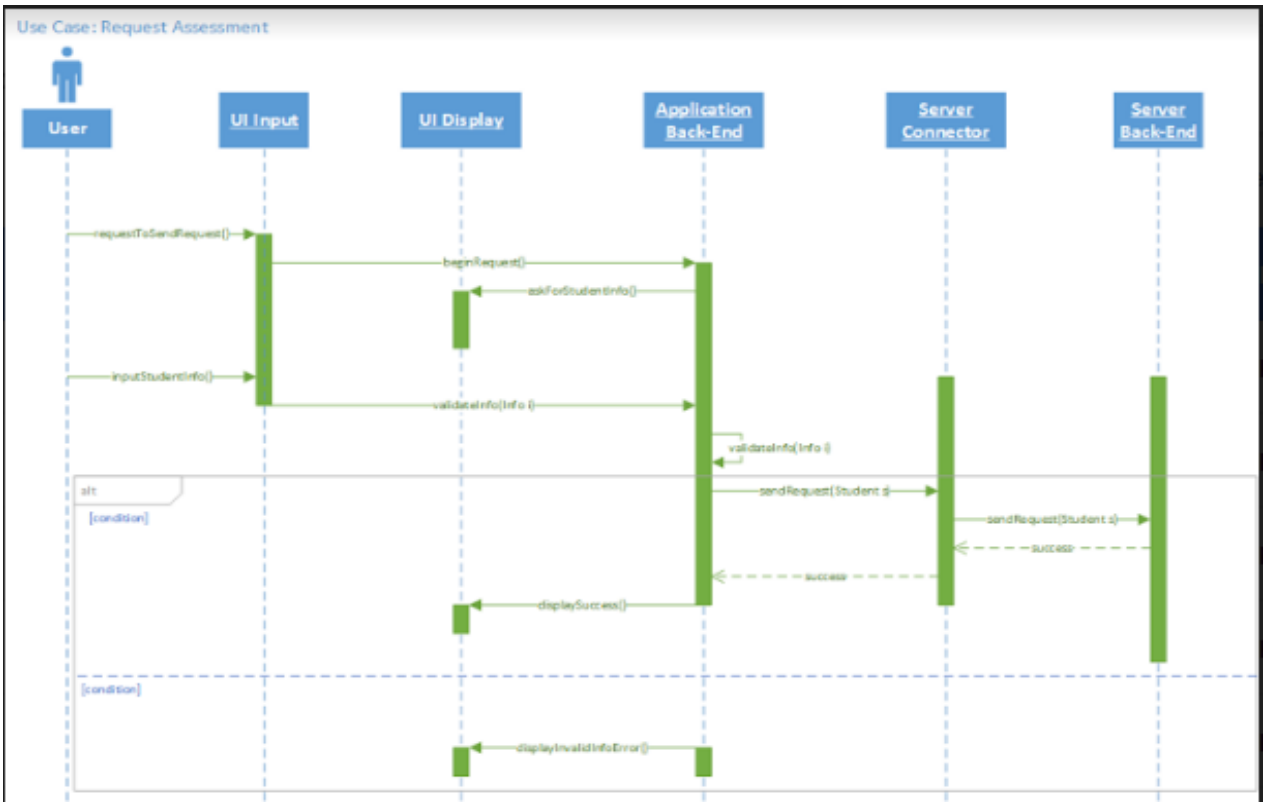
Train Watson Sequence Diagram: *After the user either requests new questions, incorrect questions, or quality feedback, the system responds by creating a file with a list of the questions matching the filter or a graphic (such as a bar graph) of the quality feedback.*



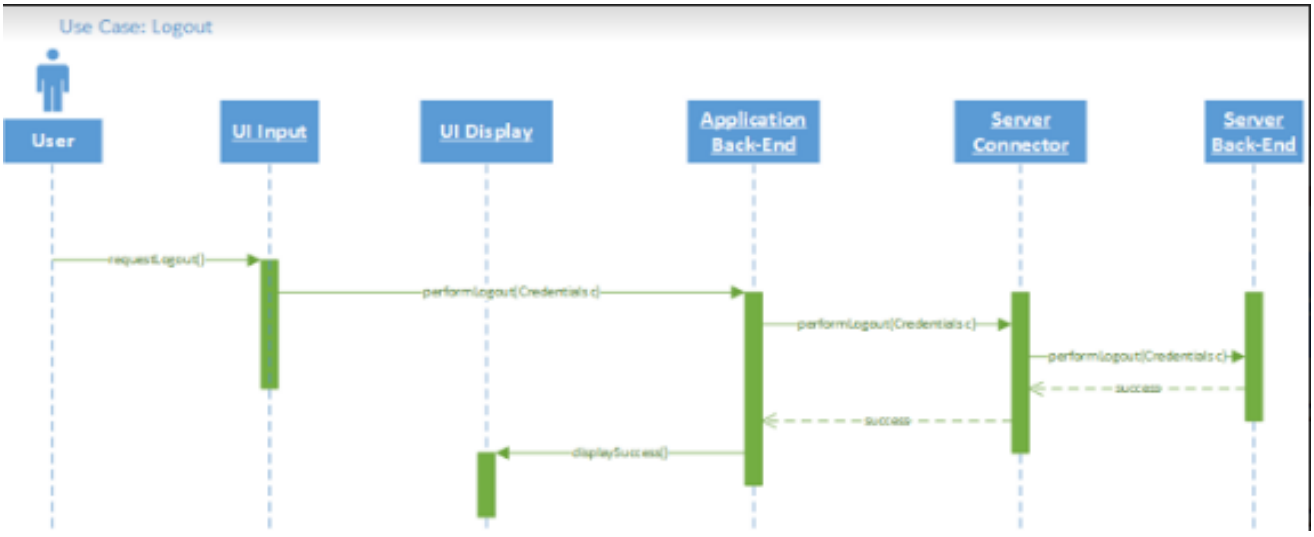
Submit Profile Sequence Diagram: *After a user inputs their profile information and requests to save, the system validates the information to ensure that there is no invalid or dangerous input. If it passes validation, the information is saved and a message stating that it was saved is displayed. Otherwise, a message displaying that there was a problem is displayed.*



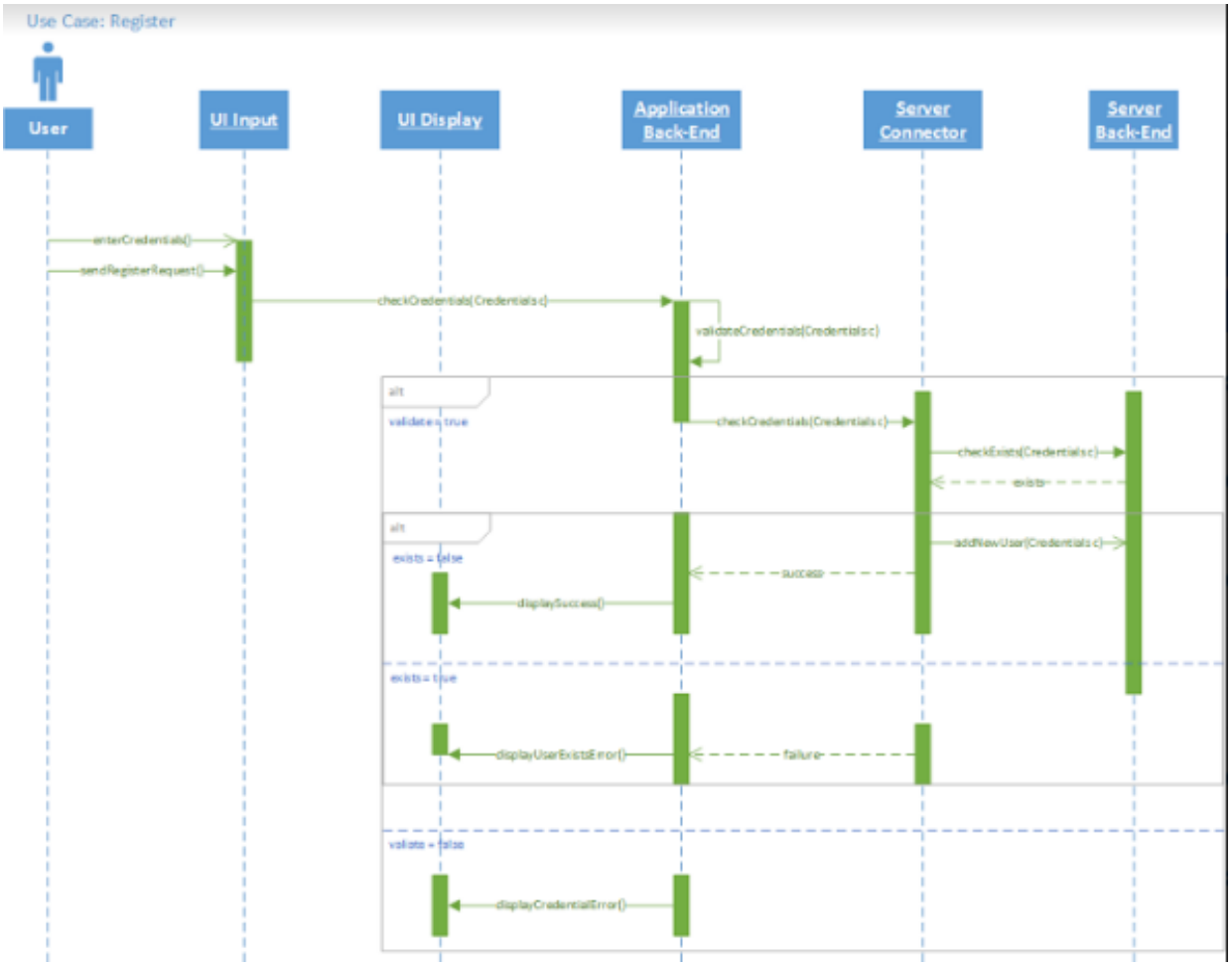
Respond to Request Sequence Diagram: *After the user selects the request they with to respond to and submits their response, the system sends a message back to the requester, sets the visibility of the selected requested assessment*



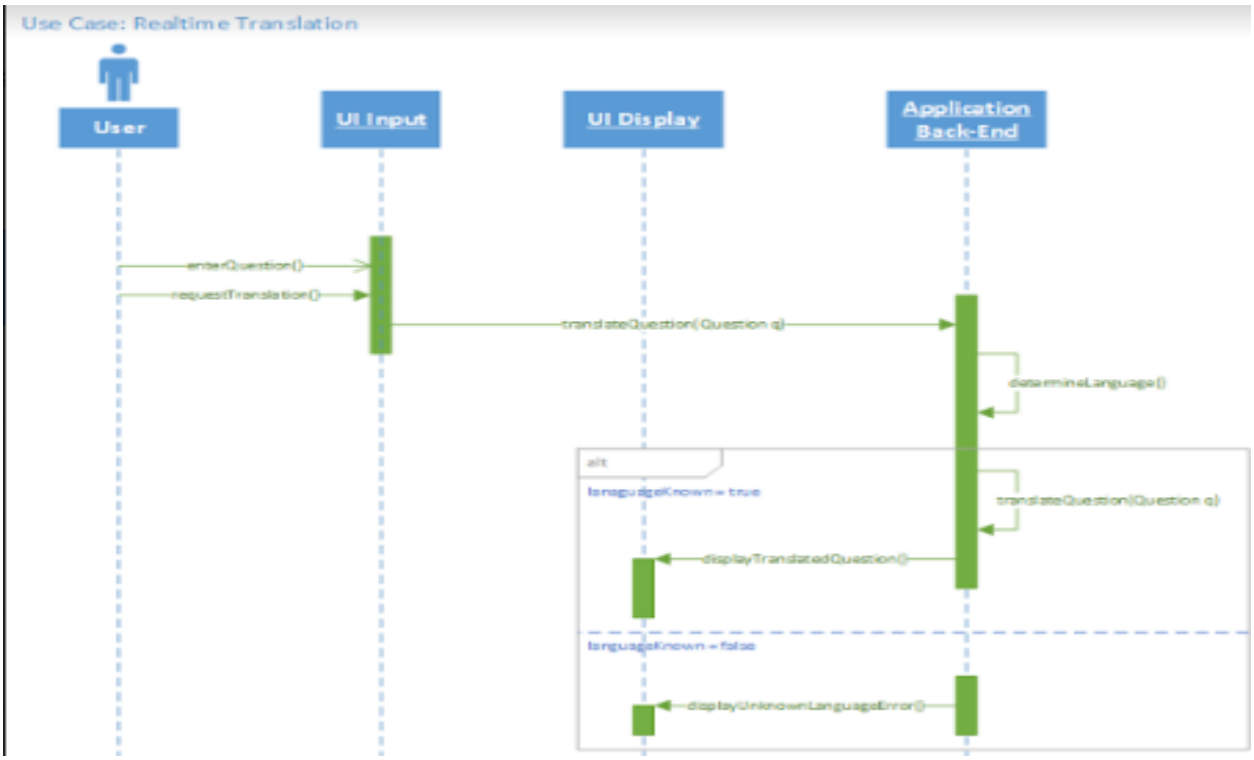
Request Assessment Sequence Diagram: *After the user requests to send a request, the system will ask for the student information. Once student information is inputted, it is validated to see if the student exists. If the student exists, the request is sent to the student and a success message is displayed. Otherwise, a message is displayed that the student could not be located.*



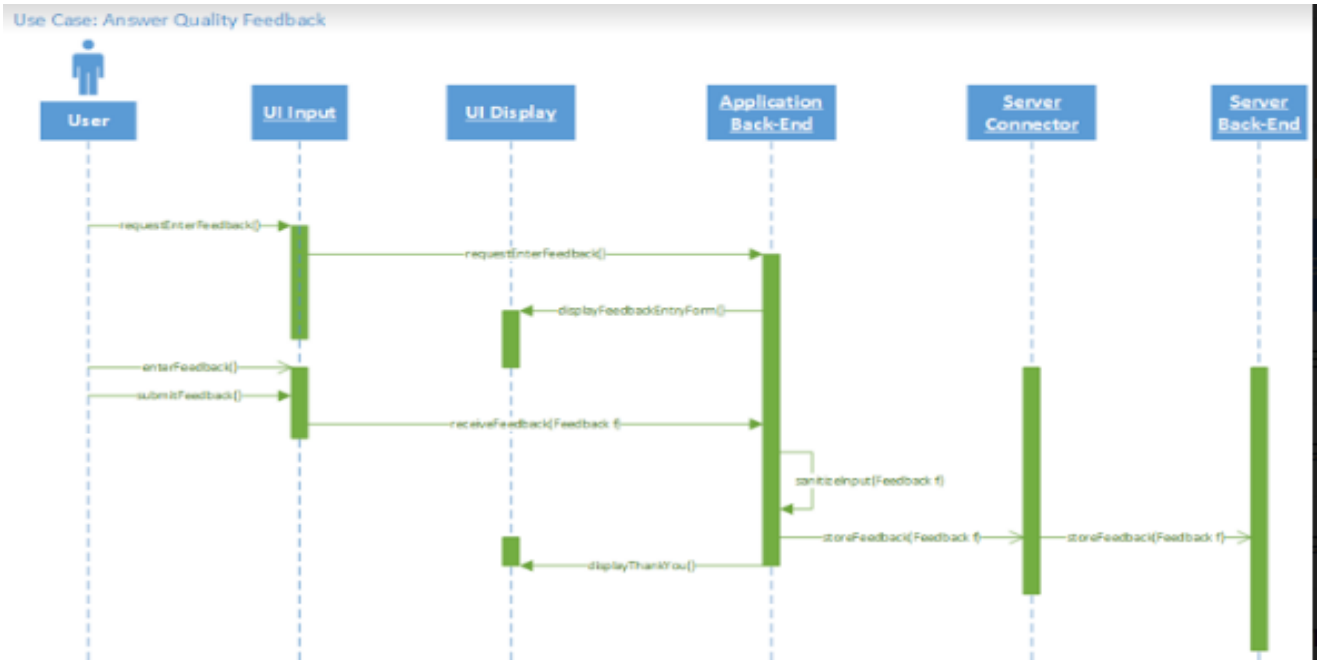
Logout Sequence Diagram: *After a user requests to logout, the system logs the user out of the server and displays success.*



