University of Wollongong

26th of May, 2017

Dear Mr. Halliwell and Mr. Freeman,

We are submitting the attached Technical Documentation. This paper will discuss what the team has been technical side of current project. It covers the functional and non-functional system requirement in more detail. It also deals with the product's final system design and project closeout.

This paper should be final, in a sense that there will be no changes along the way. If there are any changes along the timespan of this project, however, the latest copy of project requirement paper will be sent to the appropriate stakeholders. The team can be officially contacted through mha682@uowmail.edu.au.

I hope you find this report satisfactory.

Thank you and have a nice day,

Muhammad Harits Abiyyudo

Project Leader

Technical Documentation

For the

Social Interactive E-Learning System

By

Group 05 (ZeeTech)

Held at

Wollongong, Australia

In

May, 2017

EXECUTIVE SUMMARY

ZeeTech has now completed its first product – a one year project designed to create a platform that supports the integration of social media and interactive learning into online training programs. This project, titled “Craft Your Creativity”, involves the concept of gamification and adopts it as the main design approach. The result is intended to eliminate the drawbacks of individual learning as seen in other online learning systems by facilitating communication between users.

The various elements of the project are summarised as follow:

- To describe the background and scope of the project
- To summarize the project requirements and their iteration management
- To provide the overview of the system architecture
- To outline the lessons learned and recommendation
- To propose the implementation and transition plan

TABLE OF CONTENTS

INTRODUCTION

The development of eLearning platform has expanded substantially during the last two decades. Now there are numerous online learning web-applications available on the market. However, many of them only focus on the process of individual learning with no or few communication with other participants within the same programs. Furthermore, the content on such applications is merely text-based. The Craft Your Creativity (CYC) platform is developed to include a gamified interface where users can "learn through playing" which creates a positive motivation. In addition, the CYC platform also focuses on the integrating the use of social media and interaction with other participants within its course structure, for example forums, achievements, etc. to further improve their knowledge by cooperating with others. Using available knowledge from game design, ZeeTech has successfully constructed a new engine with a number of helpful tools that support instructors, or trainers, creating their training programs with ease. In the front end, the concept of gamification was extensively adopted to form a friendly and appealing interface for users.

SYSTEM REQUIREMENTS

PROBLEM STATEMENT

The current eLearning platforms focus most of the resources to support individual learning. Users, usually university students, are provided with a set of content imported from books and other traditional source of knowledge. Similarly, the assessments are simply digitalized paper examination, for example multiple choices. The process of learning stops at reading documents and answer questions on a screen.

An online e-Training platform that integrates social media and interactive learning needs to be developed. The term e-Training is used instead of e-Learning because this platform should not only help users to acquire knowledge, but also provide them with skills that are valuable in a social context.

PROJECT SCOPE

The Craft Your Creativity e-Training platform is an interactive online training system developed by ZeeTech under the supervision of Mr. Matt Halliwell and Dr. Mark Freeman from the University of Wollongong. The project has now been completed with all of the proposed features and interfaces have been developed, tested and considered functional. This report comprises the project requirements set out in previous documents in order to evaluate the extent to which these requirements are met.

The project was initially launched with an intention to create an innovative e-Training platform that integrates social media and interactive learning. In the development process, the concept of gamification was adopted and became the main design approach. The system infrastructure is separated into two layers: the front end and the back end. In the front-end layer, users or trainees undertake training programs that provide not only knowledge regarding certain areas of study but also the ability to share and learn with other users. From the back-end layer, instructors or trainers are provided with a simple yet powerful design tool called the Module Editor, which helps them build and manage their own training programs. All functionalities found in the platform are developed in accordance with the concept of gamification to ensure ease of use and effectiveness.

The platform's target audience initially aimed at students from the University of Wollongong but was later extended to all students that are interested in experiencing a new way of gaining knowledge and skills.

GENERAL SYSTEM REQUIREMENTS

The purpose of this section is to specify overall system requirements that have governed the development and implementation of the system.

- System must support the integration of social media and interactive learning into training programs.
- System must apply the concept of gamification into system functionalities.
- System must provide an easy-to-use interface for users.

- System must provide trainers with flexible and customizable when creating and modifying their programs.
- System must be web-based and accessible from multiple major platforms.

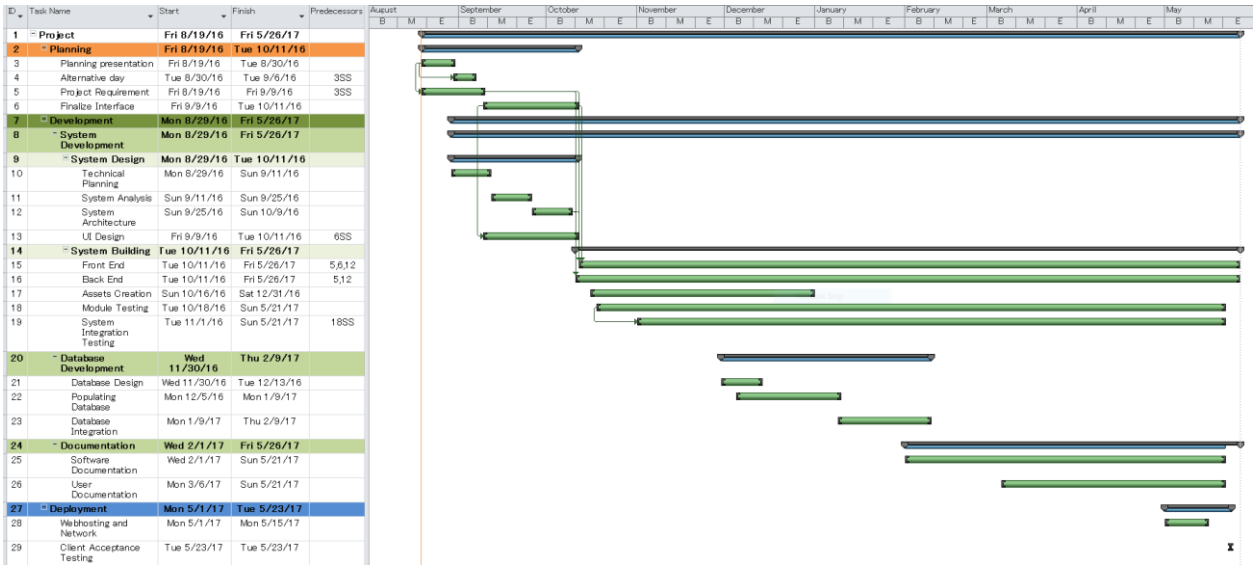
ITERATION MANAGEMENT

As the Agile system development methodology was adopted, the need for iteration management is crucial. ZeeTech practices the following processes in every stage of the project:

1. Agree with the team the objectives for the iteration, including evaluation criteria, timescales, and constraints.
2. Agree on a plan for how the team will achieve the objectives.
3. Execute the plan.
4. Assess the achievements of the team against the initial set of objectives and evaluation criteria.
5. Assess the impact of the iteration's results on the project as a whole.
6. Start the next iteration.

These activities occur continuously throughout the project and form the basic pattern by which the iteration is planned and managed. The supervisors in conjunction with the team leader also provide direction to the project as a whole, organizing work so that iteration progressively contributes to delivering the solution.

