

NANYANG
TECHNOLOGICAL
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CZ 3003 Software System Analysis and Design
Software Requirements Specification
Good Game Well Played (GGWP)

Leroy Tang Zi Wei, Alson Kong, Karen Wong, Lim Wei Cong, Sam Jian Shen, Cole, Ting-Chun Kuo, Zane Ho, Norman Fung, Jing Heng Pow

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1 Introduction

Purpose

Singapore is well known for its development in the area of Science and Technology. The ability to sustain the growth in Science and Technology is largely dependent on early education. Youth are exposed to Science and Technology since young this there is a lack of emphasis on general education. General education is essential and a part of holistic education. In the current society, where people are being judge more than just academically, there is a need to develop students and youth holistically since young to ensure Singapore stay competitive in the region and around the world.

The purpose of this document specifies the software requirement for the application which aims to educate its users on general knowledge. This application explores the usage of visual communications and interactive teaching to impart knowledge. This document will explain the motivation of the development of the application, defines the scope of the application which will include functional and non-functional requirements, Unified Modeling Language (UML) diagrams, use case.

Document Conventions

The following describes the style and format that will be adopted in this document.

- Main Section Heading:
 - Font: Times New Roman
 - Face: Bold
 - Size: 16
- Subsection Heading:
 - Font: Times New Roman
 - Face: Bold
 - Size: 14
- Text
 - Font: Times New Roman
 - Face: Normal
 - Size: 12
- Table
 - Font: Times New Roman
 - Face: Normal
 - Size: 10

■ Intended Audience and Reading Suggestions

This application is open to any users and does not have any age restrictions. It is understood that users who use this application have the basic reading and understanding abilities. However, the prototype of this application will roll out to students from 8 years old to 16 years old as the application targets to allow youth to expand their general knowledge. It is also understood that general knowledge is different from current affairs. General knowledge is facts or incident that has occurred which may invoke interest users to research into a special area.

Users of the application included student and teacher for the prototype phase. Users of the application may consider reading this document to understand how does the application work.

Developers can refer to this document for the capabilities of the application. Developers can also understand the concept and teaching methodology of this application from this document.

■ Product Scope

The aim of this application is to allow the user to gain general knowledge and also to inculcate good learning habits. It ranges from geography, geopolitical, history and more. This will be done by spreading awareness on the lack of general knowledge within the youth. This stage is termed as the Discovery Stage. As the saying goes, “You don’t know what you don’t know”. The application will test the user on certain topic and the answer will be revealed after. Explanation will also be provided should there be any. This “Test & Teach” teaching methodology allows the user to understand its shortcoming and focus on the area that is needed rather than going through things that the user already knows. This stage is term as onboarding stage.

The developers of this application aim to gamify the experience by adopting the concept of multiple levels with increasing difficulties. There will be stages where the difficulties are slightly higher than other. Completing stages will enable the user to earn points which will be accumulated for the Leadership board ranking. Users will be allowed to seek help from friends through the usage of social media should the question difficulty is beyond manageable. Similarity, users will be able to share questions as a form of challenge to their friends.

During the prototype phase, question can be deliberate to sieve out students who has weak understanding on certain areas. Through analyzing the answers, difficulties could be moderated to ensure progressive and effective learning. The platform will set restrictions in order to prevent misuse of the application such as using the application to issue homework. The key is to understand individual shortcomings and therefore invoke the interest to find out more which eventually inculcate the good habit of a learning cyc

References

2 Overall Description

Product Perspective

The application will adopt visual communications and interactive teaching to engage the user. This is to accommodate different types of users with different learning style. It is noted that the main types of learning style are visual learners, auditory and tactile. Primary emphasis will be placed on visual learning and secondary learning will be on auditory learning.

Users will have to create accounts before using the application. This is to ensure the score of individuals are tagged correctly to each user. Elaborating on the selection of topic to venture, users will be able to choose the topic which interests them. The flexibility provided is to retain the users and keep them onboard as long as possible.

Under the prototype phase, the teachers will be the administrators and the students will be the targeted users. Outside of this phase, anyone could be the user as long the user has basic reading and understanding abilities. High score is an avenue for the teachers to analyze the students' performance while from the user's perspective, high score is the measuring element used to distinguish themselves among their friends within leaderboard. Questions for the application will be stored and retrieved from its own database, likewise for users high score. Maintenance and management of the application will be conducted by the application administrators.

Product Functions

Open users and students will be considered as end users. Teachers and Student administrators will be considered as Administrators.

- End-Users (Playable Mode)
 - Adventure: A progressive learning experience
 - Allows different topic
 - Challenge: Challenge sent by friends
- Administrators
 - Viewing questions
 - Viewing answers
 - Manipulate difficulties for certain level
 - Set questions explicitly
 - Arrange question to be released based on their difficulty rating, randomized.
 - Management of accounts
 - Removal of accounts
 - Editing of accounts

■ User Classes and Characteristic

The application is designed for the open public however during the prototype phase, it is designed of the need of students and teacher. The end user are the students or the general crowd. They will be able to choose their desired modes. Teacher are the administrator during the prototype phase and they will be able to churn out analysis sheet of the students.

