E-EDUCATION PORTAL FOR STUDENTS AND TUTORS

BY

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ABSTRACT

The purpose of this project is to develop a lower entry barrier, multi-language support, easy matching of tutors with students and more functionalities web application compared to existing websites currently available in Malaysia.

Firstly, this web application is able to create more job opportunities for tutors by enabling tutor to post their available classes to the public and apply for the tender submitted by parents. Besides that, using this web application enable tutors to view and schedule their time table for student classes more easily.

Secondly, parents are able to gain a lot of benefits from using this web application it enables them to lower the cost in searching for suitable tutors according to nature classes or geographical location that are available or tender submitted by tutor. This web application also enables parents to keep themselves with their children performance in classes via the report given by tutors. Parents are more motivated to care for their children when they are able to monitor the academic performance of their children.

Lastly, for students, they will be gaining benefits in terms of academic performance when they use forum to communicate with their classmates and tutors after school in order to discuss about problems that they face in classes.

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LIST OF ABBREVIATIONS

AJAX	JavaScript + XML
API	Application Programming Interface
CGI	Common Gateway Interface
CSS	Cascading Style Sheets
EE	Enterprise Edition
EJB	Enterprise JavaBeans
HTML	HyperText Markup Language
IDE	Integrated Development Environment
JMS	Java Message Service
JPA	Java Persistence API
JSF	JavaServer Faces
JSP	JavaServer Pages
MVC	Model View Controller
SDK	Software development kit
SQL	Structure Query Language
UML	Unified Modeling Language
WWW	World Wide Web
XML	Extensible Markup Language

CHAPTER 1: PROJECT BACKGROUND

1.1 BACKGROUND INFORMATION

Today, when mention about tuition classes, first came to our mind is the words meaning paying some money for acquire tutors to get some instruction or training on certain subjects at nearby tuition center classes or private tuition that required tutors carry out at our own house. Tuition is more frequent occur on primary and secondary school students in Malaysia according to the survey done. According to survey analysis, 90% of parents in Malaysia willing sent their primary and secondary school children to take extra tuition classes after school that conducted by Malaysia government or private schools. This is because parents hope their children able to improve in academic performance on weaker subject areas. Traditionally, parents will search or get information for tutors via the word of mouth from friends, family members, flyer sent by local tuition center or local tuition institute. However, in this information era, parents and tutors matching websites become more and more common as the technological advancement became more widespread. This provided another alternative solution for parents to choose to find suitable tutors. Besides, tutors also grab more job opportunities to advertise their current and future available classes to public more easily.

Searching for suitable candidate to teach their children is not an easy task because traditionally parents have limited information about availability of tutors within parents' housing areas. Therefore, recently the tutors and parents matching websites in Malaysia are became more and more common. Nowadays, Malaysia for similar tutors and parents matching functionalities websites are more common in term of increasing similar websites count. Some websites enable browser to view the availability of geographical location of tutor via pointed in Google maps. Besides, some website support with multiple platform such as enable different feel and control for browsing in computer browser and smartphone handheld devices. In additional, some websites have auction system that allow parents to post their requirements for searching suitable candidate to teach their children.

For this project, the website development will develop based on the combination of best website functionalities for the matching parents and students to obtain better users satisfaction, ease of use and lower entry barrier mainly for parents and tutors in

Malaysia. In order to do so, the literature review on existing similar websites has been done to study which web application having advantage over another web application and which web application is non-functional features or not necessary features. In additional, conference papers have been review to study functionalities able to help increase the students' academic performance. Besides, the parents and tutors' opinions also been taken via survey sent out. This contribute to better consideration for developing the website that eventually will meet the expectation and features it shall be provided.

Parents and tutors matching websites mainly is provided a platform that allow tutors to be easier to reach by parents through internet access at home. Besides, the websites create job opportunities for tutors by listing their own profile to allow access by parents. Most of the tutor matching website is created for the reason to provide convenient for parents that having difficulties to reach and get suitable tutors for their children through the physical searching within their own residential areas. Therefore, parents and tutors matching websites mostly will provide 24/7 availability for searching using computer devices or handheld devices in home through internet. Most of the similar type websites able to provide search services that able to highlight existing nearby parent's residential area have which tutors available. Therefore, parents do not required to waste time to physically search in their nearby housing areas.

This project involves the development of a website that able to provide a platform for the parents to search for suitable tutors and hire as their children's tutor. Purpose of this project mainly is to develop a better and more functionalities web application compare to some existing websites been review in this report later on. The web application will play a role to connect tutors in Malaysia to provide easy access platform for parents. The functionalities of this website is try to solve the problem define by the multiple problems in research from multiple researches' researches and reports. The website develop will based on model-view-controller architecture and using multiple technologies such as HTML, Java Servlet, JavaScript, CSS, JSP, JSF, JMS, JPA, AJAX, EJB and flash.

1.2 PROBLEM STATEMENT

Online tutor websites has existed in the market about a decade in Malaysia but still having a lot of problem remain unsolved. For instance, some current websites in Malaysia only able to search for private tutor, which is a not affordable and it will be a huge financial burden for most parents because parents not only need to pay to the tutors are hired, and parents still required to pay the member fees for the website's registered (Sloep P, et al. 2006, p. 4). Besides, it is more efficient and effective to teach students by grouping them according their learning stage (Motonori T, et al. 1998, p. 1-6). For example, grouping the same academic progress students into a group for every subjects. Therefore, it is essential to intelligence suggest suitable teaching method according parents' financial affordable rate. For example, suggest private tutor come in house deliver one to one lesson to children to above average financial status families and suggest more affordable price to parents' children attend traditional lesson with other students that group together according their learning stage during the classroom.

Moreover, for the students having private tutors, this method promote lone learner that not beneficial for children due to unable to solved the social isolation issues (Sloep P, et al. 2006, p. 4). This problem will promote students to be a passive learners, this mean among students no interaction with each other and cannot enhance their knowledge after classroom ended (Nori-Motlagh M, et al. 2013, p. 130). Besides, study show that existing web learning system lack of tutor's guidance for every students using online learning (Nan W & Ai-Ling Q 2011 p. 1233-1235). Besides, research done by Yan Hu and Gang Zhao found that visualization for distance learning will dramatically increase student understanding about the topic discuss and learn faster than without any visual graphic aid system (Yan H & Gang Z 2010 p. 34-38). Therefore, a system that not only having general forum for all students in the website to share knowledge among themselves, but tutor able to opt to create for their own students discussion room to distribute additional study materials that provide guideline that able help students. In addition, graphical design interface also will improve the students understanding by allow to post picture and animation in the forum (Yan H & Gang Z 2010 p. 34-38). This ultimately will promote knowledge understanding though further debate among students after when they having discussion with other students.

Besides, research from Amirul Azuani Romle and Dalbir Singh found that continuously parents' involvement will motivate their children to achieve higher academic's performance in their school (Nori-Motlagh M, et. al. 2013, pp. 130-133). However, as current market available websites in Malaysia, there is only allow for minimal or no parents involvement, which mean that parents will not know details about their children learnt what topic in classroom and their children performance. Therefore, a website functionalities that can report progresses about their children and feedbacks, comments between tutors and parents is essential for every parents because it able to save parents time that required physically approach tutors. In additional, it is essential for parents view tutor's ranking posted by other parent will encourage parent make more suitable decisions.

Nowadays, many parents are not easy to find suitable tutors for their children, especially in the city areas. Therefore, the motivation of this project is to help parents to find suitable tutors for their children via the web application of this project. Firstly, for the parents who wanted search for tuition classes, main objective is let parents aware of the availability of tutors as close as possible in their housing area. Therefore, parents able to save cost and time to send their children to tuition every time. Secondly, for the parents who wanted search for private tutor, according to Sloep, private tutor is too costly for some families hire for their children (Sloep P, et. al. 2006, pp. 1-4). Therefore, is it better to send their children to tuition outside than own house or find a nearby private tutor via this project web application because those tutors able to lowering down the travelling cost to parent location to provide their services.

Besides, for some existing parents and tutors matching website in Malaysia, it required a monthly services fees before allow the parents to use the full functionalities in the website (Wang 2011, p. 1-4) or only provided 1 to 1 tutoring services only. This will cost too high for some parents to afford it. Existing web application create entry barrier for parents to think twice before register and try it out the services. Thus, this motivate me to develop a project's website that low entry barrier that will not direct charge any member fees and service fees from parents, but only will charge some fees to tutors itself after success get their own first student and received their wage. Therefore, for the parents' point of view, this web application is totally free of charges, just only the cost using computer devices or even mobile devices access the web application using internet, for the tutors' point of view, the tutors will not face any fees

from the web application when they register as a tutor in this website, only they will be charge a small portion of service fees to maintain website after confirmed success found at least a customer and received they first pay from their customer respectively.

Lastly, most of the parents will send their own children to take extra class after school. However, most of the parents will not constantly taking care about what topic or lesson their children learnt. In additional, parents' involvement in their children academic proven will increase their children academic performance (Romle A & Dalbir S 2011, p. 1-6). Therefore, develop this website not only benefit to students, but only will benefits parents by know that their money is well spent on the tutoring classes that their children required to attend. Therefore, for this web application project, a forum will be created in order to let tutors and parent interact with each other to keep update themselves about what going on for the children learning. Parents and tutors able to use the forum report and update information about the learner itself academic performance, homework, announcement on classes and many others.

1.3 PROJECT OBJECTIVE

The main objective of this project is to develop a web application platform for the parents and tutors to interact, hire and learning among each other. This website allow the all tutors register and gather within network to form a community that allow easier access by parents at one stop searching for new tutors. Besides, the forum will act as a student, parent and tutor gathering community to share information, thought and etc.

This project objectives listed as follow:

1) To develop search capable web application that enable easier for users to access suitable tenders and classes.
2) To develop a discussion forum for parents, students and tutors sharing information with public and private communication among each other.
3) To develop ranking, comment and feedback system for assess parents and tutors.
4) To develop tender system enable parents to add open tenders and let suitable tutor to apply a tender.
5) To develop web application support English, Malay and Chinese languages.

1.4 PROJECT SCOPE

In general, this project mainly involved in develop a web application that act as medium to provide matching services between parents and tutors within Malaysia to allow local parents to contact tutors more easier and locate suitable tutors for their children. For tutors, this web application enable tutors to search for jobs easier. The development's functionalities will based on below several assumption:

i. This project main web application services that provide will limited within the geographical area within Malaysia only. Although for foreign users function are not limited, but the web application only able to handle schedule future classes that only locate in within Malaysia.
ii. All functionalities for this web application mainly is develop for parents and tutors except interactive forum that provide service for all members including students to interact with each other members.
iii. The web application will not handle the parents' various payment for the tutor service fees. Although referral fee will be charge on tutors, but all tutors' service fees will received directly from parents.
iv. All users involve in this web application website will able to use the services 24/7 with only internet connection to World Wide Web (WWW) only.
v. All users access the web application through HTTP internet protocol enable devices such as mobile smart-phone, personal computer and other capable web browsing devices.
vi. All users involve in this web application will play its own role such as for administrator is to manage web application, search job opportunity for tutors, searching and handling routine for parents, and communication services for all students, tutors and parents.

The vision of this web application is providing services that targeted low barrier entry for all parents and tutors by introduce low cost services fees compare to existing similar commercial website. Therefore, this web application only will ask for small amount fee to tutors as they success to enroll new student and got their first paid. Above and beyond, this project will aim as the large community gather place for tutor to gather and search for job opportunity available through online.

1.5 IMPACT, SIGNIFICANCE & CONTRIBUTION

This project mainly is to solve the problems mention in the problem statement that current tutor matching websites found are not solve the problems well or completely. For example, like My Private tutor website that only promote lone learner in which situation that a student are completely isolated from the schoolmate and parent's involvement that cannot promote understanding of knowledge through further debate between schoolmate (Nan W & Ai-Ling Q 2011 p. 1233-1235). Therefore, this project will develop a better platform that allow multiple kind of tuition type services offer from tutors. The services will extended from existing private home tutoring class to private home classroom, public classroom and 1 to 1 tutoring class.

Meanwhile, for Tuition Mall website that only implement static learning system without any involvement from children's parent and all students will become a passive learner that will not get any guidance by the tutors if using the online learning application that study proven that will less effective for students to learn (Romle A & Dalbir S 2011, p. 1-6). In additional, all of the websites will show in the later review are not implemented any comment and feedback system fully in their internal website that allow tutors to update parents about their children learning progress or any comments that eventually help parents' involvement and guide their children as needed. Therefore, this website will develop systems for enable parents and tutors to perform functionalities such as comments, report, discuss, guidance and feedback.

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

Nowadays, 52% of parents in Malaysia facing difficulties providing academic guidance to their children at home (Romle A & Dalbir S 2011, pp. 1-6). This is because syllabus has changed frequently from time to time. This result generation gap that today syllabus unlike the syllabus learnt from their parents' generation (Romle A & Dalbir S 2011, pp. 1-6). Therefore, most of the parents will opt to send their children take extra lessons after school hours or during holiday's period. Today's extra tutoring or private tutor is mostly obtain by referral among friends and family or direct contact via phone, website or email with tutors by hunting tutor website. Based on survey done by Amirul Azuani Romle and Dalbir Singh, they found that 23% parents cannot find suitable tutors for their children in Malaysia by using traditional ways obtain tutor via the referral among friends and family (Romle A & Dalbir S 2011, pp. 1-6). This is due to family members or friend facing similar issue on limitation of knowledge that only able obtain related information via flyer, advertisement locally. Therefore, parents is beneficial if they can acquire suitable tutors via a central website that able to search for suitable tutor for their children at home without physically searching in the nearby residential area or referral from other that could give bias opinion or limited by the tutors' sources.

2.2 WEBSITES COMPARISON

In present time, some websites do provided tutoring services already implement in Malaysia. Table 2.1 below show 12 features for each websites been compare their differences between each other. First of all, feature compared such as "Handheld device mode" descript the website able to shrink the website layout to display in smaller smart-phone screen for handheld devices ability. Then, for "Parents' search functionalities", it compare each website in term of the ability for parents directly contact wanted tutor by internal or external functionalities such as internal private message function or ability to get tutor's contact information such as cell phone number, email address or etc. Above and beyond, Table 2.1 show the comparison of the websites' service fee charge to tutors or parents. For parents' side, it is compared in term of the website required to pay registration fee, pay recurring member fee or subscription of additional

recurring services fee such as learning games or online lesson. For tutors' side, it is compared in term of the website required tutors to pay registration fees, recurring member fees or subscription fee for additional service such as helping tutor to matching parents or referral fees after success acquire student from their website's services.

Websites that listed in Malaysia internet domain has been chosen 6 out of all available existing websites. The table below is showing comparison between the 6 websites in term of capability of features provided:

Table 2.1 Comparison between tutor websites in Malaysia.

Websites / Feature	Tuition Mall	MyAone Learning	Grad-tutors	My Private Tutor	A+ Home Tuition	Tutor2u
Handheld device mode	√	√	x	x	√	x
Multi-language support	x	x	x	x	x	x
Tutor's no registration fees	√	√	√	√	√	√
Tutor's no member fees	x	x	√	x	√	√
Tutor's no subscription fees	√	√	√	x	√	√
Tutor's no pay referral fees	x	x	x	√	x	√
Parent's no registration fees	√	√	√	√	√	-
Parent's no member fees	√	√	√	√	√	-
Parent's no subscription fees	x	√	√	x	√	-
Forum for members	√	x	x	x	x	x
Parents' search functionality	√	x	√	√	x	√
Parents' direct contactable	√	x	x	√	x	x
Parent's post offer for tutor	√	x	√	√	x	x

*Tutor2u website parent's is not required to register as a member. Handheld device mode descript website ability shrink content for display in small handheld devices' screen.

2.2.1 REVIEW OF TUITION MALL WEBSITE

Figure 2.1: Tuition Mall website. (Greentail Marketing 2014)

Out of the 6 websites, Tuition Mall is the best commercial website in term of the functionalities completeness at Greentail Marketing S/B's *tuition mall in Malaysia home tuition* (2014). It not only equipped with the basic functions such as matching parents and tutors, but is also provided online tuition games and online tuition programs for the students. However, add-on functionalities in Tuition Mall website are not available for normal members. For example, parent posting tuition job offer, which is a kind of open tender quotation for a tutor to apply, then tuition centre directory or admin will help parent listing then tender post to make public in the website. Lastly, Tuition Mall website is regrettable that this website cannot support in the handheld device mode. That mean that Tuition Mall website browsing using ordinary mobile smartphone devices will display all content very tiny font. To improve the website, it is suggested Tuition Mall add-on smartphone screen mode that able to browse easier in the smartphone devices as today mostly every user own a smartphone, this make users more convenient access the Tuition Mall website.

2.2.2 REVIEW OF MY A ONE LEARNING WEBSITE

Figure 2.2: My Aone Learning Website. (My A One Learning, 2014)

Secondly, for My A1 Learning website at My Aone Learning's *my Aone tutor home tuition Malaysia* (2014), the strength is able use graphical Google maps to display all the available tutors' home or tuition classes address to help parents desire the nearest tutor available in their own residential area. Furthermore, this website introduce alternative access method by using app provided in Android devices and Apple devices that able to download and install in Google Play store or Apple Appstore. Nonetheless, this website not allow parents to direct deal with any tutor wanted to choice, it must go through the website administrator intermediate to handle for parents' every requests. In additional, this website do not provide any search functionalities for parents to direct post any tender offer for tutors. In short, this is a typical commercial website only focus on the return of the services provided for matching parents and tutors.

2.2.3 REVIEW OF GRADTUTORS WEBSITE

Figure 2.3: Gradtutor.my website. (Home Tuition Agency 2011)

Thirdly, for Grad-tutors website at Home Tuition's *home tuition Malaysia* (2011), it main page display ranking for each every tutors to suggest parent that visit to allow them to desired good option for parents to choose as their children tutor. Besides, the website allow parents to add tutors as their favorite's tutor for them. However, the tutors profile are not consistent because the registration do not enforce or even suggest each tutor to upload their personal image. Therefore, most of the tutors images listed in the search result are leave blank. This give us an image that the tutor not professional. Furthermore, it do not have any communicate capability between parents and tutors such as blog, forum or private message functionalities in this website. In short, Grad-tutor website lack of proper management their information show to visitor. Therefore, to improve the website, it is strongly suggested that administrators of Grad-tutor website filter some tutors that is not active for a period of time and enforce tutor to post complete profile to make the website look more professional and consistent.

2.2.4 REVIEW OF MY PRIVATE TUTOR WEBSITE

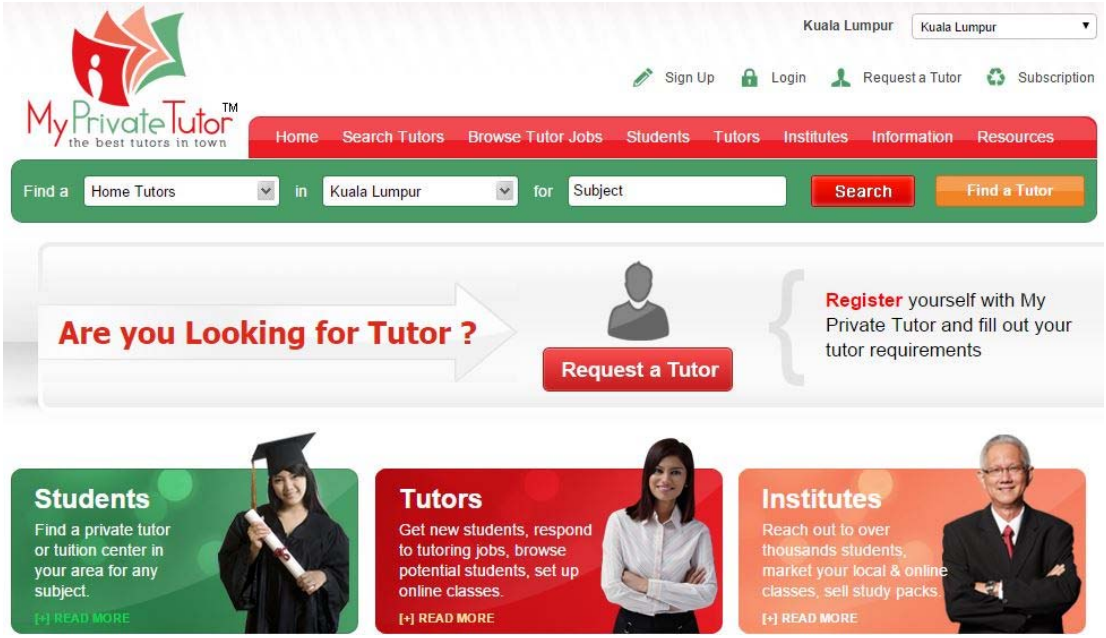


Figure 2.4: My Private Tutor website. (My Private Tutor 2014)

Fourthly, for My Private Tutor at My Private Tutor's *home tutors, tuition centers and online tutors* (2014), this website offer additional functions for institute to register as member on top of the basic functionalities for individual such as students and parents. Institute able to promote it courses offer in the website to attract more students. In meanwhile, tutors also able to approach institute available in the website to join as the institute member to provide services. Beside the strength mention, it also offer live support customer services during business hours. This live support is a great feature able to instantly solve any doubts from the users such as customers searching for tutors or tutors wanted to join My Private Tutor tuition institute. Conversely, the website do not have any place for the users to interact such as the forum, blog, comment or any ranking system. This create difficulty for later users to judge about the tutors good or bad in selecting the tutors wanted. It is suggested that this website implement ranking system for it register members and provide functionalities that allow to feedback to the parents, tutor or institute vice versa. Although this is a simple feature, but this ultimately make more credibility for the parents to make choices for their children based on previous customers' review. Besides, My Private Tutor website is enforce parents go through website administrator before contacting tutors. Although this feature help parents decide suitable tutors, however this method slow down the searching process of parents compare to self-service their own.