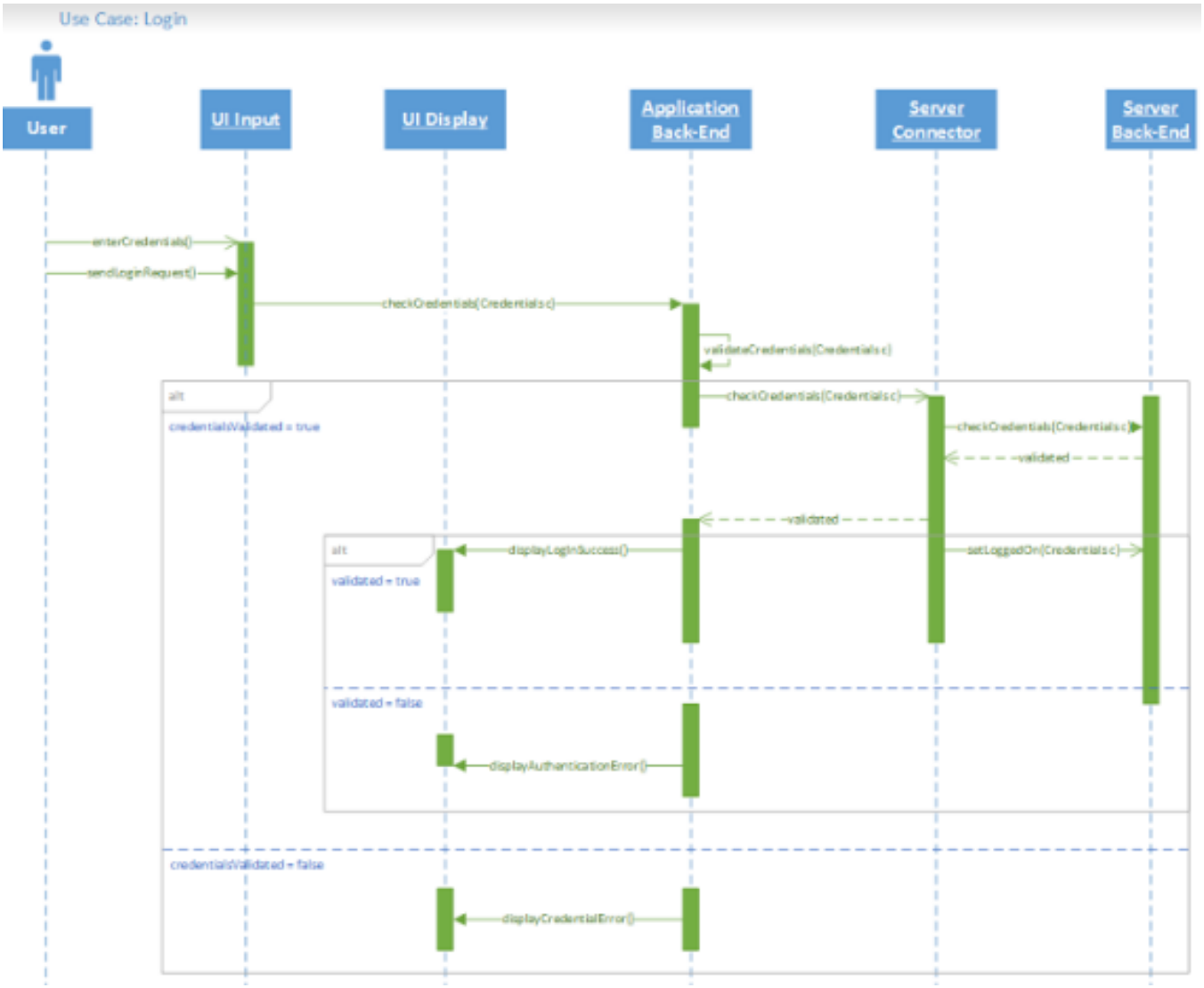
Register Sequence Diagram: *After the user enters credentials and requests to register, the system checks the credentials to see if they meet the requirements (email format, correct number of characters, etc). If valid, the system checks if a user with the same email already exists. If a user does not exist, the system adds a new user to the database and displays success. If a user with the same email already exists or the credentials do not meet requirements, an error message is displayed.*



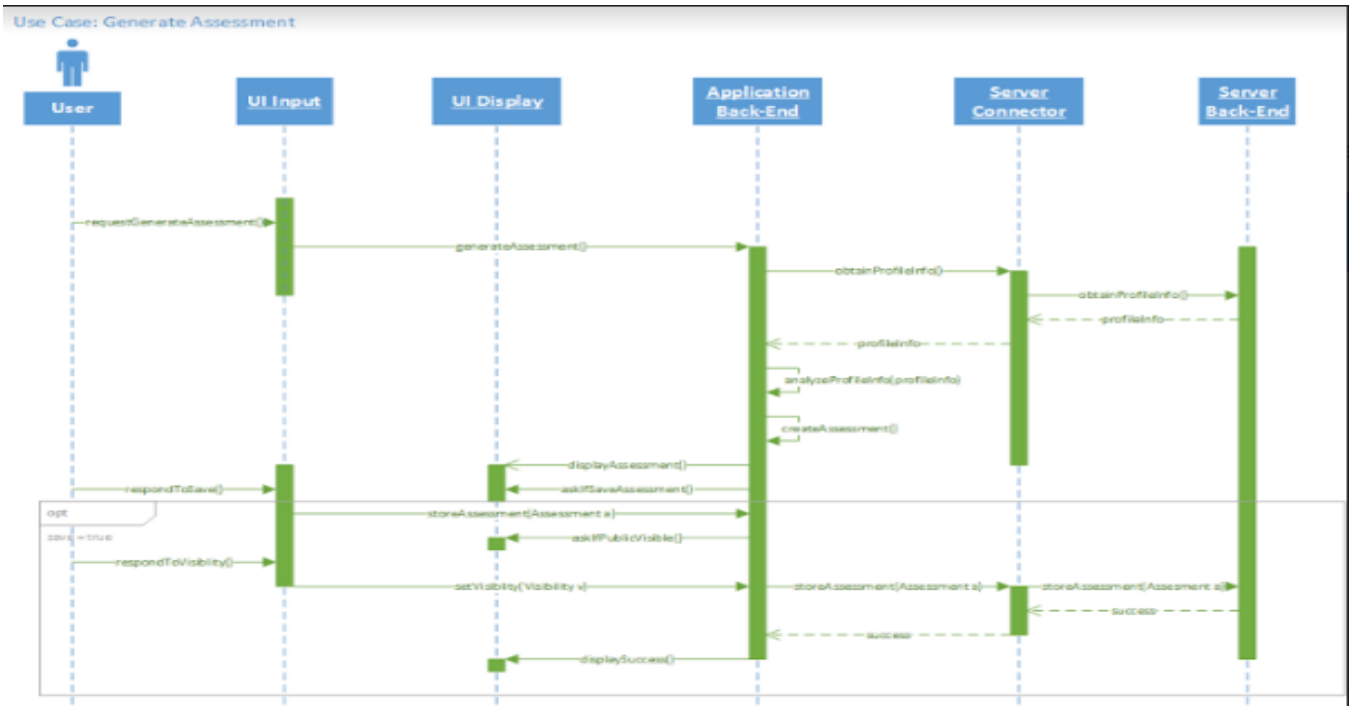
Real-time Translation Sequence Diagram: *After the user enters the question and requests a translation, the system determines the language of the question. If it can be translated, the translated text is then displayed. Otherwise, an error message is shown.*



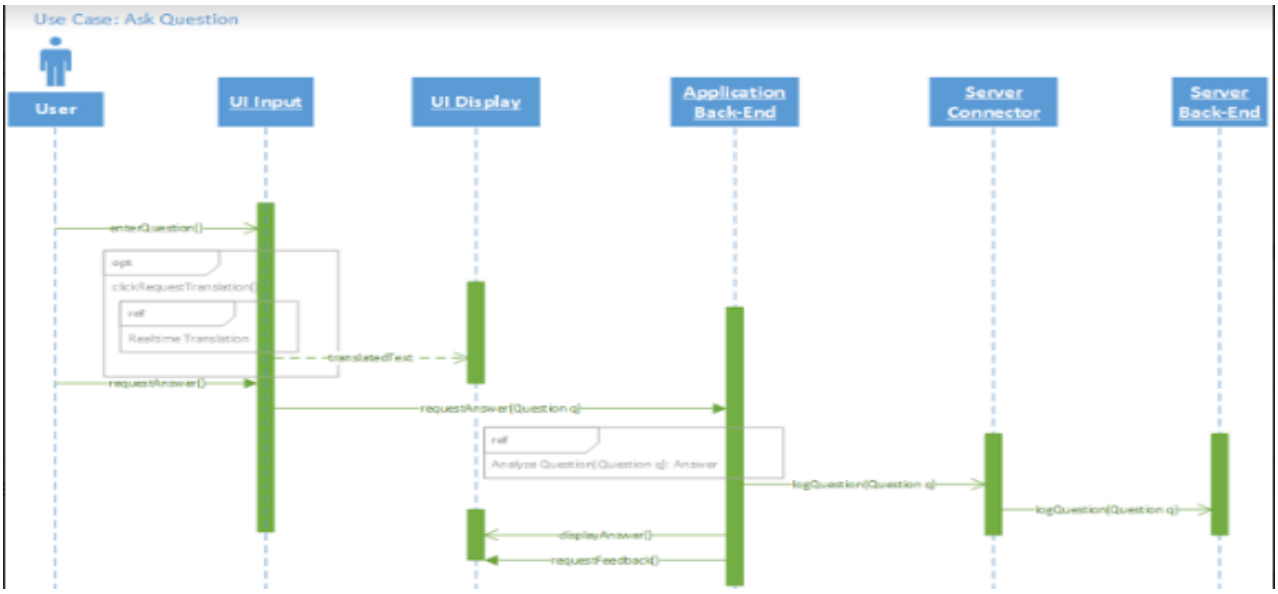
Answer Quality Feedback Sequence Diagram: *After a user requests to enter feedback, an entry form is displayed for the user to input the feedback. Once submitted, the system checks to make sure the input is not dangerous, then stores it in the database, and finally displays a thank you message to the user.*



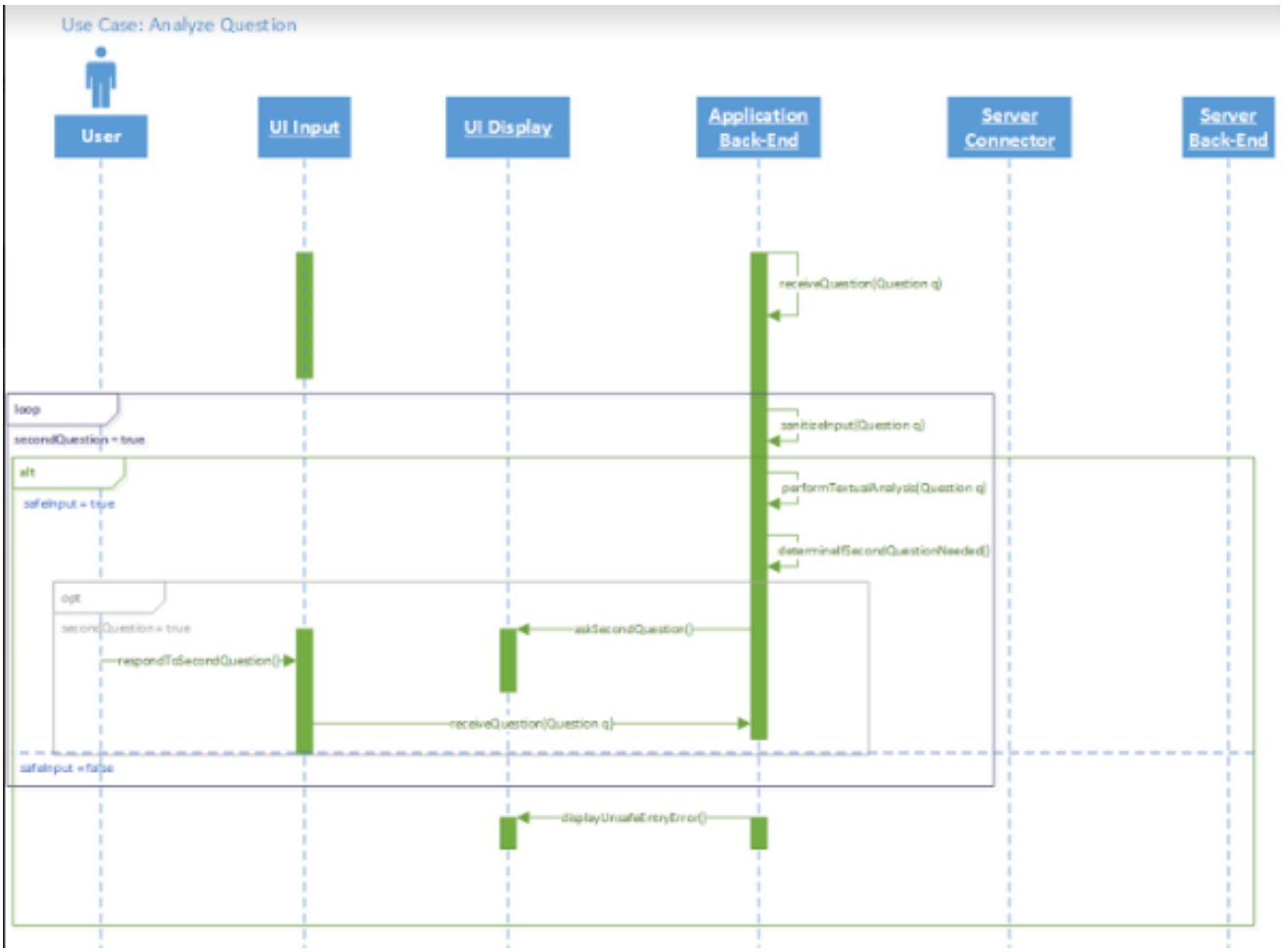
Login Sequence Diagram: *After the user enters their credentials and sends a login request, the system checks the credentials to see if they meet requirements first, and then checks to see if they are valid. If the credentials meet requirements and are valid, the user is logged on and a success message is displayed. Otherwise, an error message is displayed.*