Operating Environment

- Cloud Services
 - Firebase
- Dependencies
 - Facebook API
 - Instagram API
- Web Browser
 - Google Chrome
 - Internet Explorer
 - Mozilla Firefox

■ Design and implementation Constraints

These are the following constraints in our implementation:

1. Web Browser environment – By building for web browsers, this project can serve to benefit a wide range of computer devices without increasing the implementation effort to build for different operating applications
2. Design of application – Design efforts for the application may be outsourced to create an interactive and appealing environment for students to learn
3. Language Support – The application has been planned to support only the English language.
4. Assets – General Knowledge questions and answers have to be sourced from multiple verified parties, as some of these knowledge is domain knowledge.

■ User Documentation

There will be a video demonstration of the application. It has a step by step walkthrough on the usage of the application and also explanation to aid first time user or troubled user. It will also capture walkthrough for the administrators to further aid new administrators on the modifications of the applications.

■ Assumptions and Dependencies

It is assumed that all users that engages with the application have internet access. The internet is required to access or retrieve user data and to update the status of the game such as high score and stages.

3 Functional Requirements

View Leadership Board

- 3.1.1 The application must display a leadership board.
 - 3.1.1.1 The application must display the weekly leadership board by default
 - 3.1.1.2 The application must display the top ten ranking of players
 - 3.1.1.3 The application must display the user's ranking.
 - 3.1.1.4 The application must display the high score for each rank.
 - 3.1.1.5 The application must provide the user the option to select between viewing the high scores in weekly or daily format.
 - 3.1.1.6 When the user selects the option to change the high score's format, the application must display the user's high score in his/her preferred format (weekly/ daily).
- 3.1.2 The application must display high scores consistently
 - 3.1.2.1 High scores must be displayed in ascending order.
 - 3.1.2.2 High scores must be displayed in a numerical form.
 - 3.1.2.3 High score must be displayed as a non-negative number.
 - 3.1.2.4 High scores must be displayed in a tabular format.
 - 3.1.2.5 High score display format must indicate player's name and player's score.
- 3.1.3 The application must reset the daily high score at the end of the day at 23:59 GMT +8.
- 3.1.4 The application must reset the weekly high score at 23:59 GMT +8, on the last day of the week

Change Learning Scope

- 3.2.1 The application must provide the user the option to start learning.
- 3.2.2 When the user has selected the option to start learning, the application must prompt the user to select his learning scope.
- 3.2.3 The application must provide the user the option to change his learning scope at any time when using the application.
- 3.2.4 The application must provide the user the option to view additional information on the learning scope.
- 3.2.5 When the user has selected the option to view additional information on the learning scope, the application will display additional information related to that learning scope.
 - 3.2.5.1 Additional information is displayed in a text form and with relevant images.
 - 3.2.5.2 Additional information must be related to the selected learning scope.
- 3.2.6 The application must show only content and questions from the selected learning scope.
- 3.2.7 The application must display the selection of learning scopes in a tabular form.
 - 3.2.7.1 Each learning scope must be displayed with an image and title of the learning scope.
 - 3.2.7.2 Each learning scope must also contain an option to get additional information about the learning scope.
 - 3.2.7.3 Each learning scope must also contain an option for a user to select that learning scope and the application must redirect the user to select a stage to play in that learning scope.

Display Help

- 3.3.1 The application must provide the user an option to get help.
- 3.3.2 When the user selects the option to get help, the application must be able to provide interactive help.
 - 3.3.2.1 Help provided to the user must be relevant to the user's current context in the application.
- 3.3.3 The application must allow the user to exit from interactive help at any time.

Select Stages

- 3.4.1 When the user has selected a learning scope, the application must show the user the list of stages for that learning scope and his current progress.
 - 3.4.1.1 The application must show only stages for the learning scope that the user has selected.
 - 3.4.1.2 Unlocked stages and locked stages must be shown in a specified order.
 - 3.4.1.2.1 Locked stages must be shown after unlocked stages.
 - 3.4.1.2.2 Unlocked stages must be shown before locked stages.
 - 3.4.1.3 The user must be able to see the number and short description of stages ahead.
- 3.4.2 The application must provide the user the option to select a stage to enter the game.
- 3.4.3 The application must allow new users to start at stage 1.
- 3.4.4 Subsequent stages can only be unlocked if the user has acquired at least 2 stars in the previous stage.

Front Loading Screen

- 3.5.1 The application must be able to show the loading progress.
 - 3.5.1.1 Loading progress must be displayed in a numerical form.
 - 3.5.1.2 Loading progress must be in a percentage form.
 - 3.5.1.3 Loading progress must progress over time.
 - 3.5.1.4 Loading progress must progress relative to loading of assets.

Main Screen

- 3.6.1 The application must provide the user the option to view high score and his ranking in the high score leadership board.
- 3.6.2 When the user has selected the option to view high score and ranking, the application must redirect the user to view leadership board.
- 3.6.3 The application must show the user his most recently played stage level and the learning scope.
- 3.6.4 The application must provide the user the option to get interactive help.
- 3.6.5 When the user has selected the option to get interactive help, the application must redirect the user to the display help screen.
- 3.6.6 The application must provide the user the option to view his profile.
- 3.6.7 When the user has selected the option to view his profile, the application must redirect the user to this profile
- 3.6.8 The application must provide the user the option to return to home.
- 3.6.9 When the user has selected the option to return to home, the application must redirect the user back to the home screen.
- 3.6.10 The application must provide the user the option to search for friends
- 3.6.11 When the user selects the option to search for friends, the application must redirect the user to the search friend screen?
- 3.6.12 If the user is logged in, the application must provide the user the option to logout.