2.2.5 REVIEW OF HOME TUITION WEBSITE

Figure 2.5: A+ Home Tuition Malaysia website. (A+ Home Tuition Malaysia 2014)

Next, A+ Home Tuition website at A+ Home Tuition Malaysia's *affordable home tuition* (2014) design is relative simple and have a well navigate for users that able to support in multi-platform such as handheld smartphone or desktop personal computer. This website play a role that completely manual administrator that will help both parties to matching between parents and tutors manually. However, the website is not flexible enough let parents search and make self-decision or self-service. Therefore, every single parent must go through the website administrator intermediately which will slow down the process. For example, functions such as searching according to subject, location, tutors' qualification and ranking able to automated using server side programming. To solve the issues, it is suggested that A+ Home Tuition add in more automatic web application functionalities that will reduce the physical staff workload by manually contact both parties outside the online website environment. In additional, automated functions able to lowering down the website long term maintenance cost as it only incur first time upgrading cost to the current available web application.

2.2.6 REVIEW TUTOR2U WEBSITE

Figure 2.6: Tutor2U website. (Tutor2u 2009)

Lastly, for Tutor2u website at Tutor2u's *Malaysia largest tutor community* (2009), it is the leading tutoring agency current existing in Malaysia that matching parents and tutors services for free to allow parents' children attend private tuition at own house via Home Tuition's home tuition Malaysia (2011). The strength of Tutor2U is enable parents to perform quick matching to tutors listed in the website without going through the process of registration. Besides, it provide the web application that allow parents and tutors to enquiry directly to administrator and get their quick response. However, this website only limited to core functionalities only. Therefore it is recommended to add some functionalities like other website do enhance user's experience. For example, search tutor according profile and direct contact the tutors' capability and etc. Besides, due to Tutor2U web application no constraint on anonymous users accessing the web application functionalities, the website may incur joke bidder or harass users to the tutors. This created bad impression for the register users such as parents and tutors and ultimately provide bad experience to the users.

2.3 LITERATURE REVIEW CONCLUSION

In conclusion, although many websites perform it intended core functionalities, which is helping students to find respective tutors and correct classes to enroll. However, every websites have few sub-functionalities are differentiated with each other. For example, some website is automatic provided all the functionalities required, some website are semi-automated that required administrator monitor in order to perform. In additional, my private tutor offer for the tutor and institute to join they website. There for, every web application is emphasize on different focus such as add-on non-functional features and good graphic design, provided with good friendliness user interface able to work on multiple devices and commercial ability gain profit ability.

CHAPTER 3: PROPOSED METHOD/ APPROACH

3.1 DESIGN SPECIFICATIONS

3.1.1 DEVELOPMENT METHODOLOGY

For this project, the web application will adopt incremental prototyping which under rapid application development's class methodology which will divided by modules and develop part by part according to the important level mentioned at Tutorialspoint's SDLC software prototype model (2014). Due to this project nature, system design and experience are not design to suit for any specific group of users only. Therefore, using incremental prototyping will enable user to try it out in the middle of development. Users able to review it and provide improvement suggestion to enable make minor change before final web application done.

For the process of development, first will implement planning about how the project carry out. Then will repeating analysis, design and implement system prototype's module several times until all modules developed and final system complete. In the repetitive process, will identify a module requirements from the parent's side, student's side and tutor's side. Then will develop a complete requirements for interface and functionalities able to offer. After that will do some analysis in deep for user requirements, system requirements to conclude out a better specification about the system then only will develop the module according the plan. Lastly, after all module implemented, will integrate all the modules together become a complete web application system.

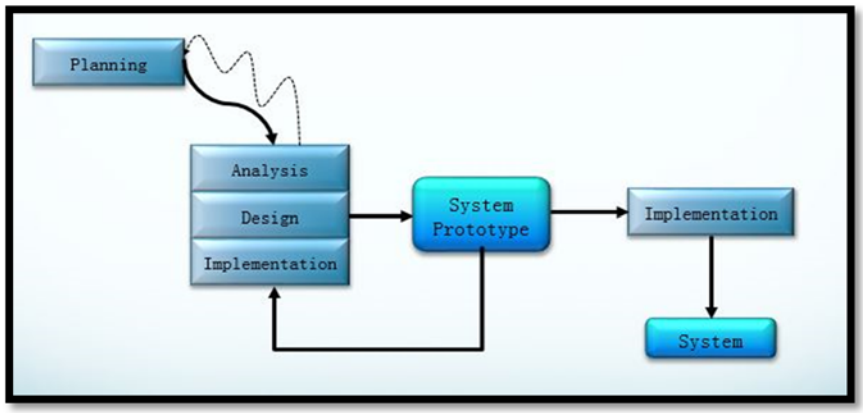


Figure 3.1: Prototype Methodology

This project will based on Model View Controller (MVC) design to build web application. This is mean that the web application will divide into 3 logic layers, which is model logic in business layer, controller logic in input layer and view logic in display layer show at w3schools's *ASP.NET MVC* (2014).

Firstly, for model layer will using relational database as the website main storage for every single of data. Relational database data are stored in tables of rows and columns and broken down into multiple tables and database enable system to create relationships among tables and link all tables together mentioned at Pennsylvania State University's relational database concepts (2014). Compare to other storage type such as file storage system, relational database able to help reduce amount of redundant data in storage and it structure nature help this project's website retrieve data more efficient and effective after go through normalization database to eliminate storing redundancy data in tables. Among many relational database available such as SQLite, MySQL, PostgreSQL and many other, this project will choose MySQL as main database storage for the web retail application mentioned at Oracle's the world most popular open source database (2014). MySQL is ideal to be this web application database because it offer small in size and fast in performance mentioned at Novell's benefits of MySQL (2014). MySQL is easy to use, powerful in term of speed, good scalability and good security implemented in database login access to prevent unauthorized personnel to access database illegally mentioned at Novell's benefits of MySQL (2014).

Secondly, for controller layer which is server side programming web application language such as CGI and java servlet. This project will using java servlet as main server side development language at Oracle's Java Servlet Technology (2014). This is because handle java servlet's Java Virtual Machine will running and handle each request using Java lightweight thread, not like CGI which is created heavy processor time intensive and memory intensive process. Besides, servlet is powerful when handling communication between web-server directly without depending on any server-specific API like CGI need. For example, servlet able to handle database connection pooling, maintain information from request to request, session tracking, caching of previous computations and share data among servlets show at polytech's Java Servlet overview (2014).

Thirdly, for view layer which is presentation side, this project mainly will using several technology such as the Hypertext markup language – HTML for core presenting static information and JavaServer Pages – JSP to dynamically generate webpage based on HTML technology. Besides, to enable support for multi-language in better design and manageability, this web application will using JSP template engine to help separate out the main business logic code with the presentation layer so that future able to manage the codes easier. In additional, some pages will be preparing with 3 type of languages included English, Malay and Chinese that enable user opt according to their preferences.

3.1.2 SOFTWARE TOOL INVOLVED

Firstly, for planning phase, this project will using visual paradigm community version to design all the unified modeling language (UML) as an aid to develop the web application. UML will be included use case diagram, use case description, activity diagram and analysis class diagram for analysis phase. Besides, for the design phase will involve design class diagram, sequence diagram and package diagram.

Netbeans will act as main integrated development environment (IDE) tool for this web application development at Oracle's netbeans (2013). This is because is support HTML5, Java Servlet, JSP and other technology that required to develop this web application, Besides, Netbeans is cross-platform support on many operating system, which tested able to run in mine development computer with installed Windows 8.1 operating system without any issue. Besides, Netbeans promote Model–view–controller (MVC) architecture, which allow more reusable code, able to independently test one of the three layer and parallel develop of separate layer together as a team. Lastly, Netbeans not depend on extra plugin developing website such as build local website for testing purpose and do not required extra plugin like Eclipse required.

Lastly, the web application are rely on the server such as Glassfish and Apache Tomcat server to run the server side application. For this project, main development server use to run server side application will be the world first Java EE 6 Application server – Oracle's glassfish (2014). This is because Glassfish support Java EE application that included Java servlet, JavaServer Page (JSP), Enterprise JavaBeans (EJB), Java Persistence Application (JPA), JavaServer Faces (JSF), Java Message Service (JMS) and Java EE software development kit (SDK) from oracle that will be

use in the web application development Israel A's What's the difference between Glassfish and Apache Tomcat? (2013). Meanwhile, for deploying web application purpose, Glassfish comes with command line utility such as "asadmin" that will provides a complete set of management and configuration commands in the GUI environment that is easy to manage and use for administrator jobs. In additional, Glassfish also allow use in non-GUI mode to manage installation spanning in several server's machines.

3.1.3 USER REQUIREMENTS

Developing a web application is critical to meet the expectation of all users' expectation. Therefore, many methods carried out to determine best user requirements that will fulfill user's expectations. As the questionnaire surveys has done for research on possible user's opinions show that they prefer on several features and functionalities capable to perform in a web application. Besides, the literature review on the conference papers regarding to improve better academic performance required parent involvement in their children academic study. In additional, similar website comparison has taken account that convenient features each of them. As a whole, all of the opinions, analysis and study from various sources will take count and summarize as below as user requirements:

Table 3.1 List of user requirements.

User Req#	Description
U1	The web application able to browse using mobile devices and desktop computer.
U2	Parent and student usage of website any features do not required any fees.
U3	Tutors capable of update student academic status.
U4	Parent be aware of own children academic performance
U5	Tutors pay referral fees after earn money.

3.1.1 SYSTEM REQUIREMENTS

System requirements are descriptions of the web application services must provide to fulfill and satisfied user requirements. This constraint under the web application must be running according to this specification. System requirement are absolute rules that guide the web application functionalities development according to each user requirements.

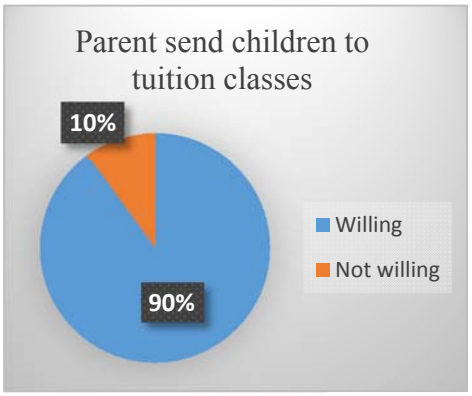
Table 3.2 List of system requirements.

System Req#	Description
S1.1	The web application shall implement using bootstrap that enable shrink the contents according to client's screen resolution.
S1.2	The web application content should generated completely at server-side before transmit to client device to reduce client-side loading required extensive processing power.
S2.1	The web application shall free of charge to parents and students regardless of any functionalities using within this web application.
S3.1	The web application shall enable tutors to insert, update or delete own current teaching students homework details.
S4.1	The web application shall enable parent to view own children academic details
S5.1	The web application should let tutor to make advance payment of referral fee.
S5.2	The web application shall let tutor to make payment at second month of a classes started.

3.2 SURVEY ANALYSIS

3.2.1 QUESTIONNAIRE

For analysis on the possible future users' that will using this website matching for parents and tutors web application, 20 set of survey questionnaires given out to study about their opinion in term of usage and functionalities required for the website. The survey questionnaire given out during Chinese New Year 2015 period, the main target responder are which taken from Taiping, Perak area, all of them are parents of generation y from different states which included Penang, Perak, KL and Johor. Among the responders, only 5 of them are current teachers enroll in teaching primary school students. The actual survey questionnaire given consist of 3 section, section A is ask for anonymous general personal demographic details, section B is study about the parents' opinion and last section C only for tutors' opinion.



According to the survey questionnaires' result, 18 parents which is 90% of them willing to spend extra money to invest tutoring classes for their children. From all of the responders, they admit that all of their children which is generation y are currently joining additional tutoring classes after the school hours.

Figure 3.2: Percentage of parents' willingness send children go tuition classes.

In additional, 12 out of 20 parents agree that their will consider to taking tutoring classes if they found benefit to themselves and the classes are interested. Therefore, we can conclude that taking for extra tutoring class are not only popular among the generation Y in Malaysia, but for parents they also found that interested willing to join the tuition class as long the classes they found that is relevant and benefited for them.

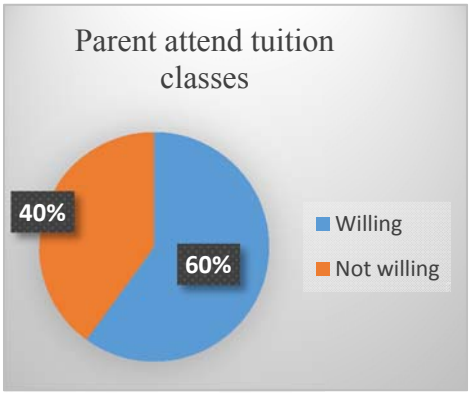


Figure 3.3: Percentage of parents' willingness go tuition classes.

According to survey questionnaire, 40% of responders totally not aware about the existing of the students and parents matching website available over internet. However, there is 60% of responders have heard and experience existing students and parents matching website. For this result, we can conclude that 40% of parents not familiar with browsing internet, therefore they are limited to access the information available on the internet.

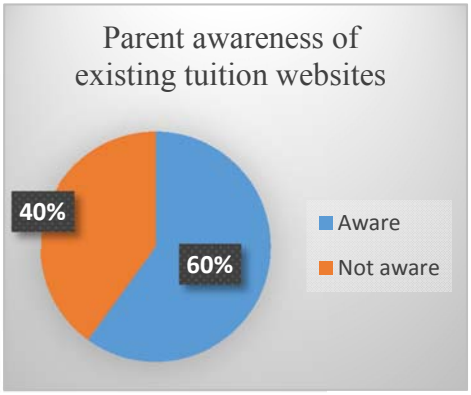


Figure 3.4: Percentage of awareness existing tuition websites.

However, mostly of them agree will give it a try to use the website if the website ease to use, support mobile devices screen and free of charge. Besides, mostly parents think that current local nearby their housing area are not easy to find tutor, this require effort to physically search the nearby places and acquire information from family members or friends. Therefore, to develop an ease of use, support mobile devices screen and free of charge web application are essential to for parents to replace some of the traditional methods that taking troublesome effort and time to search for tutors.

According to tutor's responders, their 4 of them available for take extra short term classes' student and 3 out of 5 of them available to take long term students that longer than 3 months. The result show that mostly the tutors are not fully employed and capable of taking extra students after school hours. Besides, all tutors indicated that they willing to advertise their available classes to public. However, for existing current situation, they only capable of advertise their poster in their housing area. Therefore, develop a platform, which is the project aim for able to help tutors to create more job opportunities by introducing more target audience through web application that able broadcast their advertisement not limit to nearby housing area.

Figure 3.5: Percentage of tutors availability for take extra tuition class's students.

Below table show summary of responder answer the each statement given in section B:

Table 3.3 Summary of parents answer each statements on section B questionnaire.

Statement	Disagree responder(s)	Neutral responder(s)	Agree responder(s)
1. I aware of now able to apply tuition class using internet in home.	8	0	12
2. I will consider use internet to apply tuition class if it easy obtain information I want.	3	2	15
3. I want access tutor searching website through mobile devices such as smartphone and tablet.	3	7	10
4. I think finding tutors in my nearby housing area are difficult.	9	0	11
5. I think that tutor searching website better free of charge, without any hidden fee for me.	0	0	20
6. I think lifelong learning is good for me.	3	1	16
7. I will consider taking extra classes if I interested with the subject offer.	3	5	12
8. I will invest on my children by sending them to extra tuition class after school.	0	2	18
9. I think my children weaker subjects area better go for extra tuition class after school.	0	2	18
10. I want to know my children performance during the tuition class.	2	4	12

Below table show summary of tutor answer the each statement given in section C:

Table 3.4 Summary of tutors answer each statements on section C questionnaire.

Statement	Disagree Tutor(s)	Neutral Tutor(s)	Agree Tutor(s)
1. I currently available to accept more students for short term classes (less than 3 months).	1	0	4
2. I currently available to accept more student for long term classes (more than 3 months).	2	0	3
3. I will consider advertise my available classes to search for students.	0	0	5
4. I will consider pay for some fee to get more students.	0	2	3
5. I think better pay referral fees for website after I got my first tuition fees from student.	0	0	5
6. I will apply tender required by parent if it suitable for me.	0	2	3
7. I think it better the website have feature to contact student and their parent.	1	0	4

CHAPTER 4: ANALYSIS AND SYSTEM DESIGN

4.1 USE CASE DIAGRAM

Figure 4.1: Use case diagram

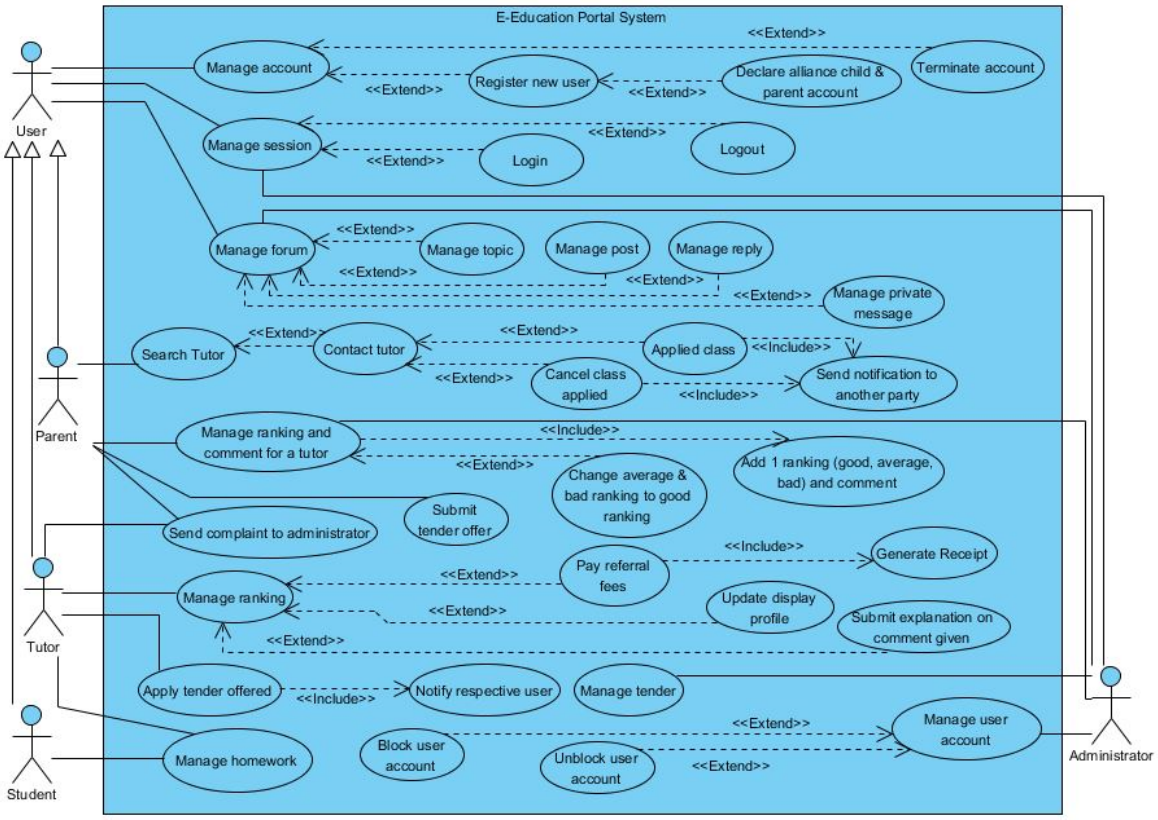


Figure above show use cases for E-Education Portal web application of the 12 functionalities.

Table 4.1 Use cases overview

No	Use case	Include/ Extend
1	Manage account	Register new user, Declare alliance child & parent account, Terminate account.
2	Manage session	Login, Logout
3	Manage forum	Manage topic, manage post, manage reply, manage private message
4	Search tutor	Contact tutor, cancel class applied, applied class, send notification to another party
5	Manage ranking and comment for a tutor	Change “average” & “bad” ranking to “good” ranking, add 1 ranking
6	Submit tender offer	-
7	Send complaint to administrator	-
8	Manage ranking	Pay referral fees, generate receipt, update display profile, Submit explanation on comment given
9	Apply tender offered	Notify respective user
10	Manage tender	-
11	Manage homework	-
12	Manage user account	Block user account, unblock user account

4.2 USE CASE SPECIFICATION

Use case name: Apply tender offered

Description:

For tutor to apply tender that created by parents account. Tutor will inspect the requirement of the tender such as subject to teach, tutor profile required, then only tutor will inspect the availability of own time slot and location the class shall schedule. If all requirement meet tutor expectation, tutor may apply the class by contacting parent to make decision. A tender created by parent only able to apply by a single tutor. The tender only able to re-apply by another tutor when the parent declare cancel by previous tutor.

Actor: Tutor

Priority: Moderate

Assumption(s):

Tutor successfully login to this system and browsing tender list summited by parents account.

Pre-condition(s):

Tender status listed are available for tutor to bid.

Post-condition(s):

Tutor is notify with the result message and navigate to homepage.

Happy pathway:

Tutor successful bid the tender posted by contact the parents via private message.

Alternate pathway(s):

1. Tutor submitted format or requirement not valid compare to the tender.

Exceptional pathway(s):

1. Tender flag as successful found tutor during tutor apply.

Happy path flow 1:

1. Tutor click on the tender want to apply.
2. System check on the tender availability to ensure the tender still available and not yet found associate tutor required and then display apply tender form to tutor.
3. Tutor fill in information such as expected tuition fees, location, class size number and time table into tender apply form then submit to the system.
4. System update database, prompt successful message to tutor and notify parent via email.

Alternate path flow 1:

1. Tutor click on the tender want to apply.
2. System check on the tender availability which considering not yet found tutor required and then display apply tender form to tutor.
3. Tutor fill in information such as expected tuition fees, location, class size number and time table into tender apply form then submit to the system.
4. System found that tutor input are not valid and then prompt error message.
5. System navigate back to previous section to enter again the form.

Exceptional path flow 1:

1. Tutor click on the tender want to apply.
2. System check on the tender availability which considering not yet found tutor required and then display apply tender form to tutor.
3. Tutor fill in the tender form and then submit to the system.
4. System found error that this current tender apply by other tutor.
5. System display error message.

Use case name: Manage account

Description:

User perform this only functionalities to register membership at very first time using website or want to terminate own account for this website.

Actor: Unregister user, parent, tutor, student

Priority: High

Assumption(s):

User want to manage their account in term of membership registration and termination. For parents, they can use this manage account use case to declare or register a new sub student account.