Generate Assessment Sequence Diagram: *When the user requests to generate an assessment, the system obtains their profile information and analyzes it. Once analyzed, an assessment is created and displayed to the user. The system then asks if the user would like to save the assessment, if they do want to save then the system asks if they want it publicly visible. The publicly visible answer(true or false) is sent back with the assessment to the server to be saved.*



Ask Question Sequence Diagram: *When the user enters a question, they can request translation before requesting their answer. Once an answer is requested, the system calls to Analyze Questions and performs the functionality and returns the answer. The question is then logged and the answer is displayed. After the answer is displayed, the system asks for feedback.*



Analyze Question Sequence Diagram: *The system receives a question from the Ask Question functionality. First, the system checks to see if the question is dangerous. If it is not dangerous, a textual analysis is performed. After the textual analysis, the system determines if it needs to ask a second question. If a second question is needed, it displays it to the user and then awaits input. The process above is repeated until another question no longer needs to be asked.*

Data Requirements

- ➔ **UC001** - Input: User whose assessment is being requested.
- ➔ **UC004** - Input: User email address and real name for registration and login.
- ➔ **UC004** - Input: User password for registration and login.
- ➔ **UC006** - Input: Filter information for useful question log (eg. major, minor, courses).
- ➔ **UC007** - Output: List of newly generated questions exported to a text file.
- ➔ **UC007** - Output: List of unanswered frequently asked questions.
- ➔ **UC009** - Input: Untranslated text.
- ➔ **UC009** - Output: Translated text.
- ➔ **UC010** - Input: User feedback pertaining to the relevance of the responses to their questions.
- ➔ **UC011** - Input: User questions.
- ➔ **UC011** - Output: Responses to user questions.
- ➔ **UC013** - Input: User profile.
- ➔ **UC015** - Output: User assessment based on their profile and search history.
- ➔ **UC019** - Input: The advisor who is requesting the student's assessment.

Non-Functional Requirements

Product: Performance Requirements

Project Name:	**Intelligent Academic Planner**				
Requirement ID:	SP-03-01			**Type** / **Functional** / **Non-Functional**	
Creation:	Oct 20 2016 01:53 AM			**User** ☐	☐
Modification:	Oct 20 2016 01:54 AM			**System** ☐	☒
Description:	The system should provide an answer to a question within 5 seconds.			Product (sub-type below)	
				Performance Requirements	
Priority:	Highest	High	Medium	✓ Low	Lowest
This Req. is Engineered From:	UP-03				
Justify why meeting SP-03-01 can contribute to the fulfilment of UP-03	Ensures an answer is quickly given by adding a performance requirement.				
Traceability:	**Use cases cf.**	N/A			
	Test cases cf.	Yet to be completed in test case worksheet!			
Acknowledgment	***Generated from the CapStone Process Management System ©2015***				

SP-03-01: *This system requirement requests that when we are ensuring that an answer is providing quickly, we should test that it answers within 5 seconds. Low priority was given to this requirement because we are focusing first on implementing features and then focusing on quality and performance of the features.*

Product: Dependability/Reliability/Security

Project Name:	Intelligent Academic Planner				
Requirement ID:	SP-01-01			Type / Functional / Non-Functional	
Creation:	Oct 05 2016 12:12 AM			User ☐ / ☐	
Modification:	Oct 05 2016 12:14 AM			System ☐ / ☒	
Description:	The system should only display information that the user knows is being displayed.			Product (sub-type below)	
				Dependability/Reliability/Security	
Priority:	Highest	✓ High	Medium	Low	Lowest
This Req. is Engineered From:	UP-01				
Justify why meeting SP-01-01 can contribute to the fulfilment of UP-01	Makes the user's profile more secure by allowing the user to specify which information is visible.				
Traceability:	Use cases cf.	N/A			
	Test cases cf.	Yet to be completed in test case worksheet!			
Acknowledgment	*Generated from the CapStone Process Management System ©2015*				

SP-01-01: *This system requirement requests that when we are ensuring that a profile is secure, we should test that it only displays information that the user has set to be public. High priority was given to this requirement because it should be done while creating the functionality of the profile and we were encouraged to keep security in mind.*

Organizational: Development Requirements

Project Name:	Intelligent Academic Planner				
Requirement ID:	SO-01-01			Type / Functional / Non-Functional	
Creation:	Sep 23 2016 12:42 PM			User ☐ / ☐	
Modification:	Oct 20 2016 01:59 AM			System ☐ / ☒	
Description:	The system should log the user out after 1 hour of inactivity.			Organizational (sub-type below)	
				Development Requirements	
Priority:	Highest	High	Medium	✓ Low	Lowest
This Req. is Engineered From:	UO-01				
Justify why meeting SO-01-01 can contribute to the fulfilment of UO-01	Ensures a user is not logged on for too long, managing their session.				
Traceability:	Use cases cf.	N/A			
	Test cases cf.	Yet to be completed in test case worksheet!			
Acknowledgment	*Generated from the CapStone Process Management System ©2015*				

SO-01-01: *This system requirement requests that when we are ensuring that a user's session is managed, we should test that it logs the user out after 1 hour of inactivity. Low priority was given to this requirement because while it is connected to logging in, logging out, and registering, it is not critical to other functionality of the system.*

4.3. Requirements Trace Table

Project Name: Intelligent Academic Planner			
User Requirements		System Requirements	
Req ID	Description	Req ID	Description
UF-A	A user can log in.	SF-A-01	The system should log-in a user within 5 seconds.
UF-B	A user can log out.	SF-B-01	The system should log-out a user within 5 seconds.
UF-C	A user can ask the system questions.	SF-C-01	The system should conduct textual analyses.
		SF-C-02	The system should be able to handle input from multiple well-known languages.
		SF-C-03	The system should recommend majors suitable for the user based on the personality assessment.
		SF-C-04	The system should gather data unique to each user.
		SF-C-05	The system should recommend courses based on the recommended majors.
UF-D	A user should receive multiple responses to a question.	SF-D-01	The system should show a minimum of 1 related search/question.
UF-E	A user can create a profile	SF-E-01	The system should allow between 100 and 600 words to describe a user's academic and professional interests.
		SF-E-02	The system should allow a user to submit 100 words of self-description about their personality.
		SF-E-03	The system should allow a user to view their personality assessments.
		SF-E-04	The system should create a personality assessment unique to each user based on the data gathered.
		SF-E-05	The system should summarize this data to be used by an advisor directing the student.
UF-F	A user can register	SF-F-01	The system should register the user within 5 seconds.
UF-G	A user can view a log of asked questions.	SF-G-01	The system should only allow Advisors and System Developers to view the question log.
UF-H	A user can provide information to improve accuracy of the system.	SF-H-01	A user can provide answer quality feedback after asking a question.
UO-01	A user's session should be managed.	SO-01-01	The system should log the user out after 1 hour of inactivity.
UP-01	A user's profile should be secure.	SP-01-01	The system should only display information that the user knows is being displayed.
UP-03	A user should receive a quick response after asking a question	SP-03-01	The system should provide an answer to a question within 5 seconds.
Acknowledgment: Generated from the CapStone process management system ©2015			

This table shows an overview of all the requirements that were gone over above.

5. Exploratory Studies

5.1. Relevant Techniques

Our team distributed a survey, containing both qualitative and quantitative questions, to 150 students in an introductory Computer Science course. Our intention was to receive feedback relevant to the thoughts and decision-making processes of a student who has recently completed high school and is considering a degree and career in Computer Science, Software Engineering, or Computer Engineering. We also accepted the input of upper level classmen with the belief that their input could provide important feedback about the information they have gathered and decisions they would have made, in hindsight.

- ➔ Qualitative Data: Open-ended questions "can lead to the discovery of new initiatives or problems that should be addressed." [8]
  - ◆ If your major/minor has changed, what was it and why did it change?
  - ◆ What are the best and worst features of your field of study?
  - ◆ Why did you choose to study at Behrend?
  - ◆ What questions/concerns did you have when deciding on your major and school?
- ➔ Quantitative Data: Closed-ended questions "allows researchers to categorize respondents into groups based on the options they have selected." [17]
  - ◆ What year are you? (Freshman, Upper)
  - ◆ What is your major and minor?

While many of our questions were based on the responses of the surveys, some students did not return their survey, some students did not ask five questions, and many students repeated questions asked by their peers.

$$(150\ surveys\ \times \frac{5\ questions}{1\ survey} - duplicate\ questions)\ \leq 750\ unique\ questions$$

This is a generous calculation of how many questions we were able to create based on the surveys.

Many additional questions were created through research conducted on the internet. Watson will need to be trained with at least 1000 question-answer pairs to ensure depth and accuracy of system knowledge . These questions will be completed by the end of the Fall 2016 semester. References 18-52 were used to generate both questions and answers for our domain.

- ➔ The following are examples of question-answer pairs:
  - ◆ Q: Does Penn State Behrend assist students in finding internships and employment opportunities?

    A: Penn State Behrend holds a career fair once a semester where a hundred or so different companies come and you can speak with them. In addition, once you post your resume to Nittany Lion Career Network, the career center will start sending your resume out to potential employers, who will then contact you without you having contacted them yourself. Kinda nifty, in my opinion.

- Q: Do Computer Engineers get hired by companies like Google, Microsoft, Amazon, and Facebook?

  A: Yes. All four of those companies require computer engineers, but they have much more rigorous interviews than most companies. You can get hired, you just need to be very well prepared for the interviews.

Our system will use keyword-concept extraction to update the frequency of each question being asked. This will continue recording into the database, for future analytical use. Our system will use machine learning algorithms to format, structure, and extract data in order to update question-answer tracking and add new useful information, if is not currently in our knowledgebase. Similarly, by crawling data from user feedback, we can track users' questions to check whether they are related to our knowledge domain, and either update the related information or add new data from the user input.

- ➔ Data Crawling
  - Question Log - update frequency of each asked question, extract new keyword and concepts to add to our knowledge domain.
  - Suggested Feedback: answers for unclear questions - updating better answer to our knowledge domain.
  - Analysis Data: data gleaned from user's input.

Our system should be able to interpret questions delivered in Natural Language. We will use tags and information extraction to ensure that the user's question is being addressed and understood properly. For example, our system will understand that the word "what" is indicative of a question.

- ➔ Natural Language Processing [9]
  - Generative Models for Parsing
    - Parse Trees
      - Part-of-Speech
      - Useful Relationships
    - Context-Free Grammar
  - Log-linear Taggers
    - Information Extraction
    - Named Entity Recognition
    - Relationships between Entities
    - Named Entity Extraction as Tagging

Our documents must be curated to ensure that the information our system is providing is reliable and accurate. This can done by feeding a variety of informational documents to our system and allowing the system to verify the information's validity through comparison of the sources.

- ➔ Document Curating [10]
  - Exact match search
  - Wildcard search
  - Proximity search

We plan to use a basic exhaustive search and complete training with fixed training data (our knowledge base). Our system will use a natural language classifier to determine what information is useful. This can be substituted by the Conversation API from Watson.

- ➔ Machine Learning Algorithms [11]
  - ◆ Supervised Learning
    - Linear Regression
    - Decision Tree (classification)
  - ◆ Unsupervised Learning
    - Gensim (python)
      Use to compare string similarity
    - NLTK (python)
      For data mining purpose
    - MonkeyLearn (Web)
      Use web service to build automated training model

5.2. Relevant Packages/Products

Watson services are accessed by APIs usually programmed in the CURL, Java, or NodeJS language. Since this project is a web application, NodeJS has more native support on the server side, and faster performance in general execution and implementation. A NodeJS server will call Bluemix RESTful Watson APIs on server usage and query MongoDB natively in the format of JavaScript. The application will have NLP handling and analysis functionalities embedded. The development team could also use Hadoop for analysis, since it is especially good for managing Big Data. Since the intention is make max usage of Watson services, the best option for the team is to use Alchemy. The MongoDB will store the data of three perspectives: user account, user question log, and analysis of all kinds of records that are needed by administration.

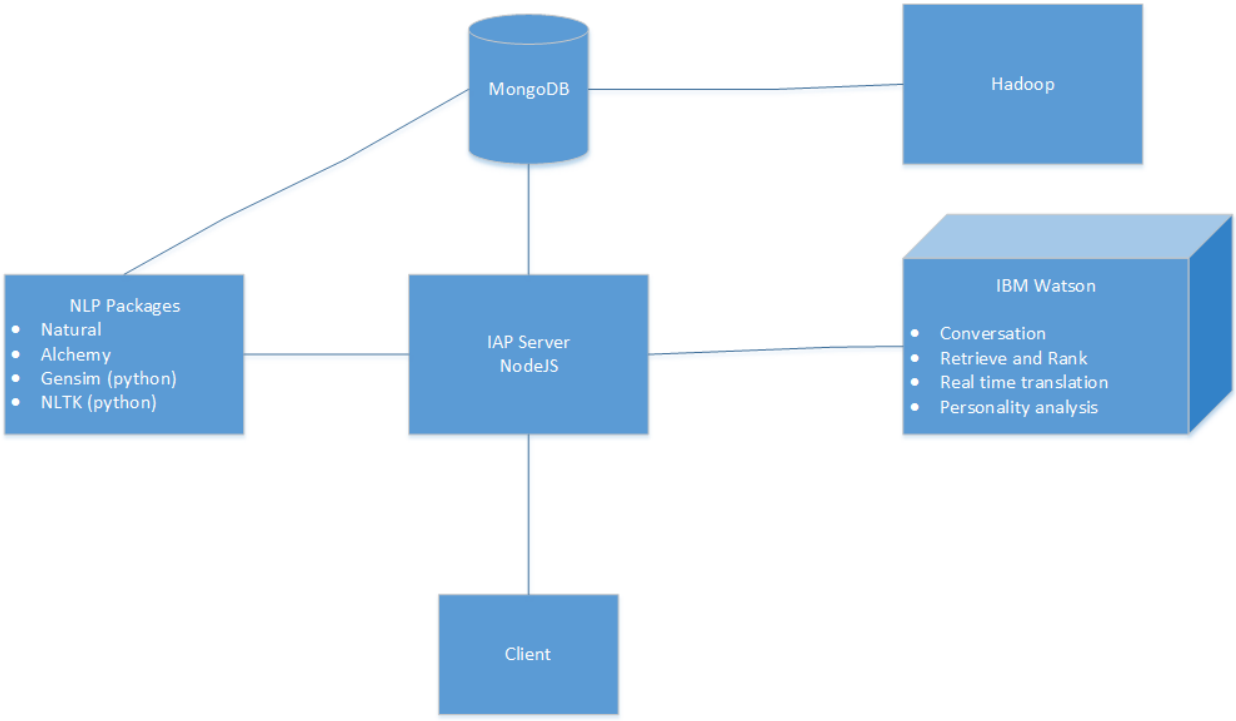
- ➔ NodeJS[12]
  - ◆ Server application type
  - ◆ We decided to use this because most of the Bluemix APIs are designed for Node.JS handling and Node.JS is an advanced, efficient server application.
- ➔ Watson Platform
  - ◆ Conversation[5]
    - Mainly used to classify the question input from user and determine if the question is in our domain or not.
  - ◆ Retrieve and rank[4]:
    - Core functionality of the project
    - Uses machine training and NLP(Natural language process) to study the training dataset and provide feedback on the answer with an accuracy measurement.
  - ◆ Real time translation[15]
    - Allows instant translation between common languages.
    - Displays desired language based on the user's account preference.
  - ◆ Personality analysis[16]

- Assessment functionality to generate personality analysis for user. This will allow us to give more specific answers to a user based on their personality.