This process was reflected upon ZeeTech's Gantt chart:



ID	Task Name	Start	Finish	Predecessors
1	Project	Fri 8/19/16	Fri 5/26/17	
2	Planning	Fri 8/19/16	Tue 10/11/16	
3	Planning presentation	Fri 8/19/16	Tue 8/30/16	
4	Alternative day	Tue 8/30/16	Tue 9/6/16	3SS
5	Project Requirement	Fri 8/19/16	Fri 9/9/16	3SS
6	Finalize Interface	Fri 9/9/16	Tue 10/11/16	
7	Development	Mon 8/29/16	Fri 5/26/17	
8	System Development	Mon 8/29/16	Fri 5/26/17	
9	System Design	Mon 8/29/16	Tue 10/11/16	
10	Technical Planning	Mon 8/29/16	Sun 9/11/16	
11	System Analysis	Sun 9/11/16	Sun 9/25/16	
12	System Architecture	Sun 9/25/16	Sun 10/9/16	
13	UI Design	Fri 9/9/16	Tue 10/11/16	6SS
14	System Building	Tue 10/11/16	Fri 5/26/17	
15	Front End	Tue 10/11/16	Fri 5/26/17	5,6,12
16	Back End	Tue 10/11/16	Fri 5/26/17	5,12
17	Assets Creation	Sun 10/16/16	Sat 12/31/16	
18	Module Testing	Tue 10/18/16	Sun 5/21/17	
19	System Integration Testing	Tue 11/1/16	Sun 5/21/17	18SS
20	Database Development	Wed 11/30/16	Thu 2/9/17	
21	Database Design	Wed 11/30/16	Tue 12/13/16	
22	Populating Database	Mon 12/5/16	Mon 1/9/17	
23	Database Integration	Mon 1/9/17	Thu 2/9/17	
24	Documentation	Wed 2/1/17	Fri 5/26/17	
25	Software Documentation	Wed 2/1/17	Sun 5/21/17	
26	User Documentation	Mon 3/6/17	Sun 5/21/17	
27	Deployment	Mon 5/1/17	Tue 5/23/17	
28	Webhosting and Network	Mon 5/1/17	Mon 5/15/17	
29	Client Acceptance Testing	Tue 5/23/17	Tue 5/23/17	

The iteration process enabled the project to become a series of smaller self-contained projects, each of which is dependent upon the results and performance of the previous one. The feedback generated by assessment at the end of iteration allows action to be taken by adjusting the plans for the next and all subsequent iterations.

PROJECT SUMMARY

REQUIREMENT LIST

1. FUNCTIONAL REQUIREMENTS

1.1. Enable player sharing their progress to social media.

Due to the change of Facebook requirement of Privacy Policy, sharing can only be done using Twitter login.

Refer to 1.7.6 for more in-depth details.

1.2. Provide an editor interface for the Trainer to maintain the Module.

Module Editor have been created, implemented, and tested.

Refer to 1.6 for more in-depth details.

1.3. Main interface for the user to play their Module.

Module Player have been created, implemented, and tested.

Refer to 1.8 for more in-depth details.

1.4. User Management

1.4.1. Register

Register function is available and functioning for both user and Trainer. Initially, CYC's Trainer registering procedure is non-existent as the product will allegedly be deployed in a specific environment like an institution or organization. After clearing things up with the client, however, it was revealed that CYC should be open to public. Trainer can now register by inputting their Organization that can then be clarified by Admin so that Admin can provide the registering Trainer with their username and password.

Register have been created, implemented, and tested.

1.4.2. Login

Logging in is available for users, Trainers, and Admin(s). Different part of CYC can be accessed depending on the account's authority.

Login has been created, implemented, and tested.

1.5. Module Management

1.5.1. Add Module

Trainer and Admin can add their own Module. This Module data will be inaccessible unless said Module creators publish their Module.

Add Module has been created, implemented, and tested.

1.5.2. Edit Module

Module can be edited through Module Editor.

Refer to 1.6 for more in-depth details.

1.5.3. Delete Module

Module can be deleted from the database. If the module is already published, the published version will also be removed from the database.

Delete Module has been created, implemented, and tested.

1.5.4. Set Module Access

Instead of using a toggle that sets the Module access from “Private” to “Public”, we implement the idea of “Publish” to CYC. It gives a leniency to the Trainer as they do not have to make the Module in one sitting and give them the opportunity to release it later. Trainer can also “Unpublish” the module if there were any issues.

Set Module Access have been created, implemented, and tested.

1.5.5. Analyze Module

Module can be analyzed by opening a specific Module. It shows the amount of like, dislike, and amount of view.

Analyze Module have been created, implemented, and tested.

1.5.6. Statistics

Overall statistic of the Modules can be accessed to see the amount of like, dislike, views, last update date, and release date.

Statistics have been created, implemented, and tested.

1.6. Module Editor

1.6.1. Viewport

Two different viewport is created. The first one is Scene and it is used to modify a scene. The other is Diagram. Diagram is used to control and

modify the flow of each Scene, logic control of transitions, triggering Achievement(s), creating a Certificate PDF from a certain scene, and setting up a score that will be displayed in the Leaderboard.

Viewport have been created, implemented, and tested.

1.6.2. Add/Delete Scene

Trainer can add/delete scene as they see fit.

Add and Delete Scene have been created, implemented, and tested.

1.6.3. Scene Selector Sidebar

Trainer can create multiple Scenes and change it to his/her liking. A Sequence of Frames that contain Actions can be modified for each Scenes and it will affect what a scene will do depending on the interaction to it.

Scene Selector Sidebar have been created, implemented, and tested.

1.6.4. Component Properties

Most of the things that is used in the module will trigger different kind of interactivity that can be seen in Component Properties.

Component Properties have been created, implemented, and tested.

1.7. User Profile

1.7.1. Show Feed/Timeline

Due to Interaction system is changed from Social Media-like to Forum-like, Show Feed/Timeline idea is dropped entirely because such feature does not work in forum environment.

1.7.2. Add Post

Due to Interaction system is changed from Social Media-like to Forum-like, Add Post is changed to Create Thread.

Create Thread have been created, implemented, and tested.

1.7.3. Change Credentials

Unless the user logged in using a credential taken from Social Media platforms like Facebook and Twitter, a User can change their password and E-Mail.

Change Credentials have been created, implemented, and tested.

1.7.4. Comment

User can comment and the already existing Thread(s).

Comment has been created, implemented, and tested.

1.7.5. Like

User can like on a comment and Module.

Like have been created, implemented, and tested.

1.7.6. Share

Share function can only be accessible if the user logged in with Twitter. This is due the change of Facebook requirement of Privacy Policy.

ZeeTech is still trying to work on it but at the time of this paper submission Share have been partially created, implemented, and tested.

1.8. Module Player

1.8.1. Run Module

CYC will provide the functionality to run the module for the player. As it stands, a module will only show up and accessible to the other users if the Trainer has already published it.

Module Player have been created, implemented, and tested.

1.8.2. Save Module

Due to the fact that CYC is mainly an interactive E-Training system with gamification implemented and not a gaming system, this requirement is dropped.