Pre-condition(s): None

Post-condition(s): None

Happy pathway:

Successful to perform a manage account function.

Alternate pathway(s):

1. User enter information not valid, such as username repeated in existing database record, confirmation password not same as the password entered.
2. User cancel registration in the middle of process.

Exceptional pathway(s):

Not applicable.

Happy path flow 1:

1. User press on manage account button.
2. System display manage account function.
3. User Choose to register a new account or terminate an existing account.
4. System display registration form or confirmation of termination account button respectively user's choice.
5. User fill in registration form or choice confirm to terminate account respectively.
6. System verify the input format correctly, then make update to database and prompt user the result perform.

Alternate path flow 1:

1. User press on manage account button.

2. System display manage account function.
3. User Choose to register a new account or terminate an existing account.
4. System display registration form or confirmation of termination account button respectively user's choice.
5. User cancel the process.
6. System display the result and navigate to main page.

Exceptional path flow 1:

Not applicable.

Use case name: Manage forum

Description:

Parent, student, tutor or administrator want to manage a single forum functionalities that mange forum, topic and reply.

Actor: Parent, student, tutor, Administrator

Priority: Low

Assumption(s):

User logged in the forum that want to post a new topic or reply message to current existing topic that want ask opinion, idea, discussion, answer or other functionalities to all public users in the forum. Besides, user able to send private message and reply private message specifically to a user existed in the forum.

Pre-condition(s):

1. User logged in forum as a parent, tutor, student or administrator role.
2. User have a permission of perform certain task.

Post-condition(s):

User prompt for result on perform manage forum.

Happy pathway:

1. User successful perform a function such as post or delete a forum, post or delete a topic, post update or delete a reply, change forum avatar, signature or others.

Alternate pathway(s):

1. User cancel the verification process during the function.

Exceptional pathway(s):

Not applicable.

Happy path flow 1:

1. System verified user identify user permission that currently logged in.
2. User select a function to perform.
3. System prompt to perform function apply for.
4. User verify the action.
5. System perform the function, update database and display result.

Alternate path flow 1:

1. System success verified user identify as what authority the user had.
2. User select a function to perform.
3. System prompt to perform function apply for.
4. User cancel the action to be perform.
5. System display result on performing the function.

Exceptional path flow 1:

Not applicable.

Use case name: Manage homework

Description:

This use case is for tutor and student to manage their homework information. The information is record about homework that tutor given to a student. This information able to update parent about how the student academic progress.

Actor: Tutor, student, parent

Priority: Moderate

Assumption(s):

Tutor able to add and delete the homework information that will give to student. For student only able to update the homework status and detail to inform tutor about the work progress. Parent able to view own children homework information about the topic given, progress.

Pre-condition(s):

Tutor, parent or student already logged in respectively.

Post-condition(s):

None

Happy pathway:

1. User successfully make a change such as update progress, add new homework, delete homework on a manage homework information function.

Alternate pathway(s):

1. User cancel the process in the middle of progress.

Exceptional pathway(s):

Not applicable.

Happy path flow 1:

1. User click on manage homework button.
2. System check user identity and display the function and homework list available to the user respectively.
3. User click on a manage homework function.
4. System verify the input.
5. User confirm to perform function selected.
6. System update database and prompt result about user data that changed on database.

Alternate path flow 1:

1. User click on manage homework button.
2. System check user identity and display the function and homework list available to the user respectively.
3. User click on a manage homework function.
4. System verify the input.
5. User cancel the input.
6. System prompt the result on screen.

Exceptional path flow 1:

Not applicable.

Use case name: Manage ranking and comment for a tutor

Description:

Parent give ranking and comment that will show to public about the tutor's performance and personality.

Actor: Parent

Priority: High

Assumption(s):

Parent already having some idea and familiar with the tutor apply for their children.

Pre-condition(s):

1. Parent only able to give comment and ranking after 1 month.
2. Parent paid the tutor first tuition fees

Post-condition(s): None

Happy pathway:

Parent successfully give ranking and comment for a tutor

Alternate pathway(s):

Parent update existing comment that previously has given to tutor.

Exceptional pathway(s):

Parent not qualified to give comment to a tutor.

Happy path flow 1:

1. Parent click on manage ranking and comment button.
2. System check and confirm parent qualified to give comment for the tutor and then display the form to let parent write.
3. Parent enter the ranking and comment then submit to the system.
4. System ask for verification
5. Parent confirmation to submit.
6. System update database and display the result on screen.

Alternate path flow 1:

1. Parent click on manage ranking and comment button.
2. System check and confirm parent qualified to give comment for the tutor and then display the form to let parent write.
3. Parent enter the ranking and comment then submit to the system.
4. System ask for verification
5. Parent cancel the process.
6. System display user cancel result on screen.

Exceptional path flow 1:

1. Parent click on manage ranking and comment button.
2. System check the parent not qualified to give comment for the tutor.
3. System display error message.

Use case name: Manage ranking

Description:

This use case is for tutor to manage their ranking by adding the explanation on comment given by parent, update own display profile to public, pay ranking fee that help them more visible by public and pay the referral fee after get new student payment for their tuition fee.

Actor: Tutor

Priority: High

Assumption(s):

Tutor after perform this function, system will add the experience to their account, the experience point which give higher ranking level that help them show ranking profile display to public. Higher ranking give the tutor opportunity to get more student due to the higher reliability and trustfulness.

Pre-condition(s):

Tutor already logged in to the system.

Post-condition(s): None

Happy pathway:

1. Successful perform manage ranking function and updated database.

Alternate pathway(s):

1. System navigate to third party payment system.

Exceptional pathway(s):

1. Credit not enough to pay error.

Happy path flow 1:

1. Tutor click on manage ranking button
2. System display all functionalities for manage ranking
3. Tutor choose a functionalities to perform.
4. System navigate to respective page help user perform the action.
5. Tutor enter the action and confirm to perform the action.

6. System display result to let tutor know the result.

Alternate path flow 1:

1. Tutor click on manage ranking button.
2. System display all manage ranking functions.
3. Tutor select payment.
4. System navigate user to third party payment system.
5. User input the payment information.
6. Payment system check tutor account and deduct the amount required from tutor account.
7. System update tutor account and prompt successful message on screen.

Exceptional path flow 1:

8. Tutor click on manage ranking button.
9. System display all manage ranking functions.
10. Tutor select payment.
11. System navigate user to third party payment system.
12. User input the payment information.
13. Payment system check tutor account insufficient credit.
14. System prompt user error.

Use case name: Manage session

Description:

For the user who are already login, system will prompt option for user to logout, else the system will provide option for user to login.

Actor: User

Priority: High

Assumption(s): Not applicable.

Pre-condition(s): Not applicable.

Post-condition(s): Not applicable.

Happy pathway:

User successful change user session stage.

Alternate pathway(s):

1. User provided username and password are wrong.

Exceptional pathway(s):

Not applicable.

Happy path flow 1:

1. User press on manage session button.
2. System check for the current user session and then display the appropriate session management option for user to opt for perform.
3. User enter the correct input, verification and submit to the system.
4. System check for user input and then display the result on screen.

Alternate path flow 1:

1. User press on manage session button.
2. System check for the current user session and then display the appropriate session management option for user to opt for perform.
3. User enter the wrong input and submit to the system.
4. System check that user input wrong username and password and then prompt user error.
5. System navigate user to enter login form page to let user enter again.

Exceptional path flow 1:

Not applicable.

Use case name: Manage tender

Description:

This use case is created for the administrator to perform management on the existing tender that posted by parents. Administrator will remove the tender after the parent found a suitable tutor or the tender too long no tutor apply for.

Actor: Administrator

Priority: Low

Assumption(s):

Tender existing in the system.

Pre-condition(s):

Administrator login to the system.

Post-condition(s): None

Happy pathway:

Administrator success to manage a tender that currently existing in the system.

Alternate pathway(s):

Not applicable.

Exceptional pathway(s):

Not applicable.

Happy path flow 1:

1. Administrator click on manage tender button.
2. System display all available tenders.
3. Administrator select an update on a tender.
4. System display an update option.
5. Administrator select an option to perform.
6. System perform the function and display result.

Alternate path flow 1:

Not applicable.

Exceptional path flow 1:

Not applicable.

Use case name: Manage user account

Description:

This use case is for administrator to manage existing user account such as give, block and unblock user.

Actor: Administrator

Priority: High

Assumption(s):

Administrator use this use case for enforce the user that posting something bad by block user account or give warning to user.

Pre-condition(s):

Administrator already logged in into the system.

Post-condition(s): None

Happy pathway:

Administrator successful perform an action for manage user account.

Alternate pathway(s):

Not applicable.

Exceptional pathway(s):

Not applicable.

Happy path flow 1:

1. Administrator click on manage user account button.
2. System display search box for administrator to search by username.

3. Administrator enter the username want to perform manage on it account.
4. System prompt to block it account or unblock it account respectively.
5. Administrator select action to perform on the user selected.
6. System perform the function required by updating the user in database and display the result on screen.

Alternate path flow 1:

Not applicable.

Exceptional path flow 1:

Not applicable.

Use case name: Search tutor

Description:

This use case is for user to search for desire tutor and contact the tutor via private message and send email to tutor account.

Actor: User

Priority: High

Assumption(s):

Users will use this use case to search for a tutor by a specific query such as name, gender, education level and etc.

Pre-condition(s):

User logged in into the system.

Post-condition(s): None

Happy pathway:

User successfully contact tutor.

Alternate pathway(s):

1. User send private message to a user.
2. User apply for a new class.
3. User cancel an existing class.

Exceptional pathway(s):

Not applicable.

Happy path flow 1:

1. User enter and submit the search query to the system.
2. System processing the query and display list of tutor that match the query entered.
3. User browse the tutors' list and select a tutor.
4. System prompt user to choice for a functionality.
5. User selected a functionality and send to the system.
6. System process the user requirement by updating database, notify the tutor respectively and then display the result to user.

Alternate path flow 1:

1. User enter and submit the search query to the system.
2. System processing the query and display list of tutor that match the query entered.
3. User browse the tutors' list and select a tutor.
4. System prompt user to choice for a functionality.
5. User choose to send a private message to the particular tutor.
6. System display private message form.
7. User enter the message and submit to the system.
8. System update database and notify tutor through email.

Alternate path flow 2:

1. User enter and submit the search query to the system.
2. System processing the query and display list of tutor that match the query entered.
3. User browse the tutors' list and select a tutor.
4. System prompt user to choice for a functionality.

5. User choose to apply a class from a list of classes listed by the tutor.
6. System prompt confirmation with the user.
7. User confirm to apply particulate class.
8. System update database and prompt tutor via email.

Alternate path flow 3:

1. User enter and submit the search query to the system.
2. System processing the query and display list of tutor that match the query entered.
3. User browse the tutors' list and select a tutor.
4. System prompt user to choice for a functionality.
5. User choose to cancel a class from a list of classes listed by the tutor.
6. System prompt confirmation with the user.
7. User confirm to cancel particulate class.
8. System update database and prompt tutor via email.

Exceptional path flow 1:

Not applicable.

Use case name: Send complaint to administrator

Description:

This use case is for parent and tutor to send complaint message about another user or the services provided by the website to notice administrator take action later.

Actor: Parent, tutor

Priority: Low

Assumption(s):

User having some issue cannot resolve by themselves and their have a need to get the assist or help by the administrator by contacting administrator with sending the issue their facing.

Pre-condition(s):

User already logged in to the system.

Post-condition(s): None

Happy pathway:

User successful send complaint to the administrator.

Alternate pathway(s):

1. User submitted complaint to none exist user.

Exceptional pathway(s):

Not applicable.

Happy path flow 1:

1. User press on send complaint button.
2. System check for qualification that the user applicable to send compliant or not.
3. User enter complaint detail and submit to the system.
4. System confirm input correct then display successful message to user and send notify message to administrator.

Alternate path flow 1:

1. User press on send complaint button.
2. System check for qualification that the user applicable to send compliant or not.
3. User enter complaint detail and submit to the system.
4. System cannot found any being complaint user and then prompt error message to user.

Exceptional path flow 1:

Not applicable.

Use case name: Submit tender offered

Description:

This use case is let parent to create tender to the system when parents cannot find any existing list from the system offered by the tutors.

Actor: Parent

Priority: High

Assumption(s):

Parent cannot find any existing offer listed by tutors that are suitable for own. It included subject teaching not found, geographic area needed not exist and etc.

Pre-condition(s):

Parent already logged in into the system.

Post-condition(s): None

Happy pathway:

1. Parent successfully submit tender into the system.

Alternate pathway(s):

1. Parent submitted tender form with error input format.

Exceptional pathway(s):

Not applicable.

Happy path flow 1:

1. Parent click on create tender.
2. System display the tender form for parent to input.
3. Parent fill in the requirement wanted in the tender form.
4. System successfully verify that correct input, update database and then display successful result on screen.

Alternate path flow 1:

1. Parent click on create tender.

2. System display the tender form for parent to input.
3. Parent fill in the requirement wanted in the tender form.
4. System found input format not correct and display error message to users.
5. System navigate user back to previous tender form input screen.

Exceptional path flow 1:

Not applicable.

4.3 ACTIVITY DIAGRAM

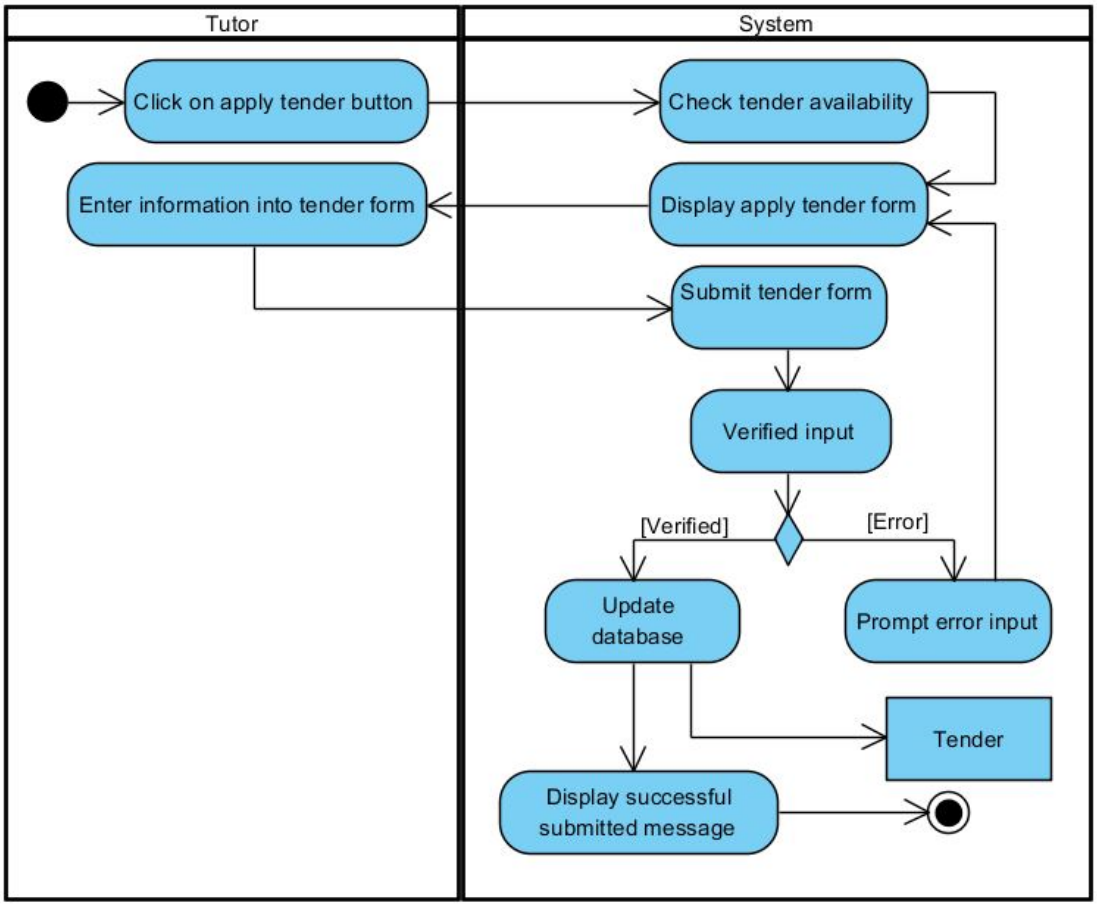


Figure 4.2: Apply tender offered activity diagram.

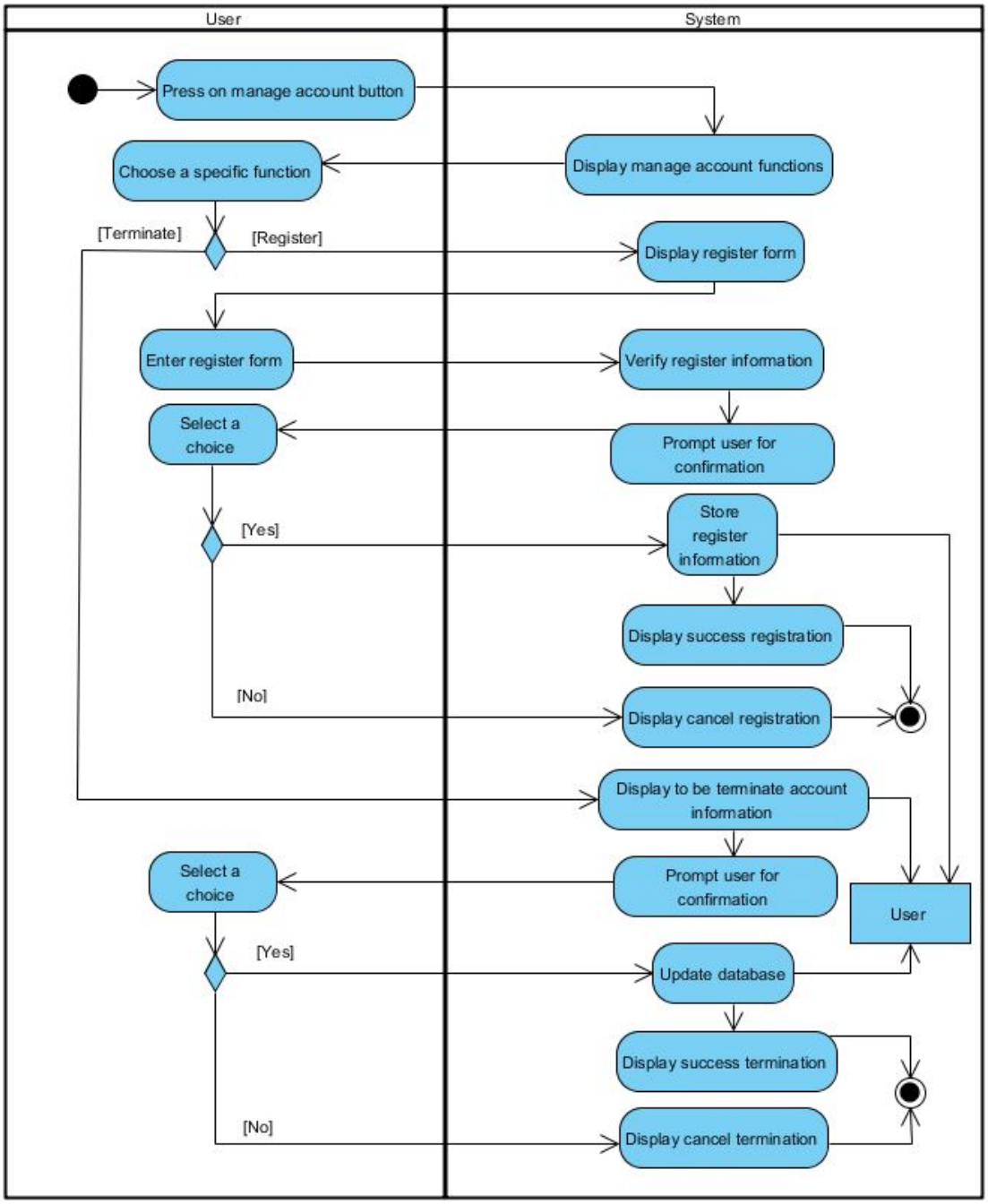


Figure 4.3: Manage account activity diagram.

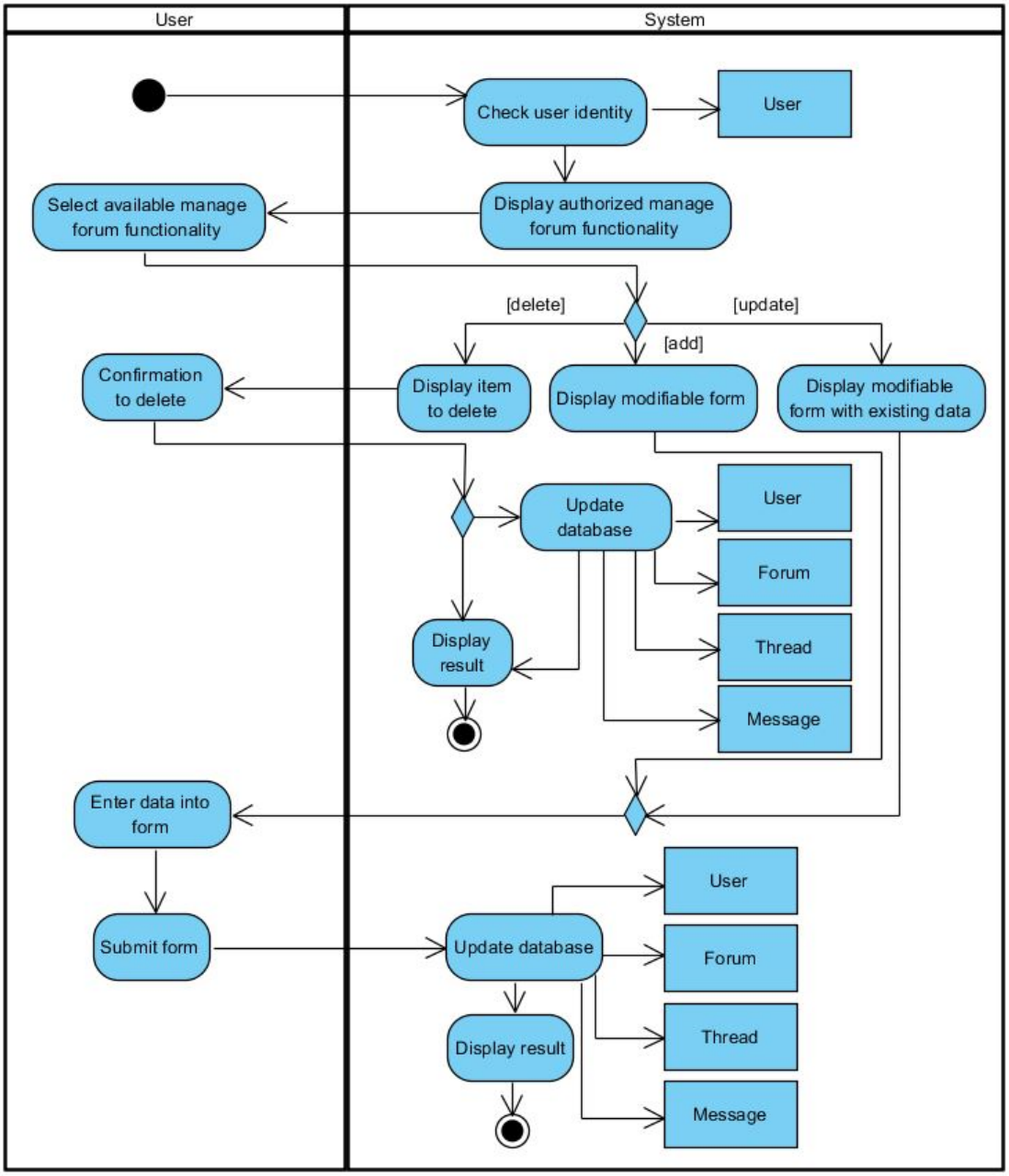


Figure 4.4: Manage forum activity diagram.

