UNIVERSITY of GREENWICH
Alliance with FPT Education

BTEC

Higher Nationals in Computing

Unit 30: Application Development

ASSIGNMENT 1

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Class: GCS0701A

Subject code: 1670

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Assignment due: 04 May 2020 Assignment submitted: 04 May 2020

UNIVERSITY of GREENWICH
Alliance with FPT Education

BTEC

ASSIGNMENT 1 FRONT SHEET

Qualification	BTEC HND Diploma in Computing and Systems Development		
Unit number and title	Unit 30: Application Development		
Assignment due	04 May 2020	**Assignment submitted**	04 May 2020
Learner's name	Huynh Cam Hung	**Assessor name**	Le Ngoc Thanh

Learner declaration: I certify that the work submitted for this assignment is my own and research sources are fully acknowledged.			
Learner signature		**Date**	

Grading grid

P1	P2	P3	M1	M2	D1

Assignment title	**Assignment 1: Requirement Analysis and Application Design**

In this assignment, you will have opportunities to provide evidence against the following criteria. Indicate the page numbers where the evidence can be found.

Assessment criteria	Expected evidence	Task	Assessor's Feedback
LO1. Produce a Software Design Document by analysing a business-related problem and deduce an appropriate solution including a set of initial requirements			
P1 Explore a business-related problem and produce a well-defined Problem Definition Statement supported by a set of user and system requirements.	1. Use case diagram to capture problem requirements 2. Screen-flow diagram and wireframes (prototype screen)	1	

P2 Determine any areas of risk related to the successful completion of your application.	3. Questions to identity any problem from the requirements, use cases, screen-flow diagram or UI 4. Answer to above questions according to personal research	2	
LO2. Use design and development methodologies with tools and techniques associated with the creation of a business application			
P3 Research the use of software development tools and techniques and identify any that have been selected for the development of this application.	5. ERD describing application database 6. UML Class diagram for the core business processing	3	

Assessment criteria	Expected Evidence	Feedback (note on Merit/Distinction if applicable)
Merit descriptor No. (M1)		
Merit descriptor No. (M2)		
Distinction descriptor No. (D1)		

Summative feedbacks:			
Assessor's Signature		Date:	

Unit Number and Title	**30: Application Development**
Academic Year	2020
Unit Tutor	Le Ngoc Thanh
Assignment Title	**Assignment 1: Requirement Analysis and Application Design**
Issue Date	
Submission Date	04 May 2020
IV Name & Date	

<table>
<tr><th colspan="3">Learning Outcomes and Assessment Criteria</th></tr>
<tr><th>Pass</th><th>Merit</th><th>Distinction</th></tr>
<tr><td colspan="2">LO1 Produce a Software Design Document by analysing a business-related problem and deduce an appropriate solution including a set of initial requirements</td><td rowspan="2">LO1 & 2
D1 Justify the tools and techniques chosen to realise a custom built website. Justify your preferred selection of tools and techniques in deducing an appropriate solution to a business related problem.</td></tr>
<tr><td>P1 Explore a business-related problem and produce a well-defined Problem Definition Statement supported by a set of user and system requirements.

P2 Determine any areas of risk related to the successful completion of your application.</td><td>M1 Analyse a business-related problem using appropriate methods and produce a well-structured Software Design Document that defines a proposed solution and includes relevant details on requirements, system analysis, system design, coding, testing and</td></tr>
</table>

	implementation.	
LO2 Use design and development methodologies with tools and techniques associated with the creation of a business application		
P3 Research the use of software development tools and techniques and identify any that have been selected for the development of this application.	**M2** Compare the differences between the various software development tools and techniques researched and justify your preferred selection as well as your preferred software development methodology.	

Assignment Brief and Guidance
As the technology is being developed rapidly nowadays, FPT Co. desires to build the continuing study environment throughout the corporation. It is necessary to develop a web-based system, which manages the activity of "Training" for internal training program of the company. This system can be used to manage trainee accounts, manage trainers, manage course categories, manage courses, manage topics, assign topic to course, assign trainer to topic, assign trainee to course. This is a system used by HR department. We have three roles in this system, an administrator, training staff and a trainer. The brief description of those roles is as follow. 1. An administrator's role ● Can login to the system through the first page of the application ● Can create/edit/delete new user account for trainer/training staff and assign/change(if existing user) username and a password

2. A training staff's role
    - A registered training staff, who is assigned a user name and a password by the administrator logs in can create trainee accounts by entering details like trainee name, trainee accounts, age, date of birth, education, main programming language, TOEIC score, experience details, department, location, etc.
    - After entering successfully all details for trainees, his/her details are then stored in the database. The training staff is given a list of trainees for him to view and search. From the list of trainees, he can also search by trainee account, programming language, TOEIC score…
    - Can update, delete trainee accounts
    - Can manage course categories such as searching, adding, updating and deleting course categories. Course category includes the information such as course category name and descriptions.
    - Can manage courses such as searching, adding, updating and deleting courses. Course includes course name and description.
    - Can add topics such as topic name and topic descriptions into a course, add courses into a category.
    - Can manage trainer profile such as adding, updating and deleting the information: Trainer name, External or Internal Type, working place, telephone, and email address.
    - Can assign trainer to a topic.
    - Can assign trainee to a course.
3. A trainer's role
    - In the same system, the trainer who have been registered by the administrator can login and can update his profile such as Trainer name, External or Internal Type, education, working place, telephone, and email address.
    - Can view courses which have a topic he is assigned to.

Your manager suggests that this would be a great opportunity for you to demonstrate your capabilities by designing and developing the application. After considering, you decide to do the project. The project consists of 4 steps which is divided into two phases. In this first phase, you have to carry on requirement analysis and produce solution design for the problem.		
Assignment Guidance		
Task	**Assessment Criteria**	**Requirement**
1	**P1** Explore a business-related problem and produce a well-defined Problem Definition Statement supported by a set of user and system requirements.	1. Use case diagram to capture problem requirements 2. Screen-flow diagram and wireframes (prototype screen)
2	**P2** Determine any areas of risk related to the successful completion of your application.	3. Questions to identity any problem from the requirements, use cases, screen-flow diagram or UI 4. Answer to above questions according to personal research
3	**P3** Research the use of software development tools and techniques and identify any that have been selected for the development of this application.	5. ERD describing application database 6. UML Class diagram for the core business processing
4	**M1** Analyse a business-related problem using appropriate methods and produce a well-structured Software Design Document that defines a proposed solution and includes relevant details on requirements, system analysis, system design, coding, testing and implementation.	7. Detail use case description for important functions
5	**M2** Compare the differences between the various software development tools and techniques researched and justify your preferred selection as well as your preferred software development	8. A presentation to introduce different software development methods (at least 3), for example: Waterfall, Prototyping, Spiral, Agile…

	methodology.	
6	**D1** Justify the tools and techniques chosen to realise a custom built website. Justify your preferred selection of tools and techniques in deducing an appropriate solution to a business related problem.	9. Critical comparison among development methods in the presentation and reasons for your selection of tools and techniques.

Submission Format
The submission is in the form of 1 word document containing required evidences and 1 presentation if necessary (M2, D1). You are required to make use of headings, paragraphs, subsections and illustrations as appropriate, and all work must be supported with research and referenced using the Harvard referencing system.

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1. System requirements

According to the requirements, we have to develop an web application which includes four roles to participate in it: Admin, Training Staff, Trainer, and Trainee. Four of them have an account to login and participate in the system.

- **Admin**

Attributes: Not include

Behaviors:

- Have the right to manage account such as Add, Delete, Search the account.

- Can update the account username and password.

- **Training staff**

Attributes: Not include

Behaviors:

- Have the right to manage Course Category, Course, and Topic such as Add, Delete, Search, and Update.

- Also can manage the trainee account and profile, and assign the trainer to topic and course, and trainee to course.

- **Trainer**

Attributes: Name, External or Internal Type, education, working place, telephone, and email address.

Behaviors:

- Can see the topics and courses he or she is assigned to.

- Can modify their profile information.

- **Trainee**

Attributes: Name, Date of birth, education, main programming language, TOEIC score, experience details, department, location.

Behaviors: Not included

2. System Architecture

2.1. Design model

The design model applied to design the application is MVC (Model - View - Controller). MVC is the shorten word of three components of the model: Model, View, Controller. This is a design model mostly used in software engineering. MVC model divided the source code into 3 parts, corresponding to each word. Each word corresponds to a separate activity in a model.

To better understand, we will go along to discuss each component.

- Component of MVC:
  - **Model**

    Model is a component to store all data of the application. This unit is a bridge between the two components below are View and Controller. The model takes the form of a database or sometimes just a normal XML file. Model clearly shows the manipulations with the database such as allowing viewing, accessing, processing data, and so on.
  - **View**

    This component contain code of the application interface. Where users can obtain MVC data information through query operations such as searching or using through websites.

    Typically, web applications use View as part of the system where HTML elements are created. Besides, View also has a function to record the user's activity to interact with the Controller. However, the View does not have a direct relationship with the Controller, nor is it able to retrieve data from the Controller, but only displays the request for the Controller to pass.

For instance, the "delete" button created by the View when the user clicks the button will have an action in the Controller.

- **Controller**

The component is responsible for handling user requests coming through the View. When the requests come, the Controller will manipulate the request and then interact with the Model to get the data users want. From there, Controller can gives data that is right for the user.

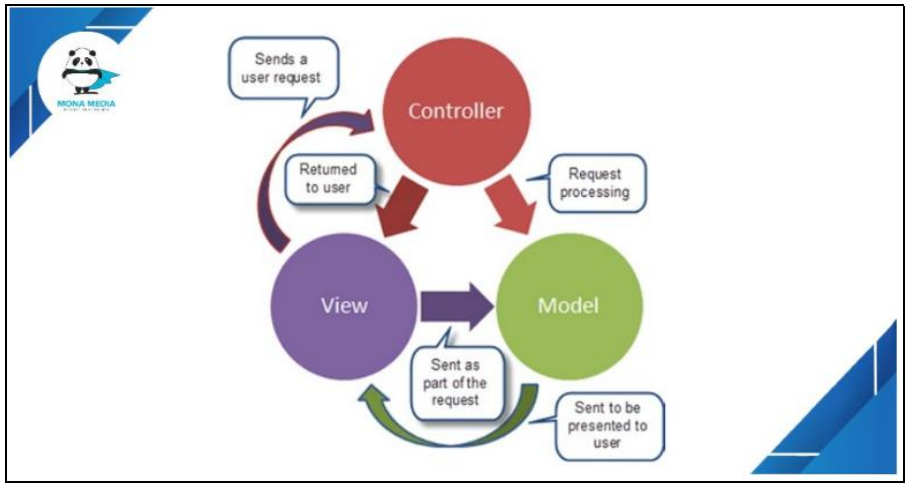

Figure 1 : Components of MVC model

In general, the MVC model is not complicate. As you can imagine, when a request is sent from the client to the server, the Controller will perform its task of receiving and processing the request. In case of need, it is possible to contact the Model, who works with the database, to assist. When the request is processed, the result will be returned to the View. At View will create HTML code into the interface and render displayed on the browser. MVC is a model that is used a lot in web application programming. A well-developed MVC system will allow

front-end, back-end development on the system without interference, sharing, editing files while one or both parties are still working. Therefore, I use the model to design the application.

2.2. UML diagrams

2.2.1. Use case diagram

- **Administrators**

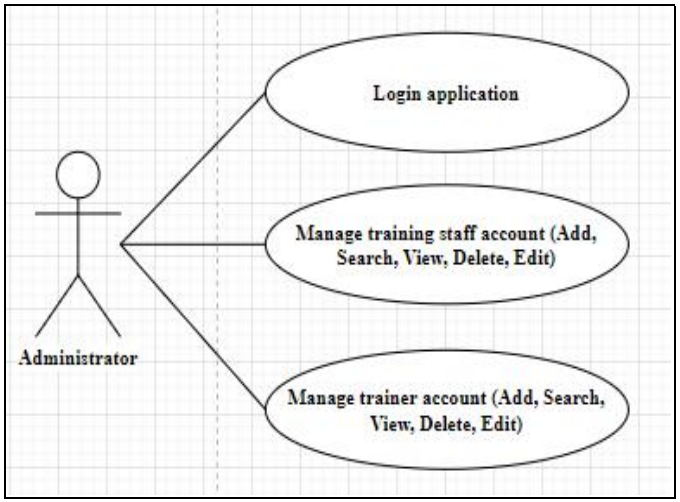

Figure 2 : Use case diagram of administrators

Name	Manage trainer/staff account
Description	Admin can add, search, view, edit and delete the trainer/staff accounts.