➔ MongoDB[14]
- ◆ Main non-relational DB for the application, since we will handle a lot of unstructured data.
- ◆ MongoDB has good features to store and sort.

➔ Natural language processing
- ◆ Monkey learn[2]
  - A mature public accessible API provider to do NLP analysis
- ◆ Natural[9]
  - Equivalent NodeJS library of NLTK(Natural language toolkit) in python. It mainly focuses on customized NLP classification.
- ◆ Alchemy[3]
  - Similar to Monkey learn, but is managed by IBM. It will provide feedback on the detailed analysis of a sentence, so we can analyze parts of sentences to determine the intent of the question.

➔ Hadoop
- ◆ The core of Apache Hadoop consists of a storage part, known as Hadoop Distributed File System (HDFS), and a processing part called MapReduce. Hadoop splits files into large blocks and distributes them across nodes in a cluster.



Relevant packages/products flow diagram

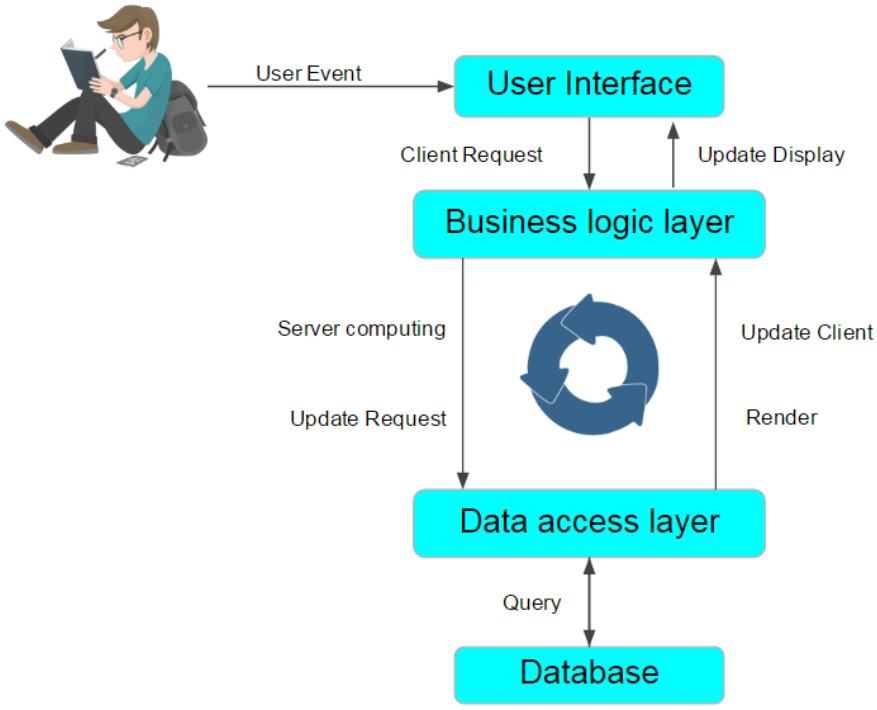
5.3. Broader Impacts

This project can be expanded to include other majors within Behrend or branches of Penn State University. On a grand scale, this type of tool would be a beneficial tool for high school juniors and seniors, as well as college freshman.

6. System Design

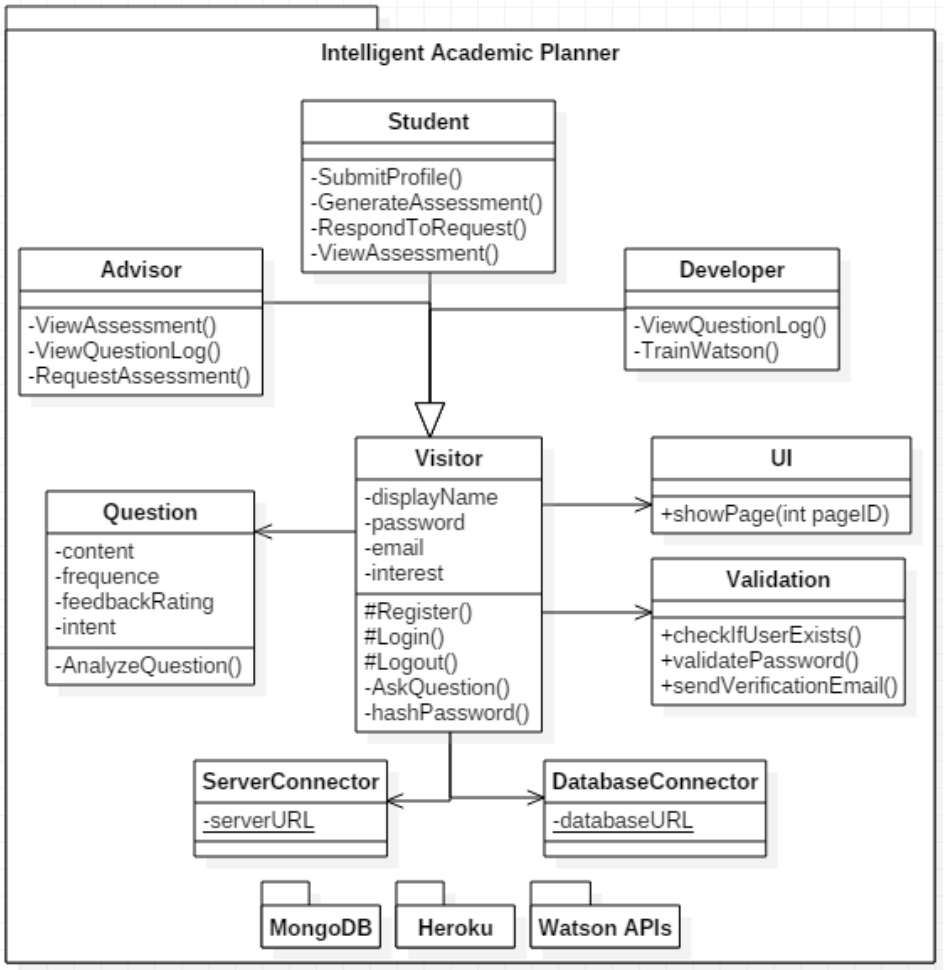
6.1. Architectural Design

➔ Layered Architecture
- Client-Server-Database model
- Server handles all computation and updates
- Server query with DB
- Feedback data to client side



User initializes a "submit question" event on the web browser, then the server will handle the question through the logic layer. The database can then be queried and, if there are no exceptions, the data will be sent to Watson through Bluemix RESTful APIs. Finally, the response information will be returned in the reverse direction.

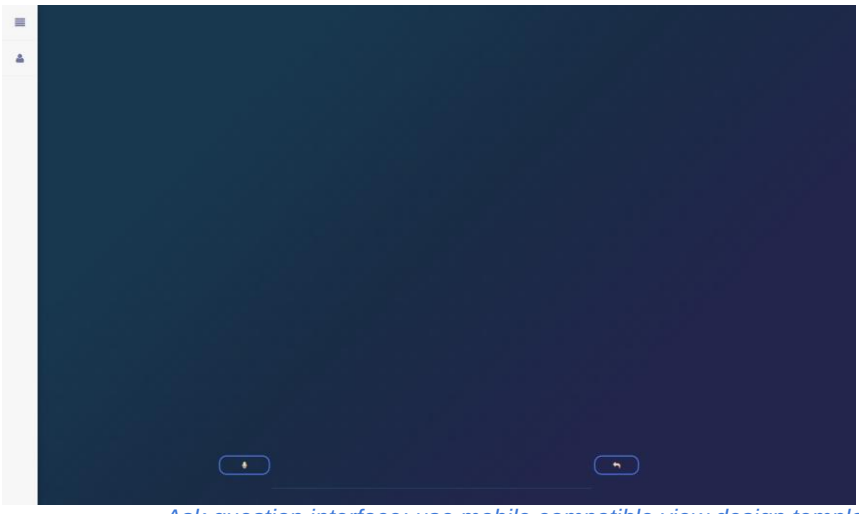
6.2. Structural Design



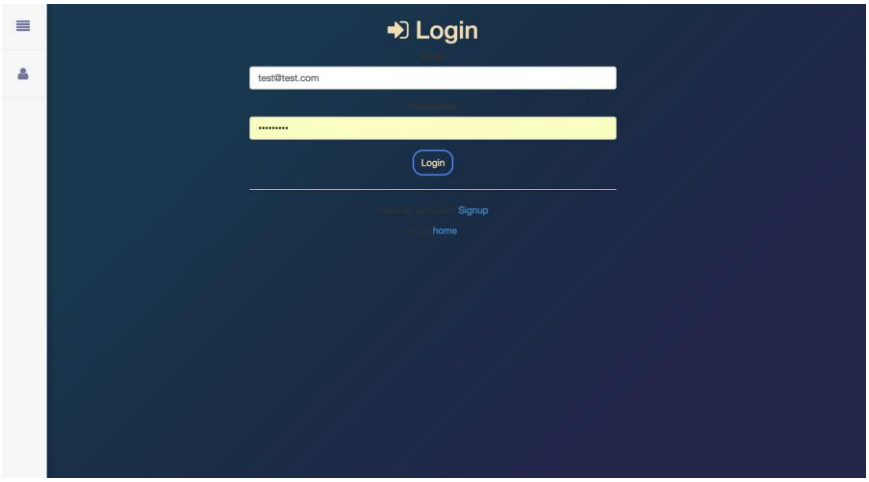
This is the class diagram of our system. We are using Heroku as our server and MongoDB as our database. All visitors have the ability to ask questions, and questions are stored on our server. The Validation class is used to check for safe and correct inputs, improving security of our system.

6.3. User Interface Design

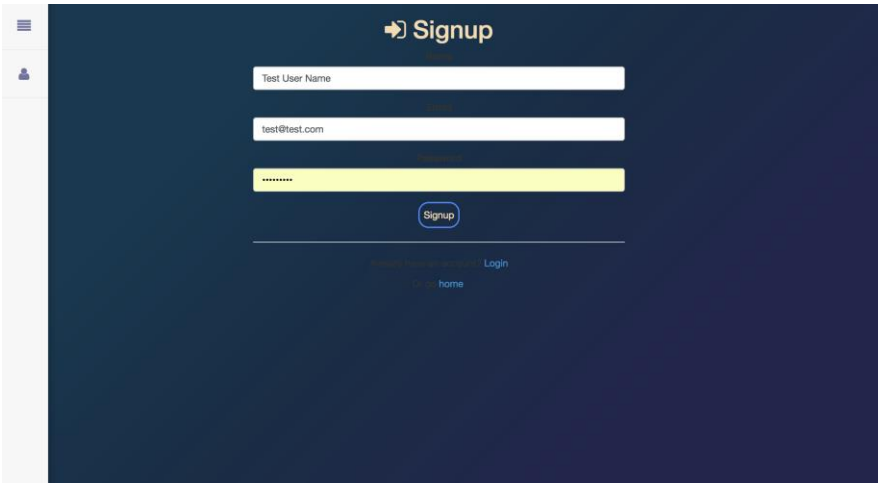
The view will be divided by 2 main sections, left side navigation of functionalities and right section of display/interactions. The user enters the question on the line at the bottom and either hits enter or the arrow button to submit the question. As the question is being answered, a loading icon appears. The user can login or view their profile using the buttons on the left side.