1.8.3. Load Module

Due to the fact that CYC is mainly an interactive E-Training system with gamification implemented and not a gaming system, this requirement is dropped.

1.8.4. Leaderboard

CYC can show the user leaderboards of selected modules. Initial planning includes showing specific user's placing on each Module but after several meeting it is deemed unnecessary since Leaderboard also acts a method to show module players' response to the Trainer.

Leaderboard have been created, implemented, and tested.

1.8.5. Achievements

Users could see their achievements from overall module the player have progress through if achievement system is implemented in the module.

Achievements have been created, implemented, and tested.

1.9. Admin Content Management System (CMS)

1.9.1. Login

Refer to 1.4.2 as all of the possible users have the same login interface.

1.9.2. Add user

Admin can add a user from their Setting Page.

Add User Achievements have been created, implemented, and tested.

1.9.3. Remove user

Admin can remove a user from their Setting Page.

Remove User Achievements have been created, implemented, and tested.

1.9.4. Reset password

Admin can reset user's password if requested through their Setting Page.

Reset password has been created, implemented, and tested.

1.9.5. Edit/delete content

Admin can remove Thread, Thread Post, and Module by accessing said content and deleting it.

Delete Content has been created, implemented, and tested.

1.10. Compatibility Requirements

1.10.1. CYC should work on 3 major Web Browser: Google Chrome, Mozilla Firefox, and Internet Explorer.

CYC can be accessed on all the platforms mentioned above without any issue.

This feature have be created, implemented, and tested.

2. NON-FUNCTIONAL REQUIREMENTS

2.1. Performance Requirements

2.1.1. CYC can run on almost any platform flawlessly.

Refer to point 2.1.1.

2.1.2. CYC accommodate multiple users.

CYC use a database that accommodates at least 1 Admin, 1 Trainer, and 1 user. User can sign themselves up as a user (no need for Admin approval) and Trainer (need Admin's approval) by using the Sign up Feature.

This feature have be created, implemented, and tested.

2.2. Security Requirements

2.2.1. Workspace of the user should be accessed through user own credentials.

This requirement is an extension of 2.2.2. Only said user can access their created Module. This includes Module description, achievement creations, and Module publishing.

This feature have be created, implemented, and tested.

2.2.2. Any other user should not be able to access to the user private data.

Only said user can access their credentials. Admin can access a small part of it but if Admin wanted to change the credential such as password, said user will be notified of the change through E-Mail.

This feature have be created, implemented, and tested.

3. ADDITIONAL FEATURES

3.1. General

3.1.1. Dislike

User can like on a comment and Module.

Dislike has be created, implemented, and tested.

3.2. Module Editor

3.2.1. File Browser

File Browser is created so that the trainer can access needed object that is already uploaded for said Module without re-uploading the object.

File Browser have been created, implemented, and tested.

3.2.2. Create Certificate(s)

A Module can generate a certificate that can be rewarded to the user as a proof of Module completion.

Create Certificate(s) have been created, implemented, and tested.

3.2.3. Stylable Texts & Text Tag Editor

Text that is used in the Module can be styled and Trainer can create a specific Tag Editor that they can generate themselves.

Stylable Texts & Text Tag Editor have been created, implemented, and tested.

3.2.4. Action Recorder

Action Recorder is implemented so that Trainer can easily record the object movement into a Frame.

Action Recorder have been created, implemented, and tested.

3.2.5. Audio

Trainer can use audio in the module. The audio can be controlled to a degree with loop (loop the audio), Frame Stop (stop audio when the Frame is over), and Wait Audio (Frame transition after the audio is over).

Audio is have been created, implemented, and tested.

3.2.6. Save/Load to local

Save/load to local is implemented so that Trainer can back up their module implementation to their device. The save file is in form of JSON

file. Loading a JSON file will load everything but the external uploaded objects.

Save/load to local has been created, implemented, and tested.

3.2.7. Full screen

Full screen is implemented so that Trainer is not restricted by the browser's viewport size.

Full screen have been created, implemented, and tested.

4. STRETCH GOALS

4.1. Multiplayer

At this point in time, Multiplayer cannot be implemented as a specific implementation to how the site can be accessed would be changed from the ground up.

4.2. Commercialization

CYC should be able to be commercialized, at least as an interactive e-training environment. Although a lot of things should be considered in order for it to be more robust as a system, such as security (as this project is not focusing itself on the security).