Actor	Administrator
Goal	- Add new trainer/staff accounts. - Search trainer/staff account and view the information. - Update username and password of existing trainer/staff account. - Delete existing trainer account/staff.
Trigger	Admin need to add, search, update, delete trainer/staff accounts.
Normal flow	Admin has to log in into the application: - Add account: 1. Admin visited add new account page. 2. Admin insert username and password for new account 3. Admin confirm to save the account - Search account: 1. Admin visited the home page. 2. Admin insert the keyword into the search bar. 3. Admin confirm to search the account via keyword. -Update account: 1. Admin search for the account need to be updated. 2. Admin enter update page with the button.

	3. Admin modify the account information in fields. 4. Admin confirm to update the account information -Delete account: 1. Admin search for the account need to be deleted. 2. Admin command to delete the account with the button. 3. Admin confirm to delete the account.

- **Training Staff**

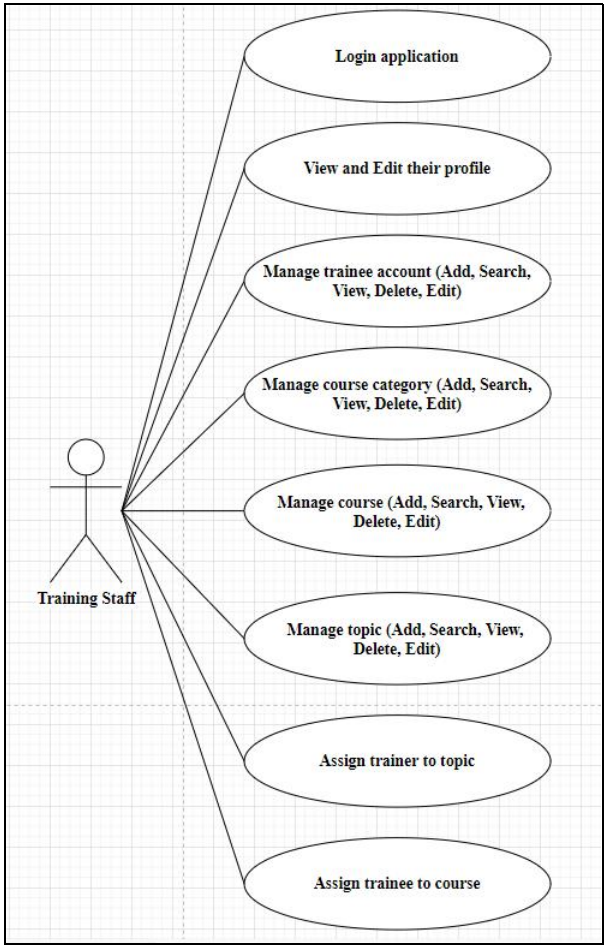

Figure 3 : Use case diagram of training staffs

Name	View and edit profile
Description	Staff can view and edit their own profile.
Actor	Training Staff
Goal	- Visit the profile page and see the information. - Update the profile information
Trigger	Staff need to change their profile information.
Normal flow	Staff has to log in into the application: 1. Visited the profile page. 2. Change the information in the field. 3. Confirm to update the profile information.

Name	Manage trainee account /category /course /topic.
Description	Staff can add, search, view, edit and delete thetrainee account /category /course /topic.
Actor	Training Staff

Goal	- Add new trainee account /category /course /topic. - Search trainee account /category /course /topic and view the information. - Update existing trainee account /category /course /topic information. - Delete existing trainee account /category /course /topic.
Trigger	Staff need to add, search, update, delete trainee account /category /course /topic.
Normal flow	Staff has to log in into the application: - Add new: 1. Staff visited add new page. 4. Staff insert information for new entity. 5. Staff confirm to save the new entity - Search: 4. Staff visited the page show list of records. 5. Staff insert the keyword into the search bar. 6. Staff confirm to search the records via keyword. -Update account: 5. Staff search for the record need to be updated. 6. Staff enter update page with the button. 7. Staff modify the information in fields.

	8. Staff confirm to update the information -Delete account: 4. Staff search for the record need to be deleted. 5. Staff command to delete the record with the button. 6. Staff confirm to delete the record.

Name	Assign trainer to topic
Description	Staff can assign the trainers to the topics which trainer will teach to trainees.
Actor	Training Staff
Goal	Assign the existing trainers into an existing topic.
Trigger	Staff need to assign trainers into the topics.

Normal flow	Staff has to log in into the application: 1. Search for an existing topic. 2. Enter edit page of the topic. 3. Insert trainer id into field 4. Assign the trainer having the id into the topic with the button

Name	Assign trainee to course
Description	Staff can assign the trainees to the courses which trainee need to participate.
Actor	Training Staff
Goal	Assign the existing trainees into an existing course.
Trigger	Staff need to assign trainees into the courses.
Normal flow	Staff has to log in into the application: 1. Search for an existing course. 2. Enter edit page of the course. 3. Insert trainee id into field. Assign the trainee having the id into the course with the button.

- **Trainer**

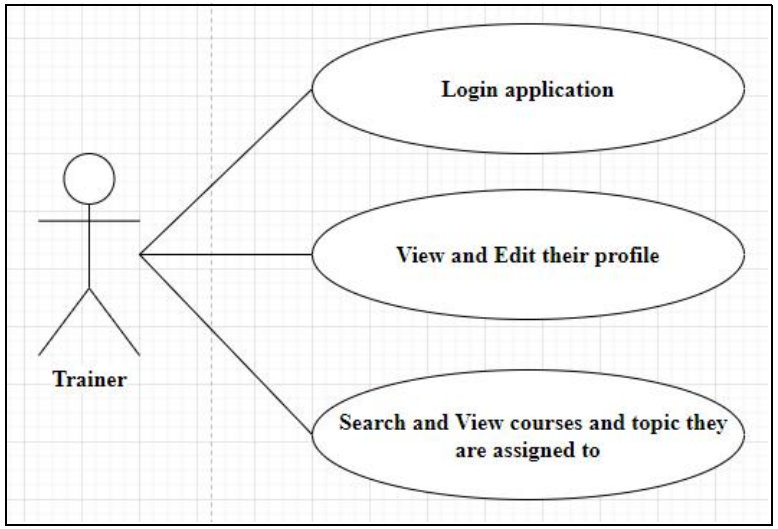

Figure 4 : Use case diagram of trainers

Name	View and edit profile
Description	Trainer can view and edit their own profile.
Actor	Trainer
Goal	- Visit the profile page and see the information. - Update the profile information

Trigger	Trainer need to change their profile information.
Normal flow	Trainer has to log in into the application: 1. Visit the profile page. 2. Change the information in the field. 3. Confirm to update the profile information.

Name	Search and view the assigned topics and courses.
Description	Trainer can view the topics and courses they are assigned to.
Actor	Trainer
Goal	Visit the page show list of teaching topics and courses.
Trigger	Trainer need to see the list of topics and courses they are assigned to.
Normal flow	1. Trainer log in into the application. 2. Visit the home page.

- **Trainee**

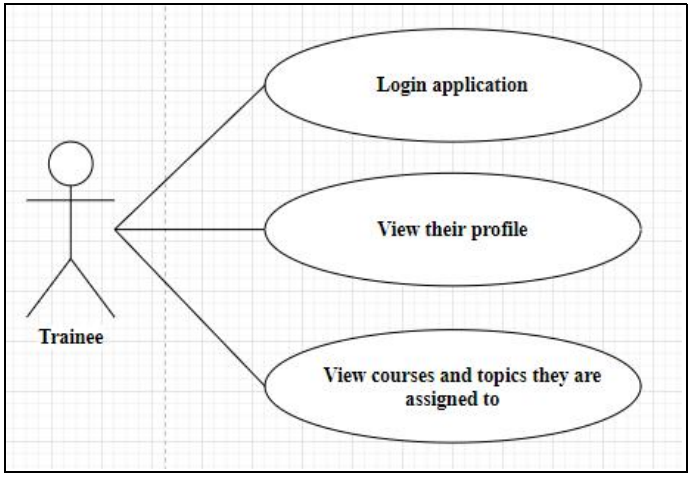

Figure 5 : Use case diagram of trainees

Name	View profile
Description	Trainee can view and edit their own profile.
Actor	Trainee
Goal	- Visit the profile page and see the information.
Trigger	Trainee want to see their profile information.
Normal flow	Trainee has to log in into the application:

	1. Visit the profile page. 2. See the information of their own profile.

Name	Search and view the assigned courses.
Description	Trainee can view the courses they are assigned to.
Actor	Trainee
Goal	Visit the page show list of studying courses.
Trigger	Trainer need to see the list of courses they are assigned to.
Normal flow	1. Trainee log in into the application. 2. Visit the home page.

2.2.2. Class Diagram

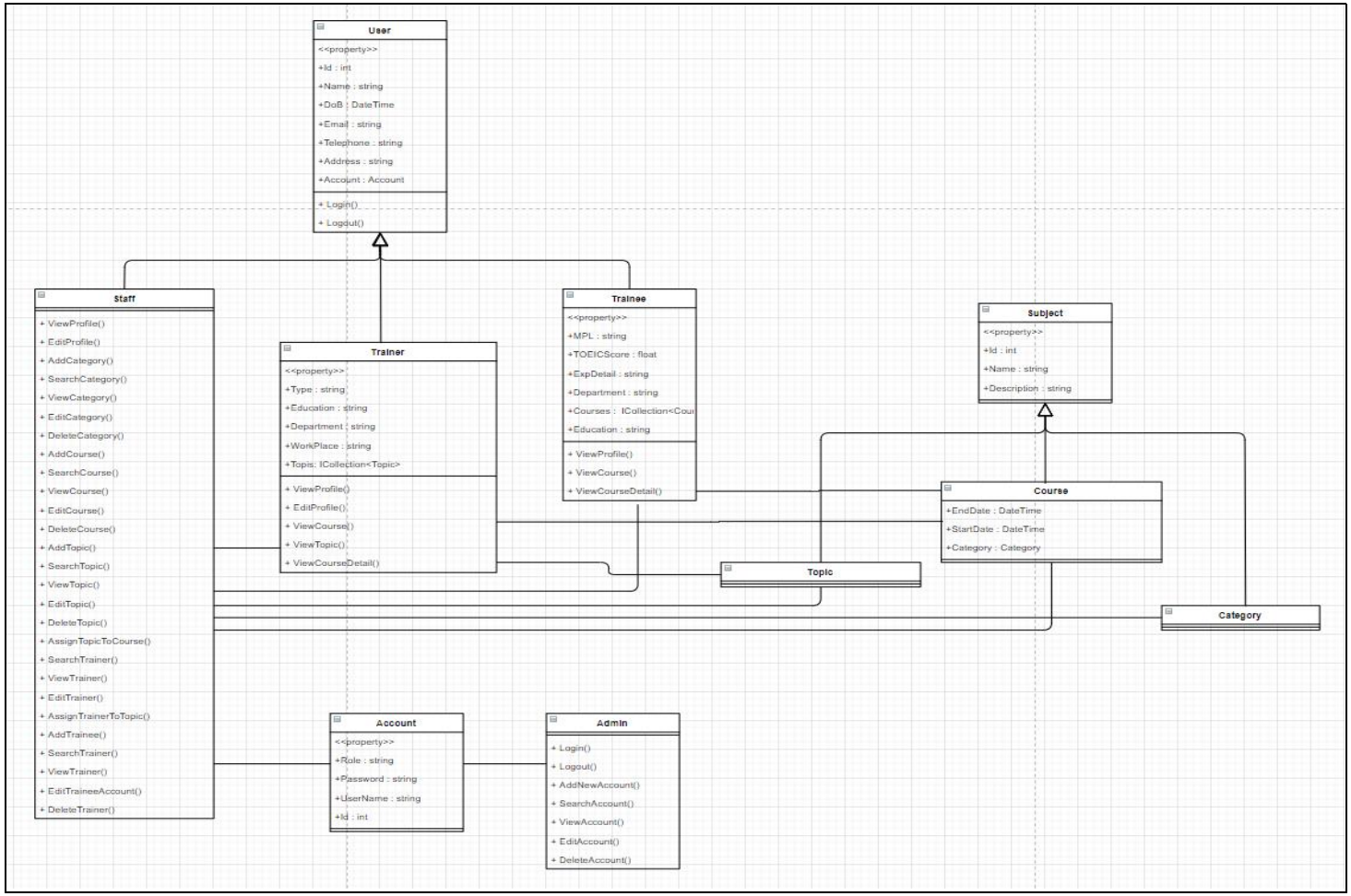

Figure 6 : Class diagram of the application

To provide the specific detail of the class diagram, I use the table below illustrates the relationship between classes.