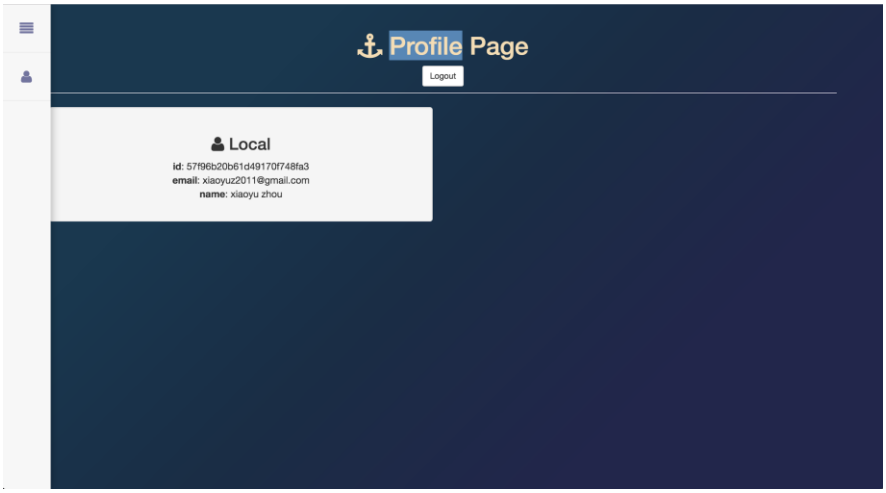
Ask question interface: use mobile compatible view design template



Login page: require register email and password

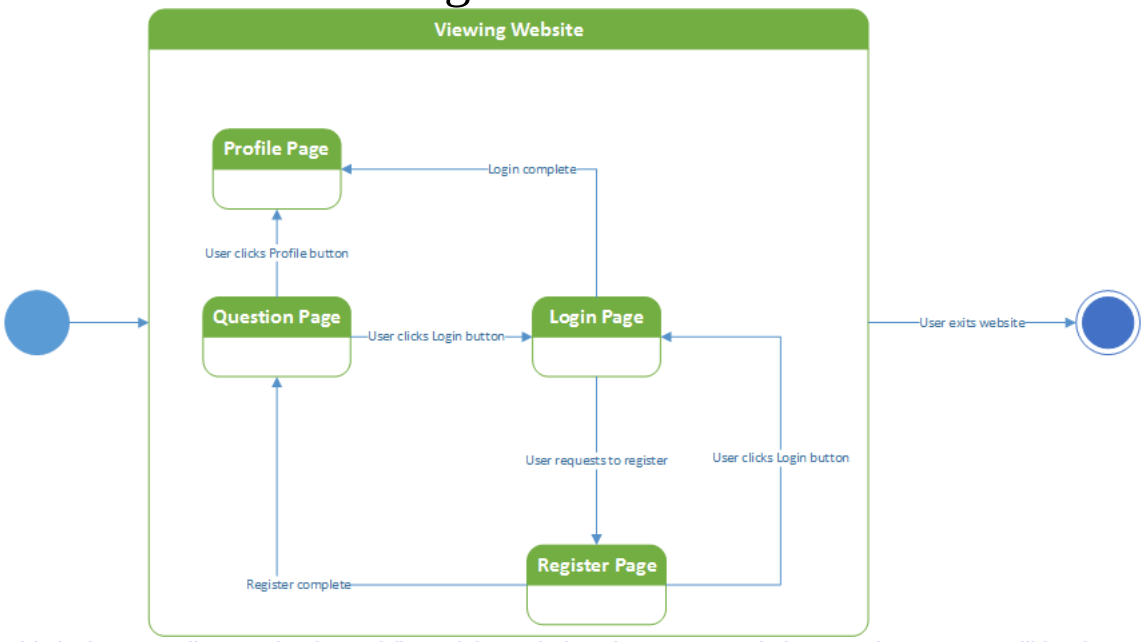


Register account page: require a display name, register email, and password



Profile page: only available after login, display regular account information

6.4. Behavioral Design

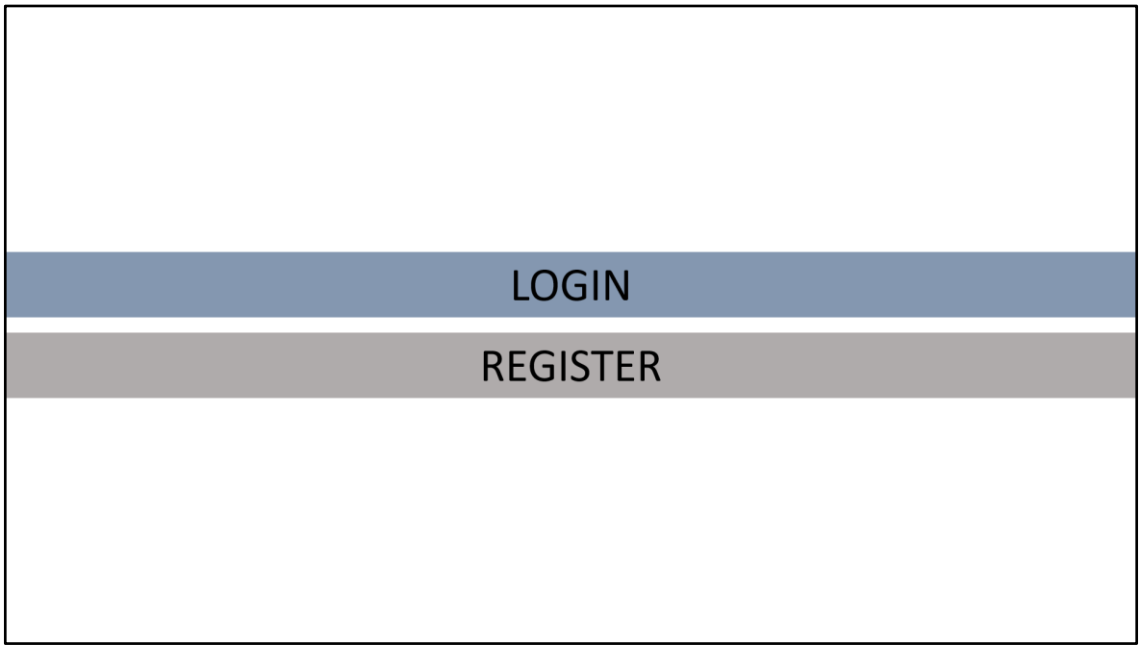


This is the state diagram for the webflow of the website where users ask the questions. Users will begin on the Question page. If the user clicks the login button, they will be taken to the login page. When login completes, they will be taken to their profile page. If they request to register instead of login, they will be taken to a register page. Once register is completed, they are taken to the question page.

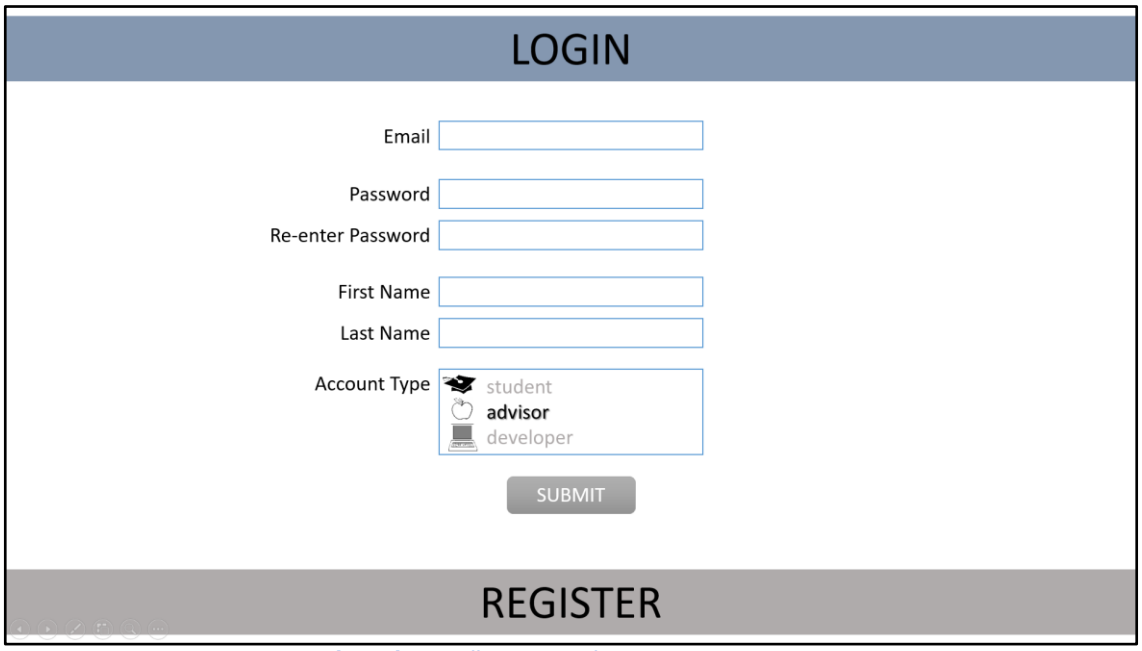
6.5. Design Alternatives & Decision Rationale

UI Alternative Designs

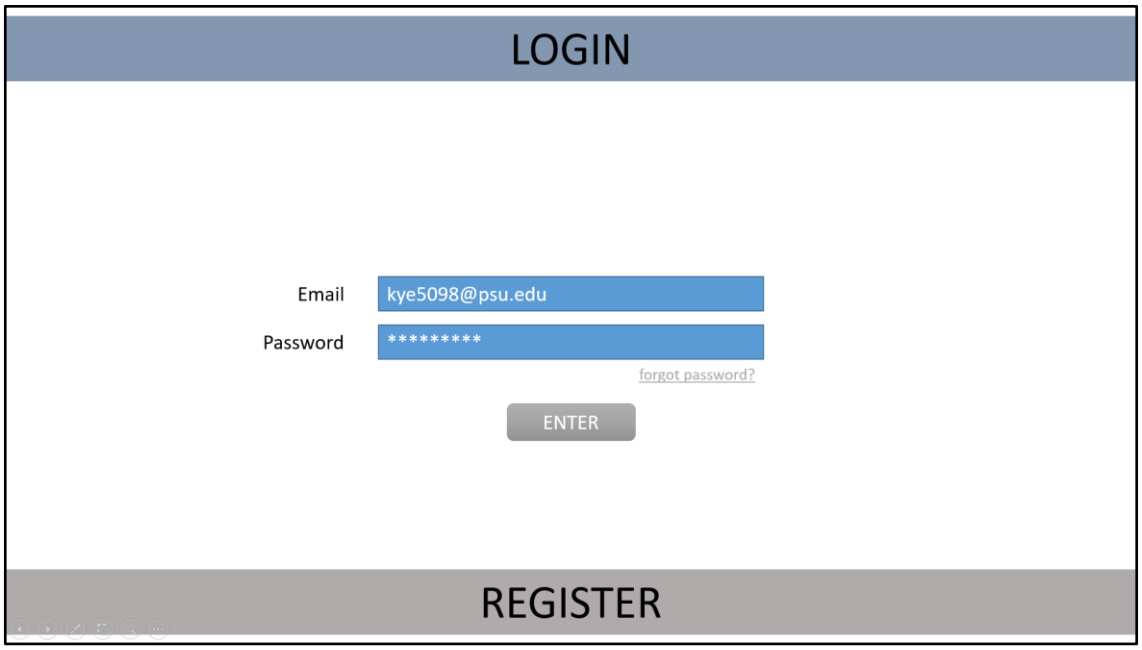
This is an alternative user interface. The color scheme is much brighter and it includes additional screens, which have not been included in the original UI design. This design is fairly simplistic and would allow for a user to access the project via their mobile device, as well.



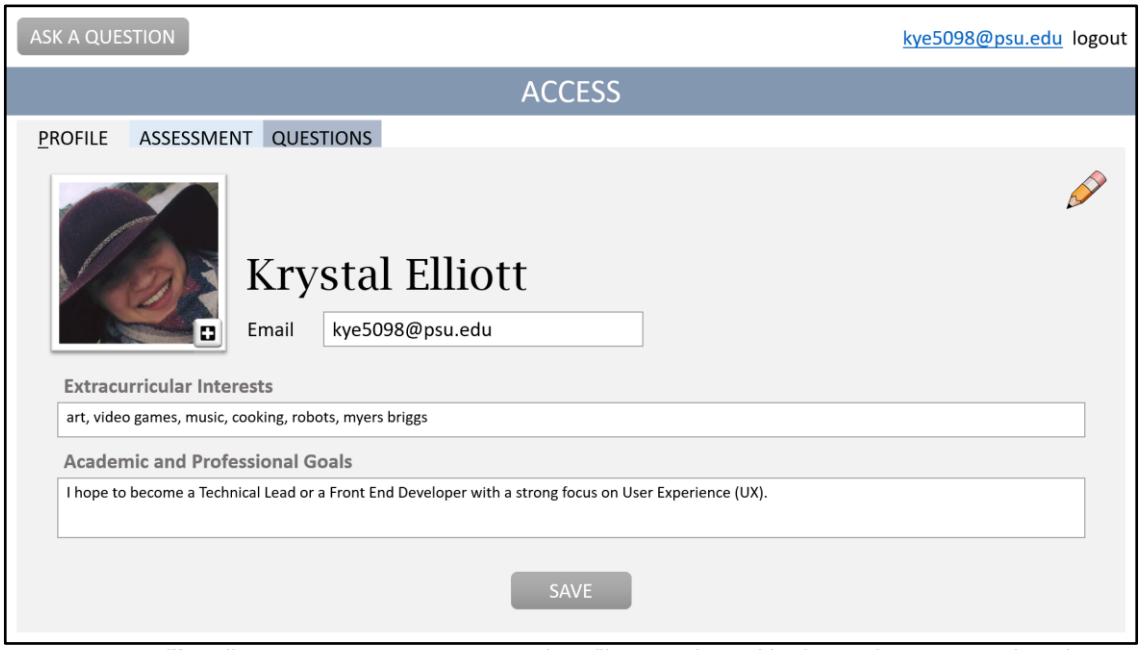
Landing Page: *offers options of logging in and registering*



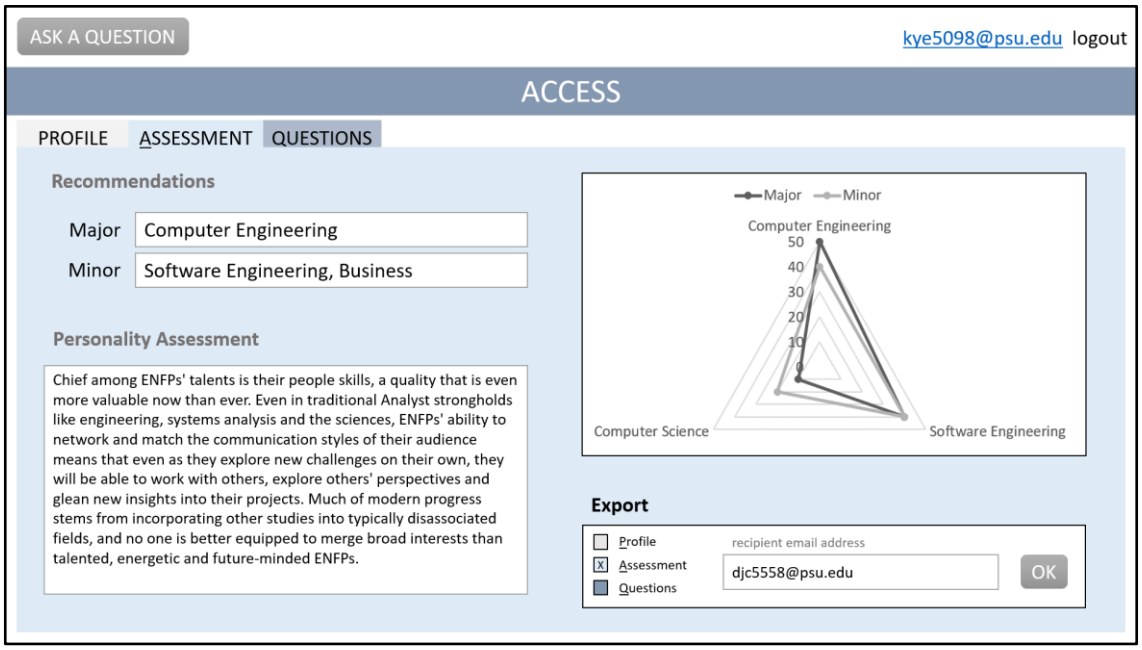
Registration: *collects user data to create an account*