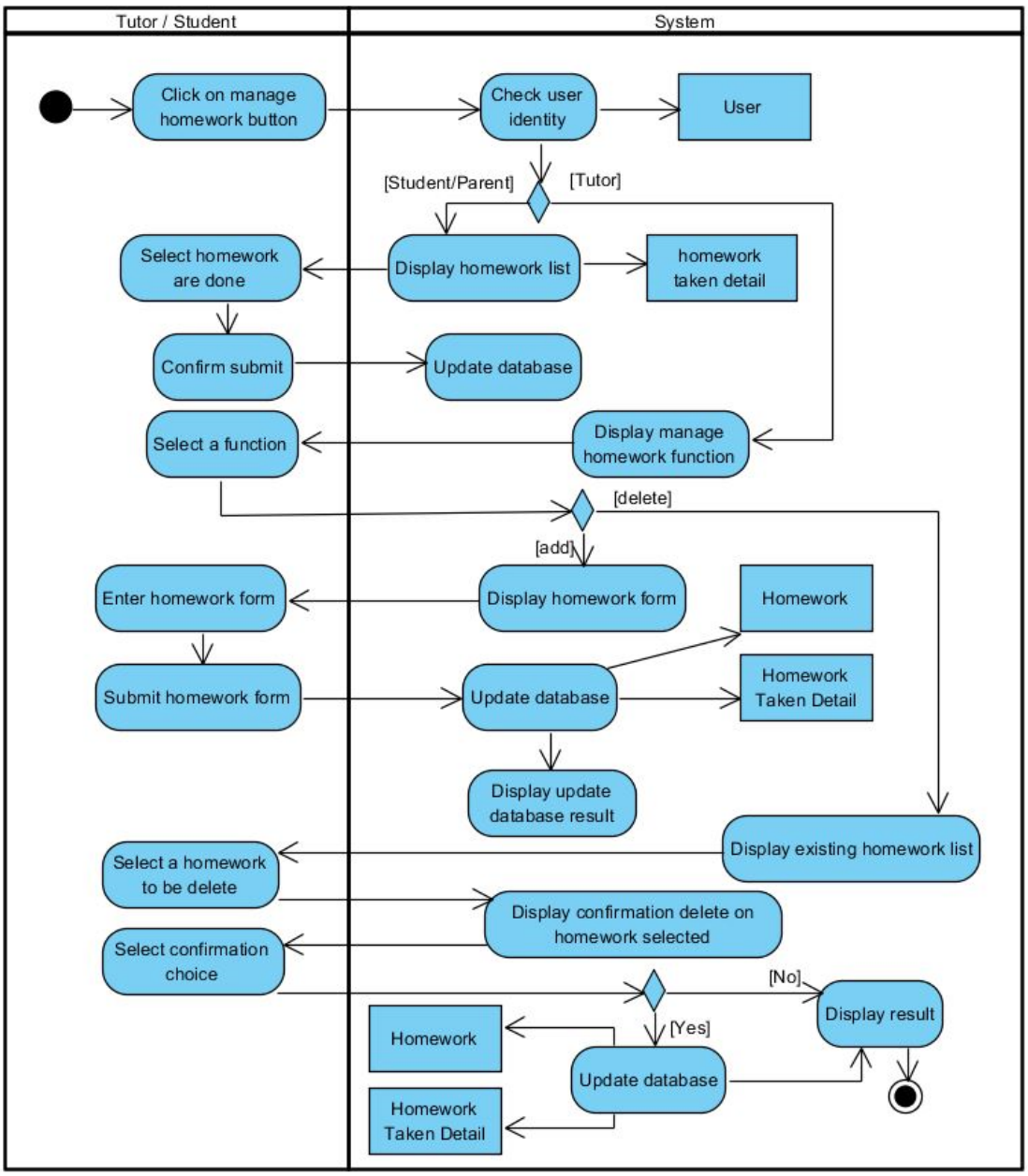


Figure 4.5: Manage homework activity diagram.

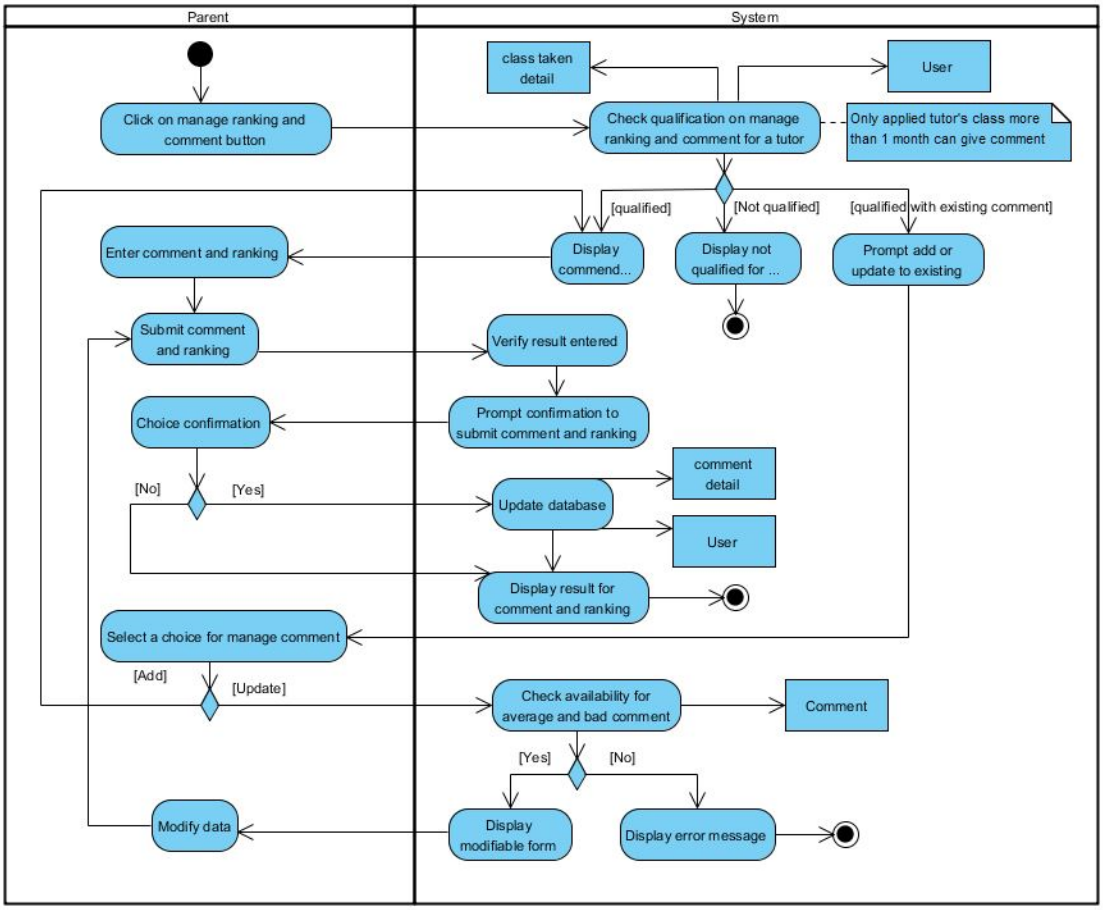


Figure 4.6: Manage ranking and comment for a tutor activity diagram.

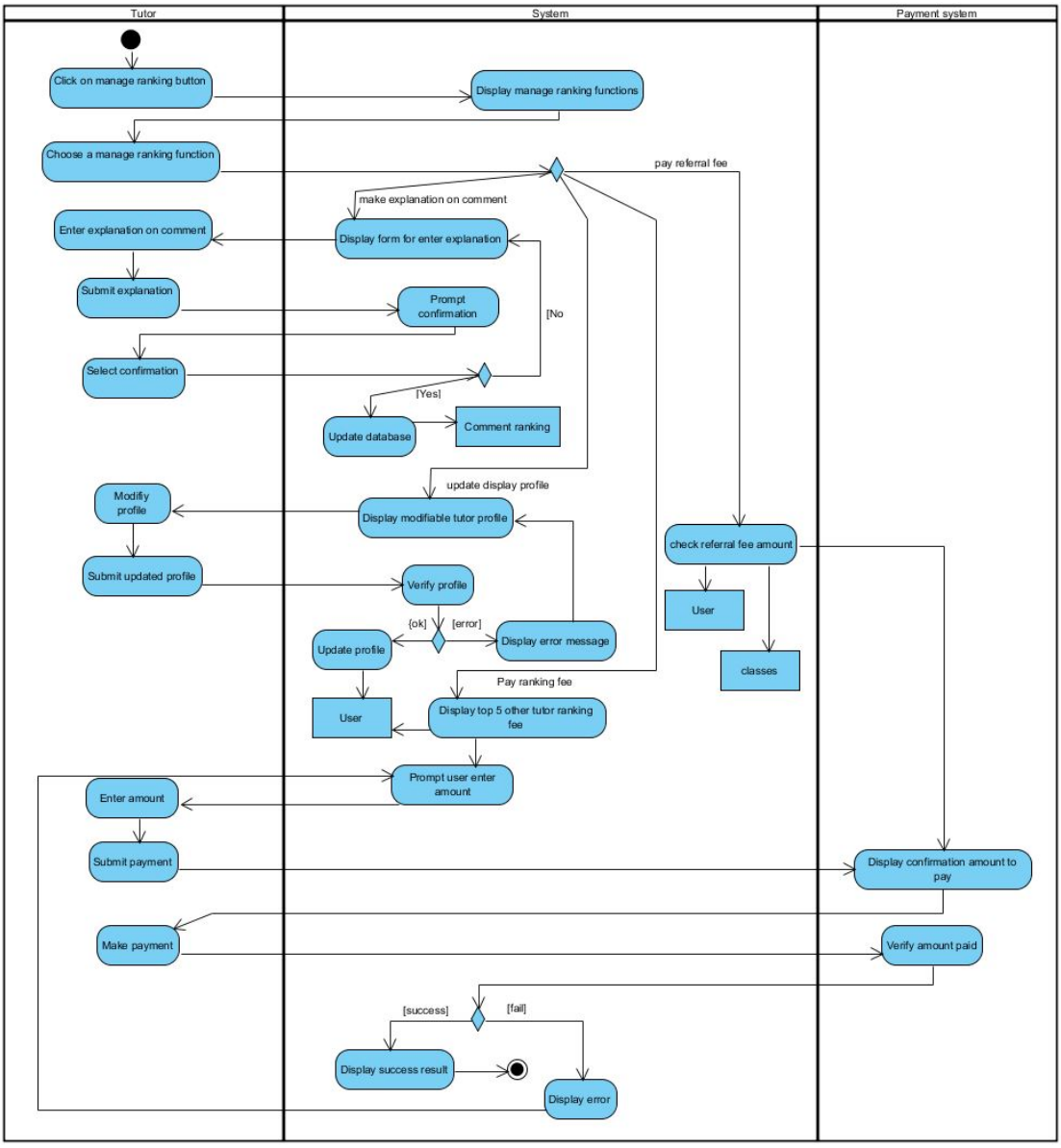


Figure 4.7: Manage ranking activity diagram.

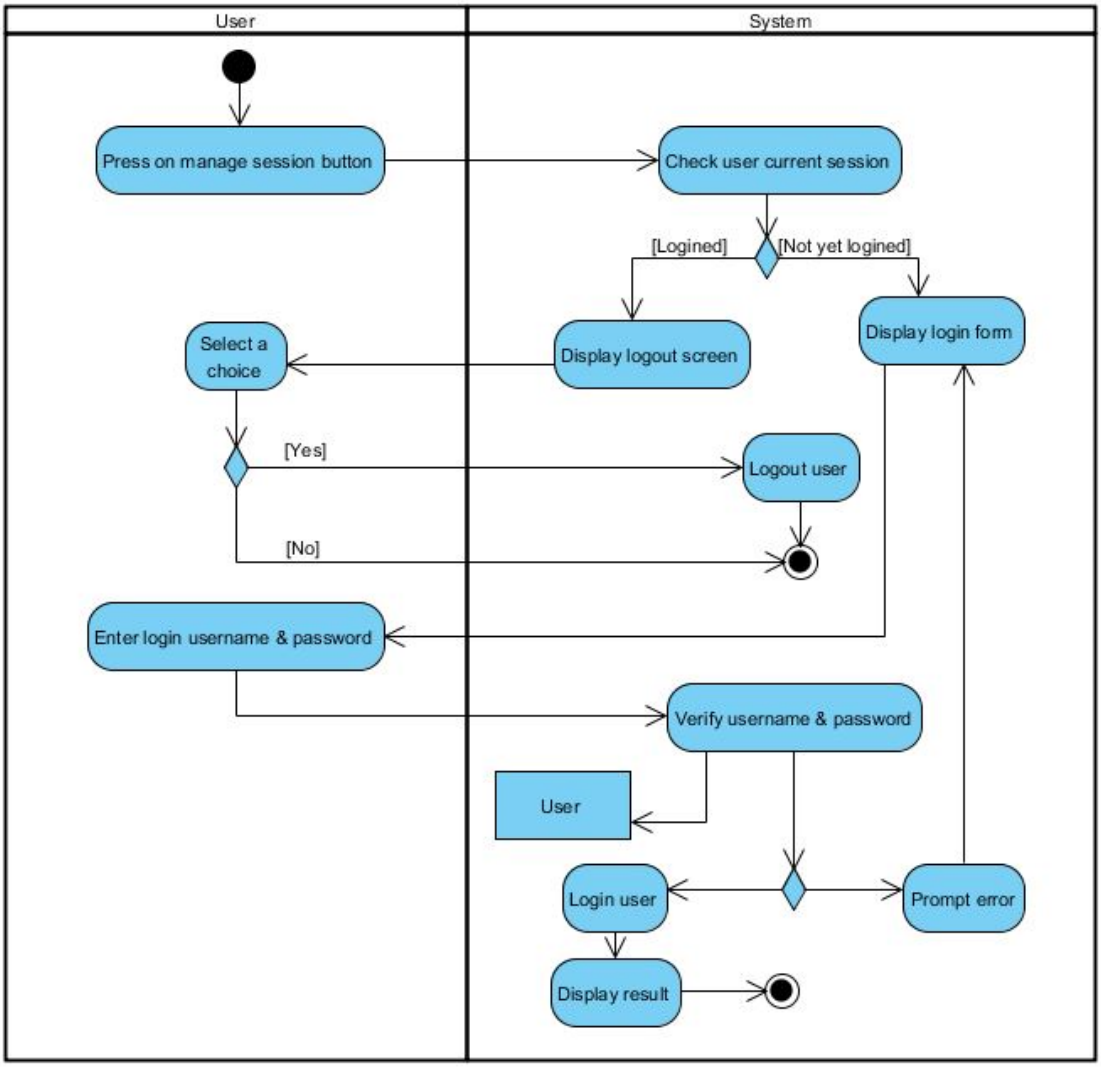


Figure 4.8: Manage session activity diagram.

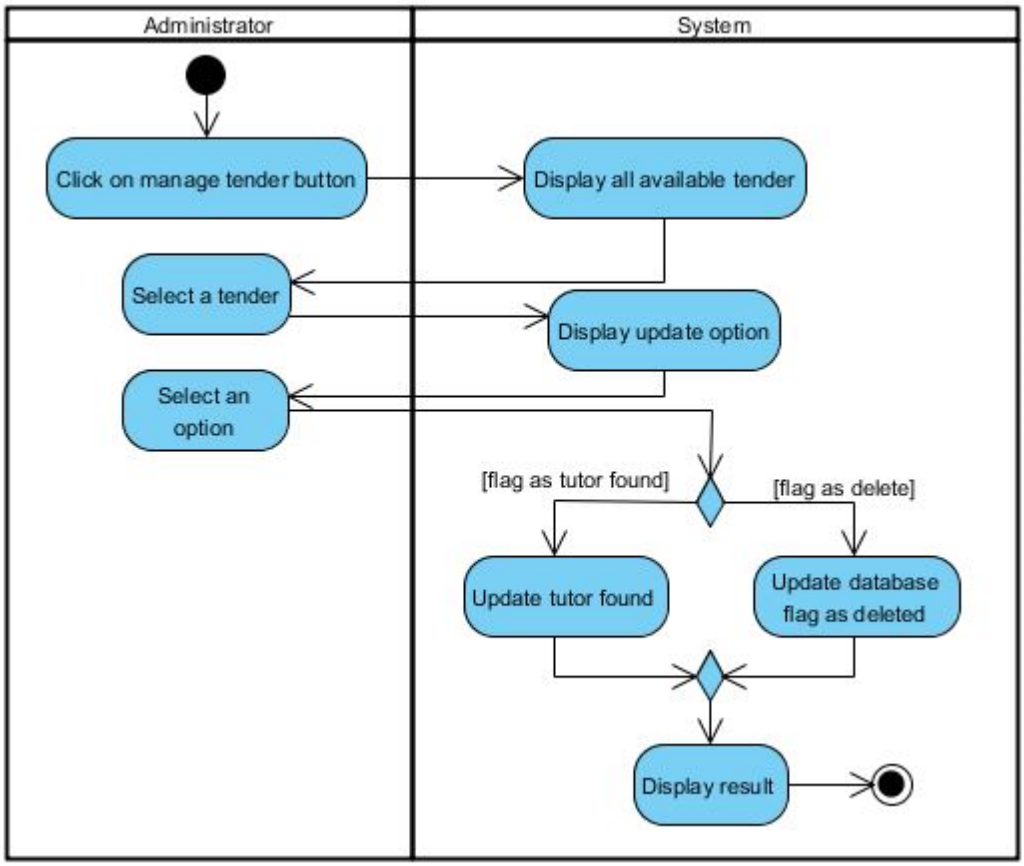


Figure 4.9: Manage tender activity diagram.

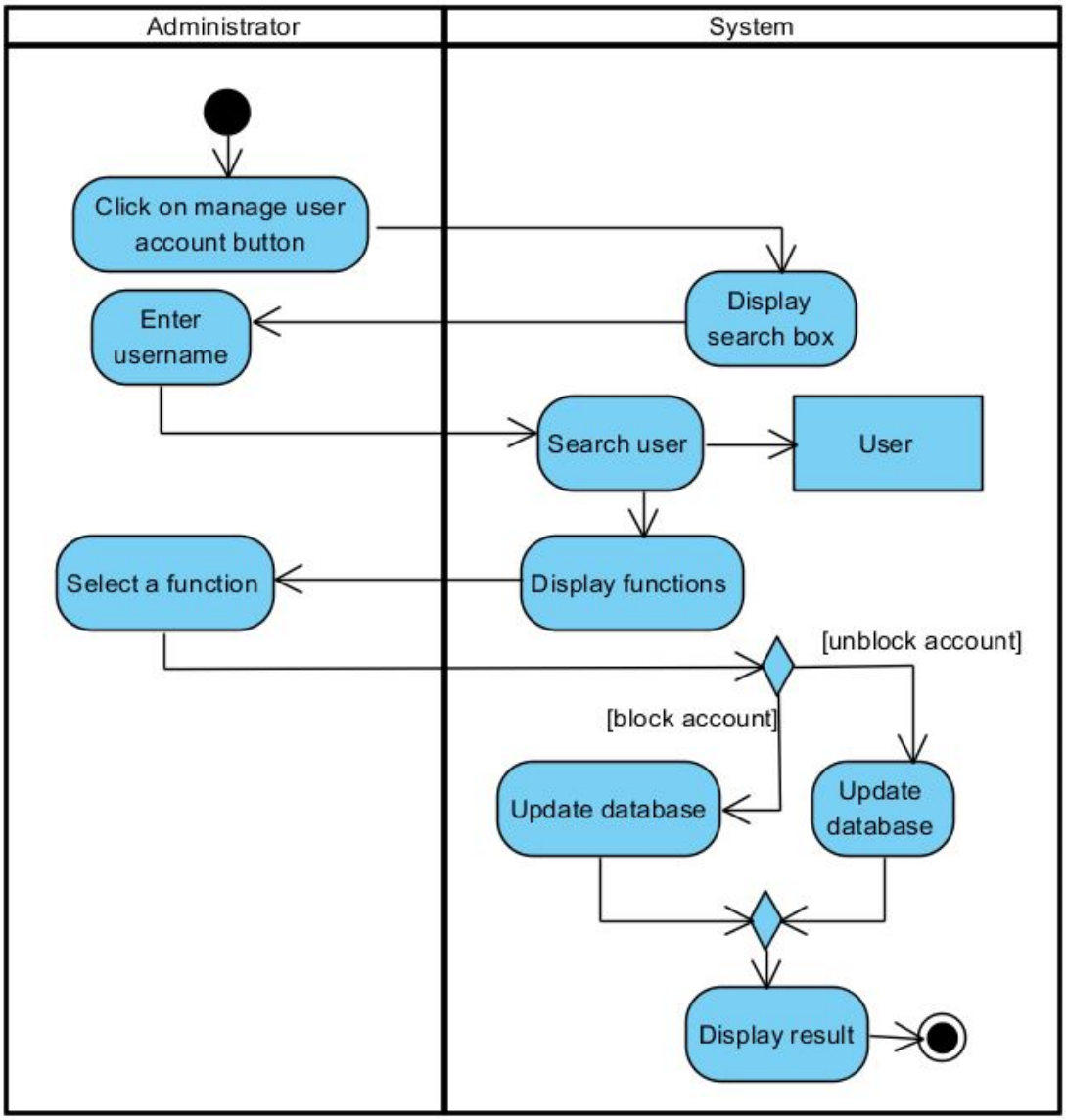


Figure 4.10: Manage user account activity diagram.