Order	Classes	Actions	Classes	Relationships
1	Admin	Manage	Account	Association
2	Staff	Inherit	User	Generalization
3	Trainer	Inherit	User	Generalization
4	Trainee	Inherit	User	Generalization
5	Staff	Has	Account	Association
6	Staff	Manage	Trainee	Association
7	Staff	Assign	Trainer	Association
8	Staff	Manage	Category	Association
9	Staff	Manage	Courses	Association
10	Staff	Manage	Topic	Association
11	Trainer	Has	Account	Association
12	Trainer	Has	Topic	Association
13	Trainer	Teach	Course	Association
14	Trainee	Has	Account	Association
15	Trainee	Learn	Course	Association
16	Category	Inherit	Subject	Generalization

17	Course	Inherit	Subject	Generalization
18	Topic	Inherit	Subject	Generalization
19	Course	Belong to	Category	Composition
20	Topic	Belong to	Course	Composition

2.2.3. ERD diagram

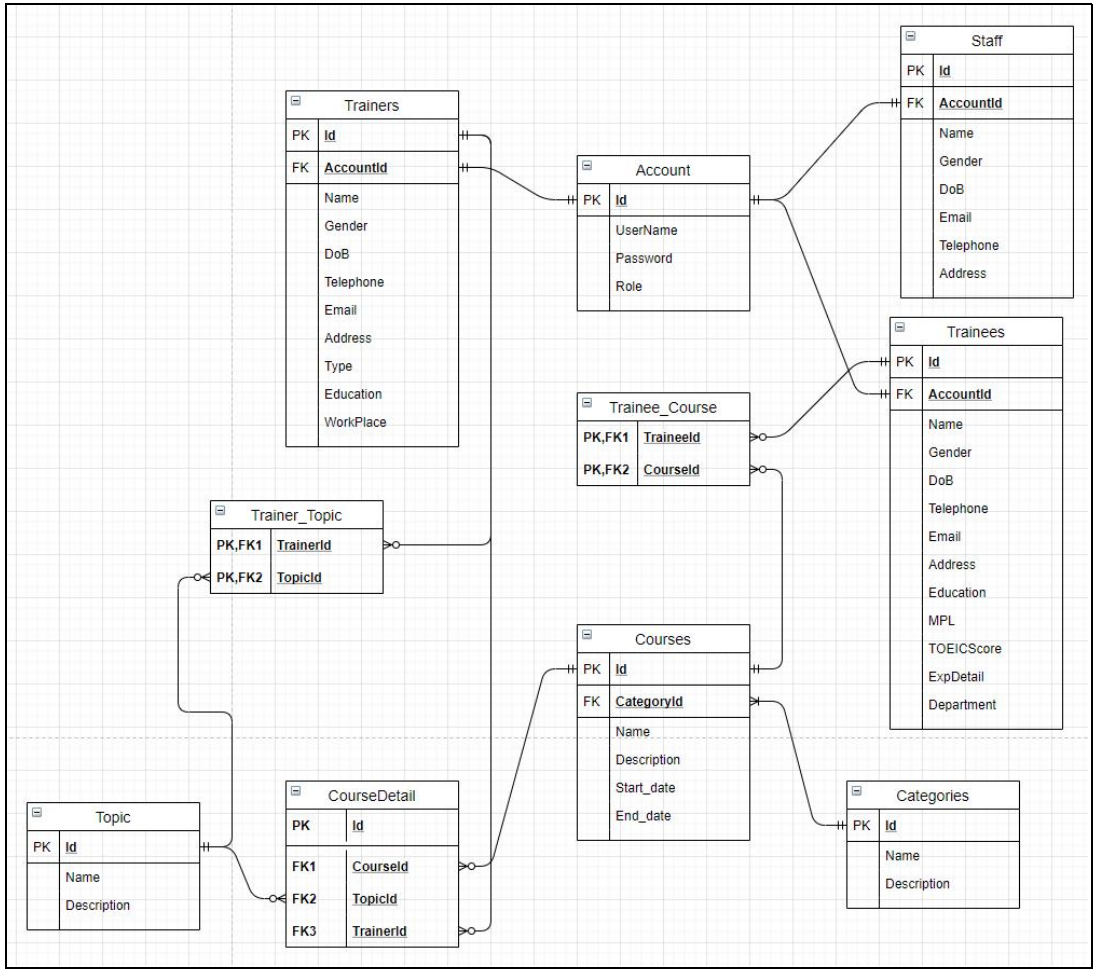

Figure 7 : The ERD design for the application

The following table describe the relationships between entity.

Entities	Relationships	Entities
Account	One to One	Staff
Account	One to One	Trainer
Account	One to One	Trainee
Course	One to Many	CourseDetail
Topic	One to Many	CourseDetail
Trainer	One to Many	CourseDetail
Trainer	Many to Many	Topic
Category	One to Many	Course
Trainee	Many to Many	Course

2.2.4. Screen flow diagram

- **Administrator**

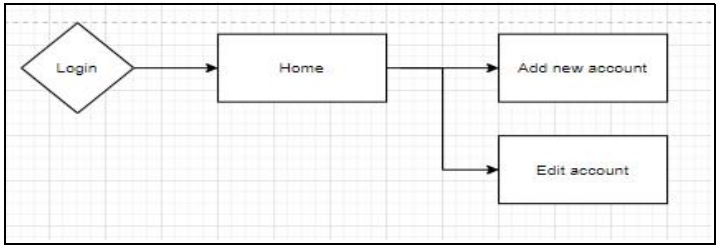

Figure 8 : Screen flow diagram when login as admin

- **Training Staff**

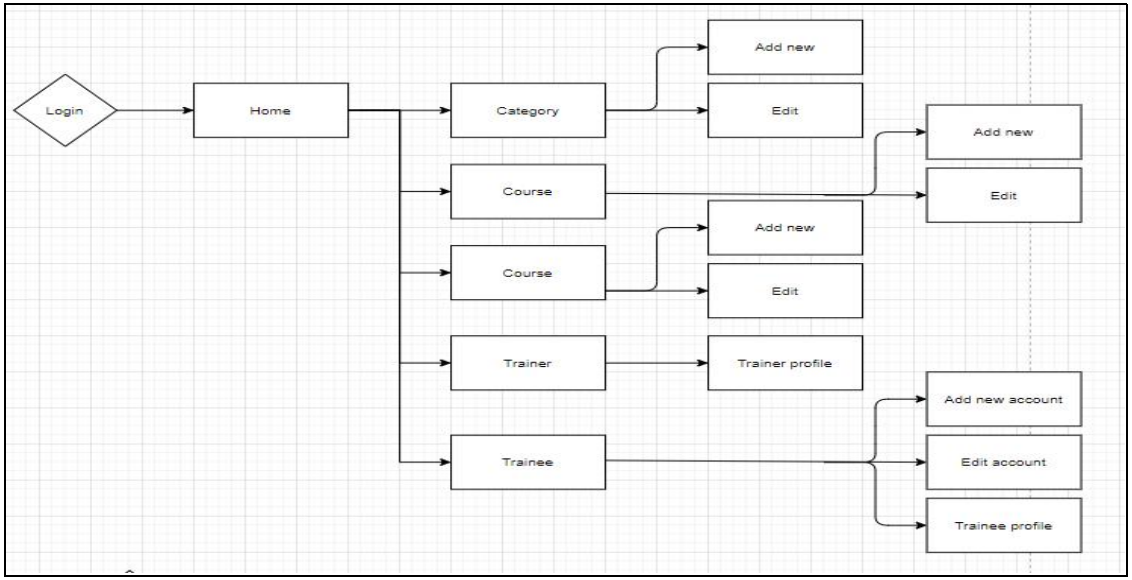

Figure 9 : Screen flow diagram when login as training staff

- **Trainer and Trainee**

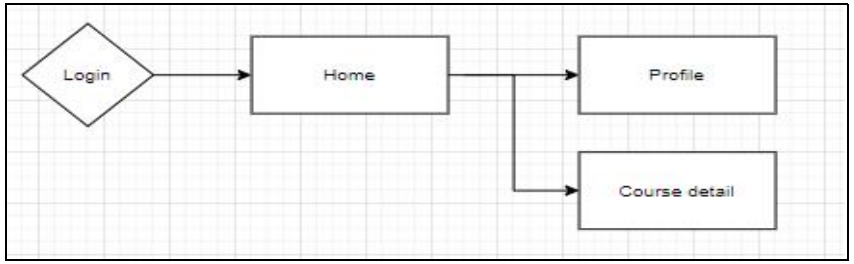

Figure 10 : Screen flow diagram when login as trainer and trainee

3. Wire frame of system

Wireframe is an important tool in product design and development. When creating a product, a wire frame is a design that helps developers, product managers, and designers can talk to each other. And whenever there is a change in the interface, everyone is easy and quick to understand and implement. Wireframe can be done quickly on paper or in computer form.

3.1. Login page

When user visit the url of application, the system will require user to enter valid username and password. If the username or password does not exist, user will can not login the system, and the page will inform user to re-enter username and password.

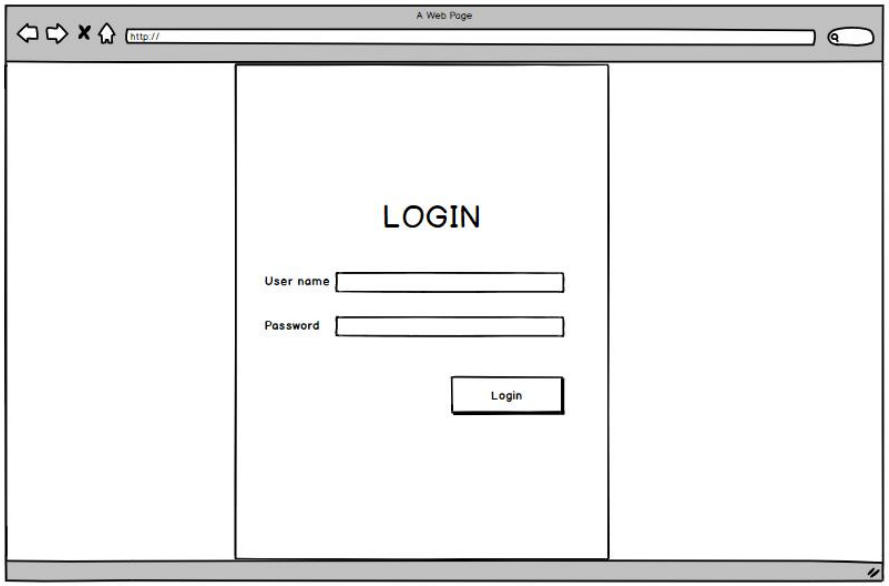

Figure 11 : Wire frame of login page

No	Item	Description	Constraints
1	Username text box	Input field for username	Min 3 characters and Max 20 characters.
2	Password text box	Input field for password	Min 3 characters and Max 20 characters.
3	Login button	The button will submit the username and password to server	

3.2. Login as Administrator

As the system has four different roles, users with different role will see different interfaces of the application. The below interfaces are designed for administrators.

- **Home page**

In the home page, administrators will see list of account exist in the system. In here, they can also search the specific accounts via the search box.