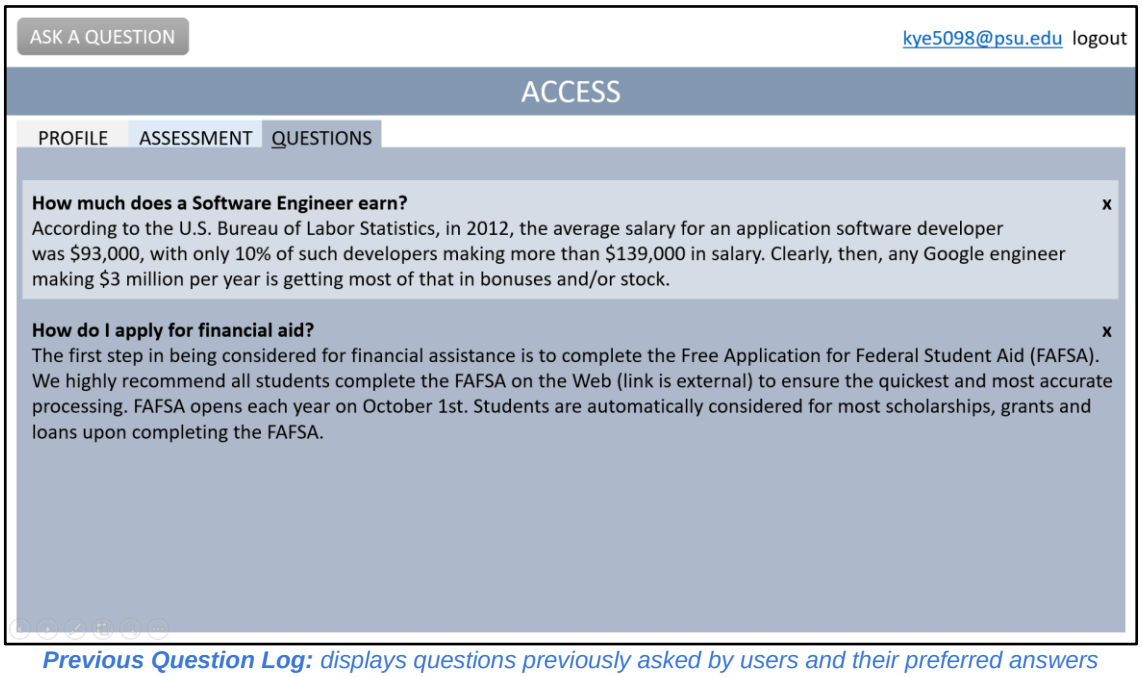
Login: *allows user to login*



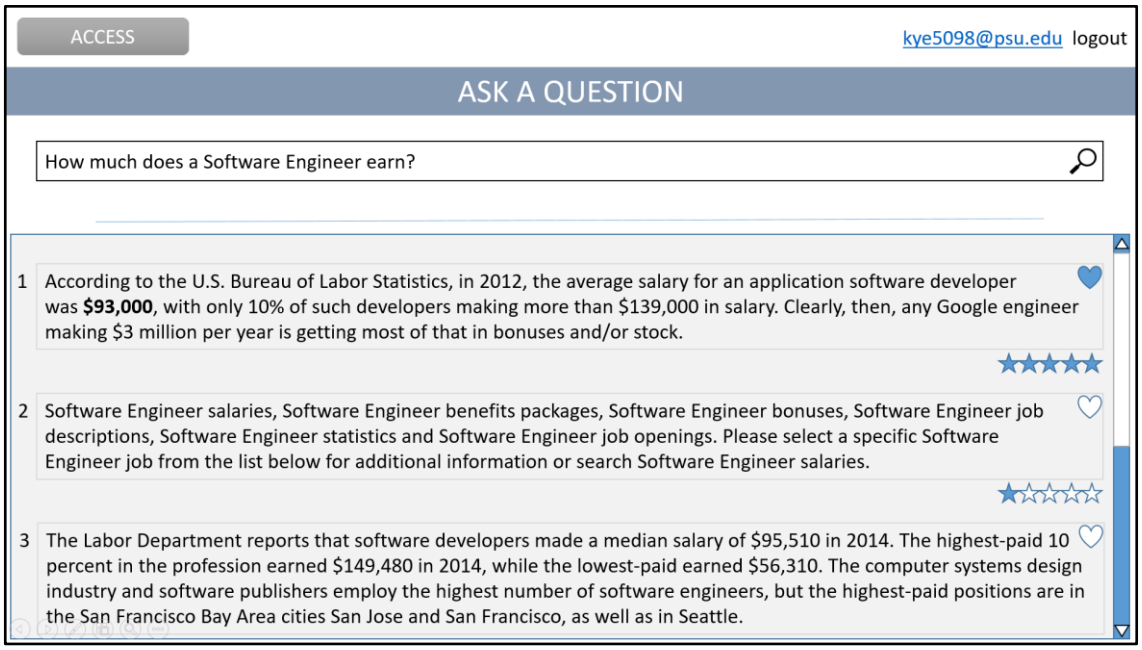
User Profile: *allows user to create a personal profile, complete with picture, interests, and goals*



Assessment: *allows user to view their personalized assessment and to send it, partially or in full, to an email address.*

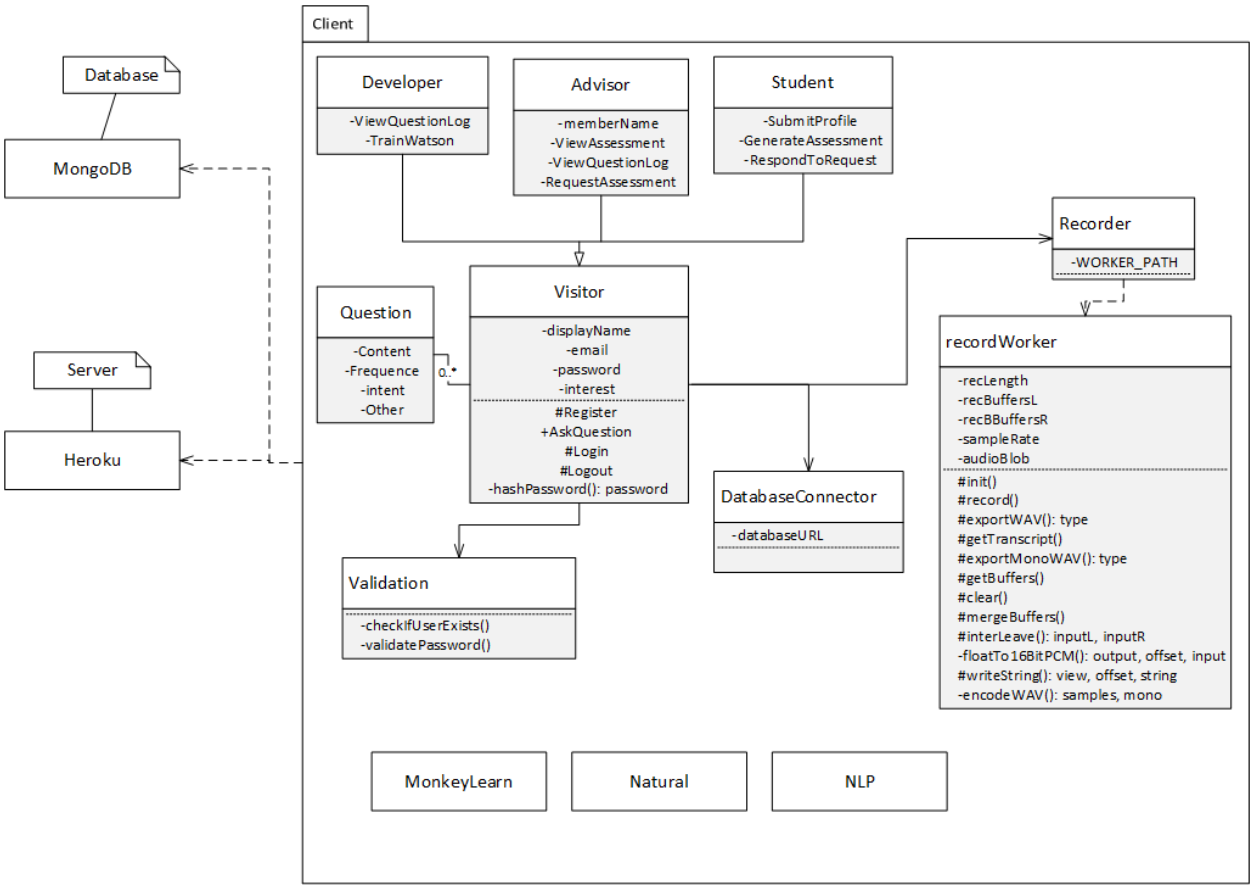


Previous Question Log: *displays questions previously asked by users and their preferred answers*



Ask Question Interface: *allows user to ask questions, rate the received answers, and select one preferred answer*

Structural Alternative Designs



➔ This design was not chosen because it places a lot of emphasis on the recorder and recordWorker. In addition, they are used for the voice-to-text functionality that we decided to not include.

Architectural Alternative Designs

➔ No alternative considered.

Behavioural Alternative Designs

➔ No alternative considered.

`

7. System Implementation

7.1. Programming Languages & Tools

- ➔ Bluemix (conversation, retrieve and rank, alchemyAPI,…)[3][4][5]
  - ◆ Input will be parsed by the server, then go into Conversation service to be guided by default classifier, with no exception, the question will be answered by retrieve and rank. In parallel, the question and answer will be analysis by Alchemy, and keep record into database.
- ➔ MongoDB[14]
  - ◆ The MongoDB is mainly use to maintain user information, question and answer information, and system analysis.
- ➔ Node.js[12]
  - ◆ Server application type, programing language in JavaScript style. For production driven development, all libraries will update to the newest version. And programming style will be in industrial standard.

7.2. Coding Conventions

- ➔ N/A

7.3. Code Version Control

- ➔ GitHub[13]

7.4. Implementation Alternatives & Decision Rationale

- ➔ PHP for Node.Js
  - ◆ NodeJS also has the advantage of an easy setup in a local development environment, which is preferred by the development team. Allen has had some experience developing with NodeJS in the past, so it he will be able to guide his teammates, should they have questions or need guidance.
- ➔ MySQL for MongoDB
  - ◆ Although MySQL is more familiar to all of us, but traditional database is not efficient and flexible enough to handle unstructured and big data which in our project we will constantly deal with.
- ➔ Project Oxford for Bluemix
  - ◆ Since Dr.Su is offering cognitive system course this semester and Allen is taking that class, also he already did some project with Bluemix, therefore it's more nature for us to select Bluemix as our main tool.
- ➔ Mobile platform for web platform
  - ◆ None of the team member has experience on mobile development, for the sake of quality ensure we will not attempt to do any mobile native

development, also web platform is suitable running on mobile device therefore, we don't consider focus on mobile native development.

7.5. Analysis of Key Algorithms

- ➔ Correlation between input question and answer
- ➔ Question frequency analysis

```
void updateFreq(questionStr)
    keyConcept <- extractConcept(questonStr)
    foreach question from questionBank
        If question.containConcept(keyConcept)
            question.ask.frenquency ++
```

- ➔ Answer quality automate improvement
- ➔ Concept extraction from question

```
conceptBank = [...] //all stored keyword from question and answers
Bool containConcept(inputStr)
    foreach concept in conceptBank
    If string.distance(inputStr, concept) > 0
        return true
    return false
```

- ➔ Keyword mapping from whole session

8. System Testing

8.1. Test Automation Framework

Steps for Installing Mocha

- ➔ Install the new package using the command **npm install --global mocha --save**
- ➔ Modify package.json's scripts to include **"test": "mocha"**
- ➔ Create test file directory with command **mkdir test**
- ➔ Edit test script with command **$EDITOR test/test.js**

Steps for Running Test Cases

- ➔ Type command npm **testcase_name**

8.2. Test Case Design

Acceptance Test Cases

N/A

System Test Cases

N/A

Integration Test Cases

N/A

Unit Test Cases

Project Name:	**Intelligent Academic Planner**	
Test Suite	TS-001: Unit Tests	
Test Case ID	TC-001 (Unit Test)	
What To Test	Login with valid user and password	
Test Data Input	valid username, valid password	
Expected Result	User is logged in	
Traceability	**Relevant User Req.(s)**	UF-A
	Relevant System Req.(s)	SF-A-01
	Relevant Use Case(s)	UC-016
Acknowledgment: Generated from the CapStone process management system ©2015		

Testing if a user can properly log in. We expect that when a correct username and password is inputted, the user should be logged in.

Project Name:	Intelligent Academic Planner	
Test Suite	TS-001: Unit Tests	
Test Case ID	TC-002 (Unit Test)	
What To Test	logout	
Test Data Input		
Expected Result	User is logged out.	
Traceability	Relevant User Req.(s)	UF-B
	Relevant System Req.(s)	SF-B-01
	Relevant Use Case(s)	UC-018
Acknowledgment: Generated from the CapStone process management system ©2015		

Testing if a user can properly log out. We expect that when a user requests to log out, they should be logged out with no inputs needed.

Project Name:	Intelligent Academic Planner	
Test Suite	TS-001: Unit Tests	
Test Case ID	TC-003 (Unit Test)	
What To Test	Register with untaken email and valid password	
Test Data Input	untaken email, valid password	
Expected Result	User is entered into database.	
Traceability	Relevant User Req.(s)	UF-F
	Relevant System Req.(s)	SF-F-01
	Relevant Use Case(s)	UC-004
Acknowledgment: Generated from the CapStone process management system ©2015		

Testing if a user can properly register. We expect that when a user inputs an untaken email and password they should be entered into the database properly.

Project Name:	Intelligent Academic Planner	
Test Suite	TS-001: Unit Tests	
Test Case ID	TC-004 (Unit Test)	
What To Test	Ask question	
Test Data Input	question string	
Expected Result	Question is logged to database and proper response is displayed	
Traceability	Relevant User Req.(s)	UF-C
	Relevant System Req.(s)	SF-C-01,SF-C-02,SF-C-03,SF-C-04,SF-C-05
	Relevant Use Case(s)	UC-011
Acknowledgment: Generated from the CapStone process management system ©2015		

Testing if a user can properly ask a question. We expect if a question is asked then the question should be logged to the database for records and a proper answer should be displayed.

Project Name:	Intelligent Academic Planner	
Test Suite	TS-001: Unit Tests	
Test Case ID	TC-005 (Unit Test)	
What To Test	answer quality feedback	
Test Data Input	feedback	
Expected Result	feedback is stored in database, thank you message is displayed	
Traceability	Relevant User Req.(s)	UF-H
	Relevant System Req.(s)	SF-H-01
	Relevant Use Case(s)	UC-010
Acknowledgment: Generated from the CapStone process management system ©2015		

Testing if a user can properly provide feedback. We expect when a user enters feedback, the feedback should be stored and a thank you message should be displayed to the user.