■ Add Friend

- 3.7.1 The application must provide the user the option to search for a friend.
 - 3.7.1.1 Friend search must be performed based on usernames.
 - 3.7.1.2 Friend search must be performed in a case-sensitive manner.
 - 3.7.1.3 Results of friend search must be displayed in a list form.
 - 3.7.1.3.1 Results of friend search must contain the name of the user that matches the search.
 - 3.7.1.3.2 Results of friend search must be displayed in the order of how much it matches the search result
 - 3.7.1.3.3 Results of friend search must contain an option to add the user as friend.
- 3.7.2 When the user selects the option to add a friend result as friend, the application must add the selected friend result as friend to the user's list of friends.

■ User Login

- 3.8.1 The application must provide the user the option to login to the application.
- 3.8.2 The application must provide the user the option to register for the application
- 3.8.3 The application must allow only logged in users to use features in its application.
- 3.8.4 When the application is launched and the user is not logged in, the application must redirect the user to the login screen.
- 3.8.5 The application must provide a social login option and a local account login option.
 - 3.8.5.1 The application must provide the option to log in with their registered account via email.
 - 3.8.5.2 The application must provide the option to login with their Google Account.
 - 3.8.5.3 The application must allow the users to login with either a registered account or a Google Account, login with both accounts is not allowed.
 - 3.8.5.4 The application must allow the user to logout via the main screen after being logged in.
 - 3.8.5.5 The application shall lock the user out of the application after 5 consecutive failed attempts.
 - 3.8.5.5.1 Upon 5 times of failed login attempts, the application must impose a 5-minutes login attempt timeout on the user's account.
 - 3.8.5.5.2 If the user attempts to login during a timeout period, the application must inform the user that the account has been locked out and to try again after the duration of the timeout has elapsed.
- 3.8.6 Upon successful login, the application must redirect the user to the main screen.

Registration

- 3.9.1 The application must provide the user the option to register for their own local account
 - 3.9.1.1 Email Address and Password must be entered
 - 3.9.1.2 Email address must be a valid email address.
 - 3.9.1.3 Password must be at least 8 characters and be alphanumeric.
 - 3.9.1.4 The application must validate the email address and password and inform the user if the password or email address is not entered in the required format.
- 3.9.2 Upon successful registration, the application must send a verification email to the user's registered email address after registering for the application.
- 3.9.3 The application must provide the user the option to resend confirmation email.

Reset Password

- 3.10.1 The application must provide the user the option to reset his password at the login page.
- 3.10.2 When the user selects the option to reset password, the application must prompt the user for his/her email address.
- 3.10.3 When the user enters the email address and submits the form, the application shall send an email notification to the user, in order to reset the password.
 - 3.10.3.1 The email must contain a link to reset the user's account password.
 - 3.10.3.2 The email must be sent only to the entered email address.
 - 3.10.3.3 When the user clicks the link, the application must prompt the user to set a new password.
 - 3.10.3.4 When the user enters the new password and submits the form, the application must update the user's account with the new password.

Rate the Game

- 3.11.1 The user must be able to rate the game.
- 3.11.2 The user shall leave a rating of a minimum of 1 star.
- 3.11.3 The user shall leave a rating of a maximum of 5 stars.
- 3.11.4 The user must also be able to leave a review.