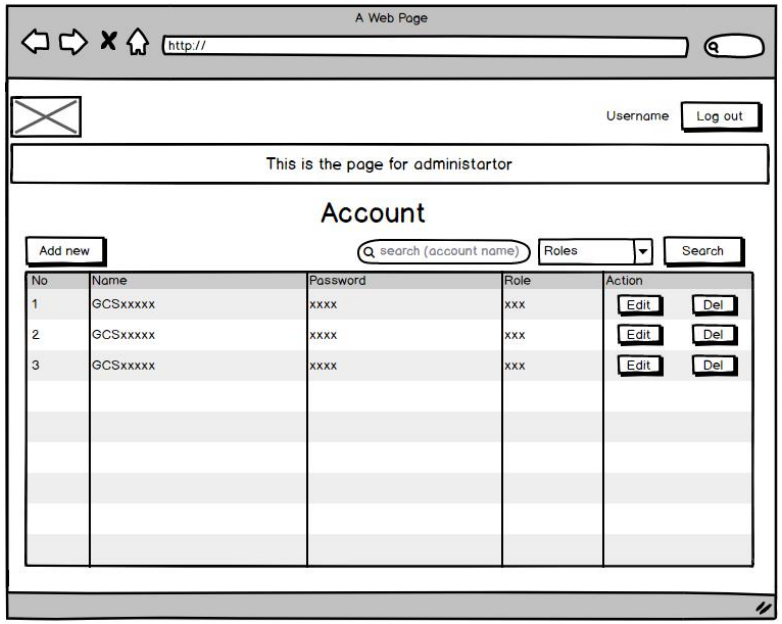

Figure 12 : Wire frame of home page for admin

No	Item	Description	Constraints
1	Logo picture	The logo of the application and it is assigned the home page link.	
2	Username label	Show the username of the login account	
3	Log out button	User will log out the application if click on it.	
4	Add new button	User will go to add new page if click on it	
5	Search box	User can search account via user name	Min 1 characters and Max 20 characters.
6	Search combo box	User can search account via role	Only includes All, Admin, Staff, Trainer, Trainee.
7	Search button	User can search account if click on it	
8	Account table	User can see list of account	
9	Edit button	User will go to edit page if click on it	
10	Del button	User will delete account if click on it	

- **Add new account**

The below page let the admin create the new account. To visit the page, admin have to click the “Add new” button in the home page.

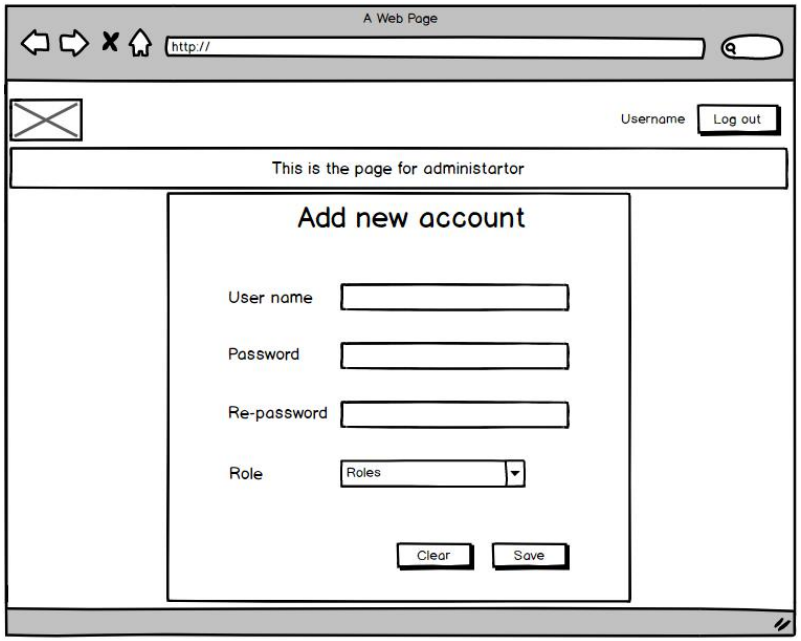

Figure 13 : Wire frame for admin add new account

No	Item	Description	Constraints
1	Logo picture	The logo of the application and it is assigned the home page link.	
2	Username label	Show the username of the login account	
3	Log out button	User will log out the application if click on it.	

4	Username text box	Input field for username	Min 3 characters and Max 20 characters.
5	Password text box	Input field for password	Min 3 characters and Max 20 characters.
6	Re-password text box	Input field for re-password which will check the input password again	- Min 3 characters and Max 20 characters. - Value similar with password text box
7	Role combo box	User can select role for the account	Only includes Admin, Staff, Trainer, Trainee.
8	Clear button	The button will clear the value of all input field	
9	Save button	The button will save the new account into the system.	

- **Edit account**

The below page let the admin edit the existing account. To edit the specific account, admin have to click the “Edit” button which in the same row with the account in the table.

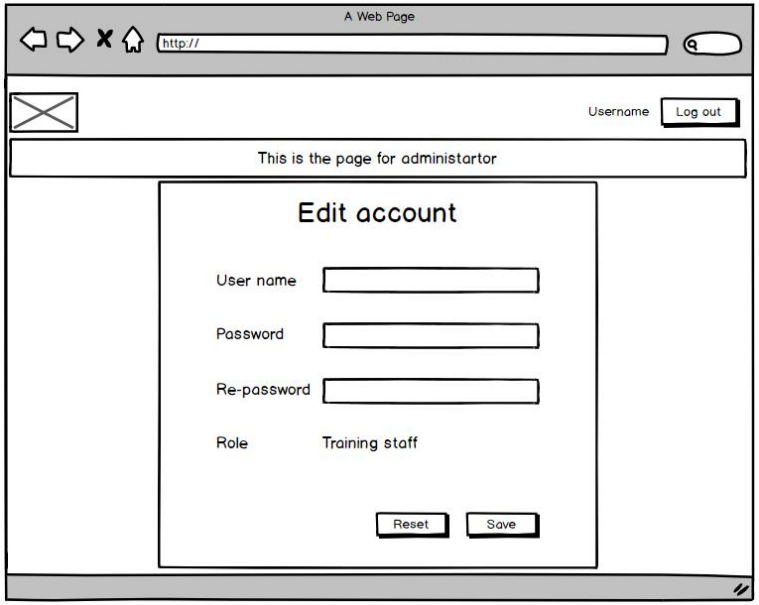

Figure 14 : Wire frame for admin edit the account

No	Item	Description	Constraints
1	Logo picture	The logo of the application and it is assigned the home page link.	
2	Username label	Show the username of the login account	

3	Log out button	User will log out the application if click on it.	
4	Username text box	Input field for username	Min 3 characters and Max 20 characters.
5	Password text box	Input field for password	Min 3 characters and Max 20 characters.
6	Re-password text box	Input field for re-password which will check the input password again	- Min 3 characters and Max 20 characters. - Value similar with password text box
7	Role label	Show the role of the account	
8	Reset button	The button will reset the origin value of all input field	
9	Save button	The button will update the account information.	

3.3. Login as Training staff

The following is the designed wire frame for training staffs.

- **Home page**

The Home page is the profile page of the training staff. In here, staffs can edit their profile by click the “Save” button after change the information. Furthermore, the home page can be visited easily by click the button “Username” in the above right corner.

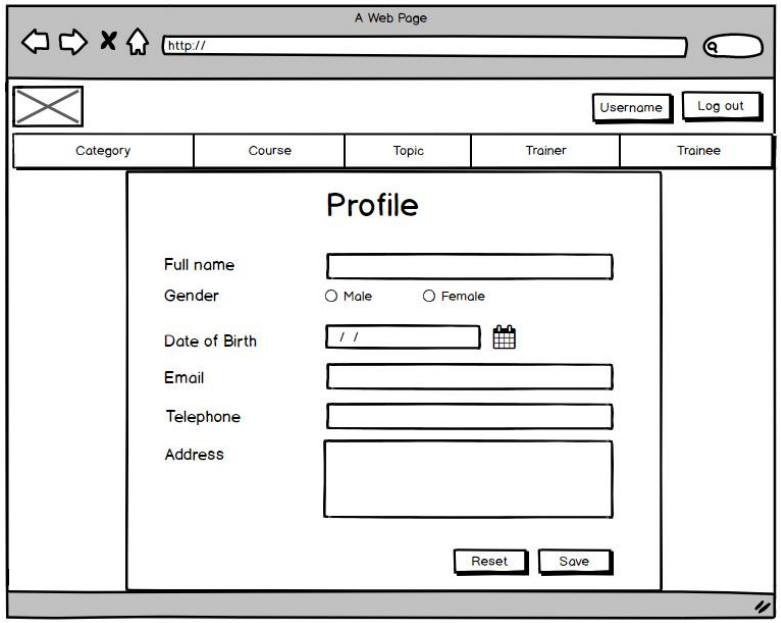

Figure 15 : Wire frame of home page for staff

No	Item	Description	Constraints
1	Logo picture	The logo of the application and it is assigned the home page link.	
2	Username label	Show the username of the login account and assigned profile page link to it	
3	Log out button	User will log out the application if click on it.	
4	Full name text box	Input field for staff name	Min 3 characters and Max 20

			characters.
5	Male and female radio button	User can select gender	
6	Date of birth date input field	Input field for date of birth	
7	Email text box	Input field for email	Email syntax
8	Telephone text box	Input field for phone number	Only number characters
9	Address text area	Input field for address	Min 3 characters
10	Reset button	The button will reset the value of all input field	
11	Save button	The button will update the staff profile information.	

- **Category main page**

The below page show the list of exist categories included in the system. To visited the page, staffs have to click the “Category” tab on the navigation bar.

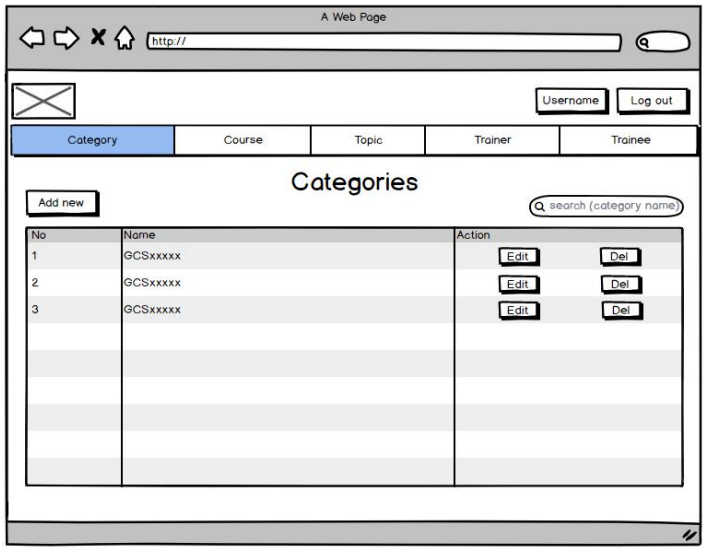

Figure 16 : Wire frame of Category main page

No	Item	Description	Constraints
1	Logo picture	The logo of the application and it is assigned the home page link.	
2	Username label	Show the username of the login account and assigned profile page link to it	
3	Log out button	User will log out the application if click on it.	
4	Add new button	User will go to add new page if click on it	
5	Search box	User can search category via name	Min 1 characters and Max 20

			characters.
6	Categories table	User can see list of category	
7	Edit button	User will go to edit page if click on it	
8	Del button	User will delete category if click on it	

- **Add new category**

The below page let the staff add the new category into the system. To visit the page, admin have to click the “Add new” button in the Category main page.