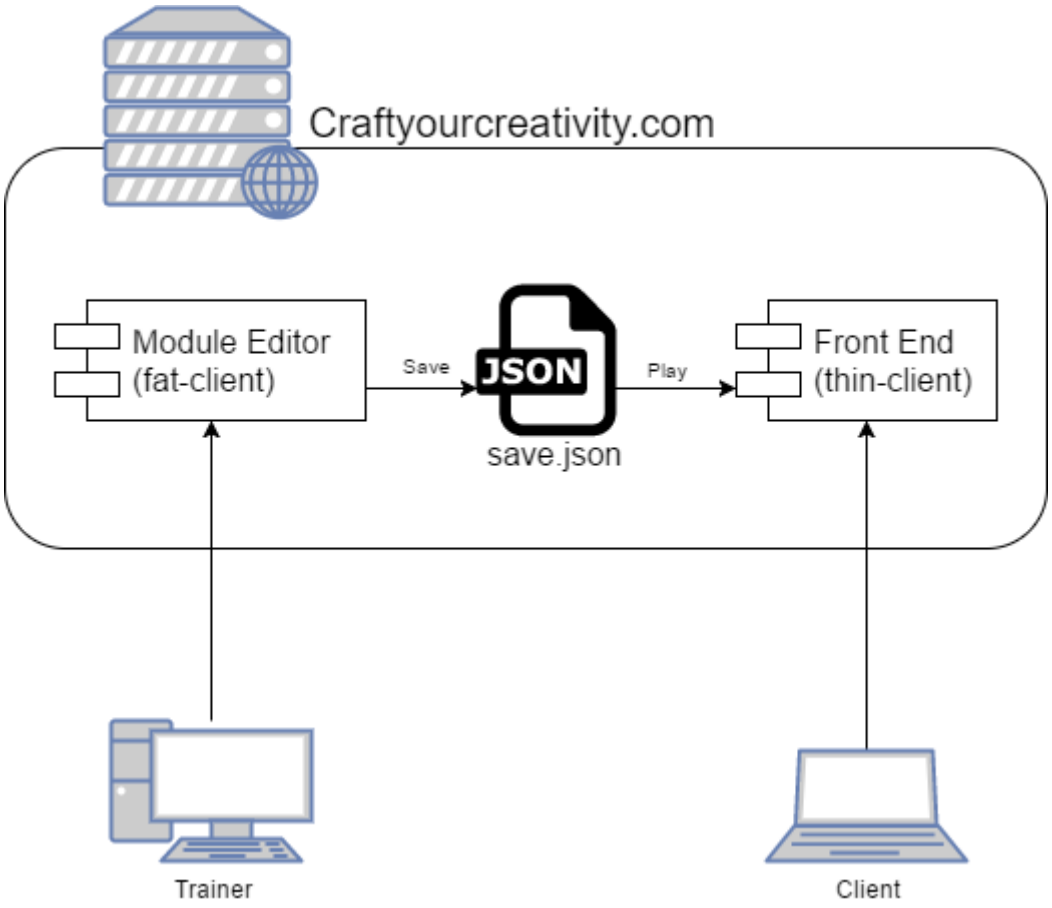
REQUIREMENT TRACEABILITY MATRIX

Functional Requirement ID	Requirement Type	Importance Level	Description	Requirement change?	Change Description	Status	Explanation
FR-01	Funtional	High	The system must identify each user by means of a registration process. The system must register each user with one and only one account to be used across all devices.	No	No changes.	Done	Self explanatory.
FR-02	Funtional	High	The system must allow Trainers to modify Modules with options to add, edit, delete, set access, analyse, and statistics.	No	No changes.	Done	Self explanatory.
FR-03	Funtional	High	The system must provide each user with a personalised profile along with functionalities to add/remove post, change credentials, comment, like, and share	Partial	Interaction system change from Social Media-esque to Forum-like. Remove post can only be done by admin.	Done	In this case, posting translates into opening a thread while commenting refer to posting in said thread.
FR-04	Funtional	High	The system must allow players to access Modules with options to run, save, load, and view Leaderboard and achievement(s).	Partial	Dropped as save and load feature for module was never mentioned in any meeting. This occurs due to miscommunication.	Done	Refer to Change Description.
FR-05	Funtional	High	The system must provide a content management system exclusively for Administrators to login, add/remove user, reset password and edit/delete content	No	No changes.	Done	Self explanatory.
FR-06	Funtional	High	The system must perform encryption on all user sensitive data.	Partial	The Importance level is changed due to the nature of the project itself. The project focuses on the Module Editor, Module Player, and the Gamification of E-Training.	Done	Self explanatory, also refer to Change Description
FR-07	Funtional	High	The system must enable synchronous collaboration. Users must be able to work in a real-time online environment, irrespective of distance.	Yes	Due to technical and time limitation, it is moved to Stretch goal.	Stretch goal	Refer to Change Description.
FR-08	Funtional	Medium	The system must support user customization. User must be able to organize materials according to preferences.	Yes	User Customization is initially a mentioned as a pseudo-accessibility, as it makes some aspect of CYC clearer in view. Now that the UI is clear it is deemed unnecessary.	Importance Level to Low	Refer to Change Description.
FR-09	Funtional	Medium	The system must be adaptable to different learning methodologies. Users must be allowed to use external tools that fulfill their particular needs, if any built-in tools do not provide the desired functionality.	No	No changes.	Done	Things such as image and sound can be imported to the Module Editor.
FR-10	Funtional	Medium	The system must enable synchronous communication. This functionality includes document sharing, voice over Internet, instant messaging, video over internet.	Yes	Due to the fact that it is theextension of FR-07, it is moved as a Strech goal.	Stretch goal	Refer to Change Description.
FR-11	Funtional	Low	The system must provide a web conferencing environment that integrates all the features mentioned in functional requirement FR-10.	Yes	Dropped entirely due to the change in FR-10.	Stretch goal	Refer to Change Description.
FR-12	Funtional	High	The system must enable asynchronous collaboration and communication. This functionality includes thread-based discussion boards, outgoing email to groups or individuals, wikis, workgroup, and group calendaring.	Partial	Since outgoing email to groups or individuals, wikis, workgroup, and group calendaring can be done using a pre-existing web services, it is dropped.	Dropped	Refer to Change Description.

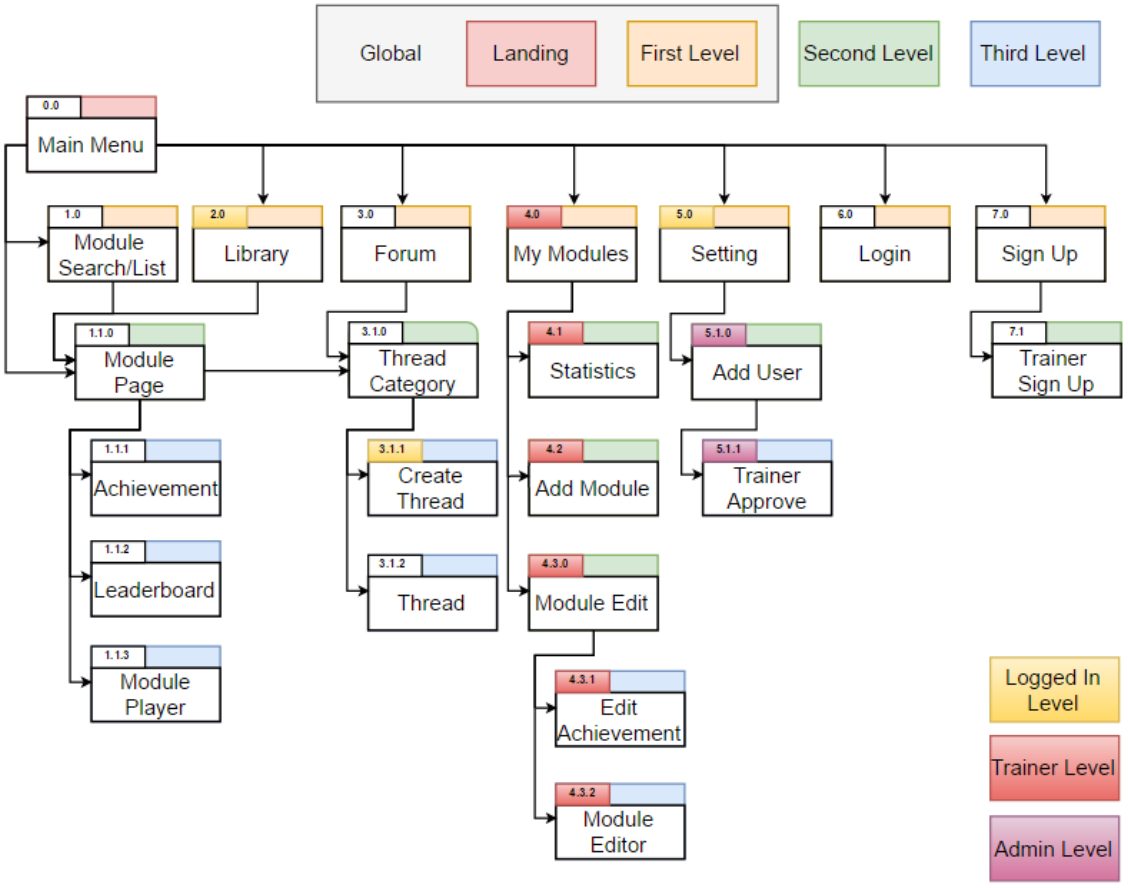
FR-13	Funtional	Medium	The system must enable a broad range of assessment.	No	No changes.	Done	The assessment broadness really depends on the Trainer's creativity on Module creation.
UR-01	Usability	-	The interface must be easy to learn and navigate.	No	No changes.	Done	Self explanatory.
UR-02	Usability	-	The interface must be easy to use.	No	No changes.	Done	Self explanatory.
UR-03	Usability	-	The interface must be appealing.	No	No changes.	Done	Self explanatory.
UR-04	Usability	-	Buttons, headings, and help/error messages must be simple to understand.	No	No changes.	Done	Self explanatory.
UR-05	Usability	-	Undo should be available for most actions.	No	No changes.	Done	Self explanatory.
UR-06	Usability	-	Actions which cannot be undone should ask for confirmation.	No	No changes.	Done	Self explanatory.
UR-07	Usability	-	The interface must be compliant to Level A of the Web Content Accessibility Guidelines 2.0 (WCAG 2.0) standard.	No	No changes.	Done	Self explanatory.
UR-08	Usability	-	The system must be customizable to meet specific user needs in the future.	No	No changes.	Done	Self explanatory.
RR-01	Reliability	-	The system must be in operation 7 days a week, 24 hours a day.	No	No changes.	Done	Self explanatory.
RR-02	Reliability	-	The system must be tolerant to operational errors.	No	No changes.	Done	Self explanatory.
RR-03	Reliability	-	The system must function reliably, with few or no interruptions.	No	No changes.	Done	Self explanatory.
RR-04	Reliability	-	The system must be able to recover cleanly from incidents such as power cuts or other disasters.	No	No changes.	Done	Self explanatory, although it really depends on the server that is used.
PR-01	Performance	-	The system must be operational 24x7 under high information load. The system must be able to support at least 100 concurrent users.	No	No changes.	Done	Self explanatory, although it really depends on the server that is used.
PR-02	Performance	-	The system must respond rapidly to user requests. The acceptable response time is within 5 seconds.	No	No changes.	Done	Self explanatory, although it really depends on the server that is used and the users' internet speed.
PR-03	Performance	-	The system must allow background tasks continue to run while user performs foreground tasks.	No	No changes.	Done	Self explanatory.
SR-01	Supportability	-	The system must be maintainable and extensible.	No	No changes.	Done	Self explanatory.
SR-02	Supportability	-	The system must ensure compatibility to migrate to upgraded hardware or new version of operating systems.	No	No changes.	Done	Self explanatory.
SR-03	Supportability	-	The system must be compatible with Chrome, Firefox, and Internet Explorer 11.	Yes	Changed to Functional Requirement with High Importance Level	Functional Requirement, High, Done	Self explanatory.
OR-01	Other	-	The system must be designed with the expectation that its operational lifetime will be many years.	No	No changes.	Done	Self explanatory.
AR-01	Additional	Medium	Dislike system	No	No changes.	Done	Self explanatory.
AR-02	Additional	High	Create a file browser in the Module Editor.	No	No changes.	Done	Self explanatory.
AR-03	Additional	High	Allow Trainer to generate a certificate for Module users.	No	No changes.	Done	Self explanatory.
AR-04	Additional	Medium	Allow Trainer to style text and make a tag editor for their Module.	No	No changes.	Done	Self explanatory.
AR-05	Additional	Medium	Allow Trainer to record action without using Sequence Panel.	No	No changes.	Done	Self explanatory.
AR-06	Additional	Medium	Allow Trainer to put audio in the Module.	No	No changes.	Done	Self explanatory.
AR-07	Additional	Medium	Allow Trainer to back up their Module to local and allow them to load said data when needed.	No	No changes.	Done	Self explanatory.
AR-08	Additional	Low	Allow Trainer to use Module Editor in full screen	No	No changes.	Done	Self explanatory.