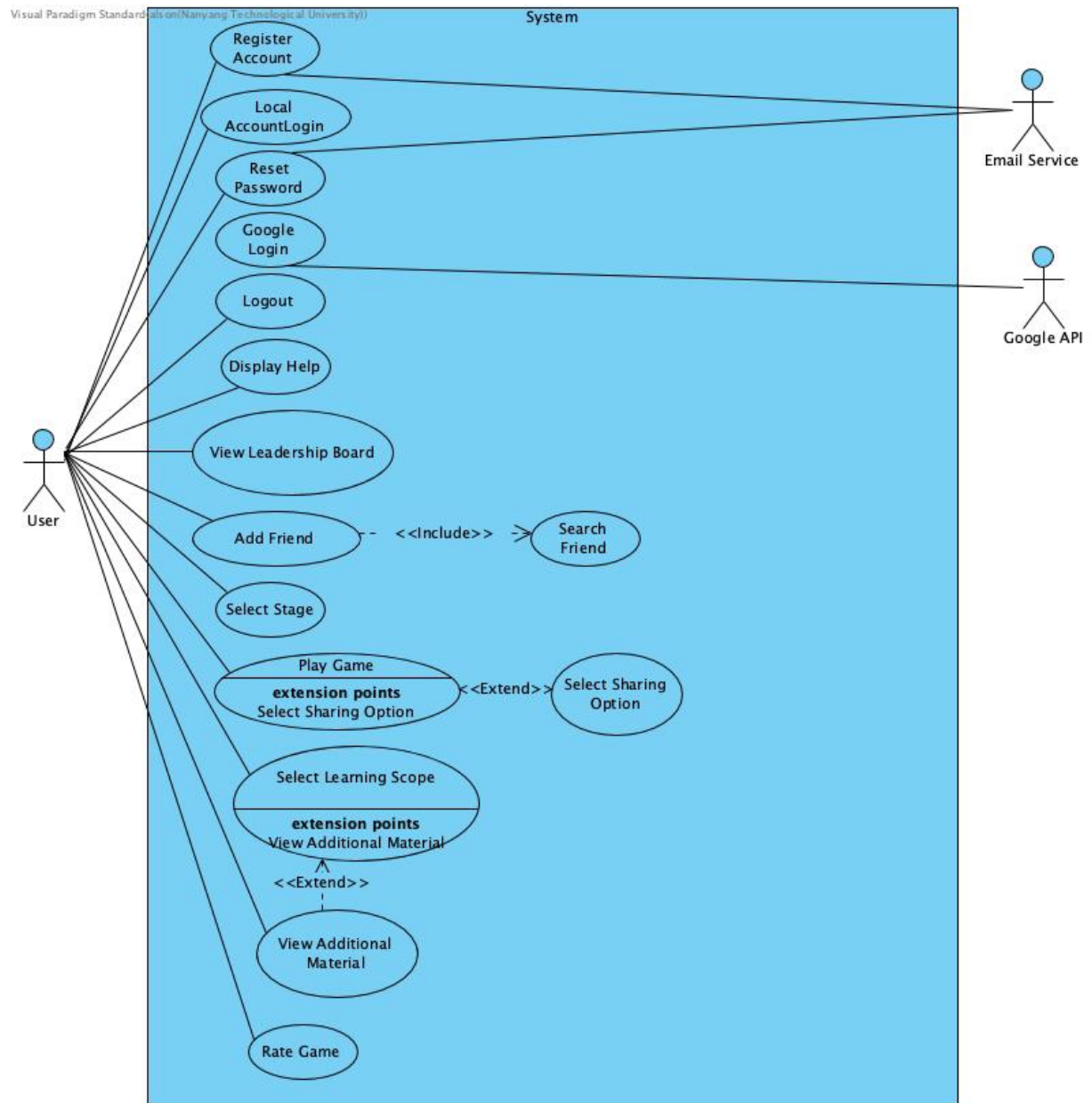
■ Play Game

- 3.12.1 The application must display one question at a time.
- 3.12.2 The application must allow questions to be answered in one of the question formats.
 - 3.12.2.1 Questions must be asked in a multiple choice selection, text answers or numbered answers format
- 3.12.3 The application must provide a countdown of 30 seconds for each question.
- 3.12.4 The application must provide bonus points for questions that are answered accurately and with time remaining on the countdown.
 - 3.12.4.1 The application must award 2 bonus points for each question answered within 10 seconds.
 - 3.12.4.2 The application must award 1 bonus points for each question answered within 20 seconds.
- 3.12.5 The application must show the correct answers at the end of the game.
- 3.12.6 The application must show the score at the end of the game.
 - 3.12.6.1 The application must
 - 3.12.6.2 The user shall acquire 1 star for the stage if the score is below 50%.
 - 3.12.6.3 The user shall acquire 2 stars for the stage if the score is between 50% to 80%.
 - 3.12.6.4 The user shall acquire 3 stars for the stage if the score is above 80%.

■ Select Sharing Option

- 3.13.1 The user can select a sharing option to post the question and option to a social media platform(Facebook,Instagram) to seek help.
 - 3.13.1.1 The user must have Facebook linked into their account to share over their facebook page
 - 3.13.1.2 The user must have Instagram linked into their account to share over their instagram page
- 3.13.2 The user can select a sharing option to post the question and answer to a social media after they answer the question.
 - 3.13.2.1 The user must have Facebook linked into their account to share over their facebook page
 - 3.13.2.2 The user must have Instagram linked into their account to share over their instagram page

4 Use Case Diagram



Use Case Description

Use Case ID:	1		
Use Case Name:	Register		
Created By:	Wei Cong	Last Updated By:	
Date Created:	17 Feb 2020	Date Last Updated:	

Actors:	User(Initiating) Email Service(Participating)
Description:	This use case allows users to create an account to access the game application using an email address and password. Account details required: <ul style="list-style-type: none"> Email address Username Password
Trigger:	Selection of register account option from the main screen.
Preconditions:	-
Postconditions:	The application creates an account for the user based on the submitted details.
Normal Flow:	<ol style="list-style-type: none"> The user selects the registration option in the application's login page The application redirects the user to the registration page and prompts the user for the required registration details. The user enters required information and submits the form. The application validates the input The application saves the account registration details. The participating Email Service actor will send an email to the new user's email address. The application saves the account's confirmation status as pending. The application redirects the user to the Resend Confirmation Email page The application informs the user that the email has been sent.
Alternative Flows:	<p>AF-S4: Duplication of username found</p> <ol style="list-style-type: none"> The application informs the user that the username is taken and to choose another username. The application resumes at step 2. <p>AF-S6: No email confirmation received.</p> <ol style="list-style-type: none"> The user does not receive confirmation email and selects the option to resend confirmation email The application resumes at step 6.
Exceptions:	<p>1.0.E.1 Application unable to create account</p> <ol style="list-style-type: none"> Application informs the user that the account could not be created and to try again later.
Includes:	-
Priority:	High
Frequency of Use:	Once per new user