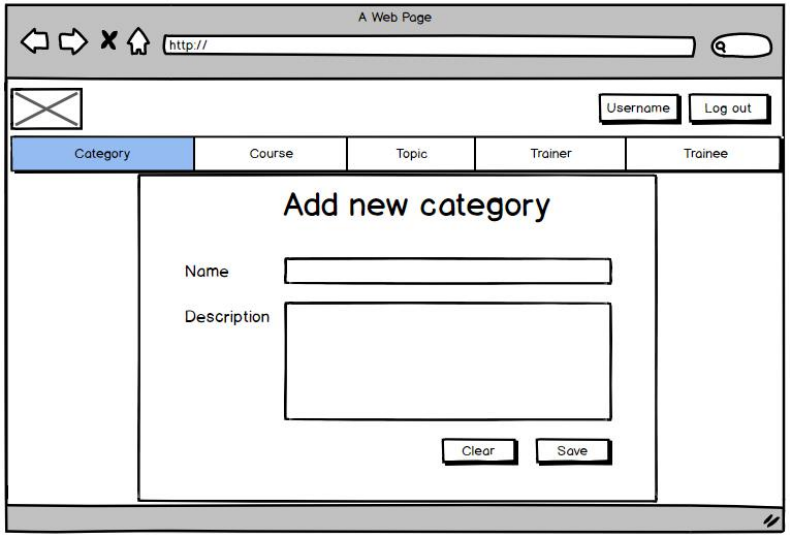

Figure 17 : Wire frame for add new category

No	Item	Description	Constraints
1	Logo picture	The logo of the application and it is assigned the home page link.	
2	Username label	Show the username of the login account and assigned profile page link to it	
3	Log out button	User will log out the application if click on it.	
4	Name text box	Input field for category name	Min 3 characters and Max 20 characters.
5	Description text area	Input field for description	
6	Clear button	The button will clear the value of all input field	
7	Save button	The button will save the new category into the system.	

- **Edit category**

The below page let the staffs edit the existing category. To edit the specific category, admin have to click the “Edit” button which in the same row with the category in the table.

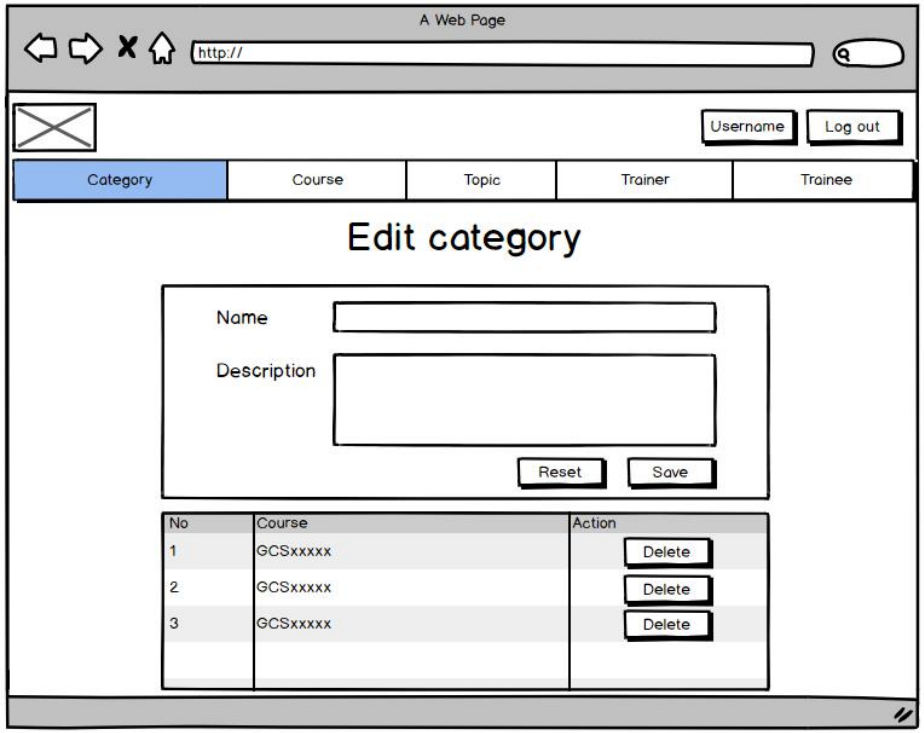

Figure 18 : Wire frame for edit category

No	Item	Description	Constraints
1	Logo picture	The logo of the application and it is assigned the home page link.	
2	Username label	Show the username of the login account and assigned profile page link to it	

3	Log out button	User will log out the application if click on it.	
4	Name text box	Input field for category name	Min 3 characters and Max 20 characters.
5	Description text area	Input field for description	
6	Reset button	The button will reset the origin value of all input field	
7	Save button	The button will update the category information.	
8	Course table	The table show list of course which is belonged to the category	
9	Delete button	Remove the course from this category but not delete it	

- **Course main page**

The below page show the list of exist courses included in the system. To visited the page, staffs have to click the “Course” tab on the navigation bar.

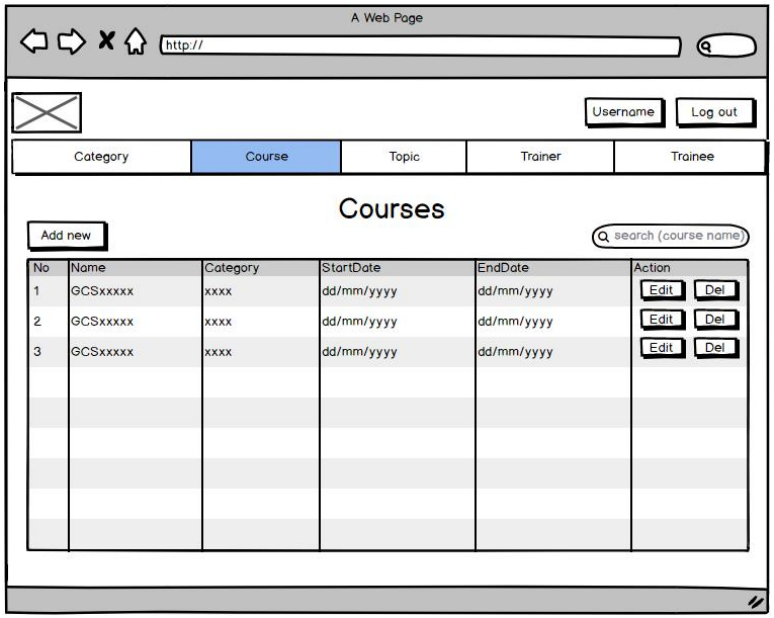

Figure 19 : Wire frame for show list of course

No	Item	Description	Constraints
1	Logo picture	The logo of the application and it is assigned the home page link.	
2	Username label	Show the username of the login account and assigned profile page link to it	
3	Log out button	User will log out the application if click on it.	
4	Add new button	User will go to add new page if click on it	

5	Search box	User can search courses via name	Min 1 characters and Max 20 characters.
6	Course table	User can see list of course	
7	Edit button	User will go to edit page if click on it	
8	Del button	User will delete course if click on it	

- **Add new course**

The below page let the staff add the new course into the system. To visit the page, admin have to click the “Add new” button in the Course main page.

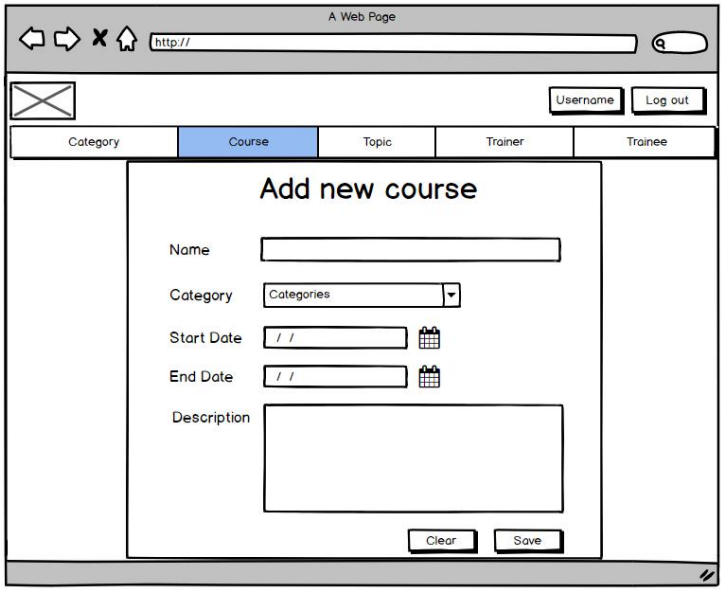

Figure 20 : Wire frame for add new course

No	Item	Description	Constraints
1	Logo picture	The logo of the application and it is assigned the home page link.	
2	Username label	Show the username of the login account and assigned profile page to it.	
3	Log out button	User will log out the application if click on it.	
4	Name text box	Input field for course name	Min 3 characters and Max 20 characters.

5	Category combo box	User can select category for course	Only includes category existing in the system.
6	Start date date input field	Input field for start date of the course	
7	End date date input field	Input field for end date of the course	
8	Description text area	Input field for description	
9	Clear button	The button will clear the value of all input field	
10	Save button	The button will save the new course into the system.	

- **Edit course**

The below page let the staffs edit the existing course. To edit the specific course, admin have to click the “Edit” button which in the same row with the course in the table.

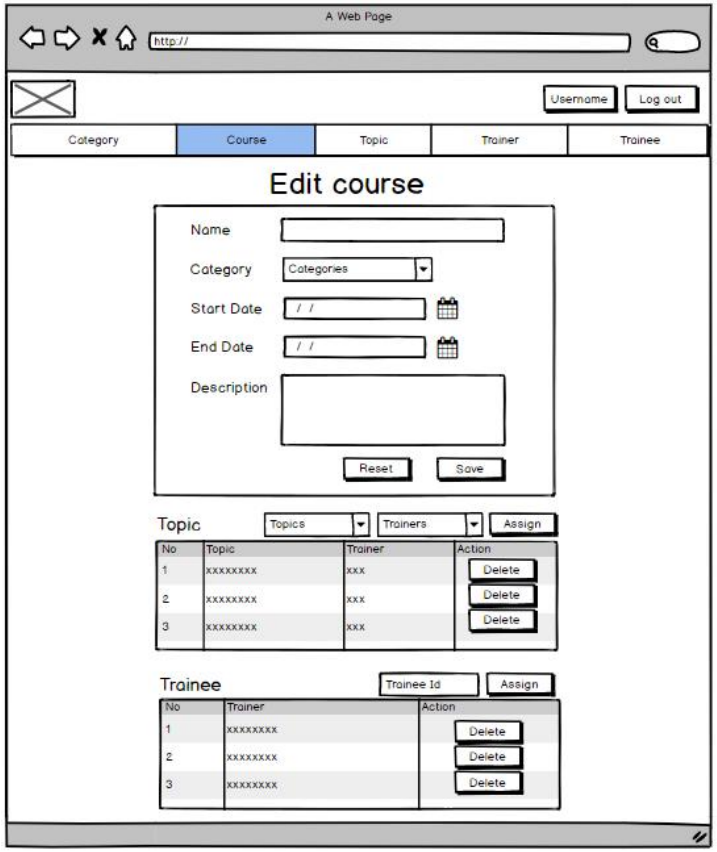

Figure 21 : Wire frame for edit course

No	Item	Description	Constraints
1	Logo picture	The logo of the application and it is assigned the home page link.	

2	Username label	Show the username of the login account and assigned profile page to it.	
3	Log out button	User will log out the application if click on it.	
4	Name text box	Input field for course name	Min 3 characters and Max 20 characters.
5	Category combo box	User can select category for course	Only includes categories existing in the system.
6	Start date date input field	Input field for start date of the course	
7	End date date input field	Input field for end date of the course	
8	Description text area	Input field for description	
9	Reset button	The button will reset the value of all input field	
10	Save button	The button will update the course information.	
11	Topic combo box	User can select topic to assign in the course	Only includes topics existing in the system
12	Trainer combo box	User can select trainer who teach the topic to assign in the course	Only includes trainers who teach the selected topic
13	Assign button 1	Assign the topic into the course	

14	Topic table	The table show list of topic which is assigned to the course.	
15	Delete button	Remove the topic from this course but not delete it	
16	Trainee id text box	User can assign trainee into course via trainee id	Integer value
17	Assign button 2	Assign the trainee into the course	
18	Trainee table	The table show list of trainees who is assigned to the course.	
19	Delete button	Remove the trainee from this course but not delete him or her	

- **Topic main page**

The below page show the list of exist topics included in the system. To visited the page, staffs have to click the “Topic” tab on the navigation bar.