SYSTEM DESIGN

SYSTEM ARCHITECTURE



INFORMATION ARCHITECTURE



DATA DICTIONARY

ACHIEVEMENT

Field Name	Data type	Data format	Field size	Description	Example
achievementID	Int	NNNNNNNNNNN	11	Unique ID for all achievements	82
moduleID	Int	NNNNNNNNNNN	11	Unique ID for module that achievement links to	21
achievementName	varchar		100	Name for achievement	You Smort
achievementDescription	text			Description for achievement	Went through the Investigation phase.

MODULE

Field name	Data type	Data format	Field size	Description	Example
moduleID	int	NNNNNNNNNNN	11	Unique ID for all modules	21
moduleVersion	varchar		100	Name for the current version of the module	1.0
userID	int	NNNNNNNNNN	11	Unique ID for the creator of the module	17
moduleName	varchar		100	Name for module	Final Twist Off
moduleDescription	text			Description for module	Take control of 3 different characters and discover the truth of the mysterious
releaseTime	timestamp	YYYY-MM-DD HH:MM:SS		The initial release time for module	2017-05-02 16:51:02
lastUpdated	timestamp	YYYY-MM-DD HH:MM:SS		The last time module updated	2017-05-02 18:15:14

MODULEENDDATA

Field name	Data type	Data format	Field size	Description	Example
moduleID	int	NNNNNNNNNNN	11	Unique ID for module that enddata links to	1
endData	varchar		100	The value set by trainer for which userdata should be saved	score

MODULEUSERDATA

Field name	Data type	Data format	Field size	Description	Example
moduleID	int	NNNNNNNNNNN	11	Unique ID for module that userdata links to	21
userID	int	NNNNNNNNNNN	11	Unique ID for user that userdata links to	1
mKey	varchar		100	Name for the userdata type	Score
mValue	varchar		100	Value for the userdata	1000
timestamp	timestamp	YYYY-MM-DD HH:MM:SS		Time when userdata inserted	2017-05-14 04:37:36

POST

Field name	Data type	Data format	Field size	Description	Example
postID	int	NNNNNNNNNNN	11	Unique ID for all posts	6
threadID	int	NNNNNNNNNNN	11	Unique ID for thread that post links to	2
userID	int	NNNNNNNNNNN	11	Unique ID for user that create the post	1
openingPost	tinyint	N	1	Indicate whether the post is opening post or not. 1 = yes, 0 = no.	1
message	text			Content of the post	Hello
timestamp	timestamp	YYYY-MM-DD HH:MM:SS		Time when post created	2017-04-04 16:03:39

POSTUSERDATA

Field name	Data type	Data format	Field size	Description	Example
postID	int	NNNNNNNNNNN	11	Unique ID for post that userdata links to	27
userID	Int	NNNNNNNNNNN	11	Unique ID for user that create the userdata	1
mKey	varchar		100	Name for userdata type	lstate
mValue	varchar		100	Value for userdata	like

THREAD

Field name	Data type	Data format	Field size	Description	Example
threadID	int	NNNNNNNNNNN	11	Unique ID for all threads	1
userID	int	NNNNNNNNNNN	11	Unique ID for user that create the thread	1
threadTitle	varchar		100	Title for thread	Welcome to CYC
threadType	varchar		100	Type for thread	General

USER

Field name	Data type	Data format	Field size	Description	Example
userID	int	NNNNNNNNNNN	11	Unique ID for all users	22
username	varchar		100	Username for user	john
password	varchar	SHA1	64	Password for user encrypted in SHA1() function	
email	varchar	name@domain.com	100	Email for user	john@gmail.com
userType	varchar		100	Type of user	player
fullname	varchar		100	Fullname for user	John
organization	varchar		100	Organization that user affliated with	unaffliated

USERACHIEVEMENT

Field name	Data type	Data format	Field size	Description	Example
userID	int	NNNNNNNNNN	11	Unique ID for user that userachievement links to	1
achievementID	Int	NNNNNNNNNN	11	Unique ID for achievement that userachievement links to	1
time	timestamp	YYYY-MM-DD HH:MM:SS		Time when userachievement unlock, using CURRENT_TIMESTAMP function	2017-04-14 21:25:41