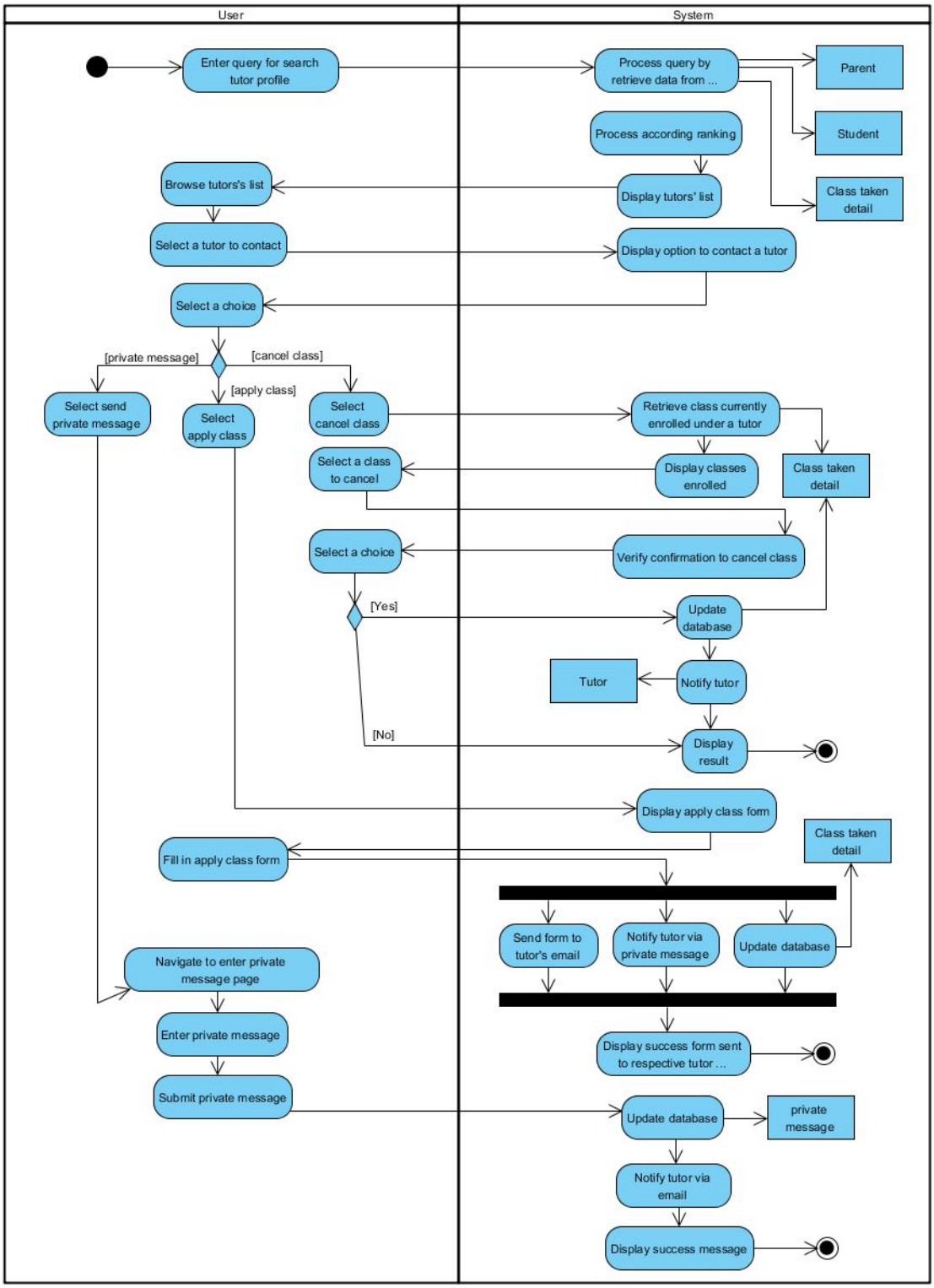


Figure 4.11: Search tutor activity diagram.

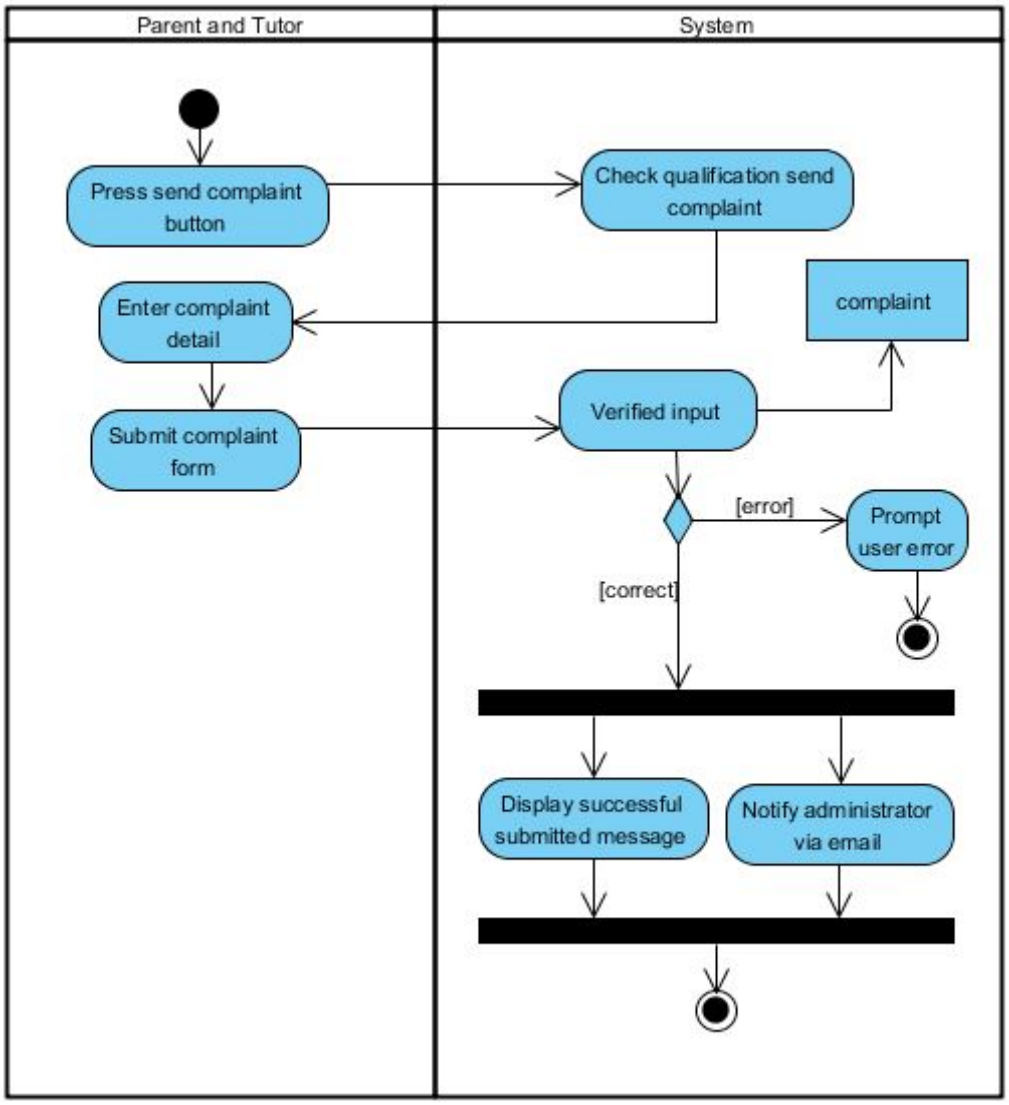


Figure 4.12: Send complaint to administrator activity diagram.

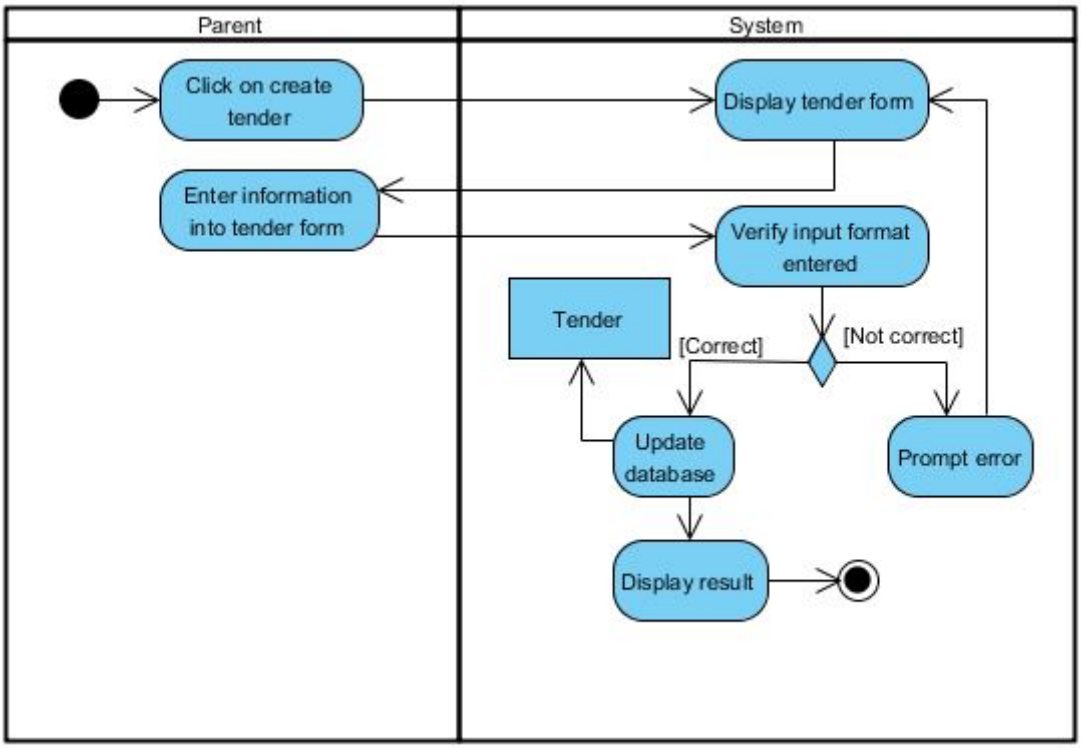


Figure 4.13: Submit tender offered activity diagram.

4.4 DATA FLOW DIAGRAM

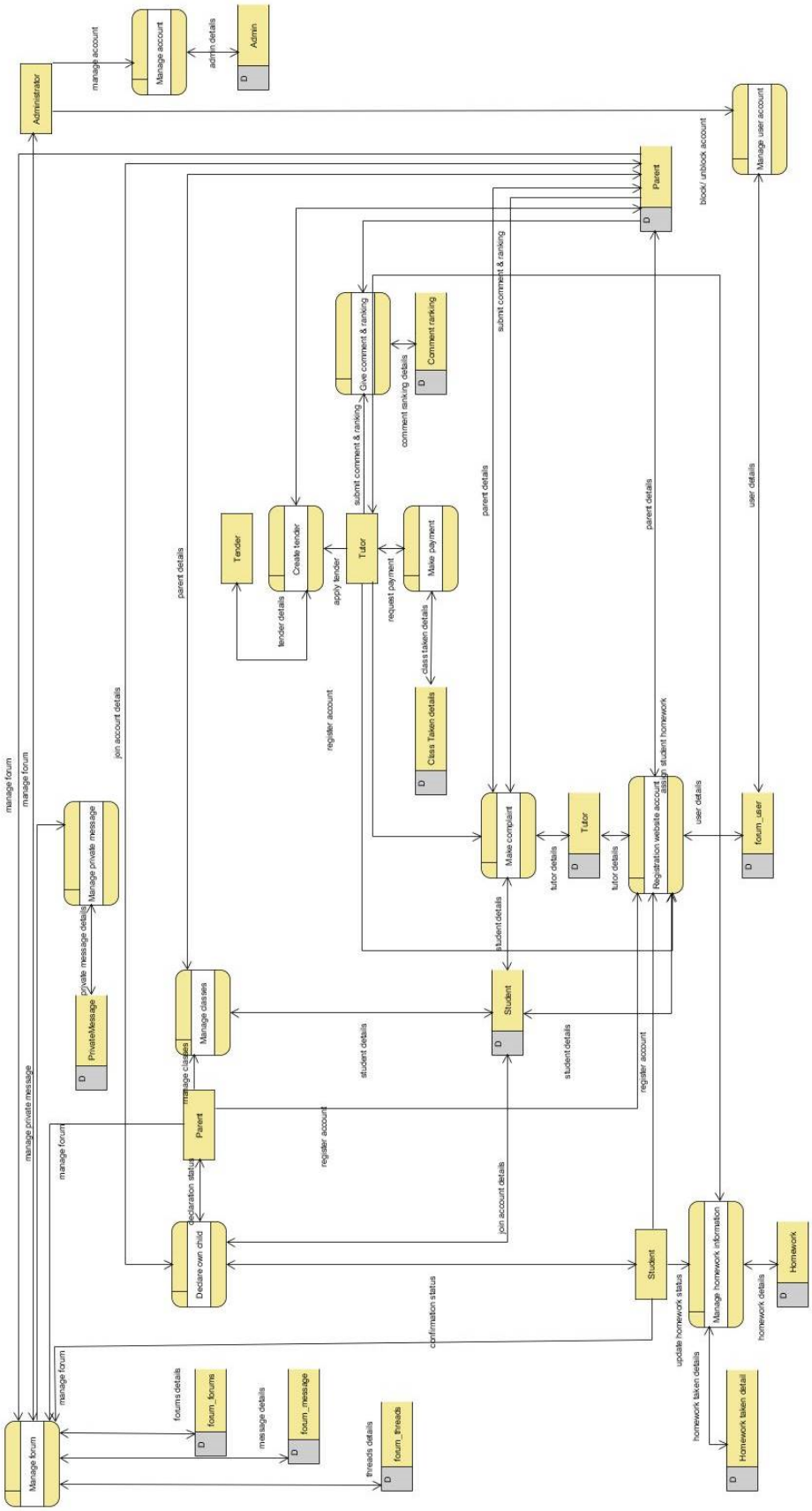


Figure 4.14: Data Flow Diagram

4.5 ENTITY RELATIONSHIP DIAGRAM

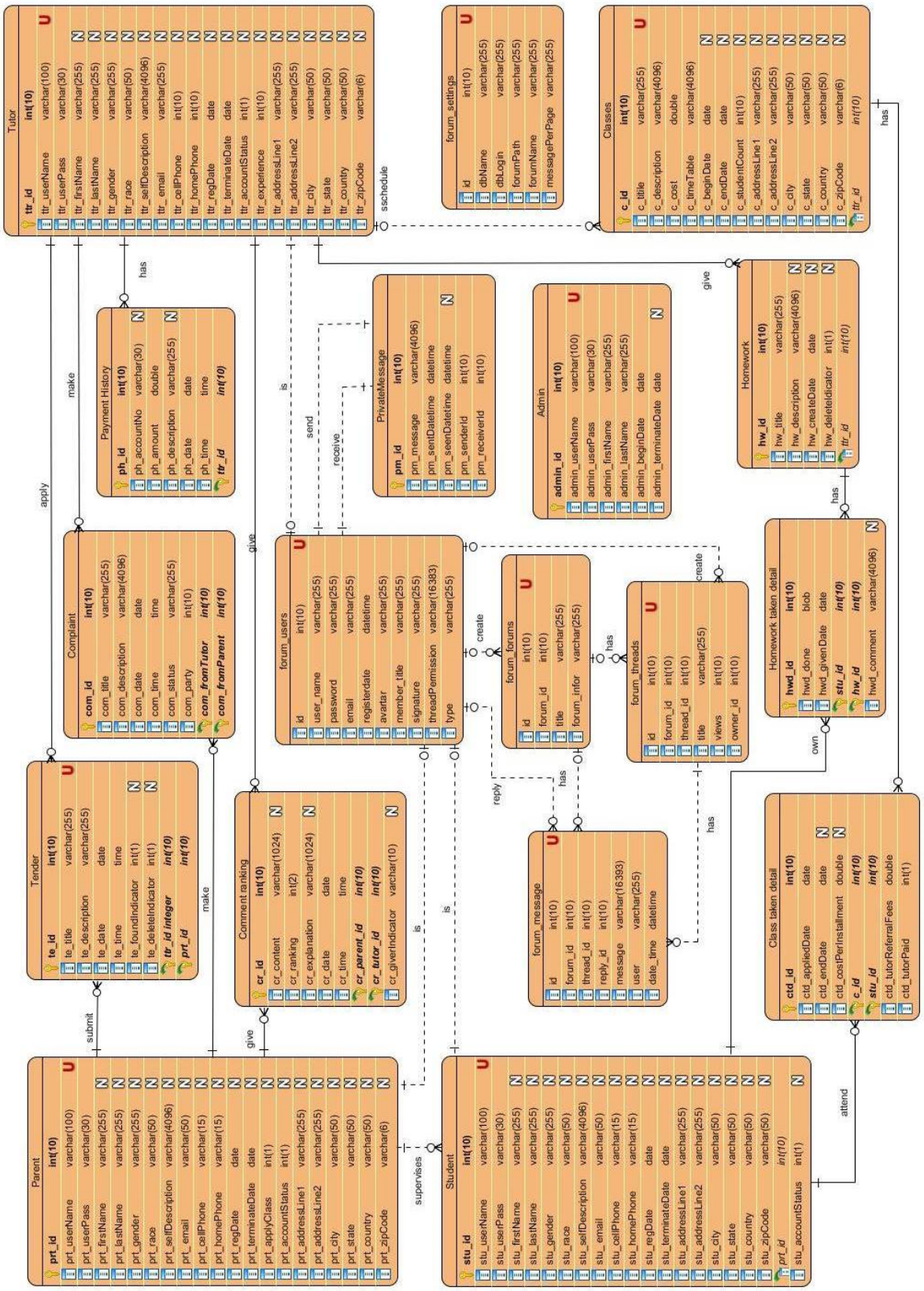


Figure 3.15 Entity relationship diagram (ERD).

4.6 DATA DICTIONARY

Table 3.4 Data dictionary - parent table.

Attribute	Data Type	Nullable	Description
+prt_id	integer(10)	no	Primary key for parent table
prt_userName	varchar(100)	no	User unique login id
prt_userPass	varchar(30)	no	User associated login password
prt_firstName	varchar(255)	yes	User first name
prt_lastName	varchar(255)	yes	User last Name
prt_gender	varchar(10)	yes	User gender (male/ female)
prt_race	varchar(50)	yes	User race
prt_selfDescription	varchar(4096)	yes	User own short introduction
prt_email	varchar(50)	yes	User email address
prt_cellPhone	varchar(15)	yes	User hand phone contact number
prt_homePhone	varchar(15)	yes	User home contact number
prt_regDate	date	yes	Registration date
prt_terminateDate	date	yes	Set other than 31/12/9999 indicated user terminated by that date.
prt_applyClass	TinyInt(3)	yes	Indicator stated parent master account only manage own children (student) account or parent also apply classes for own.
prt_accountStatus	TinyInt(3)	yes	False value indicated this parent account block by administrator and cannot login to the system.
prt_addressLine1	varchar(255)	yes	User address line 1
prt_addressLine2	varchar(255)	yes	User address line 2
prt_city	varchar(50)	yes	User city
prt_state	varchar(50)	yes	User state
prt_country	varchar(50)	yes	User country
prt_zipCode	varchar(6)	yes	User zip code

Table 3.5 Data dictionary - student table.

Attribute	Data Type	Nullable	Description
+stu_id	integer(10)	No	Primary key for student table
stu_userName	varchar(100)	No	User unique login name
stu_userPass	varchar(30)	No	User associated login password
stu_firstName	varchar(255)	Yes	User first name
stu_lastName	varchar(255)	Yes	User last Name
stu_gender	varchar(10)	yes	User gender
stu_race	varchar(50)	yes	User race
stu_selfDescription	varchar(4096)	yes	User own short description
stu_email	varchar(50)	yes	User email address
stu_cellPhone	varchar(15)	yes	User hand phone contact number
stu_homePhone	varchar(15)	yes	User home contact number
stu_regDate	date	yes	Registration date
stu_terminateDate	date	yes	Set other than 31/12/9999 indicated user terminated by that date.
stu_applyClass	TinyInt(3)	yes	Indicate a record whether parent only help their children apply class or itself also will apply for class.
stu_addressLine1	varchar(255)	yes	Address line 1
stu_addressLine2	varchar(255)	yes	Address line 2
stu_city	varchar(50)	yes	City
stu_state	varchar(50)	yes	State
stu_country	varchar(50)	yes	Country
stu_zipCode	varchar(6)	yes	Zip code
+#prt_id	integer(10)	no	Foreign key for parent table
Stu_accountStatus	TinyInt(3)	yes	False value indicator blocked account

Table 3.6 Data dictionary - tutor table.