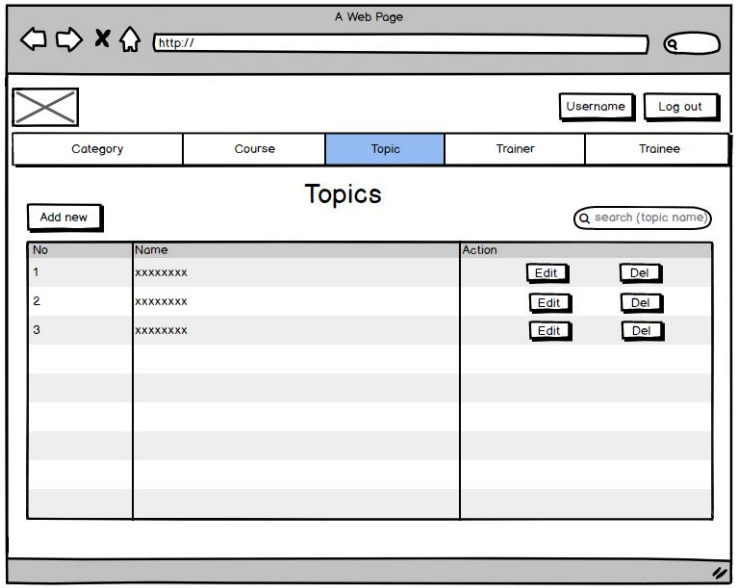

Figure 22 : Wire frame for show list of topics

No	Item	Description	Constraints
1	Logo picture	The logo of the application and it is assigned the home page link.	
2	Username label	Show the username of the login account and assigned profile page link to it	
3	Log out button	User will log out the application if click on it.	
4	Add new button	User will go to add new page if click on it	

5	Search box	User can search topics via name	Min 1 characters and Max 20 characters.
6	Topic table	User can see list of topics	
7	Edit button	User will go to edit page if click on it	
8	Del button	User will delete topic if click on it	

- **Add new topic**

The below page let the staff add the new topic into the system. To visit the page, admin have to click the “Add new” button in the Topic main page.

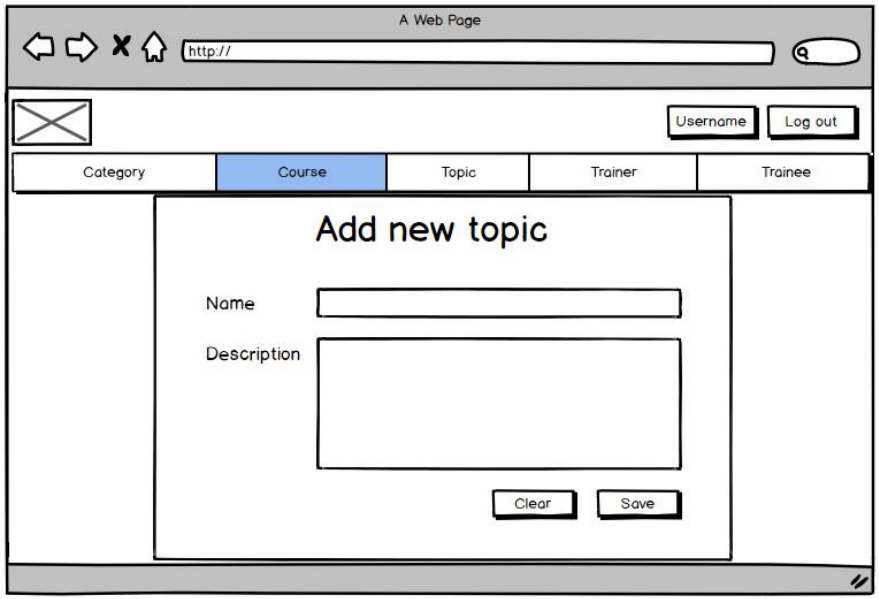

Figure 23 : Wire frame for add new topic

No	Item	Description	Constraints
1	Logo picture	The logo of the application and it is assigned the home page link.	
2	Username label	Show the username of the login account and assigned profile page link to it	
3	Log out button	User will log out the application if click on it.	
4	Name text box	Input field for topic name	Min 3 characters and Max 20 characters.

5	Description text area	Input field for description	
6	Clear button	The button will clear the value of all input field	
7	Save button	The button will save the new topic into the system.	

- **Edit topic**

The below page let the staffs edit the existing topic. To edit the specific topic, admin have to click the “Edit” button which in the same row with the topic in the table.

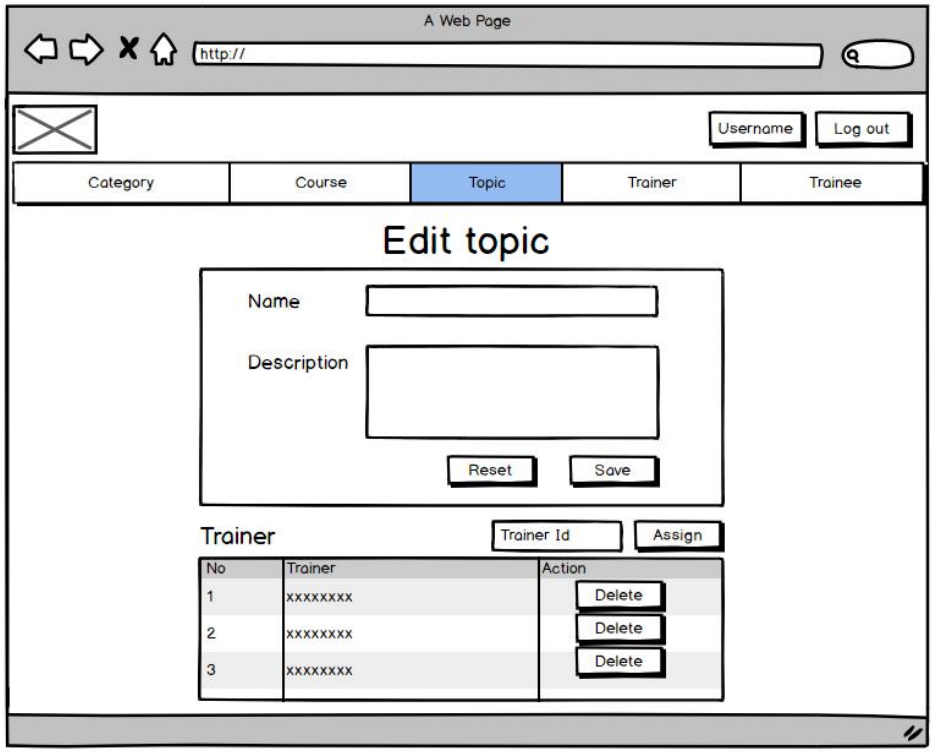

Figure 24 : Wire frame for edit topic

No	Item	Description	Constraints
1	Logo picture	The logo of the application and it is assigned the home page link.	
2	Username label	Show the username of the login account and assigned profile page link to it	

3	Log out button	User will log out the application if click on it.	
4	Name text box	Input field for topic name	Min 3 characters and Max 20 characters.
5	Description text area	Input field for description	
6	Reset button	The button will reset the value of all input field	
7	Save button	The button will update the topic information	
8	Trainer id text box	User can assign trainer into topic via trainer id	Integer value
9	Assign button	Assign the trainer into the topic	
10	Trainer table	The table show list of trainers who is assigned to the topic.	
11	Delete button	Remove the trainer from this topic but not delete him or her	

- **Trainer main page**

The below page show the list of exist Trainers included in the system. To visited the page, staffs have to click the “Trainer” tab on the navigation bar.

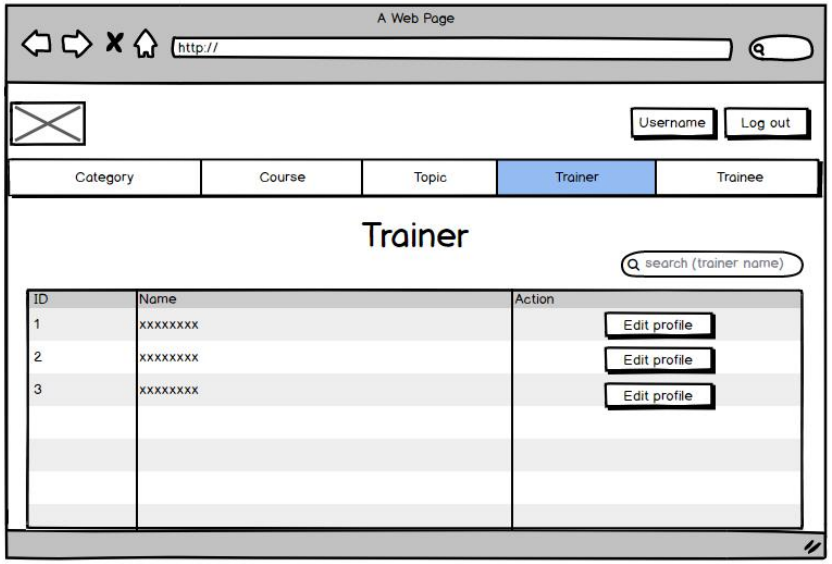

Figure 25 : Wire frame for show list of trainers

No	Item	Description	Constraints
1	Logo picture	The logo of the application and it is assigned the home page link.	
2	Username label	Show the username of the login account and assigned profile page link to it	
3	Log out button	User will log out the application if click on it.	
4	Search box	User can search trainers via name	Min 1 characters and Max 20 characters.

5	Trainer table	User can see list of trainers	
6	Edit button	User will go to edit page if click on it	
7	Del button	User will delete trainer if click on it	

- **Edit trainer profile**

The below page let the staffs edit the profile of existing trainer. To edit the specific trainer profile, admin have to click the “Edit profile” button which in the same row with that trainer in the table.

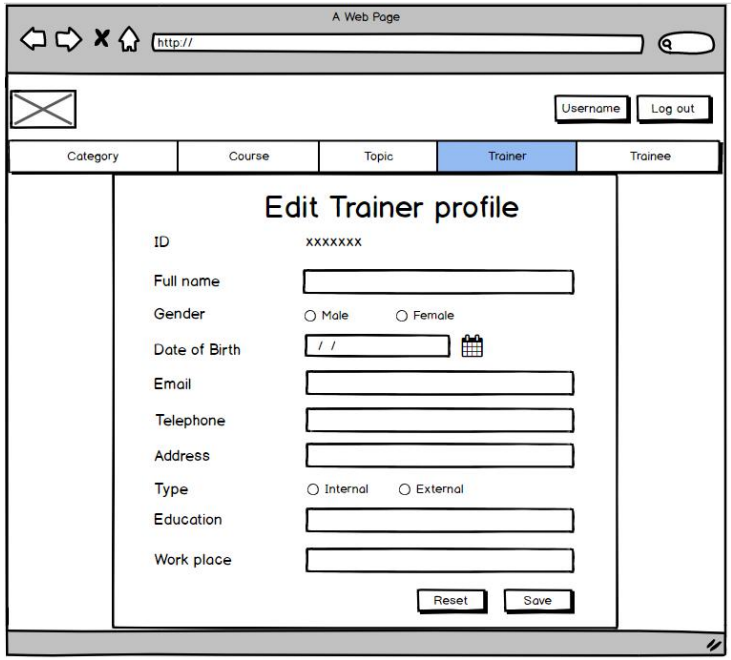

Figure 26 : Wire frame for edit trainer profile

No	Item	Description	Constraints
1	Logo picture	The logo of the application and it is assigned the home page link.	
2	Username label	Show the username of the login account and assigned profile page link to it	
3	Log out button	User will log out the application if click on it.	
4	Id label	Display the id of trainer	
5	Full name text box	Input field for trainer name	Min 3 characters and Max 20 characters.
6	Male and female radio button	User can select trainer gender	
7	Date of birth date input field	Input field for date of birth	
8	Email text box	Input field for email	Email syntax
9	Telephone text box	Input field for phone number	Only number characters
10	Address text box	Input field for address	Min 3 characters
11	Internal and external radio button	User can select trainer type	
12	Education text box	Input field for education	Min 3 characters and Max 20

			characters.
13	Work place text box	Input field for work place	Min 3 characters
14	Reset button	The button will reset the value of all input field	
15	Save button	The button will update the trainer profile information.	

- **Trainee main page**

The below page show the list of exist trainees included in the system. To visited the page, staffs have to click the “Trainee” tab on the navigation bar.