Use Case ID:	2		
Use Case Name:	Local Account Login		
Created By:	Leroy	Last Updated By:	
Date Created:	16 Feb 2020	Date Last Updated:	

Actors:	User
Description:	This use case allow user to login to the application through: 1. Created account on the platform through registered email address.
Trigger:	Selection of login on the main screen for unauthenticated users.
Preconditions:	The user has a registered local account created through the Register Account Use Case User is not authenticated through the Login use case.
Postconditions:	User is successfully authenticated
Normal Flow:	1. The user enters login details for his account and submits the login form 2. The application validates the submitted login details with the list of known existing users 3. The application informs the user that login is successful.
Alternative Flows:	AF-S2: Login details not valid, login not successful 1. The application informs the user that login is not successful due to wrong password or username. 2. The application resumes at Step 1.
Exceptions:	-
Includes:	-
Priority:	High
Frequency of Use:	Once per user's session

Use Case ID:	3		
Use Case Name:	Logout		
Created By:	Alson	Last Updated By:	
Date Created:	17 Feb 2020	Date Last Updated:	

Actors:	User
Description:	This use case allows the users to logout of his current account.
Trigger:	Selection of logout on the main screen.
Preconditions:	User is authenticated via the Login Use Case.
Postconditions:	User is no longer authenticated
Normal Flow:	<ol style="list-style-type: none">1. The user selects the option to logout on the main page2. The application logouts the user3. The application updates all authentication information that the user is no longer logged in.4. The application informs the user that he/she has been logged out.
Alternative Flows:	-
Exceptions:	-
Includes:	-
Priority:	High
Frequency of Use:	Once per user's session

Use Case ID:	4		
Use Case Name:	Display help		
Created By:	Jing Herng	Last Updated By:	
Date Created:	16 Feb 2020	Date Last Updated:	

Actors:	User (initiating user)
Description:	This use case allows the user to seek interactive help when the user needs help with using the application.
Trigger:	Selection of help from the main screen
Preconditions:	User is authenticated via the Login Use Case.
Postconditions:	The application provides help for the user.
Normal Flow:	<ol style="list-style-type: none">1. The user selects the option to get help in the main screen2. The application redirects the user to the help page
Alternative Flows:	-
Exceptions:	-
Includes:	-
Priority:	Low
Frequency of Use:	Not frequent

Use Case ID:	5		
Use Case Name:	View Leadership Board		
Created By:	Zane	Last Updated By:	
Date Created:	13 Feb 2020	Date Last Updated:	

Actors:	User
Description:	This use case allows users to view his ranking and highscore information, displayed in relative order to other players.
Trigger:	Selection of view leadership board from main screen
Preconditions:	User is authenticated through the Login Use Case
Postconditions:	The application displays the leadership board to the user.
Normal Flow:	<ol style="list-style-type: none"> 1. The user selects the view leadership board option. 2. The application redirects the user to the leadership board page. 3. The application loads and displays the weekly leadership board. 4. If the user is interested to see the leadership board in the daily format, the user selects the option to view the daily leadership board on the view leadership board page. 5. The application displays the daily leadership board
Alternative Flows:	AF S-4 User is not interested to see the leadership board in the daily <ol style="list-style-type: none"> 1. The application resumes at step 3.
Exceptions:	-
Includes:	-
Priority:	Medium
Frequency of Use:	Not frequent per user

Use Case ID:	6		
Use Case Name:	Add Friend		
Created By:	Zane	Last Updated By:	
Date Created:	18 Feb 2020	Date Last Updated:	

Actors:	User
Description:	This use case allows the user to add other users as friends.
Trigger:	Selection of add friend from the list of usernames displayed by the included #7 Search Friend use case
Preconditions:	User is authenticated via the Login Use Case.
Postconditions:	The application adds the selected friend to the user's list of friends.
Normal Flow:	<ol style="list-style-type: none">1. The user uses the included Search Friend use case to search for users.2. The application displays a list of friends that fulfills the search result.3. The user selects add friend option on one of the search results.4. The application adds the selected friend to the user's list of friends.
Alternative Flows:	-
Exceptions:	-
Includes:	#7 Search Friend
Priority:	Medium
Frequency of Use:	Not frequent per user

Use Case ID:	7		
Use Case Name:	Search Friend		
Created By:	Zane	Last Updated By:	
Date Created:	18 Feb 2020	Date Last Updated:	

Actors:	User (initiating user)
Description:	This use case allows the user to search other users.
Trigger:	Selection of add friend from the main page
Preconditions:	User is authenticated through the Login Use Case
Postconditions:	The application display search result as a list of usernames
Normal Flow:	<ol style="list-style-type: none">1. The user select search friend option from the main page2. The application redirects the user to the search friend page3. The user enters username to search and submits the form4. The application display a list of usernames as search result, in the order that they match the entered username
Alternative Flows:	AF-S4 The application returns no result <ol style="list-style-type: none">1. The application informs the user that no matching usernames have been found.2. Application returns to step 3.
Exceptions:	-
Includes:	-
Priority:	Medium
Frequency of Use:	Not frequent per user

Use Case ID:	8		
Use Case Name:	Select Stage		
Created By:	Karen	Last Updated By:	
Date Created:	18 Feb 2020	Date Last Updated:	