Attribute	Data Type	Nullable	Description
+ttr_id	integer(10)	no	Primary for tutor table
ttr_userName	varchar(100)	no	User login id
ttr_userPass	varchar(30)	no	User login password
ttr_firstName	varchar(255)	yes	User first name
ttr_lastName	varchar(255)	yes	User last Name
ttr_gender	varchar(10)	yes	User gender
ttr_race	varchar(50)	yes	User race
ttr_selfDescription	varchar(4096)	yes	User own short introduction
ttr_email	varchar(50)	yes	User email address
ttr_cellPhone	varchar(15)	yes	User hand phone contact number
ttr_homePhone	varchar(15)	yes	User home contact number
ttr_regDate	date	yes	Registration date
ttr_terminateDate	date	yes	Set other than 31/12/9999 indicated user terminated by that date.
ttr_accountStatus	TinyInt(3)	yes	False indicate account block by administrator
ttr_experience	integer(10)	yes	Experience number show to public, higher meaning better
ttr_addressLine1	varchar(255)	yes	Address line 1
ttr_addressLine2	varchar(255)	yes	Address line 2
ttr_city	varchar(50)	yes	City
ttr_state	varchar(50)	yes	State
ttr_country	varchar(50)	yes	Country
ttr_zipCode	varchar(6)	yes	Zip code

Table 3.7 Data dictionary - classes table.

Attribute	Data Type	Nullable	Description
+c_id	integer(10)	no	Primary key fpr classes table
c_titile	varchar(255)	no	Class subject title
c_description	varchar(4096)	no	Detail description of class
c_cost	double(10)	no	Fess for single session
c_timetable	varchar(4096)	no	Record first iteration time pattern of class
c_beginDate	date	yes	Class start from which date
c_endDate	date	yes	Class end at which date
c_studentCount	integer(10)	yes	Indicate an estimate class number
c_addressLine1	varchar(255)	yes	Address line 1
c_addressLine2	varchar(255)	yes	Address line 2
c_city	varchar(50)	yes	City
c_state	varchar(50)	yes	State
c_country	varchar(50)	yes	Country
c_zipCode	varchar(6)	yes	Zip code
+#ttr_id	integer(10)	no	Foreign key to tutor table, indicate this class schedule by who

Table 3.8 Data dictionary - tender table.

Attribute	Data Type	Nullable	Description
+te_id	integer(10)	no	Primary key for tender table
te_title	varchar(255)	no	Tender title
te_description	varchar(255)	no	Tender description
te_date	date	no	Tender submitted date
te_time	time(7)	no	Tender submitted time
te_foundIndicator	TinyInt(3)	yes	True indicated this tender successfully already apply by a tutor
te_deleteIndicator	TinyInt(3)	yes	True indicated this tender deleted by administrator or parent who submitted
+#ttr_id	integer(10)	no	Foreign key for tutor table
+#prt_id	integer(10)	no	Foreign key for parent table

Table 3.9 Data dictionary - complaint table.

Atrribute	Data Type	Nullable	Description
+com_id	integer(10)	no	Primary key for complaint table
com_title	varchar(255)	no	Complaint title
com_description	varchar(4096)	no	Complaint description
com_date	date	no	Complaint submitted date
com_time	time(7)	no	Complaint submitted time
com_status	varchar(255)	no	Administrator given comment on this complaint
com_party	integer(10)	no	Indicated who is received complaint, who is sending complaint or just general complaint
+#com_fromTutor	integer(10)	no	Foreign key for tutor table
+#com_fromParent	integer(10)	no	Foreign key for parent table

Table 3.10 Data dictionary – comment ranking table.

Attribute	Data Type	Nullable	Description
+cr_id	integer(10)	no	Primary key for comment ranking table
cr_content	varchar(1024)	yes	Comment details
cr_ranking	integer(2)	no	Ranking – Good , average, bad
cr_explanation	varchar(1024)	yes	Receiver of this comment opt for reply comment 1 time only
cr_date	date	no	Comment given date
cr_time	time(7)	no	Comment give time
+#cr_parent_id	integer(10)	no	Foreign key for parent table
+#cr_tutor_id	integer(10)	no	Foreign key for tutor table
cr_giverIndicator	varchar(10)	no	Indicated this comment given by tutor or parent

Table 3.11 Data dictionary – homework taken detail table.

Attribute	Data Type	Nullable	Description
hwd_id	integer(10)	no	Primary key for homework taken detail table that descript students current taken homework
hwd_done	TinyInt(3)	no	True indicate student declare this homework has been done
hwd_givenDate	date	no	This indicate the date student taken this homework
+#stu_id	integer(10)	no	Foreign key to student table
+#hw_id	integer(10)	no	Foreign key to homework table

Table 3.12 Data dictionary – class taken detail table.

Attribute	Data Type	Nullable	Description
ctd_id	integer(10)	no	Primary key for class taken detail table that record the class taking detail by students
ctd_appliedDate	date	no	Date for a class student applied
ctd_endDat	date	yes	Date to record that a student not enroll anymore in a class
ctd_costPerInstallment	double(10)	yes	Record of each period fees for a class, can be monthly, count of classes taken or etc.
+#c_id	integer(10)	no	Foreign key to classes table
+#stu_id	integer(10)	no	Foreign key to student table
ctd_tutorReferralFees	Double(10)	yes	Tutor referral fees shall pay
Ctd_tutorPaid	TinyInt(3)	yes	Indicator of referral fees payment, true indicated paid

Table 3.13 Data dictionary – admin table.

Attribute	Data Type	Nullable	Description
+admin_id	integer(10)	no	Primary key, this table mainly record admin login detail
admin_userName	varchar(100)	no	Admin username
admin_userPass	varchar(30)	no	Admin password
admin_firstName	varchar(255)	no	Admin first name
admin_lastName	varchar(255)	no	Admin last name
admin_beginDate	date	no	Admin added date
admin_terminateDate	date	no	Admin terminated date

Table 3.14 Data dictionary – private message table.

Attribute	Data Type	Nullable	Description
+pm_id	integer(10)	no	Primary key for private message table
pm_message	varchar(8192)	no	Actual private message content
pm_sentDatetime	datetime	no	Sender submitted date and time
pm_seenDatetime	datetime	yes	Receiver received date and time
pm_senderId	integer(10)	no	Record for sender primary key
pm_receiverId	integer(10)	no	Indicated sender user type: student/ tutor/ parent

Table 3.15 Data dictionary – payment history table.

Attribute	Data Type	Nullable	Description
+ph_id	integer(10)	no	Primary key
ph_accountNo	varchar(30)	yes	Payer account number use during the transaction
ph_amount	double(10)	no	Amount paid
ph_description	varchar(255)	yes	Payment detail
ph_date	date	no	Payment date
ph_time	time(7)	no	Payment time
+#ttr_id	integer(10)	no	Foreign key to tutor table, indicated who is the payer

Table 3.16 Data dictionary – homework table.

Attribute	Data Type	Nullable	Description
+hw_id	integer(10)	no	Primary key
hw_title	varchar(255)	no	Homework topic
hw_description	varchar(4096)	yes	Home contents
hw_createDate	date	yes	Homework added date
hw_deleteIdicator	TinyInt(3)	yes	Homework deleted indicator, if true meaning homework information deleted
#ttr_id	integer(10)	no	Foreign key to tutor table

Table 3.17 Data dictionary – forum_forums table.

Attribute	Data Type	Nullable	Description
+id	integer(10)	no	Primary key for forum_forums table
forum_id	integer(10)	no	Unique key for forum_forums table to act as indicator of master post in the forum main page that only able manage by administrator
Title	varchar(255)	no	Forum each master post title
Forum_infor	varchar(255)	no	Forum each master post information

Table 3.18 Data dictionary – forum_message table.

Attribute	Data Type	Nullable	Description
+id	integer(10)	no	Primary key for forum_message table
forum_id	integer(10)	no	Unique key for forum_forums table to act as indicator of master post in the forum main page that only able manage by administrator
thread_id	integer(10)	no	Foreign key to forum_thread table
reply_id	integer(10)	no	Unique key to identify forum_message table each message written on each thread
message	varchar(16383)	no	Reply message detail for each thread
user	varchar(255)	no	Username that identify owner of the reply message is from which user
date_time	datetime	no	Message created date and time record

Table 3.19 Data dictionary – forum_setting table.

Attribute	Data Type	Nullable	Description
+id	integer(10)	no	Primary key for forum_message table
dbName	varchar(255)	no	MySql database connection name
dbLogin	varchar(255)	no	MySql database login username
dbPassword	varchar(255)	no	MySql database login password
forumPath	varchar(255)	no	Web application dynamic forum path
forumName	varchar(255)	no	Forum dynamic name
messagePerPage	varchar(255)	no	Setting show forum maximum message for a page

Table 3.20 Data dictionary – forum_threads table.

Attribute	Data Type	Nullable	Description
+id	integer(10)	no	Primary key for forum_threads table
forum_id	integer(10)	no	Foreign key to forum_forums table
thread_id	integer(10)	no	Unique key to identity each thread
title	varchar(255)	no	Thread's title
views	integer(10)	no	Show a thread how popular using number indicator show user visited times
owner_id	integer(10)	no	Record of user who created threads

Table 3.21 Data dictionary – forum_users table.

Attribute	Data Type	Nullable	Description
+id	integer(10)	no	Primary key for forum_users table
user_name	varchar(255)	no	Forum display username to public
password	varchar(255)	no	Forum login password
email	varchar(255)	no	Forum important notification will notify user by using this email address
registerdate	datetime	no	User registration of forum date and time
avatar	varchar(255)	no	Web application storage path to access avatar picture that will display as a profile photo in forum
member_title	varchar(255)	no	User's name title
signature	varchar(255)	no	User's quotes special own short sentence
threadPermission	varchar(16383)	no	Permission access constraint post belong to another user in forum, able access a user's post when this consist of another user's id
type	varchar(255)	no	Either Admin/ Parent/ Student/ Tutor

CHAPTER 5: SYSTEM IMPLEMENTATION AND TESTING

5.1 IMPLEMENTATION ISSUES AND CHALLENGES

The challenges of this project is finding fact that required to support website functionalities development that suitable for this user requirement. To search for facts, I spent a lot time to during holidays to search for existing tutors that currently teaching in the primary and secondary school. Firstly, I asked one of my relative which currently teaching in primary school to complete a survey for me. Next, I seek help from my relative by spent 2 days on my relative house to waiting their colleague to visit during Chinese New Year to participate on the survey I created. This is big challenge for me because I am very shy to ask for participate the survey. However, luckily I able to done some survey, which is 5 set of surveys done from tutors and 15 set of survey done by parents, which give me total of 20 set of surveys. Besides, for some responders from parents, I also need to translate the survey questionnaire to them as there are not able to understand fully English content.

In additional, I also facing issues on development for the system itself, mainly is developing the system design, I do not sure that how to implement is the better user experience. Therefore, I spent a lot of time to search for similar website implementation such as payment system, Taobao ranking system and etc. Besides, I also facing problem on designing entity relationship design diagram (ERD). The ERD diagram I wait until the very last minute only complete because from time to time, the database found less some data or indicator that force me make changes on it.

5.2 WEB APPLICATION TESTING & IMPLEMENTATION

5.2.1 WEB APPLICATION IMPLEMENTATION

The web application user interfaces is implementing using multiple Java servlet template files. The template files included each pages of the header, footer and construction of tables. For example, when need a table display in a java servlet page, just required call the include function from the “table_start.jsp”, “table_title.jsp” and other related files for construction a complete table. This enable of model view controller (MVC) that separate database concern and controller logic with the user

interfaces. Therefore, this web application able to make changes of the whole web application theme for every page's top heading bars until bottom page's footer by modify few template java servlet files. This enable majority of interfaces to change easily without required construct everything and programmer effort of integration layout interfaces with existing functional coding in java servlet files.

In additional, the web application are separated into 2 major modules, first module is forum related functionalities, and second module is the non-forum related functionalities such as tender request and apply features, comment and ranking features, classes application feature, and many others. Each module database login settings such as database's username, database's password, page name are maintain in the "mainVariable.java". Therefore, each module able to using separate of database that ease of maintenance for administrator in future. Each part of the module able to easily running on different server or temporary shut down a module without effect on another module running.

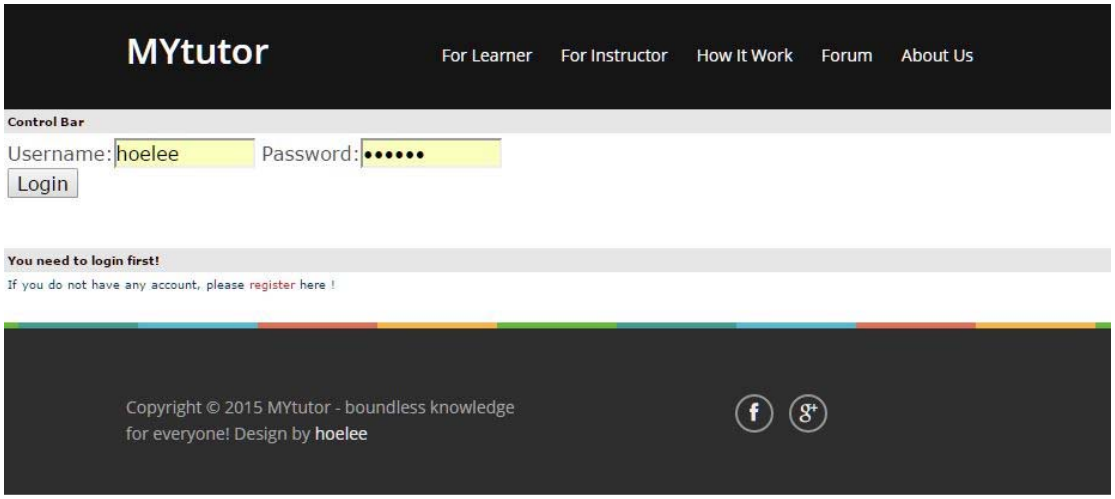


Figure 5.1: Session controller prevent unauthorized user access website functionalities.

Figure above shown the forum session controller that required all user login. This is mandatory for users to perform logged in function first before authorize to access the web application functionalities such as forum, search class and etc. Any user may choose different role play in the system, which included student, parent or tutor, just depend on user's role wanted to play in this system. Besides that, children of parents also able to register with this web application in order for them to access forum information and enabling them to discuss in the forum. Last but not least, the web application are maintained by admin role user. Admin able perform additional security function such as add forum root topic, delete topics, threads, messages, tenders and classes.

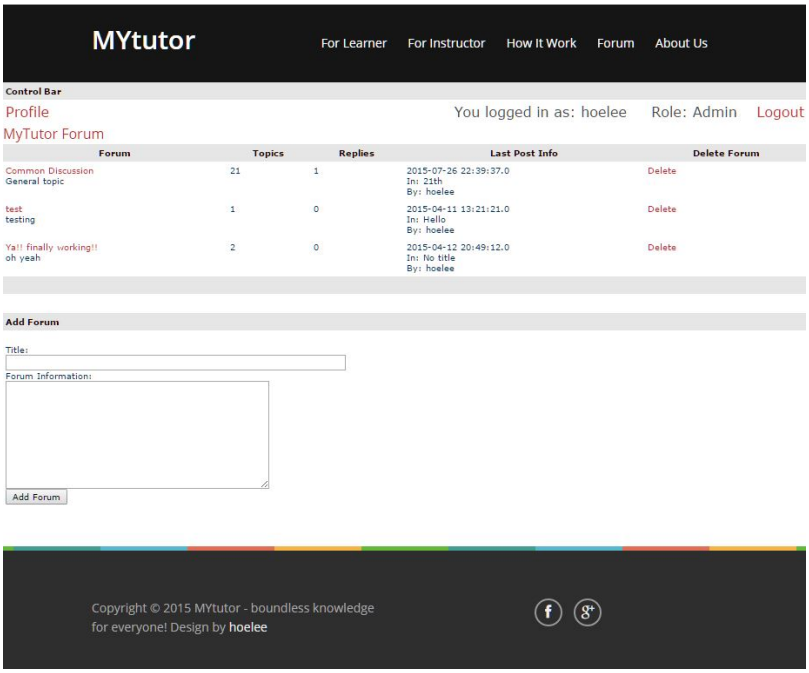


Figure 5.2: Forum logged in as admin main page.

After user logged in, the web application will redirect users to the forum main page. Above figure shown a user logged in as admin role account privileged. Admin have additional privileged to that have additional functionalities such as add new topic into forum and delete existing topic in forum. For the normal users such as logged in as student, tutor or parent role, system will hire all the unauthorized functionalities. Therefore, without authorized user cannot perform those functionalities.

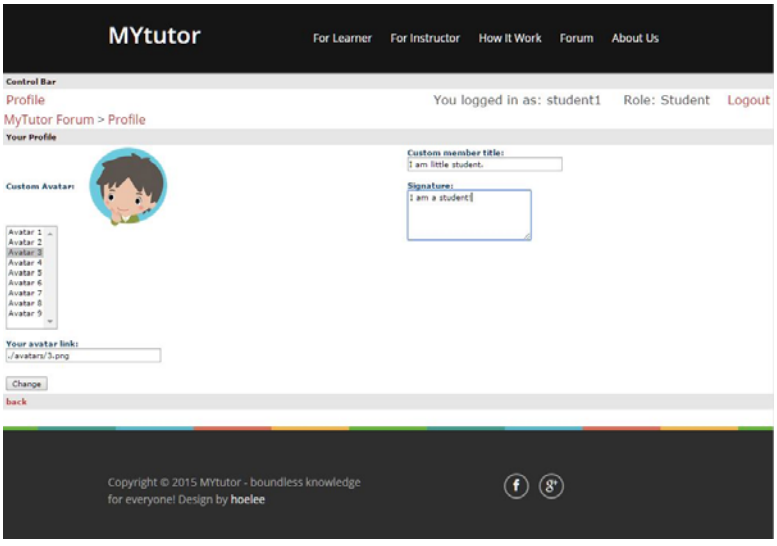


Figure 5.3: Manage forum user profile.

Figure above shown the abilities to select custom avatar picture from available choices in the server side. This avatar will show in the forum when user post message. Besides that, every users able to customize prefer member title and signature.

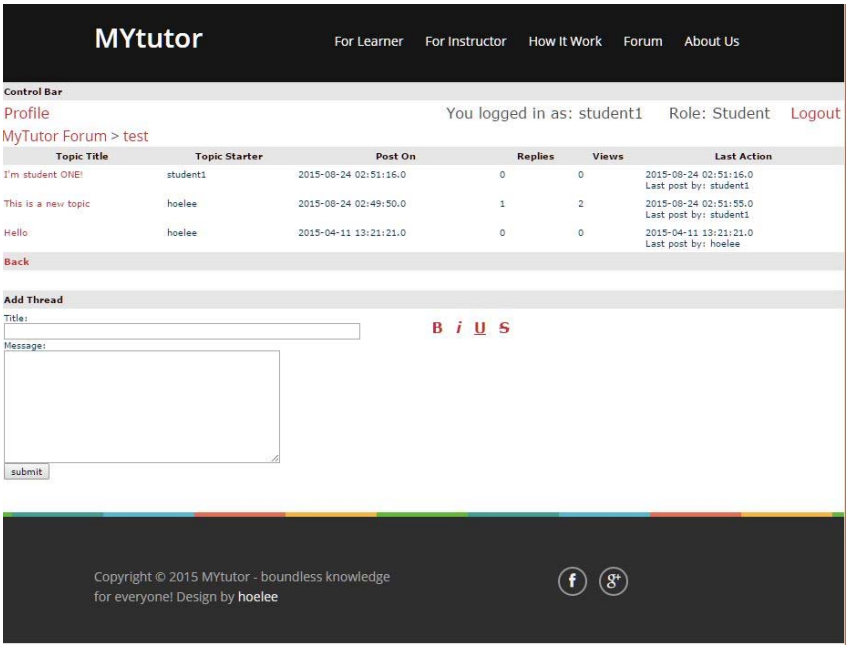


Figure 5.4: Forum topic.

Figure above shown the user able to add thread to the existing topic in the forum. Each of the threads posted by the users, system will automatically record all information related to posted date and time, thread creator username. In additional, system will automatically show latest reply message's username, date and time for every threads.

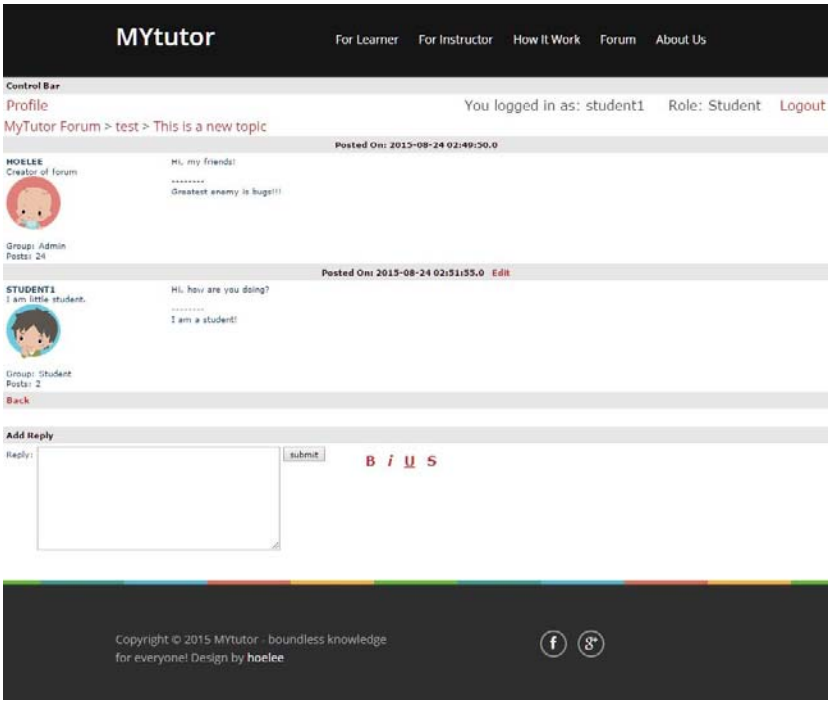


Figure 5.5: Forum message.

The figure above shown the simple comment and reply of 2 users, which is playing student and admin role. This page enable user to add reply to existing topic available. Users overall information will be shown here, which included username, avatar, message, signature and the total message posted that available in history.