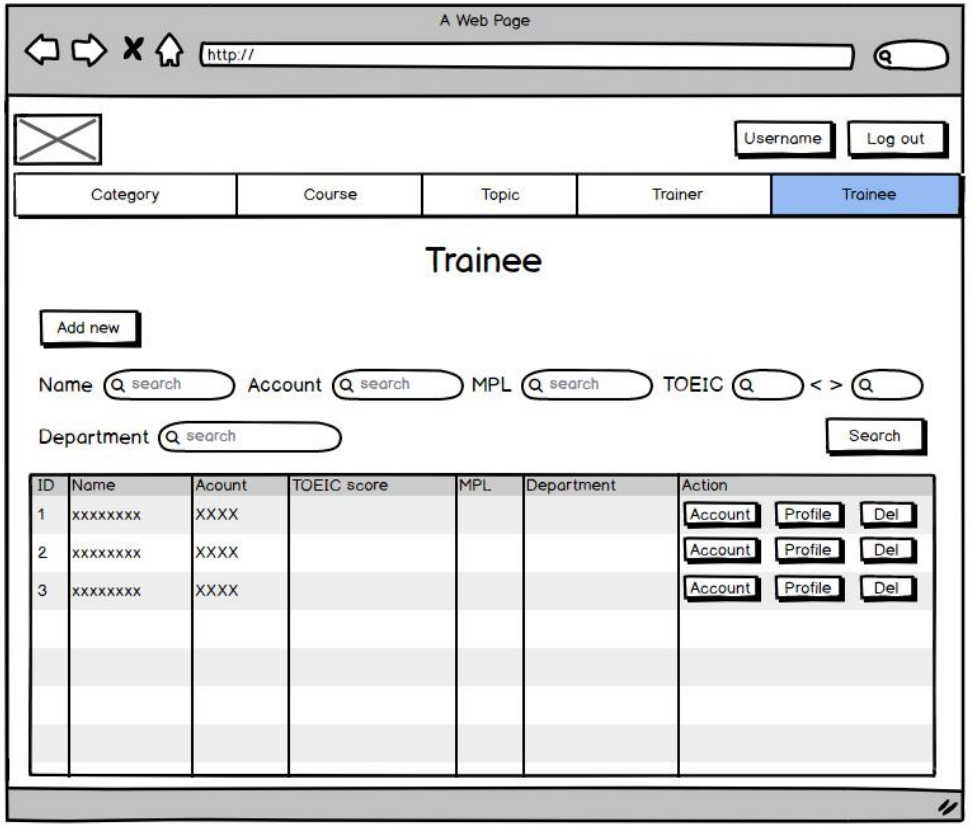

Figure 27 : Wire frame for show list of trainee

No	Item	Description	Constraints
1	Logo picture	The logo of the application and it is assigned the home page link.	
2	Username label	Show the username of the login account and assigned profile	

		page link to it	
3	Log out button	User will log out the application if click on it.	
4	Add new button	User will go to add new page if click on it	
5	Full name search box	User can search trainee via trainee name	Min 1 characters and Max 20 characters.
6	Account name search box	User can search trainee via account username	Min 1 characters and Max 20 characters.
7	MPL search box	User can search trainee via main programming language	Min 1 characters and Max 20 characters.
8	TOEIC search box 1	User can search trainee which is higher the specific value	- Integer value - Min 0 and Max 1000
9	TOEIC search box 2	User can search trainee which is lower the specific value	- Integer value - Min 0 and Max 1000
10	Department search box	User can search trainee via department	Min 1 characters and Max 20 characters.
11	Search button	User can search trainee if click on it	
12	Trainee table	User can see list of trainee	

13	Account button	User will go to trainee account edit page if click on it	
14	Profile button	User will go to trainee profile edit page if click on it	
15	Del button	User will delete trainee if click on it	

- **Add new trainee account**

The below page let the staff add the new trainee account into the system. To visit the page, admin have to click the “Add new” button in the Trainee main page.

Figure 28 : Wire frame for add new trainee account

No	Item	Description	Constraints
1	Logo picture	The logo of the application and it is assigned the home page link.	
2	Username label	Show the username of the login account and assigned profile page link to it.	
3	Log out button	User will log out the application if click on it.	
4	Username text box	Input field for username	Min 3 characters and Max 20 characters.
5	Password text box	Input field for password	Min 3 characters and Max 20 characters.
6	Re-password text box	Input field for re-password which will check the input password again	- Min 3 characters and Max 20 characters. - Value similar with password text box
8	Clear button	The button will clear the value of all input field	
9	Save button	The button will save the new account into the system.	

- **Edit trainee account**

The below page let the staffs edit the username and password of existing trainee account. To edit the specific account, admin have to click the "Account" button which in the same row with that trainee in the table.

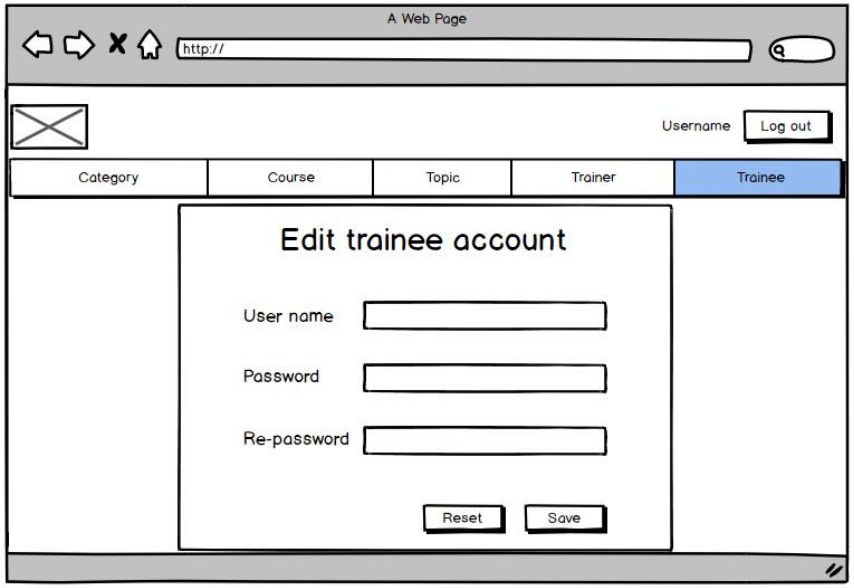

Figure 29 : Wire frame for edit trainee account

No	Item	Description	Constraints
1	Logo picture	The logo of the application and it is assigned the home page link.	
2	Username label	Show the username of the login account and assigned profile page link to it.	
3	Log out button	User will log out the application if click on it.	

4	Username text box	Input field for username	Min 3 characters and Max 20 characters.
5	Password text box	Input field for password	Min 3 characters and Max 20 characters.
6	Re-password text box	Input field for re-password which will check the input password again	- Min 3 characters and Max 20 characters. - Value similar with password text box
8	Reset button	The button will reset the value of all input field	
9	Save button	The button will update the account information.	

- **Edit trainee profile**

The below page let the staffs edit the profile of existing trainee. To edit the specific trainee profile, admin have to click the “Profile” button which in the same row with that trainee in the table.

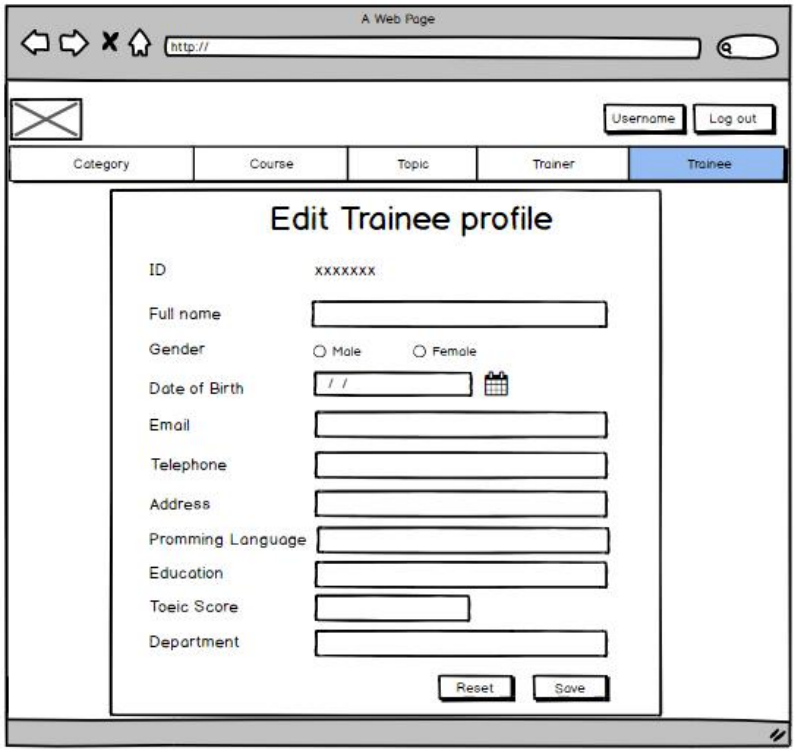

Figure 30 : Wire frame for edit trainee profile

No	Item	Description	Constraints
1	Logo picture	The logo of the application and it is assigned the home page link.	
2	Username label	Show the username of the login account and assigned profile page link to it	

3	Log out button	User will log out the application if click on it.	
4	Id label	Display the id of trainee	
5	Full name text box	Input field for trainee name	Min 3 characters and Max 20 characters.
6	Male and female radio button	User can select trainee gender	
7	Date of birth date input field	Input field for date of birth	
8	Email text box	Input field for email	Email syntax
9	Telephone text box	Input field for phone number	Only number characters
10	Address text box	Input field for address	Min 3 characters
11	Programming language text box	Input field for programming language	Min 1 characters and Max 20 characters.
12	Education text box	Input field for education	Min 3 characters and Max 20 characters.
13	TOEIC Score number input field	Input field for trainee TOEIC score	- Integer value - Min 0 and Max 1000
14	Department text box	Input field for department	Min 3 characters and Max 20 characters.

15	Reset button	The button will reset the value of all input field	
16	Save button	The button will update the trainee profile information.	

3.4. Login as Trainer

- **Home page**

In the home page, trainers will see list of courses they have to teach. In here, they can also see the topics they are assigned to.

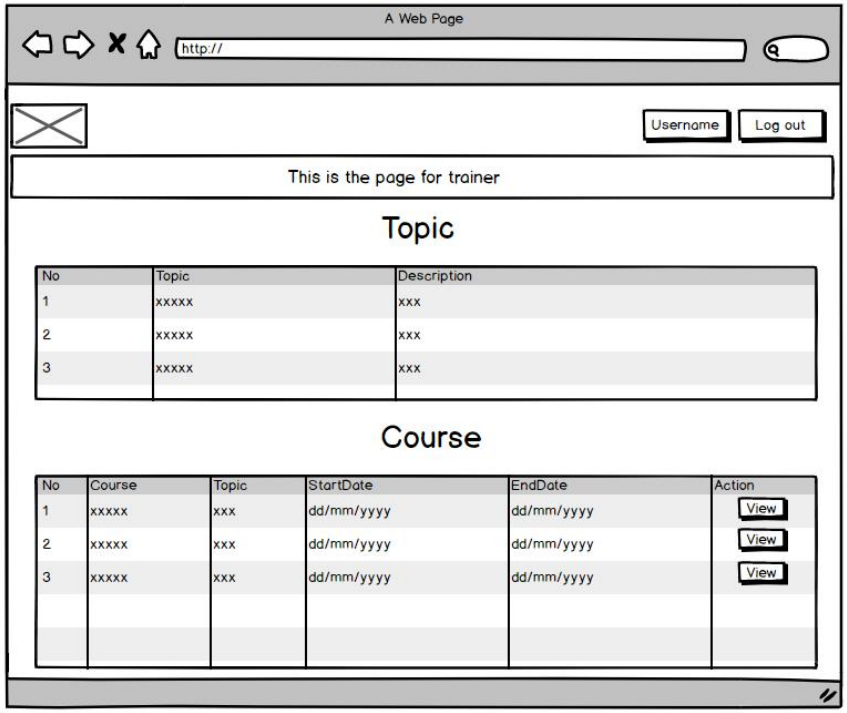

Figure 31 : Wire frame of home page for trainer

No	Item	Description	Constraints
1	Logo picture	The logo of the application and it is assigned the home page link.	
2	Username label	Show the username of the login account and assigned profile page link to it	
3	Log out button	User will log out the application if click on it.	
4	Topic table	User can see list of topics they are assigned to	
5	Course table	User can see list of courses they are assigned to	
6	View button	User will go to page show course detail information if click on it	

- **Profile page**

The below page show the profile information of trainer. In here, trainers can edit their profile by click the “Save” button after change the information. Furthermore, the Profile page can be visited easily by click the button “Username” in the above right corner.