USERFACEBOOK

Field name	Data type	Data format	Field size	Description	Example
userID	int	NNNNNNNNNN	11	Unique ID for user that use Facebook to login	24
facebookID	varchar		100	Unique ID from specified facebook user	

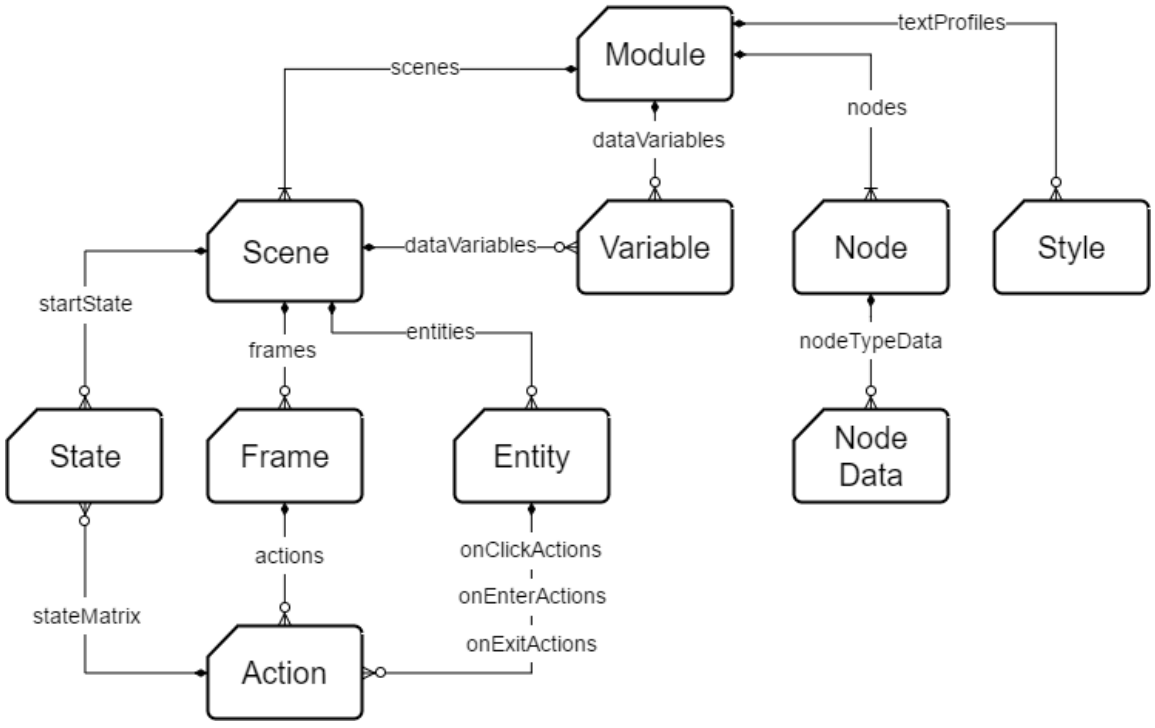
USERTWITTER

Field name	Data type	Data format	Field size	Description	Example
userID	int	NNNNNNNNNN	11	Unique ID for user that use Facebook to login	27
twitterID	varchar		100	Unique ID from specified twitter user	

VIEWS

Field name	Data type	Data format	Field size	Description	Example
userID	int	NNNNNNNNNNN	11	Unique ID for user that view links to	1
moduleID	int	NNNNNNNNNNN	11	Unique ID for module that view links to	1
time	timestamp	YYYY-MM-DD HH:MM:SS		Time when use view the module linked	2017-05-11 18:04:40

MODULE ARCHITECTURE



MODULE DATA DICTIONARY

Data ID	Data Object	Field Name	Description	Alternate Name	Data Type
DD001	Root	scenes	Contain references to the scenes in the module	Scenes	Array of Scene
DD002	Root	nodes	Describes the logic of the module flow	Nodes	Array of Node
DD003	Root	dataVariables	Contain the key and the initial values of the module's Project Variables	Project Variable	Map of Variable
DD004	Root	textProfiles	Contain descriptions of text tag profiles in the module	Text Styles	Map of Style
DD005	Root	windowSizeX	Describes the width of the module	Module Width	Integer
DD006	Root	windowSizeY	Describes the height of the module	Module Height	Integer
DD007	Root	lastUniqueID	Describes the last Unique ID of module objects. This ID is used to identify and refer to a module object easily	Last ID	Integer
DD008	Scene	sceneID	Identification of the object	Scene ID	Integer
DD009	Scene	sceneName	Name label of the scene	Scene Name	String
DD010	Scene	entities	Describes the entities contained in the scene	Entities	Array of Entity
DD011	Scene	frames	Describes the frames contained in the scene	Frames	Array of Frame
DD012	Scene	startState	Describe the initial state for each of the entities in the scene	Initial State	Map of State
DD013	Scene	dataVariables	Contain the key and the initial values of the scene's Scene Variables	Scene Variable	Map of Variable
DD014	Frame	actions	Describe the actions contained in the frame in a 2 dimensional Array, each column represent an action group	Actions	Array of Action

DD015	Frame	nextFrameOptions	Describe how the user would proceed to the next frame	Next Frame Options	[User Input Forced, User Input, Wait Indefinitely, Automatic]
DD016	Action	actionID	Identification of the object	Action ID	Integer
DD017	Action	actionName	Describes the name of the Action	Action Name	String
DD018	Action	isEntityAction	Describes the type of Action	Is Entity Action	Boolean
DD019	Action	isDataAction	Describes the type of Action	Is Data Action	Boolean
DD020	Action	isLinkAction	Describes the type of Action	Is Link Action	Boolean
DD021	Action	isAudioAction	Describes the type of Action	Is Audio Action	Boolean
DD022	Action	duration	Describes in milisecond how long the animation of the action should play	Duration	Integer
DD023	Action	offset	Describes in milisecond how long the animation of the action should delay before starting	Offset	Integer
DD024	Action	easing	Describes how the animation of the action should be interpolated	Easing	Easing Function
DD025	Action	targetID	Describes the subject of the animation	Target ID	Integer
DD026	Action	stateMatrix	Describes what property would be changed or animated by the action	State Matrix, Values List	State
DD027	Entity	entityID	Identification of the object	Entity ID	Integer
DD028	Entity	entityName	Name of Entity	Entity Name	String
DD029	Entity	posx	Describes the x position of the entity	Position	Float
DD030	Entity	posy	Describes the y position of the entity	Position	Float
DD031	Entity	rotation	Describes the rotation of the entity	Rotation	Float
DD032	Entity	scalex	Describes the width of the entity	Scale	Float
DD033	Entity	scaley	Describes the height of the entity	Scale	Float
DD034	Entity	anchorx	Describe where the Entity will be drawn in	Anchor	Float