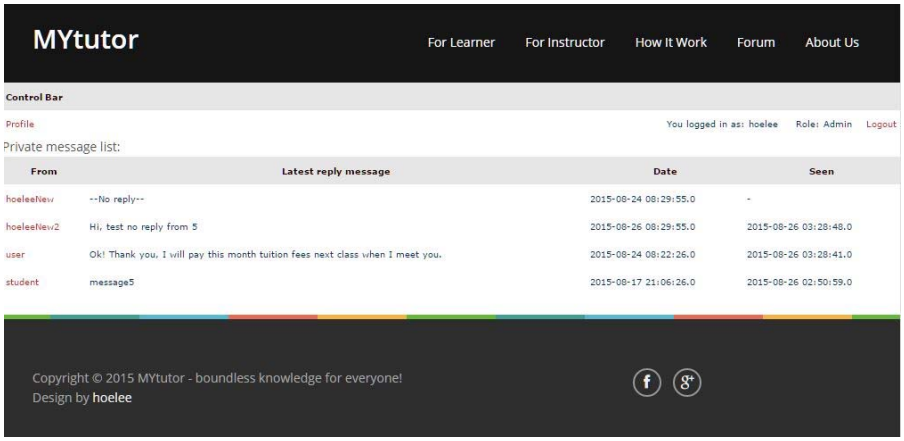


Figure 5.6: Private message for a user.

Figure above display the list of private message sent out from admin to other users and the private message received from other user. The private message functionality will available for each every users in the web application for private communication purposes. When the user sent out message not yet reply by the receiver, system will sort the private message on top and display "--No reply--". Besides, the system will sort private message which not yet seen message on top on the list for ease user access to the message.

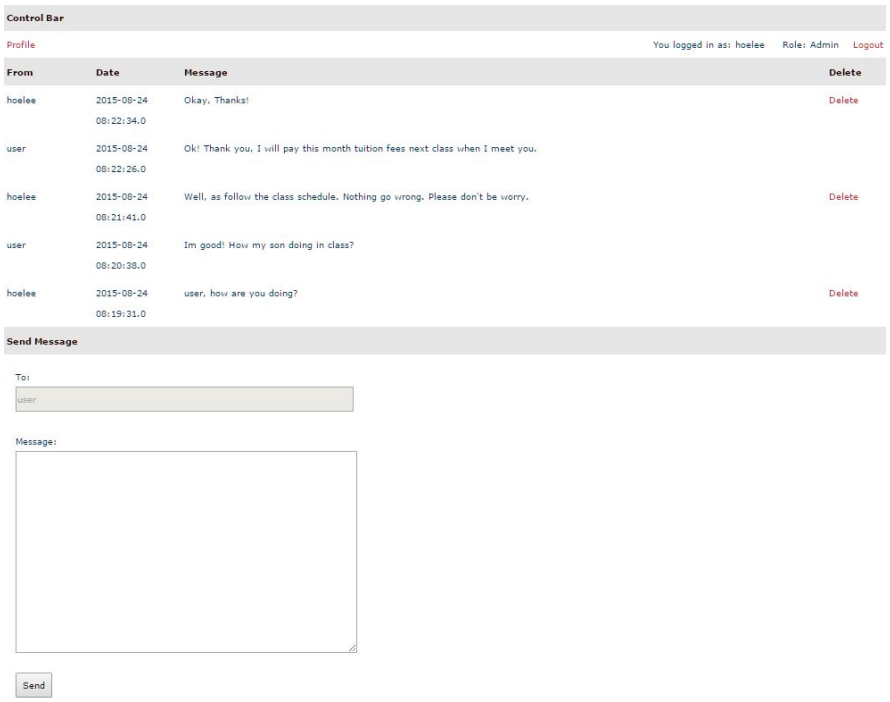


Figure 5.7: Private message communication detail with another user.

Figure above shown the sample of communication between 2 users. Within this private message communication, users are only allow for send message to other party and constraint to delete own sent out private message. The private message enable ease of communication for every users that do not constraint sender and receiver.

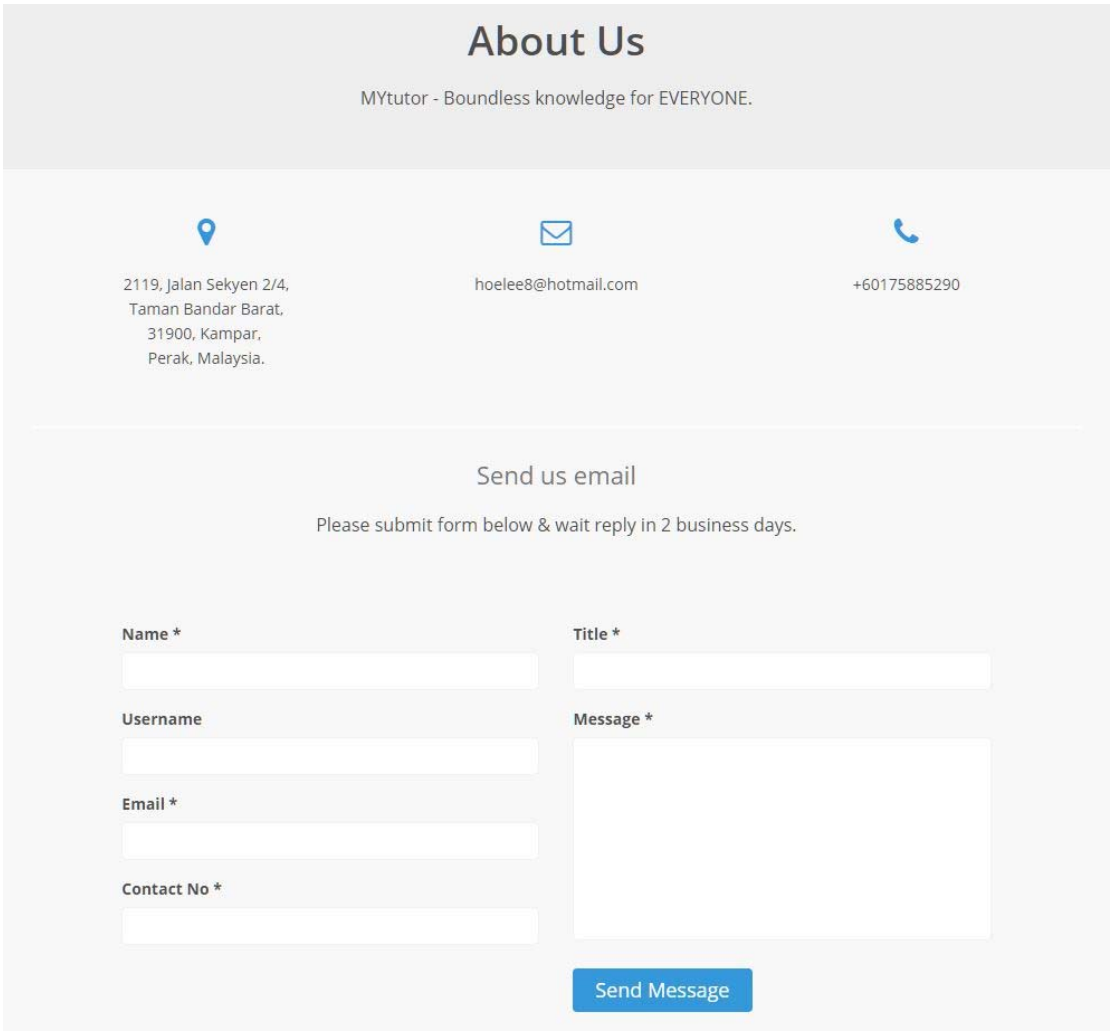


Figure 5.8: Contact administrator about us page.

Figure above show the about us page that allow users to make complaints, requests, and inquiries directly to administrator though email method. This mean that after the User click send message, web application will acknowledge administrator by generating a email and send though email to administrator account. Later on, administrator able contact the user directly or through private message.

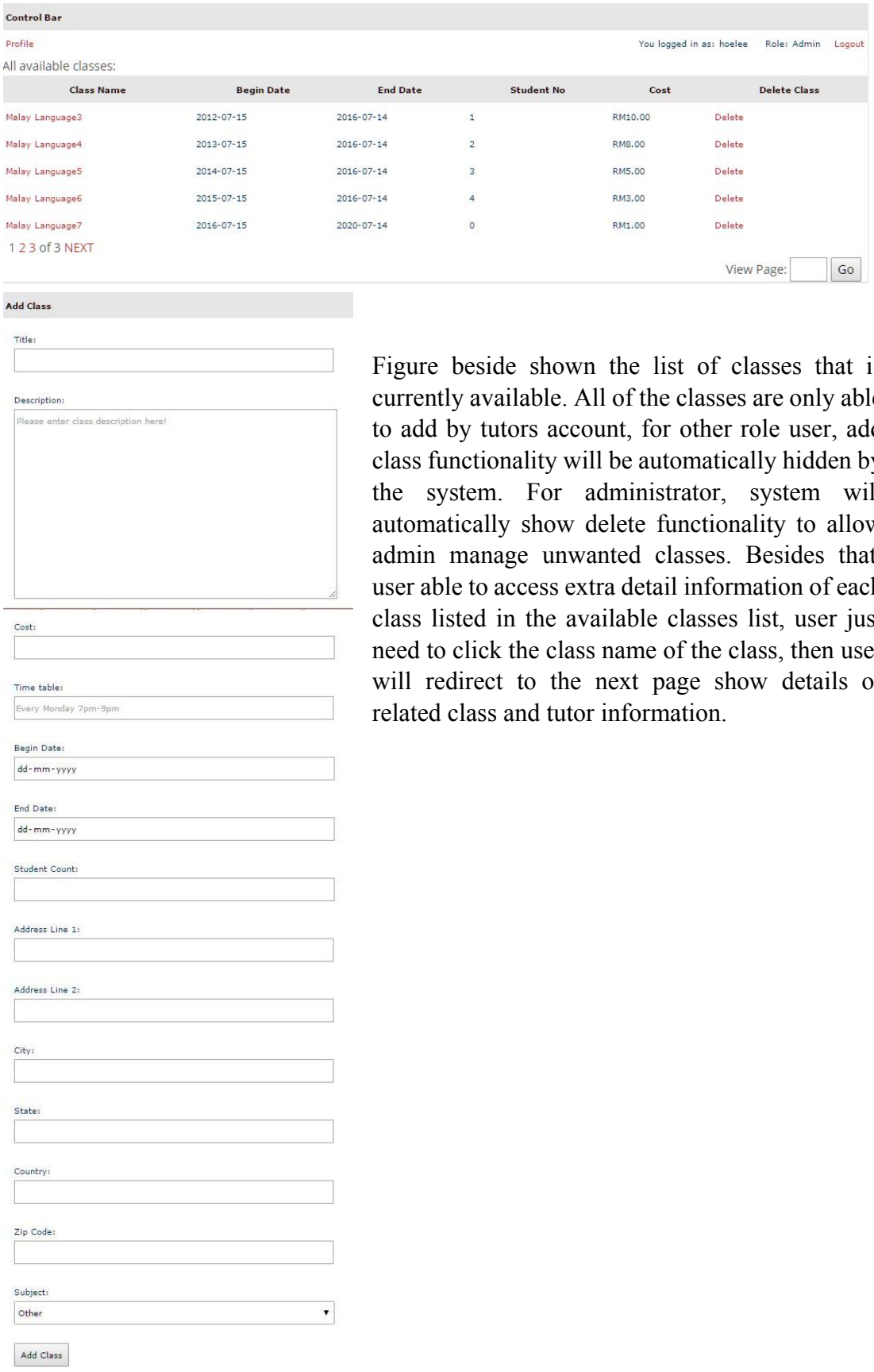
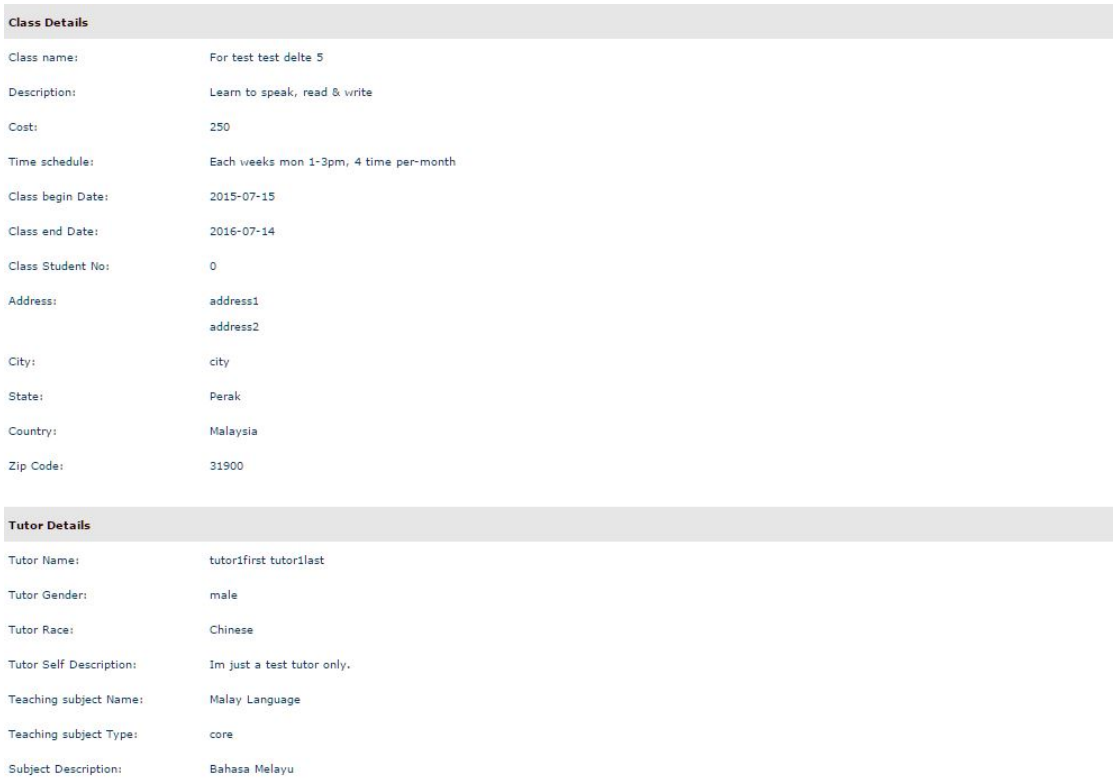


Figure beside shown the list of classes that is currently available. All of the classes are only able to add by tutors account, for other role user, add class functionality will be automatically hidden by the system. For administrator, system will automatically show delete functionality to allow admin manage unwanted classes. Besides that, user able to access extra detail information of each class listed in the available classes list, user just need to click the class name of the class, then user will redirect to the next page show details of related class and tutor information.

Figure 5.9: Available classes list added by tutors.



Class Details

Class name:	For test test delte 5
Description:	Learn to speak, read & write
Cost:	250
Time schedule:	Each weeks mon 1-3pm, 4 time per-month
Class begin Date:	2015-07-15
Class end Date:	2016-07-14
Class Student No:	0
Address:	address1 address2
City:	city
State:	Perak
Country:	Malaysia
Zip Code:	31900

Tutor Details

Tutor Name:	tutor1first tutor1last
Tutor Gender:	male
Tutor Race:	Chinese
Tutor Self Description:	Im just a test tutor only.
Teaching subject Name:	Malay Language
Teaching subject Type:	core
Subject Description:	Bahasa Melayu

Figure 5.10: Class details

The above image is display about a class details which included class information and respective tutor's information. After the class's information, web application also will provide private message box that enable user directly contact tutor in order for acquire further information related to this class. Besides that, there is a apply class button that allow parent and student apply class. After both party agree the class schedule, pricing, location, and time table, tutor will include the user as a student enroll in the respective class.

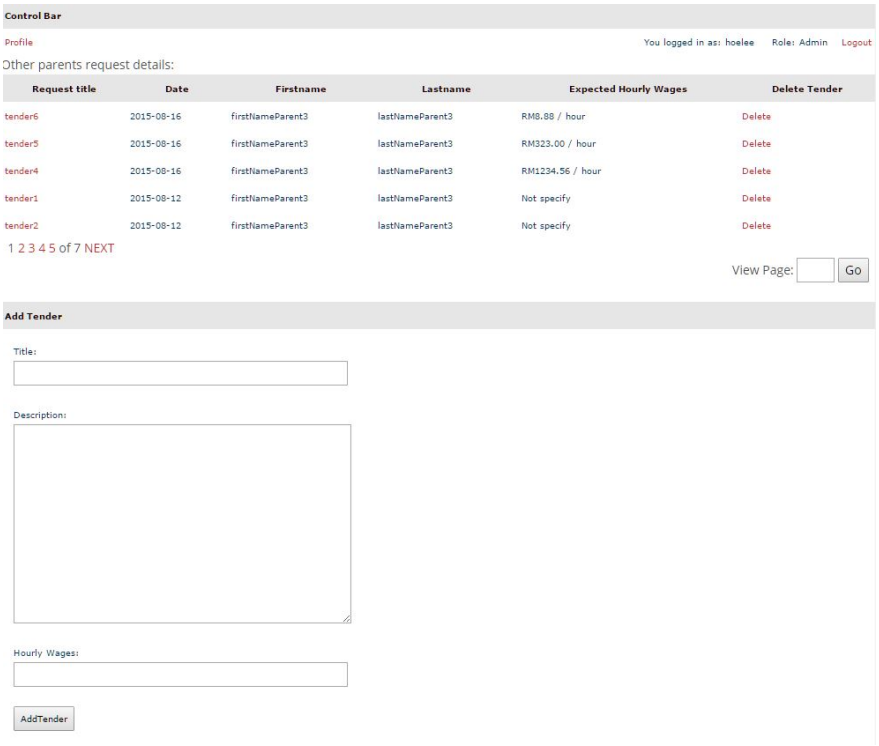


Figure 5.11: Tender list.

The above image shown the all other parent tenders list. The purpose of the list is for the tutor to visit and apply later whenever tutor found that the class requested by parent meet their expectation and ability to provide lesson. This feature is provided mainly for parent if the parent found out the classes currently tutor offer are not meet their expectation or location too far from own housing areas.

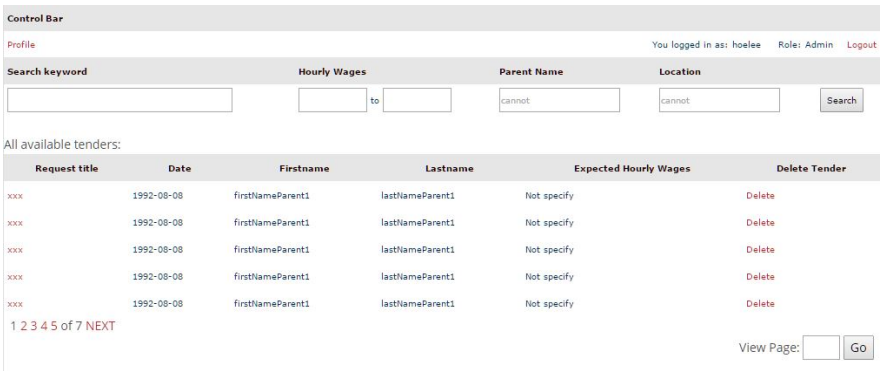


Figure 5.1281: Search function for existing tenders.

Figure above show the ability of web application to filter out expected title, subject and location from all the tender requested and posted by parents' previously. After a tutor found a suitable tender, tutor can contact parent via private message and apply the tender. This enable tutor ease of access to more job opportunities.

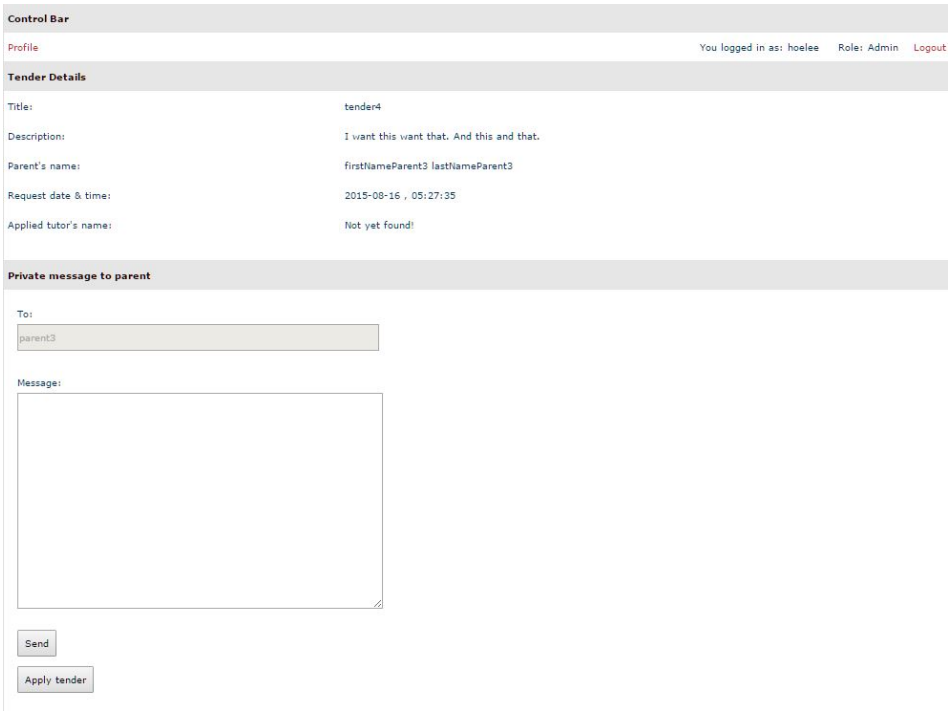


Figure 5.13: Tender details

Figure above shown a tender details information that posted by parents to request tutors. The "Apply tender" button only available when user logged in as tutor role, if the tutor applied the tender, then this tender will listed in the tutor applied tenders' list and will not available to search in the public tender list. After applied, the parent need to accept the tutor application only the record will take count as a successful application.