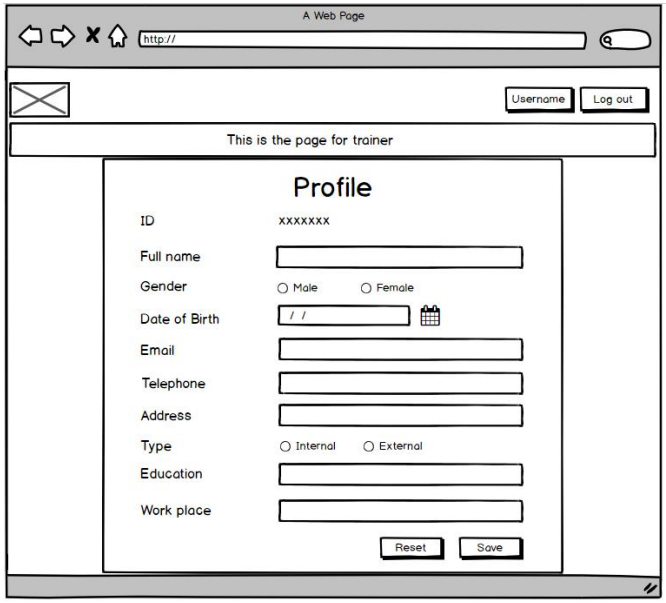

Figure 32 : Wire frame for trainer profile page

No	Item	Description	Constraints
1	Logo picture	The logo of the application and it is assigned the home page link.	
2	Username label	Show the username of the login account and assigned profile page link to it	
3	Log out button	User will log out the application if click on it.	
4	Id label	Display the id of trainer	

5	Full name text box	Input field for trainer name	Min 3 characters and Max 20 characters.
6	Male and female radio button	User can select trainer gender	
7	Date of birth date input field	Input field for date of birth	
8	Email text box	Input field for email	Email syntax
9	Telephone text box	Input field for phone number	Only number characters
10	Address text box	Input field for address	Min 3 characters
11	Internal and external radio button	User can select trainer type	
12	Education text box	Input field for education	Min 3 characters and Max 20 characters.
13	Work place text box	Input field for work place	Min 3 characters
14	Reset button	The button will reset the value of all input field	
15	Save button	The button will update the trainer profile information.	

- **Course detail page**

In the Course detail page, trainers will see the detail of the course. Also they can see the list of trainees who are assigned to the course. To see the specific course detail, trainers have to click the “View” button which in the same row with that course in the table located at home page.

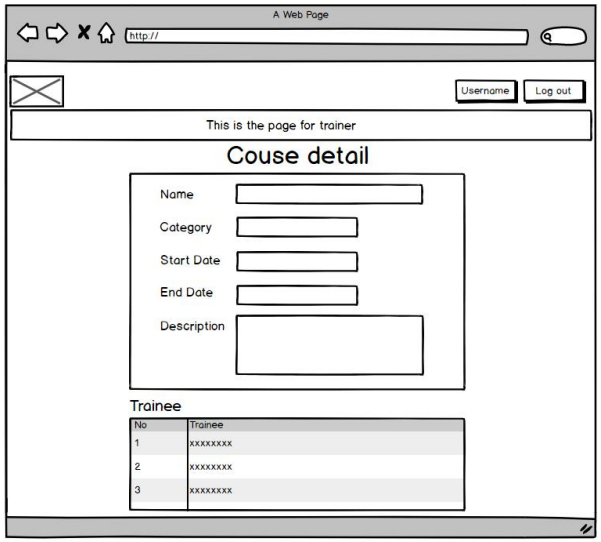

Figure 33 : Wire frame for show the detail of course

No	Item	Description	Constraints
1	Logo picture	The logo of the application and it is assigned the home page link.	
2	Username label	Show the username of the login account and assigned profile page to it.	
3	Log out button	User will log out the application if click on it.	

4	Name text box	Display the course name	Read only
5	Category text box	Display category of the course	Read only
6	Start date text box	Display start date of the course	Read only
7	End date text box	Display end date of the course	Read only
8	Description text area	Display the description	Read only
9	Trainee table	The table show list of trainees who is assigned to the course.	

3.5. Login as Trainee

- **Home page**

In the home page, trainees will see list of courses they have to took.

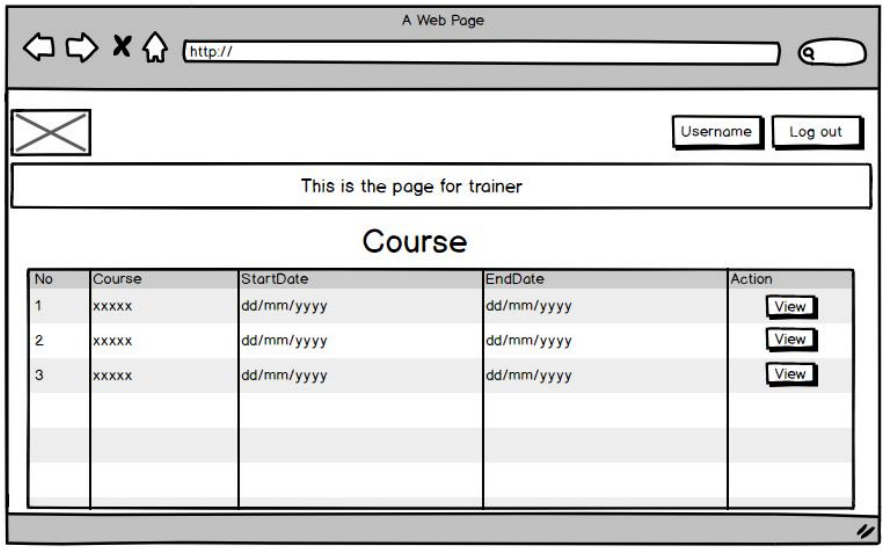

Figure 34 : Wire frame of home page for trainee

No	Item	Description	Constraints
1	Logo picture	The logo of the application and it is assigned the home page link.	
2	Username label	Show the username of the login account and assigned profile page link to it	
3	Log out button	User will log out the application if click on it.	
4	Course table	User can see list of courses they are assigned to	
5	View button	User will go to page show course detail information if click on it	

- **Profile page**

The below page show the profile information of trainee. In here, trainees can edit their profile by click the “Save” button after change the information. Furthermore, the Profile page can be visited easily by click the button “Username” in the above right corner.

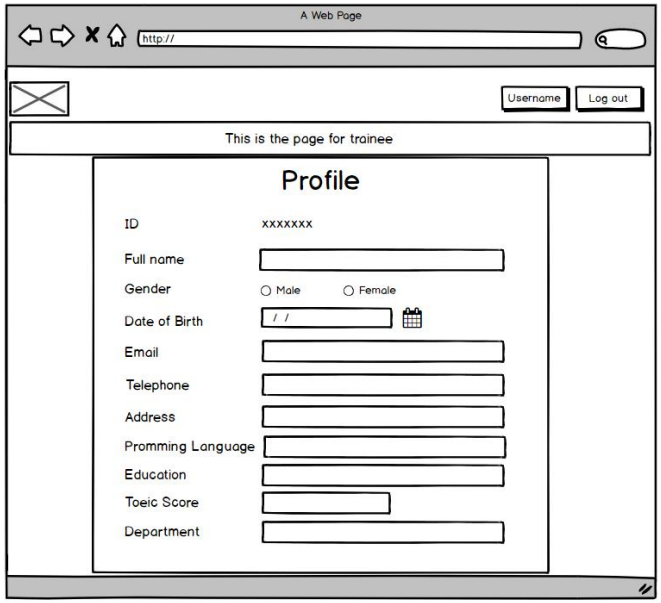

Figure 35 : Wire frame for show profile of trainee

No	Item	Description	Constraints
1	Logo picture	The logo of the application and it is assigned the home page link.	

2	Username label	Show the username of the login account and assigned profile page link to it	
3	Log out button	User will log out the application if click on it.	
4	Id label	Display the id of trainee	
5	Full name text box	Display trainee name	Read only
6	Male and female radio button	Display trainee gender	Read only
7	Date of birth date input field	Display date of birth	Read only
8	Email text box	Display email	Read only
9	Telephone text box	Display phone number	Read only
10	Address text box	Display address	Read only
11	Programming language text box	Display programming language	Read only
12	Education text box	Display education	Read only
13	TOEIC Score number input field	Display trainee TOEIC score	Read only
14	Department text box	Display department	Read only

- **Course detail page**

In the Course detail page, trainees will see the detail of the course. Also they can see the list of trainers and the topics they will teach in the course. To see the specific course detail, trainers have to click the “View” button which in the same row with that course in the table located at home page.

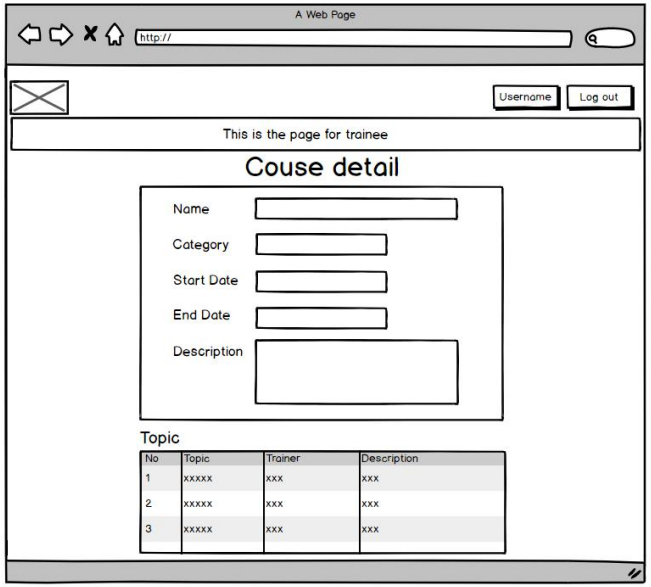

Figure 36 : Wire frame for show the course detail

No	Item	Description	Constraints
1	Logo picture	The logo of the application and it is assigned the home page link.	
2	Username label	Show the username of the login account and assigned profile page to it.	

3	Log out button	User will log out the application if click on it.	
4	Name text box	Display the course name	Read only
5	Category text box	Display category of the course	Read only
6	Start date text box	Display start date of the course	Read only
7	End date text box	Display end date of the course	Read only
8	Description text area	Display the description	Read only
9	Topic table	The table show list of topic, which is assigned to the course, and its trainer	

4. Table of questions to identity the risk

No	Questions	Answers
1	In the requirement do not includes the role of trainees. Should we allow trainees to login the application?	Although these are no specific detail of role for trainee, the application should allow them to participate. Because it is quite inconvenience for trainees if they can not check the courses schedule. My suggestion is to provide the interface to let trainee see their courses schedule.

2	In the use case diagram of trainee, we only let them to see the theirs profile information but do lot let them modify it. For better convenience, we should allow the permission for trainers , shouldn't we?	The requirements of the application does not require to specific functions to trainees. Providing so many permission to trainees is not necessary. Furthermore, in my opinion, trainees should not be allowed to modified their profile in most case. Therefore, it is quite risky to programme this function to the application.
3	In the ERD, I see that it does not include the table for admin. According to the requirement, admin take an important role in the system. It is inappropriate for not having the data for the admin, isn't it?	The problem was considered before designing the ERD. The answer is unnecessary for including the data of administrators. Because the data seem kind of redundant, the table is eliminated from the ERD. However, these are still some percentages to cause errors for the application. Therefore, we have prepared several plans to fix the possible risks when it happens.
4	The designed wire frame of the application seems quite simple. This may cause the customer to unsatisfied with the interface. Should we use the more attractive design?	The application is designed for education purpose. Therefore, attractive design was not considered. However, to ensure the satisfaction of customer, the design will be presented to them before programming. If they are not satisfied by the interfaces, the attractive design will be considered.

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