Actors:	User (initiating user)
Description:	This use case allows the user to select stage in order to start game
Trigger:	Selection of Start Game option from Main Screen
Preconditions:	User is authenticated through the Login Use Case
Postconditions:	The application displays the leadership board to the user.
Normal Flow:	<ol style="list-style-type: none">1. The user selects the option to start the game from the Main Screen.2. The application redirects the user to the select stage page.3. The application loads the list of stages for the user's learning scope and displays the user's progress.4. The user selects a stage.5. The application redirects the user to the Play Game screen.
Alternative Flows:	AF-S4: Selection of locked stage. <ol style="list-style-type: none">1. Application displays error messages and prompts the user to select the stage that has been unlocked.2. Application return to step 2.
Exceptions:	
Includes:	
Priority:	High
Frequency of Use:	Frequent, multiple times per user's session

Use Case ID:	9		
Use Case Name:	Play game		
Created By:	Wei Cong	Last Updated By:	
Date Created:	16 Feb 2020	Date Last Updated:	

Actors:	User (initiating user)
Description:	This use case allows the user to play the game selected from the relevant learning scope and stage.
Trigger:	Selection of the start game option after selecting the game's stage.
Preconditions:	User is authenticated through the Login Use Case User has selected the game stage through the Select Stage Use Case
Postconditions:	User's score has been updated for that game stage Application must unlock the next stage if the user achieved at least 2 stars for the current stage.
Normal Flow:	<ol style="list-style-type: none"> 1. The user selects the stage from the select stage page 2. The application redirects the user to the play game page 3. The application loads questions that belongs to the user's currently selected learning scope and prompts the user in the question's format 4. The user inputs an answer to the question 5. The application checks the answer against the input and informs the user of the result. 6. The application saves the user's score in that stage. 7. If there are any more questions in that stage, the application loads the next question, the application resumes at Step 3. 8. The application calculates the score for the stage and informs the user about the score for the stage. 9. The application saves the user's score for the stage. 10. The application updates and unlocks the next stage if the overall score for the stage is at least 50% correct.
Alternative Flows:	-
Exceptions:	-
Includes:	-
Priority:	High
Frequency of Use:	Frequent per user's session

Use Case ID:	10		
Use Case Name:	Change learning scope		
Created By:	Zane	Last Updated By:	
Date Created:	13 Feb 2020	Date Last Updated:	

Actors:	User
Description:	This use case allows the user to change the learning scope
Trigger:	Selection of Change Learning Scope Option from the Main Page.
Preconditions:	User is authenticated through the Login Use Case
Postconditions:	The application informs the user that the learning scope has been updated.
Normal Flow:	<ol style="list-style-type: none">1. The user selects the select learning scope option on the main page2. The application redirects the user to the select learning scope page.3. The application displays and loads the list of available learning scopes and highlights the currently selected learning scope4. The user selects one of his learning scopes5. The application updates the user's learning scope to the newly selected learning scope.6. The application informs that the learning scope has been updated.
Alternative Flows:	-
Exceptions:	-
Includes:	-
Priority:	High
Frequency of Use:	Once per user's session

Use Case ID:	11		
Use Case Name:	View Additional Material		
Created By:	Norman	Last Updated By:	
Date Created:	18 Feb 2020	Date Last Updated:	

Actors:	Users		
Description:	This use case allows the user to learn additional material about the learning scope that he/she is not sure about. The content of the additional material will be reused in the form of questions to test the user's understanding of the learning scope.		
Trigger:	Selection of view additional info from the play game page.		
Preconditions:	User is authenticated via the Login Use Case		
Postconditions:	The application displays the additional material to the user.		
Normal Flow:	<ol style="list-style-type: none">1. The user selects the option to view additional info from the play game page.2. The application redirects the user to the view additional material page.3. The application loads the additional material content and displays it to the user.		
Alternative Flows:	-		
Exceptions:	-		
Includes:	-		
Priority:	High		
Frequency of Use:	Once per user's session		

Use Case ID:	12		
Use Case Name:	Rate and review stage		
Created By:	Cole	Last Updated By:	
Date Created:	16 Feb 2020	Date Last Updated:	

Actors:	User		
Description:	This use case allows users to give ratings and write a review for their experience with the application.		
Trigger:	Selection of rate game option in Main Page.		
Preconditions:	User is authenticated through the Login Use Case		
Postconditions:	The application saves the rating		
Normal Flow:	<ol style="list-style-type: none">1. The user selects the rate option in the main page.2. The application redirects the user to the rate game page.3. The user selects his rating, enters his review and submits the form.4. The application validates the submitted information5. The application saves the rating and review information.		
Alternative Flows:	AF-S4 No rating selected <ol style="list-style-type: none">1. The application informs the user that the rating is not valid and informs the user that rating has to be selected.2. The application resumes at Step 3.		
Exceptions:	-		
Includes:	-		
Priority:	High		
Frequency of Use:	Once per user		

Use Case ID:	13		
Use Case Name:	Google Login		
Created By:	Cole	Last Updated By:	
Date Created:	18 Feb 2020	Date Last Updated:	