			relation to its origin		
DD035	Entity	anchor y	Describe where the Entity will be drawn in relation to its origin	Anchor	Float
DD036	Entity	alpha	Describe the translucency of the entity	Alpha	Float
DD037	Entity	tint	Describes the color/tint of the entity	Tint	Color
DD038	Entity	text	Describes the text content of the entity	Text	String
DD039	Entity	link	Describes the link target of the entity	Link	String
DD040	Entity	src	Describes the image path for the entity	Source	String
DD041	Entity	isAButton	Describes the type of the Entity	Is A Button	Boolean
DD042	Entity	isAQSprite	Describes the type of the Entity	Is A Sprite	Boolean
DD043	Entity	isAQText	Describes the type of the Entity	Is A Text	Boolean
DD044	Entity	onClickActions	Describes how the entity would behave when clicked	On Click Actions	Array of Action
DD045	Entity	onEnterActions	Describes how the entity would behave when entered	On Enter Actions	Array of Action
DD046	Entity	onExitActions	Describes how the entity would behave when exited	On Exit Actions	Array of Action
DD047	Node	nodeID	Identification of the node	Node ID	Integer
DD048	Node	nodeName	Describe the name of the node	Node Name	String
DD049	Node	nodeSize	Describe the size of the node	Node Size	[small, normal]
DD050	Node	x	Describe the x position of the node in the diagram	Position	Float
DD051	Node	y	Describe the y position of the node in the diagram	Position	Float
DD052	Node	flowInput	Describe whether the node accepts flow input	Flow Input	Boolean
DD053	Node	flowOutput	Describe the exit flows of the node and where it is headed to	Flow Output	Map of NodeID
DD054	Node	nodeTypeID	Describe the type of the	Node	String

			node	Type	
DD055	Node	nodeTypeData	Describe the data of the node	Node Type Data	Map of Node Data
DD056	Node Data	value	Describe the value of the node data	Value	Variable
DD057	Node Data	dataInput	Describe whether the node data accepts data input and where it is from	Data Input	String
DD058	Node Data	dataOutput	Describe whether the node data accepts data output	Data Output	Boolean
DD059	Variable	type	Describe the type of the variable	Type	[Text, Number, Color, Link, Rich Text]
DD060	Variable	value	Describe the value of the variable	Value	String

PROJECT CLOSEOUT

PROJECT TEAM STAFFING

The production of the project consists of the following skilful and knowledgeable team members followed by their responsibilities:

Resource Responsibility P - Primary Responsibility A - Approval Authority S - Supporting Responsibility (Contributor or Reviewer) I - Information Only	Muhammad Harits Abiyyudo	Ananda Rasyid Putra Soedarmo	Deni Barasena	Huy Tuan Anh Nguyen	Andree Yosua
Administrator					
Informed Client and Supervisor	P	S	I	I	I
Manage Project	P	S	P	S	S
Document Each Meeting	A	P	I	I	I
Manage Weekly Meetings	P	S			
Marketing					
Customer Behavior & Market Research	I	I	S	P	I
SWOT Anaysis	S	I	I	P	I
Market Mix Decision	S	S	I	P	
Implementation and Control	I	S	A	P	I
Technical					
System Development	A	S	P		P
Social and Interactive E-Leaning		P	A		P
Assets		P	A		I
Database and Content	I	S	P	S	P
Documentation	S		P	I	S

The group consists of 5 members, and divided by the following 3 divisions or titles from administrator, marketing, and technical. It is stated as titles due to the fact during the process of development there were major changes in responsibilities. Notably after further research regarding the subject, confusions surrounding the term marketing in this project and discussions with the supervisor lead to some responsibilities not considered as a priority or removed entirely. The group however was flexible to compensate when switching responsibilities during development. From the result of the schedule performance measurement detailing group opinions towards current progress and towards each member, shows that there were no clear conflicts enough to hinder the development progress.

LESSONS LEARNED

DESIGN PLANNING

At the start of the project the group was to develop a prototype user interface that would suit the needs of the client and throughout the first few months the client was satisfied in how much the user interface has been improved overtime. This however became the largest obstacle during the second session of the project. The client drastically added changes specifically to user interface in terms of colour and throughout this process created a new requirement which is being able to change colour themes for the system. This became a major problem due to the fact at this phase the group should already be focusing on developing the system as the user interface has already been discussed last session. This became a setback as it creates difficulties when setting priority for development. In the near future the group should research further regarding user interface and how simplicity works best.

PRESENTATION STRUCTURE

Throughout the project, it is a part of the criteria for the group to present some the following aspects about the system. The planning presentation detailing information based on the researches perform after interviewing the client and the solution to the problem, the interface presentation which shows the overall interface of system will be, the progress presentation where the group must explain their overall progress in the system's development and current challenges faced, and finally the prototype presentation with the purpose of giving a walkthrough of the system. The group continues to have difficulties in regards to professionalism during each presentation. It is important to consider crucial points in the presentation and rehearse to manage the time allocation determined by the marking guide. This issue keeps recurring throughout the presentations in which as group besides the actual system the importance of presenting the system is vital for a project.

COMMUNICATION

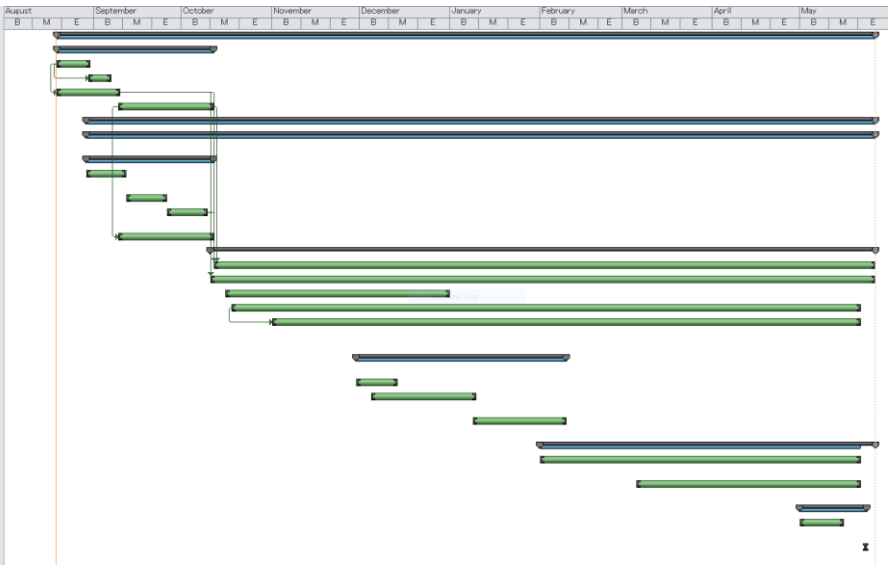
This correlates to the overall progress of the system, as the group continues to develop further upon the system there was a brief hiatus from client mostly due to the

fact it was quite difficult to get into contact with the client via email. Of course to mitigate this issue the group also makes use of other means such as Skype however the matter is the client often replies at a long period of time even reaching to a few days after the email or message was sent. The group notices that keeping in contact with client is key to a product that satisfies the client to a certain degree however this difficulty slows down progress of the development due the fact that most of the messages sent to the client are confirmations and doubts regarding the system whether it is an issue to a certain implementation that a client wants or a feature that the group is unable to implement.