Project Name:	Intelligent Academic Planner	
Test Suite	TS-001: Unit Tests	
Test Case ID	TC-006 (Unit Test)	
What To Test	Real time translation	
Test Data Input	non-english text	
Expected Result	english text	
Traceability	Relevant User Req.(s)	UF-C
	Relevant System Req.(s)	SF-C-02
	Relevant Use Case(s)	UC-009
Acknowledgment: Generated from the CapStone process management system ©2015		

Testing if a user can properly translate text. We expect that if the user enters non-english text, the system should display the text in english.

Project Name:	Intelligent Academic Planner	
Test Suite	TS-001: Unit Tests	
Test Case ID	TC-007 (Unit Test)	
What To Test	Analyze question	
Test Data Input	question with ambiguous response	
Expected Result	another question to make answer less ambiguous	
Traceability	Relevant User Req.(s)	UF-C,UF-D
	Relevant System Req.(s)	SF-C-01,SF-C-03,SF-C-04,SF-C-05,SF-D-01
	Relevant Use Case(s)	UC-012
Acknowledgment: Generated from the CapStone process management system ©2015		

Testing if the system can properly analyze a question. We expect that if a user asks a question that is ambiguous, the system should respond with another question.

Project Name:	Intelligent Academic Planner	
Test Suite	TS-001: Unit Tests	
Test Case ID	TC-008 (Unit Test)	
What To Test	submit profile	
Test Data Input	new profile information	
Expected Result	profile information is stored to database	
Traceability	Relevant User Req.(s)	UF-E
	Relevant System Req.(s)	SF-E-01,SF-E-02
	Relevant Use Case(s)	UC-013
Acknowledgment: Generated from the CapStone process management system ©2015		

Testing if a user can properly submit a profile. We expect that when new profile information is entered, the information should be stored to the database.

Project Name:	Intelligent Academic Planner	
Test Suite	TS-001: Unit Tests	
Test Case ID	TC-009 (Unit Test)	
What To Test	generate assessment and save with visbility	
Test Data Input	descriptive text, yes to saving assessment, yes to visible to advisors	
Expected Result	assessment is stored to database with true visibility	
Traceability	Relevant User Req.(s)	UF-E,UP-01
	Relevant System Req.(s)	SF-E-04,SF-E-05,SP-01-01
	Relevant Use Case(s)	UC-015
Acknowledgment: Generated from the CapStone process management system ©2015		

Testing if a user can properly generate an assessment. We expect that if descriptive text is given, the user requests to save their assessment, and they say yes to sharing with advisors then the assessment should be saved to the database with true visibility.

Project Name:	Intelligent Academic Planner	
Test Suite	TS-001: Unit Tests	
Test Case ID	TC-010 (Unit Test)	
What To Test	Respond yes to request	
Test Data Input	yes to request	
Expected Result	assessment is visible to person that requested it	
Traceability	Relevant User Req.(s)	UF-E
	Relevant System Req.(s)	SF-E-05
	Relevant Use Case(s)	UC-001
Acknowledgment: Generated from the CapStone process management system ©2015		

Testing if a user can properly respond to a request. We expect that if the user responds yes, the assessment that was requested should be visible by the person that requested it.

Project Name:	Intelligent Academic Planner	
Test Suite	TS-001: Unit Tests	
Test Case ID	TC-011 (Unit Test)	
What To Test	view assessment	
Test Data Input		
Expected Result	assessment is displayed	
Traceability	Relevant User Req.(s)	UF-E
	Relevant System Req.(s)	SF-E-03
	Relevant Use Case(s)	UC-005
Acknowledgment: Generated from the CapStone process management system ©2015		

Testing if a user can properly view an assessment. We expect that the assessment should be displayed when the user requests it to be.

Project Name:	Intelligent Academic Planner	
Test Suite	TS-001: Unit Tests	
Test Case ID	TC-012 (Unit Test)	
What To Test	train watson	
Test Data Input	answer question pair	
Expected Result	question is properly answered when asked	
Traceability	Relevant User Req.(s)	UF-H
	Relevant System Req.(s)	
	Relevant Use Case(s)	UC-007
Acknowledgment: Generated from the CapStone process management system ©2015		

Testing if a user can properly train watson. We expect that when a new question and answer pair is trained, the system should give the proper answer when the question is asked.

Project Name:	Intelligent Academic Planner	
Test Suite	TS-001: Unit Tests	
Test Case ID	TC-013 (Unit Test)	
What To Test	Login with incorrect password	
Test Data Input	correct username, incorrect password	
Expected Result	User is not logged in. Error message is displayed	
Traceability	Relevant User Req.(s)	UF-A
	Relevant System Req.(s)	SF-A-01
	Relevant Use Case(s)	UC-016
Acknowledgment: Generated from the CapStone process management system ©2015		

Testing if a user can properly log in. We expect that when a correct username but an incorrect password is inputted, the user should not be logged in.

Project Name:	Intelligent Academic Planner	
Test Suite	TS-001: Unit Tests	
Test Case ID	TC-014 (Unit Test)	
What To Test	Login with incorrect username	
Test Data Input	incorrect username, correct password	
Expected Result	User is not logged in. Error message is displayed.	
Traceability	Relevant User Req.(s)	UF-A
	Relevant System Req.(s)	SF-A-01
	Relevant Use Case(s)	UC-016
Acknowledgment: Generated from the CapStone process management system ©2015		

Testing if a user can properly log in. We expect that when an incorrect username but a correct password is inputted, the user should not be logged in.

Project Name:	Intelligent Academic Planner	
Test Suite	TS-001: Unit Tests	
Test Case ID	TC-015 (Unit Test)	
What To Test	Login with both incorrect username and password	
Test Data Input	incorrect username, incorrect password	
Expected Result	User is not logged in. Error message is displayed.	
Traceability	Relevant User Req.(s)	UF-A
	Relevant System Req.(s)	SF-A-01
	Relevant Use Case(s)	UC-016
Acknowledgment: Generated from the CapStone process management system ©2015		

Testing if a user can properly log in. We expect that when both an incorrect username and an incorrect password is inputted, the user should not be logged in.

Project Name:	Intelligent Academic Planner	
Test Suite	TS-001: Unit Tests	
Test Case ID	TC-016 (Unit Test)	
What To Test	Respond no to Request	
Test Data Input	no to request	
Expected Result	no changes made to visibility	
Traceability	Relevant User Req.(s)	UF-E
	Relevant System Req.(s)	SF-E-05
	Relevant Use Case(s)	UC-001
Acknowledgment: Generated from the CapStone process management system ©2015		

Testing if a user can properly respond to a request. We expect that if the user responds no, there are no changes to the assessment.

Project Name:	Intelligent Academic Planner	
Test Suite	TS-001: Unit Tests	
Test Case ID	TC-017 (Unit Test)	
What To Test	Register with invalid password	
Test Data Input	untaken email, invalid password	
Expected Result	User is not stored in database. Error message indicating invalid password displayed.	
Traceability	Relevant User Req.(s)	UF-F
	Relevant System Req.(s)	SF-F-01
	Relevant Use Case(s)	UC-004
Acknowledgment: Generated from the CapStone process management system ©2015		

Testing if a user can properly register. We expect that when a user inputs an untaken email and an invalid password they should not be entered into the database and an error message is displayed.

Project Name:	Intelligent Academic Planner	
Test Suite	TS-001: Unit Tests	
Test Case ID	TC-018 (Unit Test)	
What To Test	Register with taken email	
Test Data Input	taken email, valid password	
Expected Result	User is not entered into database. Error is displayed indicating email is taken.	
Traceability	Relevant User Req.(s)	UF-F
	Relevant System Req.(s)	SF-F-01
	Relevant Use Case(s)	UC-004
Acknowledgment: Generated from the CapStone process management system ©2015		

Testing if a user can properly register. We expect that when a user inputs a taken email and a valid password they should not be entered into the database and an error message is displayed.

Project Name:	Intelligent Academic Planner	
Test Suite	TS-001: Unit Tests	
Test Case ID	TC-019 (Unit Test)	
What To Test	Register with both taken email and invalid password	
Test Data Input	taken email, invalid password	
Expected Result	User is not entered into database. Error is displayed indicating taken email.	
Traceability	Relevant User Req.(s)	UF-F
	Relevant System Req.(s)	SF-F-01
	Relevant Use Case(s)	UC-004
Acknowledgment: Generated from the CapStone process management system ©2015		

Testing if a user can properly register. We expect that when a user inputs a taken email and an invalid password they should not be entered into the database and an error message is displayed.

Project Name:	Intelligent Academic Planner	
Test Suite	TS-001: Unit Tests	
Test Case ID	TC-020 (Unit Test)	
What To Test	Generate assessment and save with false visiblity	
Test Data Input	descriptive text, yes to saving assessment, no to visible to advisors	
Expected Result	Assessment is stored to database with false visibility	
Traceability	Relevant User Req.(s)	UF-E
	Relevant System Req.(s)	SF-E-04,SF-E-05
	Relevant Use Case(s)	UC-015
Acknowledgment: Generated from the CapStone process management system ©2015		

Testing if a user can properly generate an assessment. We expect that if descriptive text is given, the user requests to save their assessment, and they say no to sharing with advisors then the assessment should be saved to the database with false visibility.

Project Name:	Intelligent Academic Planner	
Test Suite	TS-001: Unit Tests	
Test Case ID	TC-021 (Unit Test)	
What To Test	Generate Assessment and do not save	
Test Data Input	descriptive text, no to saving assessment	
Expected Result	Assessment is not stored to database.	
Traceability	Relevant User Req.(s)	UF-E
	Relevant System Req.(s)	SF-E-04,SF-E-05
	Relevant Use Case(s)	UC-015
Acknowledgment: Generated from the CapStone process management system ©2015		

Testing if a user can properly generate an assessment. We expect that if descriptive text is given and the user says no to saving the assessment then the assessment should not be saved to database.

Project Name:	Intelligent Academic Planner	
Test Suite	TS-001: Unit Tests	
Test Case ID	TC-022 (Unit Test)	
What To Test	View Question Log	
Test Data Input		
Expected Result	Question Log is displayed	
Traceability	Relevant User Req.(s)	UF-G
	Relevant System Req.(s)	SF-G-01
	Relevant Use Case(s)	UC-006
Acknowledgment: Generated from the CapStone process management system ©2015		

Testing if a user can properly view the question log. We expect that when they ask to view the question log, the question log should be displayed.

Project Name:	Intelligent Academic Planner	
Test Suite	TS-001: Unit Tests	
Test Case ID	TC-023 (Unit Test)	
What To Test	Ask Question performance	
Test Data Input	Question with known answer	
Expected Result	Answer is received within 5 seconds	
Traceability	Relevant User Req.(s)	UP-03
	Relevant System Req.(s)	SP-03-01
	Relevant Use Case(s)	UC-011
Acknowledgment: Generated from the CapStone process management system ©2015		

Testing the speed of ask question. We expect that when a user asks a question then the answer should be displayed within 5 seconds.

Project Name:	Intelligent Academic Planner	
Test Suite	TS-001: Unit Tests	
Test Case ID	TC-024 (Unit Test)	
What To Test	Log out after 1 hour of inactivity	
Test Data Input		
Expected Result	User is logged out after 1 hour of inactivity	
Traceability	Relevant User Req.(s)	UO-01
	Relevant System Req.(s)	SO-01-01
	Relevant Use Case(s)	
Acknowledgment: Generated from the CapStone process management system ©2015		

Testing the management of a user's session. We expect that if the user is inactive for an hour or more, they will be logged out automatically by the system.

8.3. Test Execution Report

Unit Testing Report

Project Name:	Intelligent Academic Planner
Test Case ID:	TC-001
Testing Tools Used:	Mocha
Testing Type:	Agile (automated) testing
Execution Steps:	1 click left side bar
	2 click user icon
	3 click perfered login method
	4 input valid credential

Test Execution Records:

#	Tester	Test Date	Actual Result	Status	Defect	Correction
1	Daria	10/15/2016	User is not logged in	Fail	Not implemented	10/30/2016 by Allen
2	Daria	11/15/2016	User is logged in	Pass		

Execution Summary:	Success
Acknowledgment: Generated from the CapStone process management system ©2015	

Test Execution Report for testing log in. This functionality has been implemented and is passing tests.

Project Name:	Intelligent Academic Planner					
Test Case ID:	TC-002					
Testing Tools Used:	Mocha					
Testing Type:	Agile (automated) testing					
Execution Steps:	1	click left sidebar				
	2	click user icon				
	3	click logout button				
	4	back to main page				
Test Execution Records:						
#	Tester	Test Date	Actual Result	Status	Defect	Correction
1	Daria	10/15/2016	User is not logged out	Fail	Not yet implemented	10/30/2016 by Allen
2	Daria	11/15/2016	User is logged out	Pass		
Execution Summary:	Success					
Acknowledgment: Generated from the CapStone process management system ©2015						

Test Execution Report for testing log out. This functionality has been implemented and is passing tests.

Project Name:	Intelligent Academic Planner					
Test Case ID:	TC-003					
Testing Tools Used:	Mocha					
Testing Type:	Agile (automated) testing					
Execution Steps:	1	click left side bar				
	2	click user icon				
	3	click sign in icon				
	4	click sign up				
	5	input username, email, password				
	6	go to profile page				
Test Execution Records:						
#	Tester	Test Date	Actual Result	Status	Defect	Correction
1	Daria	10/15/2016	User is not added to database	Fail	Not yet implemented	10/30/2016 by Allen
2	Daria	11/15/2016	User is added to database	Pass		
Execution Summary:	Success					
Acknowledgment: Generated from the CapStone process management system ©2015						

Test Execution Report for testing register. This functionality has been implemented and is passing tests.

Project Name:	Intelligent Academic Planner					
Test Case ID:	TC-004					
Testing Tools Used:	Mocha					
Testing Type:	Agile (automated) testing					
Execution Steps:	1	input question				
	2	view answer				
Test Execution Records:						
#	Tester	Test Date	Actual Result	Status	Defect	Correction
1	Daria	11/15/2016	Question is not answered	Fail	Not yet implemented	
Execution Summary:	Not yet implemented					
Acknowledgment: Generated from the CapStone process management system ©2015						

Test Execution Report for testing asking a question. This functionality has not yet been implemented and is therefore failing tests.