5.2.2 WEB APPLICATION BLACK BOX TESTING

Table 5.1: Manage account for every users test case

Test case T1A	
Unit to test	Manage account – create account
Assumption	User want to register an account.
Prerequisite(s)	None
Execution step(s)	Enter registration information form Confirmation of registration
Expected result	System show registration form that let user fill in and submit to system verify. Then user will be prompt confirmation of registration. After confirmed, system will store user information into database. Successful register account: System redirect user to main page Unsuccessful register account: System prompt error message and request modification of registration information.
Actual result	Successfully register account
Pass/ Fail	Pass
Comment	Run in intended manner.

Table 5.2: Manage account – terminate account test case

Test case T1B	
Unit to test	Manage account – terminate account
Assumption	Existing user want to terminate account
Prerequisite(s)	Logged in an user account
Execution step(s)	Select terminate account in profile Confirmation of terminate account
Expected result	System retrieve user's prompt confirmation of terminate account, then system retrieve user's session name and perform update on database. Then, system will display result to user. <u>Account terminated:</u> System prompt account terminated information and send notification to user email address. <u>Account not terminated:</u> System show error message cannot perform termination
Actual result	Successfully terminate an account
Pass/ Fail	Pass
Comment	Run in intended manner. Not allow for termination checking required for administrator management of violate rule's users.

Table 5.3: Manage forum test case

Test case T2	
Unit to test	Manage forum
Assumption	User want to add, update or delete a topic, thread or message inside forum.
Prerequisite(s)	Login to user account
Execution step(s)	Submit request of a modification to system.
Expected result	System get request from user and check user authorization to perform respective function. Then system will update database and refresh the current screen. Add Topic: System added new topic and refresh page Delete Topic: System deleted existing topic and refresh page Add Thread: System added new thread and refresh page Delete Thread: System deleted existing thread and refresh page Add Message: System added new message and refresh page Update Message: System updated existing message and refresh page Delete Message: System deleted existing message and refresh page
Actual result	Successfully perform modification information in forum
Pass/ Fail	Pass
Comment	Run in intended manner. Page number implementation required for ease of navigation within result shown.

Table 5.4: Search tutor test case

Test case T3	
Unit to test	Search tutor
Assumption	User want to search tutor posted available classes
Prerequisite(s)	User logged in either as parent, student or tutor account
Execution step(s)	Enter search keyword and submit to system System display respective classes result Fill in details and apply class Send private message contact tutor
Expected result	System retrieve search keyword and display class list accordingly. Then system retrieve detail of user application of class. System store all the application request details into database and prompt tutor via email. Lastly, system redirect user private message page that allow user to contact tutor via private message. <u>Search result displayed:</u> System display as the search query entered <u>Class applied:</u> System sent private message acknowledge tutor class want to apply by parent and navigate parent to private message.
Actual result	Successfully apply tender
Pass/ Fail	Pass
Comment	Run in intended manner.

Table 5.5: Manage ranking from tutors test case

Test case T4A	
Unit to test	Manage ranking
Assumption	Tutor want to provide feedback comment to parent
Prerequisite(s)	Login to tutor account
Execution step(s)	Select a comment given by parent
	Write feedback comment and submit to system
Expected result	System display all available provide feedback comment list.
	Then tutor select a comment and submit own feedback to parent.
	Parent ranking added:
	System added new ranking from a tutor
Actual result	Successfully provided feedback to parent
Pass/ Fail	Pass
Comment	Run in intended manner.

Table 5.6: Manage ranking from parents test case

Test case T4B	
Unit to test	Manage ranking and comment for a tutor
Assumption	Parent want to get a ranking to tutor
Prerequisite(s)	Login to parent account
Execution step(s)	Select a tutor which enrolling or enrolled tutor's classes Send ranking and comment for respective tutor
Expected result	System retrieve tutor's list available for parent to rank and comment. Then system retrieve respective ranking and comment for a particular tutor and update into database. Tutor ranking and comment added: System added new ranking and comment for a tutor
Actual result	Successfully add ranking and comment
Pass/ Fail	Pass
Comment	Run in intended manner.

Table 5.7: Send complaint to administrator test case

Test case T5	
Unit to test	Send complaint email to administrator
Assumption	User want to complaint something to administrator
Prerequisite(s)	None
Execution step(s)	Fill in complete details of complaint and related information Submit to system
Expected result	System retrieve all details of complaint then generate email and send as an email message to administrator email address. Complaint message sent: System generated complaint message from user input and sent to administrator specify email address.
Actual result	Successfully complaint sent
Pass/ Fail	Pass
Comment	Run in intended manner.

Table 5.8: Submit tender offer from parent test case

Test case T6A	
Unit to test	Submit tender offer
Assumption	Parent want to submit tender that offer job for tutor
Prerequisite(s)	Parent logged in as parent account
Execution step(s)	Fill in complete details of complaint and related information Submit to system
Expected result	System retrieve all details of complaint then generate email and send as an email message to administrator email address. Tender submitted: System added record get from parent into database
Actual result	Successfully complaint sent
Pass/ Fail	Pass
Comment	Run in intended manner.

Table 5.9: Manage tender for parents update tutor application status test case

Test case T6B	
Unit to test	Manage tender
Assumption	Parent want to update status existing tender posted to public. Status included accept and reject tutor application.
Prerequisite(s)	Login to parent account
Execution step(s)	Select own tender that currently apply by tutor. Click accept tutor application button. Tender application status updated: System update database's record related for decision on the acceptance of tutor application for a tender previously offered by parent respectively
Expected result	System update tender from the database accordingly.
Actual result	Successfully accept tender that apply by tender
Pass/ Fail	Pass
Comment	Run in intended manner.

Table 5.10: Apply tender test case

Test case T6C	
Unit to test	Apply tender
Assumption	Tutor want to apply for tender posted by parent.
Prerequisite(s)	Login to tutor account
Execution step(s)	Select a tender details Click apply tender button.
Expected result	System retrieve tutor session name, find out the tutor's id and assign to respective tender. Then system send out private message notification to parent. <u>Tender applied:</u> System assign tutor id into the tender as the application of the parent's tender request
Actual result	Successfully apply tender
Pass/ Fail	Pass
Comment	Run in intended manner.

Table 5.11: Manage homework for tutors test case

Test case T7A	
Unit to test	Manage homework – tutor add and delete homework assign to student
Assumption	Tutor want to add and delete homework given details to student.
Prerequisite(s)	Login to tutor account
Execution step(s)	Fill in homework details form Submit to the system
Expected result	System retrieve tutor form and tutor session information, then update database with tutor id and respectively with the received homework student id into database Homework added: System added homework details that assign to student Homework deleted: System deleted homework details that previously assign to a student
Actual result	Successfully add or delete homework assign to student details
Pass/ Fail	Pass
Comment	Run in intended manner.

Table 5.12: Manage homework for students test case

Test case T7B	
Unit to test	Manage homework – Student declare completion of homework assigned
Assumption	Student want to declare completion homework assigned by tutor.
Prerequisite(s)	Login to student account
Execution step(s)	Select homework Press confirmation of homework button
Expected result	System retrieve student session and then show all available homework details that assign by tutors. Then, system will retrieve user request and update accordingly into database. <u>Homework done declaration:</u> System update database declare a homework assign progress finish and then will refresh the homework page <u>Homework notified declaration:</u> System update database declare a homework assign been notified by student and then will refresh the homework page
Actual result	Successfully update homework status.
Pass/ Fail	Pass
Comment	Run in intended manner.

Table 5.13: Manage user account for administrators test case

Test case T8	
Unit to test	Manage user account
Assumption	Administrator want to perform user account management such as block user account to login or unblock user to login.
Prerequisite(s)	Login to administrator account
Execution step(s)	Select a user Select confirm changing user account status
Expected result	System display available account username for admin to select. Then after admin select and confirmation of changing status. System update to database. User's account block: System update database declare account deactivate and refuse user to perform login capability. User's account unblock: System update database declare account in activate stage and accept user to perform login capability.
Actual result	Successfully changing user account status.
Pass/ Fail	Pass
Comment	Run in intended manner.

Table 5.14: Manage session for all users test case

Test case T9	
Use case to test	Manage session
Assumption	Session management changing state for login and logout.
Prerequisite(s)	User registered with MyTutor account.
Execution step(s)	User enter username and password into login form. Click login button perform login.
Expected result	The system retrieve username and password from form input, then compare with database's username match in database. Then hash password retrieve and compare hashed password store in database. Then system provide session accordingly to user's browser. Success login: User redirect to main page Unsuccessful login: Prompt fail login message and request try login again
Actual result	Success login
Pass/ Fail	Pass
Comment	Run in intended manner.

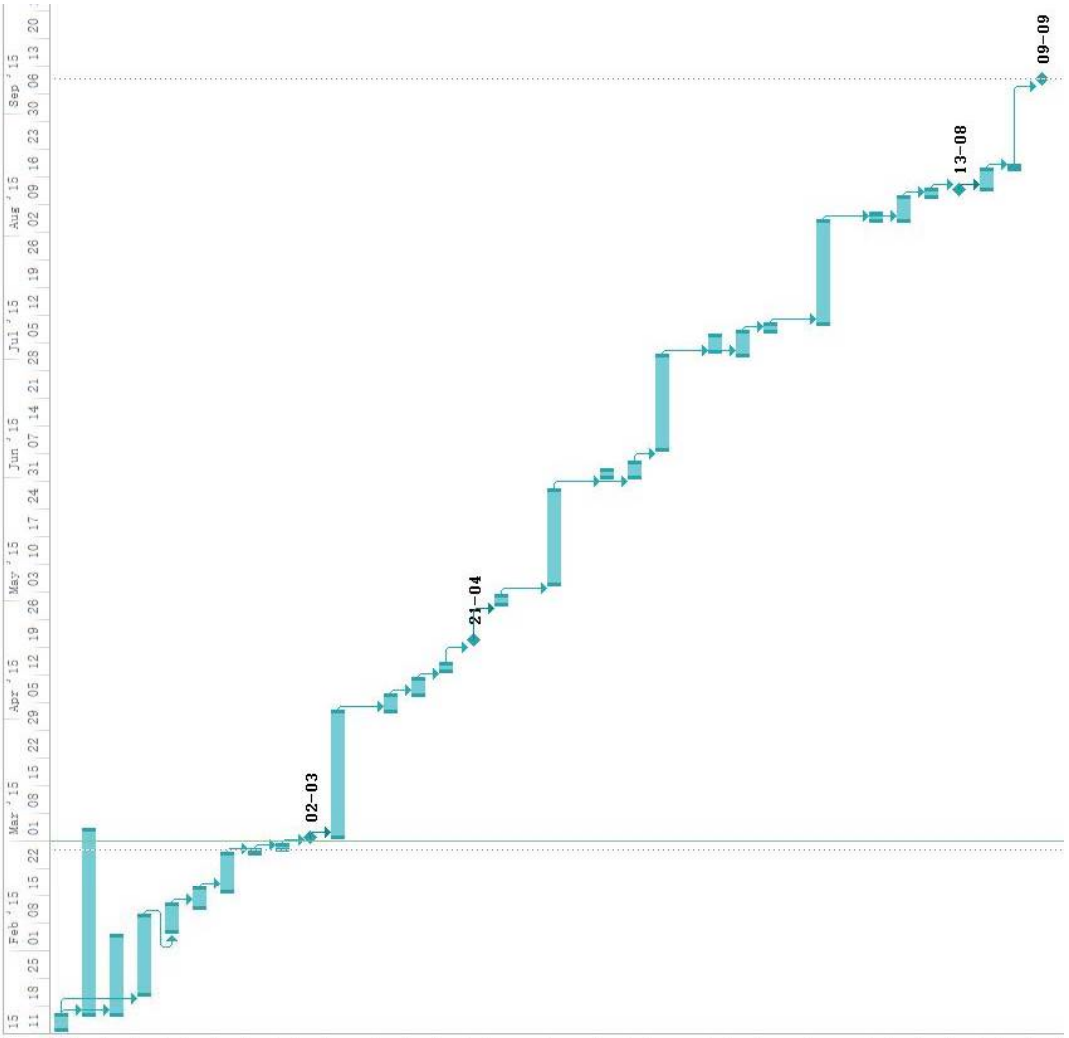
Table 5.15: Black Box testing summary

No	Test case	functionality	Expectation
T1A	Manage account - register	Register a account	Yes
T1B	Manage account – terminate	Terminate a account	Lack authority control
T2	Manage forum	Manage topic, thread, reply	Page no navigation
		Manage Private Message	Yes
T3	Search tutor	Apply, cancel & update classes	Yes
T4A	Manage ranking from tutors	Add ranking to parent	Yes
T4B	Manage ranking from parents	Add or update ranking to tutor	Yes
T5	Send Complaint to admin	Send email	Mail Server login
T6A	Submit tender offer from parent	Add tender	Yes
T6B	Manage tender	Update acceptance of tender status	Yes
T6C	Apply tender	Apply tender from available list	
T7A	Manage Homework – tutor	Add & delete homework's assign	Yes
T7B	Manage Homework - student	Change homework progress status	Yes
T8	Manage user account	Change user account status – Block user/ Unblock user	Yes
T9	Manage session	Login & logout	Yes

The table above shown summary of test case carried out. T1B test case not meet expected of control termination account feature. The system shall allow perform termination when required to check for constraint without any debt. In additional, for T2 test case – forum, currently is not as expected ease of navigation between each pages. For example, ease of jumping to any page with input of page number. This shall be improve for the next update version. For T5 test case, currently system implemented using Google mail server that are not stable. This is due to the Google rule and regulation constraint not identify application to simply access and connect though unsecure without any encryption communication internet channel. Therefore, some period of time, Google will automatically set to the default setting and email function will be temporary suspend until administrator restore back correctly setting in Google email account.

5.3 TIMELINE

Next page attached with figure 4.1 that show the current timeline and future schedule for this project development. Although before March, the actual planned is slower than schedule due to a lot of holidays and other subjects' assignment and extra-curricular from school. However, I am able to meet the milestone to submit the report on 2nd of March. For the schedule after 3rd of March, all are planned schedule for future guideline.



Task Name	Duration	Start	Finish	Predecessors
Project requirement analysis	4 days	Mon 12-01-15	Thu 15-01-15	
Module analysis	30 days	Fri 16-01-15	Tue 03-03-15	1
Literature review	14 days	Fri 16-01-15	Wed 04-02-15	1
Survey gathering	14 days	Wed 21-01-15	Mon 09-02-15	1
Review of analysis	4 days	Fri 06-02-15	Thu 12-02-15	4FS-2 days
UML diagram design	3 days	Thu 12-02-15	Mon 16-02-15	5FS-3 days
Database modelling	6 days	Mon 16-02-15	Wed 25-02-15	6FS-1 day
Module breakdown	1 day	Thu 26-02-15	Thu 26-02-15	7
FYP1 Document compilation	1 day	Fri 27-02-15	Fri 27-02-15	8
Report submission	0 days	Mon 02-03-15	Mon 02-03-15	9
Prototype development for module 1	24 days	Mon 02-03-15	Thu 02-04-15	10
Prototype testing	2 days	Fri 03-04-15	Mon 06-04-15	11
Prototype refinement	4 days	Tue 07-04-15	Fri 10-04-15	12
Presentation preparation	2 days	Mon 13-04-15	Tue 14-04-15	13
FYP1 completion	0 days	Tue 21-04-15	Tue 21-04-15	14FS+4 days
Schedule for next prototype development	2 days	Thu 30-04-15	Fri 01-05-15	15FS+7 days
Prototype development for module 2	18 days	Tue 05-05-15	Thu 28-05-15	16FS+1 day
Prototype testing	2 days	Mon 01-06-15	Tue 02-06-15	17FS+1 day
Prototype refinement	4 days	Mon 01-06-15	Thu 04-06-15	17FS+1 day
Prototype development for module 3	18 days	Mon 08-06-15	Wed 01-07-15	19FS+1 day
Prototype testing	2 days	Fri 03-07-15	Mon 06-07-15	20FS+1 day
Prototype refinement	4 days	Thu 02-07-15	Tue 07-07-15	20
Schedule for next prototype development	2 days	Wed 08-07-15	Thu 09-07-15	22
Prototype development for module 4	18 days	Fri 10-07-15	Tue 04-08-15	23
Prototype testing	2 days	Wed 05-08-15	Thu 06-08-15	24
Prototype refinement	4 days	Wed 05-08-15	Mon 10-08-15	24
FYP2 compilation	2 days	Tue 11-08-15	Wed 12-08-15	26
FYP2 report submission	0 days	Thu 13-08-15	Thu 13-08-15	27
Presentation preparation	3 days	Thu 13-08-15	Mon 17-08-15	28
FYP2 presentation	1 day	Tue 18-08-15	Tue 18-08-15	29
Completion of FYP2	0 days	Wed 09-09-15	Wed 09-09-15	30

Figure 5.14 Gantt chart for development

CHAPTER 6: CONCLUSION

In conclusion, this project will develop a web application that will include all core tutors and parents matching website functionalities that most similar websites in Malaysia have. For example, easy searching and automatic suggestion suitable tutors system according to physical distance, tutor's profile or ranking in the website and a suitable services fees payment system for tutors. Besides, this project will develop additional functionalities that some current similar existing websites in Malaysia do not have. For example, real time interactive forum that allow members to interact with each other and support in multi-language such as English, Malay and Chinese.

As well in preparing this report, I found out that current tutors and parents website that having high barrier entry, not ease of use and lack of functionalities. This motivate me to develop a better web application to contribute to the public. Besides, I also facing problem on the studying the requirement of the website through surveys. This is due to the nature of this website nature that need opinion from tutors. However, actual situation that is very hard for me to surveying tutors due to less opportunities contact them.

Last by not the least, to summarize the highlights of the previous chapters is aim to develop a tutors and parents matching web application that is enhance from current existing similar website exist in Malaysia. This project eventually will allow for tutors being engage and parents to easier involvement into this system by using forum that study proven able to increase students' academic performance by a better and easier communicate environment for tutors and parents.

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APPENDICES

UNIVERSITI TUNKU ABDUL RAHMAN

Faculty of Information Communication Technology

Bachelor of Information System (HONS) Information System Engineering

FINAL YEAR PROJECT

Title: E-Education Portal for Student and Tutors

This is a study of the function required by develop a better tutors and parents matching website for primary and secondary school student through opinion from parents and tutors.

Survey Questionnaire

Dear respondent, I am final year students from Universiti Tunku Abdul Rahman (UTAR) Perak Campus, currently pursuing course of Bachelor of Information System (HONS).

The purpose of conducting this study is to find out the required functionalities to develop a better parent and tutors matching website that help parents search extra tutoring class for student studying in primary and secondary school. Your participation will be appreciated and greatly contribute to the outcome of this survey. The responses that you gave will be used strictly for **academic purpose only**.

Thank you for your participation.

Name	**Student ID**
Lee Teong Hoe	11ACB05774

Instruction:

1. There are **THREE (3)** section in this questionnaire. Please answer **ALL** of the questions in **section A and section B**. For tutors only, please answer **section C**.

2. The questionnaire consists of 5 pages and 23 questions (6 questions for section A, 10 question for section B and 7 questions for section C).

3. Completion of this questionnaire will take you approximately 5-10 minutes.

4. The information and data provided will be **kept strictly confidential**.

Section A: Personal Details

Please put a tick (√) in the check box to specify your answer. The following sample will only be used in determining our sample general information.

1. Gender
   - □ Male
   - □ Female

2. Age
   - □ Below 25 years old
   - □ 25-35 years old
   - □ 33-45 years old
   - □ 45-55 years old
   - □ 55 years old and above

3. Ethnic group
   - □ Malay
   - □ Chinese
   - □ Indian
   - □ Others (Please specify:_____)

4. Number of children own
   - □ 1 child
   - □ 2 children
   - □ 3 children
   - □ 4 children
   - □ Others (Please specify:____)

5. Number of children currently studying primary & secondary school
   - □ 1 child
   - □ 2 children
   - □ 3 children
   - □ 4 children
   - □ Others (Please specify:____)

6. Number of primary and secondary children currently taking extra tutoring class(s).
   - □ 1 child
   - □ 2 children
   - □ 3 children
   - □ 4 children
   - □ Others (Please specify:____)

Section B: General opinion

This section is seeking opinion regarding the parents and tutors matching website.

Please circle your answer to each statement using 3 Likert scale:

[(1) = Disagree; (2) = Neutral; (3) = Agree]

Part 1: Tutor searching website usage

Statement	Disagree	Neutral	Agree
1. I aware of now able to apply tuition class using internet in home.	1	2	3
2. I will consider use internet to apply tuition class if it easy obtain information I want.	1	2	3
3. I want access tutor searching website through mobile devices such as smartphone and tablet.	1	2	3
4. I think finding tutors in my nearby housing area are difficult.	1	2	3
5. I think that tutor searching website better free of charge, without any hidden fee for me.	1	2	3
6. I think lifelong learning is good for me.	1	2	3
7. I will consider taking extra classes if I interested with the subject offer.	1	2	3
8. I will invest on my children by sending them to extra tuition class after school.	1	2	3
9. I think my children weaker subjects area better go for extra tuition class after school.	1	2	3
10. I want to know my children performance during the tuition class.	1	2	3

Section C: Tutor opinion

This section is seeking opinion **only** for tutors' opinion regarding the usage of parents and tutors matching website that will help tutors search for students.

Please circle your answer to each statement using 3 Likert scale:

[(1) = Disagree; (2) = Neutral; (3) = Agree]

Statement	Disagree	Neutral	Agree
1. I currently available to accept more students for short term classes (less than 3 months).	1	2	3
2. I currently available to accept more student for long term classes (more than 3 months).	1	2	3
3. I will consider advertise my available classes to search for students.	1	2	3
4. I will consider pay for some fee to get more students.	1	2	3
5. I think better pay referral fees for website after I got my first tuition fees from student.	1	2	3
6. I will apply tender required by parent if it suitable for me.	1	2	3
7. I think it better the website have feature to contact student and their parent.	1	2	3

------ END ------

Thank you for your participation

E- Education Portal for Students and Tutors - Lee Teong Hoe

ORIGINALITY REPORT

0%	0%	0%	0%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Submitted to University of Huddersfield Student Paper	<1%

EXCLUDE QUOTES	OFF	EXCLUDE MATCHES	OFF
EXCLUDE BIBLIOGRAPHY	OFF		