PROJECT SCHEDULE

Development of CYC (Craft your Creativity) has a one year development cycle starting at 16th August 2016. Below are the phases during system development in the Gantt chart details include appointed starting dates of process and estimated completion dates of each phase

ID	Task Name	Start	Finish	Predecessors
1	Project	Fri 8/19/16	Fri 5/26/17	
2	Planning	Fri 8/19/16	Tue 10/11/16	
3	Planning presentation	Fri 8/19/16	Tue 8/30/16	
4	Alternative day	Tue 8/30/16	Tue 9/6/16	3SS
5	Project Requirement	Fri 8/19/16	Fri 9/9/16	3SS
6	Finalize Interface	Fri 9/9/16	Tue 10/11/16	
7	Development	Mon 8/29/16	Fri 5/26/17	
8	System Development	Mon 8/29/16	Fri 5/26/17	
9	System Design	Mon 8/29/16	Tue 10/11/16	
10	Technical Planning	Mon 8/29/16	Sun 9/11/16	
11	System Analysis	Sun 9/11/16	Sun 9/25/16	
12	System Architecture	Sun 9/25/16	Sun 10/9/16	
13	UI Design	Fri 9/9/16	Tue 10/11/16	6SS
14	System Building	Tue 10/11/16	Fri 5/26/17	
15	Front End	Tue 10/11/16	Fri 5/26/17	5,6,12
16	Back End	Tue 10/11/16	Fri 5/26/17	5,12
17	Assets Creation	Sun 10/16/16	Sat 12/31/16	
18	Module Testing	Tue 10/18/16	Sun 5/21/17	
19	System Integration Testing	Tue 11/1/16	Sun 5/21/17	18SS
20	Database Development	Wed 11/30/16	Thu 2/9/17	
21	Database Design	Wed 11/30/16	Tue 12/13/16	
22	Populating Database	Mon 12/5/16	Mon 1/9/17	
23	Database Integration	Mon 1/9/17	Thu 2/9/17	
24	Documentation	Wed 2/1/17	Fri 5/26/17	
25	Software Documentation	Wed 2/1/17	Sun 5/21/17	
26	User Documentation	Mon 3/6/17	Sun 5/21/17	
27	Deployment	Mon 5/1/17	Tue 5/23/17	
28	Webhosting and Network	Mon 5/1/17	Mon 5/15/17	
29	Client Acceptance Testing	Tue 5/23/17	Tue 5/23/17	



In terms of time constraints the group managed to allocate the schedule so that when compared the development of the system, the group managed to synchronize with the Gantt chart. However during the period of development there were plenty of cases

where it was rushed. Due to in this case there was an assessment required to be completed by most of the members that takes up time during summer break when it supposed to be put into developing the system. Nonetheless the group was able to keep up with the Gantt chart schedule through skill and perseverance.

RECOMMENDATION

In the end the group ZeeTech managed to complete the major requirements through planning and executed the project successfully considering the following lessons learned:

RECOMMENDATION #1

During the process design planning in the initiation of the project the group have research further in regards to human computer interaction and colour combination where in the end the system ended to have simplicity and a consistent theme throughout in comparison the first few prototypes

RECOMMENDATION #2

In accordance to the subject outline it is important for the group to present in front of the supervisor and explain the aspects of the system. It is also important that considering that each presentation has a time limit to which the group must be able to explain critical points about the system during that time and properly rehearse these parts

RECOMMENDATION #3

In order for the system to fulfil the requirements and satisfies the client communication is key. The group must always consider multiple ways to communicate to the client and always prepare important questions regarding the system before the meeting start.

TRANSITION PLAN

Since the product itself is deployed to a server, transitioning the product to the client will be as follow:

1. Give client the access to Admin account; this contains the username and password of Admin.
2. Give client the access to cyc.noreply@gmail.com.
3. Supply system training to the Client.
4. Provide a Tier 3 technical support to the client for a month. Call in technical support will be provided if possible. Tier 1 technical support will be provided for two months after the Tier 3 support have passed.

SYSTEM INSTALLATION PROCESS

OPEN THE PROJECT

PREREQUISITES

- Java SE Development Kit 8
- Java IDE
- Tomcat 8
- MySQL 5.6 or MariaDB 10.1

RUN THE PROJECT

Using Netbeans IDE 8.2

1. Team > Git > Clone
2. Insert the repository URL

```
https://github.com/ZeeTechUOW/craftyourcreativity.git
```

3. Open the project
4. Import the .sql in /db/ folder to your database
5. Edit ProjectProperties.java in package Model to match the database url, user, and pass
6. Run the project

Using other Java IDE

1. Clone the project

```
https://github.com/ZeeTechUOW/craftyourcreativity.git
```

2. Open the project
3. Add all library from /lib/ folder

4. Set the project configuration to use Tomcat 8
5. Import the .sql in /db/ folder to your database
6. Edit ProjectProperties.java in package Model to match the database url, user, and pass
7. Run the project

DEPLOYING TO WEB SERVER

When compiling and running the project in your machine, the project is already deployed in your local machine. In case you want to deploy the project in server, the server should meet these requirements:

- Tomcat 8
- MySQL 5.6 or MariaDB 10.1

DEPLOYING THE PROJECT TO WEB SERVER

1. Clean and build the project
2. Copy .war file from /dist/ folder in project root folder
3. Stop the Tomcat service in web server
4. Locate and navigate to the tomcat directory in web server
5. Paste the .war file into /webapps/ folder
6. Start the Tomcat service The project could be accessed from local machine from

```
http://localhost:8084/your-webapps-name/
```

Or

```
http://server-ip-address/your-webapps-name/
```

Change the server-ip-address to your web server ip address and your-webapps-name to .war file name from before.

(OPTIONAL) EDIT THE WEBAPPS INTO ROOT WEBAPPS

To change and access your webapps URL from

```
http://server-ip-address/your-webapps-name/
```

To

```
http://server-ip-address/
```

You could rename .war to ROOT.war before deploying to web server. If this method doesn't work then most likely your Tomcat is configured to use auto-deploy. For this situation, you need to edit the configuration with step as follow:

1. Stop the Tomcat service in web server
2. Locate and navigate to Tomcat directory in web server
3. Go to /conf/ folder
4. Edit server.xml to add this code in Host node (right before </Host> tag)

```
<Context path="" docBase="yourAppContextName">

 <!-- Default set of monitored resources -->
 <WatchedResource>WEB-INF/web.xml</WatchedResource>

</Context>
```

5. Start the Tomcat service in web server, the webapps now accessible from root URL

CONCLUSION

The Craft Your Creativity platform was developed by ZeeTech with an aim to address the current drawbacks of existing online training programs associated with individual learning. By facilitating the integration of social media and interactive learning, ZeeTech has successfully developed a system where users can communicate effectively with others inside or outside to enhance the learning process. Also, through the application of gamification on the system's design approach, the CYC platform can motivate users by offering them a friendly and easy-to-use interface.

There is, however, much to be improved in order to make the system a fully developed product. Apart from continually adding tools to the module editor to support trainers in designing their courses, the user interface should also be improved by further adjustments and added functionalities.

The CYC e-Training Platform satisfies all user requirements and constraints mentioned in the report as well as instructions from the supervisors. It is a friendly yet powerful for both trainees and trainers to accomplish their goals.