Project Name:	Intelligent Academic Planner					
Test Case ID:	TC-005					
Testing Tools Used:	Mocha					
Testing Type:	Agile (automated) testing					
Execution Steps:	1	User asks question				
	2	System displays response and requests feedback				
	3	User enters feedback				
	4	See that feedback is stored in database				
Test Execution Records:						
#	Tester	Test Date	Actual Result	Status	Defect	Correction
1	Daria	11/15/2016	Feedback is not added to database and thank you message not displayed	Fail	Not yet implemented	
Execution Summary:	Not yet implemented					
Acknowledgment: Generated from the CapStone process management system ©2015						

Test Execution Report for testing feedback. This functionality has not yet been implemented and is therefore failing tests

Project Name:	Intelligent Academic Planner					
Test Case ID:	TC-006					
Testing Tools Used:	Mocha					
Testing Type:	Agile (automated) testing					
Execution Steps:	1	User enters untranslated text				
	2	User requests translation				
	3	See that text becomes translated				
Test Execution Records:						
#	Tester	Test Date	Actual Result	Status	Defect	Correction
1	Daria	11/15/2016	No text outputted	Fail	Not yet implemented	
Execution Summary:	Not yet implemented					
Acknowledgment: Generated from the CapStone process management system ©2015						

Test Execution Report for testing real-time translation. This functionality has not yet been implemented and is therefore failing tests

Project Name:	Intelligent Academic Planner					
Test Case ID:	TC-007					
Testing Tools Used:	Mocha					
Testing Type:	Agile (automated) testing					
Execution Steps:	1	User enters ambiguous question				
	2	See that system responds with another question relevant to the question asked				
Test Execution Records:						
#	Tester	Test Date	Actual Result	Status	Defect	Correction
1	Daria	11/15/2016	No output	Fail	Not yet implemented	
Execution Summary:	Not yet implemented					
Acknowledgment: Generated from the CapStone process management system ©2015						

Test Execution Report for analyzing a question. This functionality has not yet been implemented and is therefore failing tests

Project Name:	Intelligent Academic Planner					
Test Case ID:	TC-008					
Testing Tools Used:	Mocha					
Testing Type:	Agile (automated) testing					
Execution Steps:	1	User enters profile information				
	2	User submits profile information				
	3	See that profile information is stored in database				
Test Execution Records:						
#	Tester	Test Date	Actual Result	Status	Defect	Correction
1	Daria	11/15/2016	Profile information not stored to database	Fail	Not yet implemented	
Execution Summary:	Not yet implemented					
Acknowledgment: Generated from the CapStone process management system ©2015						

Test Execution Report for submitting a profile. This functionality has not yet been implemented and is therefore failing tests

Project Name:	Intelligent Academic Planner					
Test Case ID:	TC-009					
Testing Tools Used:	Mocha					
Testing Type:	Agile (automated) testing					
Execution Steps:	1	User requests assessment				
	2	User requests to save assessment				
	3	User requests that assessment is made visible to advisers				
	4	See that assessment is stored in database with true visibility				
Test Execution Records:						
#	Tester	Test Date	Actual Result	Status	Defect	Correction
1	Daria	11/15/2016	No assessment shown	Fail	Not yet implemented	
Execution Summary:	Not yet implemented					
Acknowledgment: Generated from the CapStone process management system ©2015						

Test Execution Report for generating an assessment and saving it visible to advisors. This functionality has not yet been implemented and is therefore failing tests

Project Name:	Intelligent Academic Planner					
Test Case ID:	TC-010					
Testing Tools Used:	Mocha					
Testing Type:	Agile (automated) testing					
Execution Steps:	1	User receives a request to view assessment				
	2	User agrees to allow access to assessment				
	3	See that visibility of assessment is change to true in database				
Test Execution Records:						
#	Tester	Test Date	Actual Result	Status	Defect	Correction
1	Daria	11/15/2016	Visibility not changed	Fail	Not yet implemented	
Execution Summary:	Not yet implemented					
Acknowledgment: Generated from the CapStone process management system ©2015						

Test Execution Report for requesting to view an assessment. This functionality has not yet been implemented and is therefore failing tests

Project Name:	Intelligent Academic Planner					
Test Case ID:	TC-011					
Testing Tools Used:	Mocha					
Testing Type:	Agile (automated) testing					
Execution Steps:	1	User requests to view assessment				
	2	See that assessment is displayed				
Test Execution Records:						
#	Tester	Test Date	Actual Result	Status	Defect	Correction
1	Daria	11/15/2016	Assessment not shown	Fail	Not yet implemented	
Execution Summary:	Not yet implemented					
Acknowledgment: Generated from the CapStone process management system ©2015						

Test Execution Report for viewing assessment. This functionality has not yet been implemented and is therefore failing tests

Project Name:	Intelligent Academic Planner					
Test Case ID:	TC-012					
Testing Tools Used:	Mocha					
Testing Type:	Agile (automated) testing					
Execution Steps:	1	go to retrieve and rank				
	2	go to corpus				
	3	input queststion and answer				
	4	select answer				
Test Execution Records:						
#	Tester	Test Date	Actual Result	Status	Defect	Correction
1	Daria	10/15/2016	No change in answer quality	Fail	Not yet implemented	10/30/2016 by Allen
2	Daria	11/15/2016	Question successfully answered	Pass		
Execution Summary:	Success					
Acknowledgment: Generated from the CapStone process management system ©2015						

Test Execution Report for testing training Watson. This functionality has been implemented and is passing tests.

Project Name:	Intelligent Academic Planner					
Test Case ID:	TC-013					
Testing Tools Used:	Mocha					
Testing Type:	Parameter value coverage					
Execution Steps:	1	User attempts to login with invalid password				
	2	See that error is displayed and user is not logged in.				
Test Execution Records:						
#	Tester	Test Date	Actual Result	Status	Defect	Correction
1	Daria	10/18/2016	User is not logged in but no error is displayed	Fail	Not implemented	10/30/2016 by Allen
Execution Summary:	Not fully implemented					
Acknowledgment: Generated from the CapStone process management system ©2015						

Test Execution Report for logging in with an invalid password. This functionality has not yet been implemented and is therefore failing tests

Project Name:	Intelligent Academic Planner					
Test Case ID:	TC-014					
Testing Tools Used:	Mocha					
Testing Type:	Parameter value coverage					
Execution Steps:	1	User attempts to login with incorrect username				
	2	See that user is not logged in and an error is displayed				
Test Execution Records:						
#	Tester	Test Date	Actual Result	Status	Defect	Correction
1	Daria	10/18/2016	User is not logged in but error is not displayed	Fail	Not implemented	10/30/2016 by Allen
Execution Summary:	Not fully implemented					
Acknowledgment: Generated from the CapStone process management system ©2015						

Test Execution Report for logging in with an incorrect username. This functionality has not yet been implemented and is therefore failing tests

Project Name:	Intelligent Academic Planner					
Test Case ID:	TC-015					
Testing Tools Used:	Mocha					
Testing Type:	Parameter value coverage					
Execution Steps:	1	User attempts to login with both incorrect username and password				
	2	See that error message is displayed and user is not logged in.				
Test Execution Records:						
#	Tester	Test Date	Actual Result	Status	Defect	Correction
1	Daria	10/18/2016	User is not logged in but no error is displayed	Fail	Not implemented	10/30/2016 by Allen
Execution Summary:	Not fully implemented					
Acknowledgment: Generated from the CapStone process management system ©2015						

Test Execution Report for logging in with an invalid password and incorrect username. This functionality has not yet been implemented and is therefore failing tests

Project Name:	Intelligent Academic Planner					
Test Case ID:	TC-016					
Testing Tools Used:	Mocha					
Testing Type:	Parameter value coverage					
Execution Steps:	1	User receives request to view assessment				
	2	User denies request				
	3	See that request's visibility stays false in database				
Test Execution Records:						
#	Tester	Test Date	Actual Result	Status	Defect	Correction
1	Daria	11/18/2016	Can't Test	Fail	Not implemented	
Execution Summary:	Not implemented					
Acknowledgment: Generated from the CapStone process management system ©2015						

Test Execution Report for requesting to view an assessment and it is denied. This functionality has not yet been implemented and is therefore failing tests

Project Name:	Intelligent Academic Planner					
Test Case ID:	TC-017					
Testing Tools Used:	Mocha					
Testing Type:	Parameter value coverage					
Execution Steps:	1	User attempts to register with invalid password				
	2	See that an error is displayed about invalid password and user is not added to database				
Test Execution Records:						
#	Tester	Test Date	Actual Result	Status	Defect	Correction
1	Daria	10/18/2016	User is not added to database but no error is displayed	Fail	Not implemented	10/30/2016 by Allen
Execution Summary:	Not fully implemented					
Acknowledgment: Generated from the CapStone process management system ©2015						

Test Execution Report for registering with an invalid password. This functionality has not yet been implemented and is therefore failing tests

Project Name:	Intelligent Academic Planner					
Test Case ID:	TC-018					
Testing Tools Used:	Mocha					
Testing Type:	Parameter value coverage					
Execution Steps:	1	User attempts to register with a taken email				
	2	See that an error message is displayed stating the email is taken and the user is not added to database.				
Test Execution Records:						
#	Tester	Test Date	Actual Result	Status	Defect	Correction
1	Daria	10/18/2016	User is not added to database but no error is displayed	Fail	Not implemented	10/30/2016 by Allen
Execution Summary:	Not fully implemented					
Acknowledgment: Generated from the CapStone process management system ©2015						

Test Execution Report for logging in with a taken email. This functionality has not yet been implemented and is therefore failing tests

Project Name:	Intelligent Academic Planner					
Test Case ID:	TC-019					
Testing Tools Used:	Mocha					
Testing Type:	Parameter value coverage					
Execution Steps:	1	User attempts to login with both taken email and invalid password				
	2	See that error is displayed stating email is taken and user is not added to database.				
Test Execution Records:						
#	Tester	Test Date	Actual Result	Status	Defect	Correction
1	Daria	10/18/2016	User is not added to database but no error is displayed	Fail	Not implemented	10/30/2016 by Allen
Execution Summary:	Not fully implemented					
Acknowledgment: Generated from the CapStone process management system ©2015						

Test Execution Report for logging in with an invalid password and taken email. This functionality has not yet been implemented and is therefore failing tests

Project Name:	Intelligent Academic Planner					
Test Case ID:	TC-020					
Testing Tools Used:	Mocha					
Testing Type:	Parameter value coverage					
Execution Steps:	1	User requests to generate assessment				
	2	User requests to save assessment				
	3	User requests that advisers cannot view their assessment				
	4	See that the assessment is stored in the database with false visiblity				
Test Execution Records:						
#	Tester	Test Date	Actual Result	Status	Defect	Correction
1	Daria	11/18/2016	Can't Test	Fail	Not Implemented	
Execution Summary:	Not Implemented					
Acknowledgment: Generated from the CapStone process management system ©2015						

Test Execution Report for generating an assessment that is requested to be saved but not shared. This functionality has not yet been implemented and is therefore failing tests

Project Name:	Intelligent Academic Planner					
Test Case ID:	TC-021					
Testing Tools Used:	Mocha					
Testing Type:	Parameter value coverage					
Execution Steps:	1	User requests to generate assessment				
	2	User requests to not save assessment				
	3	See that assessment is not stored in database				
Test Execution Records:						
#	Tester	Test Date	Actual Result	Status	Defect	Correction
1	Daria	11/18/2016	Can't Test	Fail	Not Implemented	
Execution Summary:	Not Implemented					
Acknowledgment: Generated from the CapStone process management system ©2015						

Test Execution Report for generating an assessment but not saving it. This functionality has not yet been implemented and is therefore failing tests

Project Name:	Intelligent Academic Planner					
Test Case ID:	TC-022					
Testing Tools Used:	Mocha					
Testing Type:	Agile (automated) testing					
Execution Steps:	1	Developer requests to view question log				
	2	See that question log is displayed				
Test Execution Records:						
#	Tester	Test Date	Actual Result	Status	Defect	Correction
1	Daria	11/17/2016	Can't Test	Fail	Not Implemented	
Execution Summary:	Not Implemented					
Acknowledgment: Generated from the CapStone process management system ©2015						

Test Execution Report for viewing question log. This functionality has not yet been implemented and is therefore failing tests

Project Name:	Intelligent Academic Planner					
Test Case ID:	TC-023					
Testing Tools Used:	Mocha					
Testing Type:	Agile (automated) testing					
Execution Steps:	1	User asks question				
	2	See that system responds within 5 seconds				
Test Execution Records:						
#	Tester	Test Date	Actual Result	Status	Defect	Correction
1	Daria	11/18/2016	Can't Test	Fail	Not Implemented	
Execution Summary:	Not Implemented					
Acknowledgment: Generated from the CapStone process management system ©2015						

Test Execution Report for speed of asking a question. This functionality has not yet been implemented and is therefore failing tests

Project Name:	Intelligent Academic Planner					
Test Case ID:	TC-024					
Testing Tools Used:	Mocha					
Testing Type:	Agile (automated) testing					
Execution Steps:	1	User is inactive for 1 hour				
	2	See that system logs user out				
Test Execution Records:						
#	Tester	Test Date	Actual Result	Status	Defect	Correction
1	Daria	11/18/2016	User stays logged in	Fail	Not implemented	
Execution Summary:	Not Implemented					
Acknowledgment: Generated from the CapStone process management system ©2015						

Test Execution Report for logging a user out after 1 hour of inactivity. This functionality has not yet been implemented and is therefore failing tests

Integration Testing Report

N/A

System Testing Report

N/A

Acceptance Testing Report

N/A

9. Challenges & Open Issues

9.1. Challenges Faced in Requirements Engineering

- ➔ Initially, we struggled to determine the scope of the project. Watson has many features, therefore we had to be very specific about which of these features would make the most sense for our project's initial development.
- ➔ Understanding the domain, or what sort of questions we wanted Watson to answer.
- ➔ Be able to benchmark the accuracy of answering system.
- ➔ Be able to automate the training/learning system.
- ➔ Getting enough questions to be able to train Watson properly.

9.2. Challenges Faced in System Development

- ➔ Build and automate the backend system for training with retrieve and rank
- ➔ Build workable model to analyze questions and answer accuracy
- ➔ Try to utilize IBM Watson API to maximize the performance

9.3. Open Issues & Ideas for Solutions

- ➔ N/A

10. System Manuals

10.1. Instructions for System Development

How to setup development environment

The Intelligent Academic Planner project is a web application, that will be accessible publicly on Heroku, a Node.JS environment host platform. The source code will be stored by GitHub, for version control purposes. And the master version will always be automatically deployed and run on Heroku. There is no restriction on what IDE will be used by each group member.

Notes on system further extension

- ➔ Automate question and feedback log DB
- ➔ Natural language extension[9]
- ➔ Analytical library
- ➔ Visual recognition on building[7]
- ➔ Attitude analysis on question
- ➔ Campus direction utility
- ➔ Course info helper (location, material, etc…)
- ➔ News/feeds utility[17]

10.2. Instructions for System Deployment

Platform Requirements

NodeJS: main server platform, version require v6.0 and up
MongoDB: version require 3.0.x and up
Modern Web Browser: Firefox, Chrome, Edge, Safari, Opera, Iceweasel
Bluemix
Heroku-Github

System Installation

NodeJS: local install by installer or any online NodeJS IDE
MongoDB: no installation required
Bluemix: no installation required
Client: user defined browser installation

10.3. Instructions for System End Users

11. Conclusion

This section will be gone over in future reports.

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