Actors:	User (Initiating) Google API(participating)		
Description:	This use case allows the user to login to the application through Google account.		
Trigger:	Selection of login on the main screen for unauthenticated users.		
Preconditions:	The user has a valid Google account. User is not authenticated through the Login use case.		
Postconditions:	User is successfully authenticated.		
Normal Flow:	<ol style="list-style-type: none"> 1. The user selects the Login with Google account option on the login page. 2. The application redirects the user to Google login page. 3. Participating Google API actor prompts the user for login details and performs the authentication process. 4. Participating Google API actor redirects the user back to the application. 5. The application validates the login session information. 		
Alternative Flows:	-		
Exceptions:	-		
Includes:	-		
Priority:	High		
Frequency of Use:	Once per user's use		

Use Case ID:	14		
Use Case Name:	Reset Password		
Created By:	Alson	Last Updated By:	
Date Created:	17 Feb 2020	Date Last Updated:	

Actors:	User (initiating) Email Service(participating)		
Description:	This use case allows the user to reset the account's password.		
Trigger:	Selection of the reset password on the login page.		
Preconditions:	User has a local account created via the Register Use Case		
Postconditions:	The user's account password will be updated		
Normal Flow:	<ol style="list-style-type: none"> 1. The user selects the forget password option at the login page. 2. The application redirects the user to the forget password page and prompts for email address of account to be reset. 3. The user enters the email address and submits the form. 4. The application validates the submitted input and checks if there is an account with the entered details. 5. The participating Email Service Actor sends an email to the email address. 6. The user selects the reset password option in the email that has sent 7. The application redirects the user to the reset password page to prompt the user for a new password and a confirm password. 8. The user enters the new password and confirm password and submits the form 9. The application validates that submitted password. 10. The application updates the user's account with the submitted password and informs the user that the user account has been updated with the new password. 		
Alternative Flows:	<p>AF S-5: No email exists in the application</p> <ol style="list-style-type: none"> 1. The application informs the user that no account has been created with the submitted email address. 2. The application informs the user to verify his/her submitted email address. 3. The application resumes at Step 1 <p>AF S-9: Password and confirm password does not match</p> <ol style="list-style-type: none"> 1. The application informs the user that the enter password and confirm password does not match. 2. The application informs the user to verify that the password and confirm password has been entered correctly. 3. The application resumes at Step 8 		
Exceptions:	-		
Includes:	-		
Priority:	High		
Frequency of Use:	Not frequent per user's session		

Use Case ID:	15		
Use Case Name:	Select Sharing Option		
Created By:	Sam	Last Updated By:	
Date Created:	18 Feb 2020	Date Last Updated:	

Actors:	User
Description:	This use case allows users to seek help or share their answer with social media.
Trigger:	
Preconditions:	The user must have either Facebook or Instagram linked to their account.
Postconditions:	The user successfully shared their games on the respective social media.
Normal Flow:	<ol style="list-style-type: none">1. The user select sharing option button2. The application prompt the user to select the social media platform3. The application directs users to the social media platforms
Alternative Flows:	
Exceptions:	16.0.E.1 User ends the sharing process after being redirected. <ol style="list-style-type: none">1. No sharing is done.
Includes:	
Priority:	Low
Frequency of Use:	Not frequent per user's session

5 External Interface Requirements

User interfaces

5.1.1 User login

It allows the user to log in using her login credentials. It will then be checked against the information stored in the database. Upon successful login, the user will be redirected to the respective interface based on the information used to log in. For example, the administrator will be redirected to the management page. Normal user, will then be directed to the main page.

5.1.2 Main Page

In this page, the user information will be displayed. For example, his current stage level in each topic or the last played game.

- In the adventure mode, it will display the current status of the stage. The user can choose if he would like to proceed or he can change his topic and proceed with the game.
- In the challenge mode, the challenger's information will be display. Current user will have to option to accept or deny the challenge. Should the user accept the challenge, he will be redirected otherwise the challenge will go away and the user will be at the main page.

5.1.3 Front Loading Screen

In this page, when the user clicks into the application. It will show a loading bar with percentage as an indication of the progress. It provides a good feedback to let the user know if the application is still working.

5.1.4 Display help

In this page, a interactive page will be produced to guide the user on the usage of the application. User can choose to exit the page anytime they want.

5.1.5 Game Page

The page will display the question with visual to allow user of different learning style to be able to use the application. The selection of the answer will be button based or rather multiple-choice question.

5.1.6 Answer Page

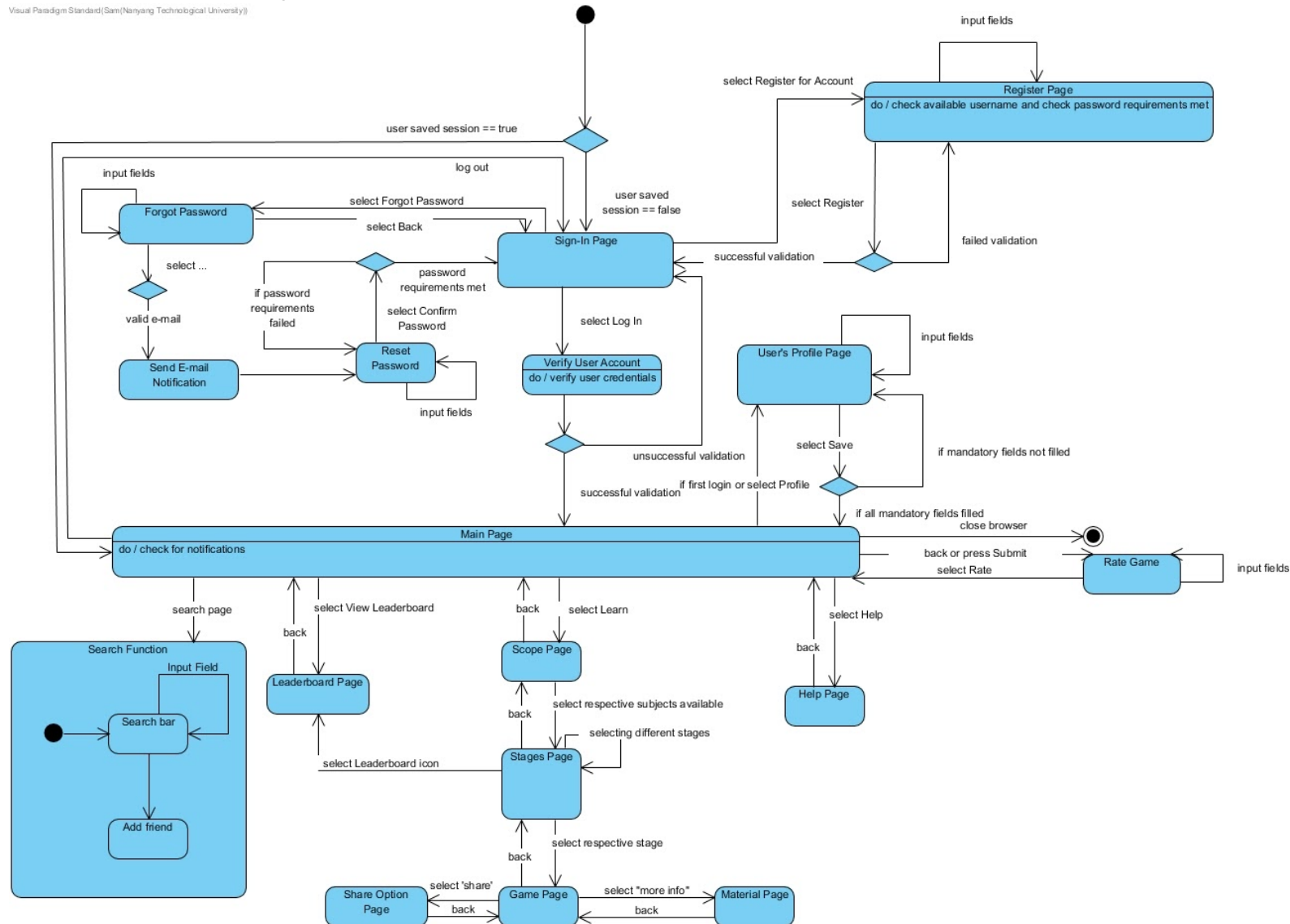
In this page, the answer of the question will be revealed with explanation to deliver the teaching. In any case, the answer will be shown so that the user will have a chance to realign his understand towards the question with the answer give.

Hardware interface

The application will be web based, The device must support internet connectivity and web browser. These browser are Google Chrome, Mozilla Firefox, Microsoft Edge and Internet Explore

State machine Diagram

Visual Paradigm Standard (Sam(Nanyang Technological University))



6 Non-Functional Requirement

Performance

- 6.1.1 The application must respond to user requests within 1 seconds.
- 6.1.2 The application must be able to support 2000 queries request and still respond within 3 seconds.
- 6.1.3 The application application must be able to support a minimum of 2000 users online concurrently.
- 6.1.4 Email notification for password reset must reach the user within 1 minute.

7 Data Dictionary

Term	Definition
Application	The application refers to the game application.
User	Human user of the application who is registered. The Users include Teachers, Students and Administrator.
Teacher	Human user of the application who is registered. They are the administrator during the prototype phase
Student	Human user of the application who is registered. They are the end user or target audience during the prototype phase.
Admin	Human user of the application who is registered. They have access and authorized privileges to perform management tasks in the application.
Topic	Topic refers to the topic regarding general knowledge. It could be relating to history, social science geography and others.
Player	The student using this application.
Friend	Friend is a fellow player in the application where a player can add another player into their friend list.
Rank	Ranks in the game given based on mastery of the student on the topic and the amount of points they have accumulated.
Learning Scope	The general topic the user can select to learn more about a particular area. E.g general knowledge's category - country, food, culture etc.
Stages	A different level in the games, showing the progress of the player, stage 1 being the first stage.
Game	The quiz belonged to stages of the learning scope. In this case, each game may have questions on the selected learning scope and points will be recorded for answering the questions correctly. The questions will be in the form of MCQ, text answer or numbered answers format.
Point	Points earned when players answer the questions correctly. Used to determine the players position in the leader board. This may be in the form of stars where 1 star is awarded if the game's score is below 50%, 2 for 50% to 80% and 3 stars for score above 80%.
User Interface (UI)	Medium where the player interacts with the Application.
Sharing on Social media	This function allows users to share a question on social media platforms such as Facebook and Instagram to seek help on questions
Leadership board	This is a function that displays the application users ranking based on points collected from playing the game. It is reset daily or weekly based on display options.