BROADCASTING REAL TIME INFORMATION USING MOBILE AND INTERNET TECHNOLOGY

(BADMINTON TOURNAMENT LIVE SCORE SYSTEM)

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SUPERVISOR'S DECLARATION

"I hereby declare that I have read this report and in my opinion the report is sufficient in terms of scope and quality for the award of the Bachelor in Computer Science (Software Engineering)"

Signature: .....

Supervisor: DR. ADZHAR BIN KAMALUDIN

Date: 11 JUN 2013

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First and foremost praise the God for all his blessings for giving me patience and good health throughout the duration of this project.

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ABSTRACT

Badminton is an international sport which is included in international games like Asian Games and Olympic Games. International badminton governing organization is known as Badminton World Federation (BWF). After the two centuries since it is founded, badminton is now widely claimed as the second most popular sport in the world behind soccer in terms of participation. Badminton is the main sport that Malaysia targets for its first Olympic gold medal. Almost all Malaysians have interest on badminton. If the game is promoted properly in Malaysia, we can produce a new generation who are committed towards this sport and become a fan and supporters for Malaysia. To develop the interest toward this sport, a platform which functions as a mediator between the fans and the sports events is needed. The need of user to know about the results of badminton tournament is fulfilled by the system. Moreover, the system enables the results reach users through email alerts and SMS messages. Besides that, it creates medium for sharing through its discussion board feature. This feature helps users to point out their thoughts and opinions about badminton sport in a good way. This web-based application is a bridge for the users to the badminton world.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Badminton is a racquet sport played by either two opposing players called singles, or two opposing pairs called doubles, who take positions on opposite halves of a rectangular court that is divided by a net. There are five categories in badminton sports, men's singles and double, women's singles and doubles and mixed doubles. Badminton is originated from India during British colonisation in 1870s which was played by British officers. International Badminton Federation, the first international governing body of body was established in 1934. Now the international badminton governing organisation is known as Badminton World Federation (BWF). In 1996, badminton was introduced in Commonwealth Games in Kingston, Jamaica and has been part of every Commonwealth Games since then. Badminton was introduced in 1992 Olympic Games in 1992. After the two centuries since it is founded, badminton is now widely claimed as the second most popular sport in the world behind soccer in terms of participation.

Asian nations have been the most dominant ones in the world for badminton games. Malaysia is known as one of the Asian country that has consistently produced world-class players in the past few decades. Badminton is the main sport that Malaysia targets for its first Olympic gold medal. Almost all Malaysians have interest on badminton. If the game is promoted properly in Malaysia, we can produce a new generation who are committed towards this sport and become a fan and supporters for Malaysia.

Nowadays, badminton tournaments are telecasted live on television channels. Malaysia's television networks spending millions to get the license for telecasting badminton tournaments to entertain badminton fans all over Malaysia. Sometimes, it is hard for fans, who are working or travelling to know the updates of their favourite badminton matches instantly. It is possible to reach badminton fans through website, social sites and mobile.

Web portals and alert newsletters through email, mobile and social sites can make updates of badminton tournament reach their fans easily and on time. By developing an online badminton tournament live score system, it is easy to reach the fan community. There are several steps involve in developing system by using this method: - customer registration, gathering details, deciding method of approaching and finally delivering customers requirement. This system can help information to reach users easily and can promote badminton game as well.

1.1.1 Problem Statement

Usual television telecasting or newspaper report can only reach certain group of customers. Traditional way of getting information is not in real time. There is a certain time gap between information time and the time it reach the audience. People sometimes will forget the date or time of the telecast of their favourite badminton matches. Due to their work or lack of busy schedule thy will miss the telecast. Badminton fans need an on time reminder to avoid this problem. An update of date and time of their favourite matches is needed, so that real fans would not get disappointed.

People of fans who are busy with unavoidable task have to rely on the newspapers or other news media to get the update or result of their favourite badminton games. Fans need instant updates of scores and results of the game. By getting instant updates they don't have to rely on late news or the next day's newspaper.

Fans need platform to voice out their opinion about the badminton matches. There must be a proper medium to deliver their opinions and discuss the topic with others who are with same interest. This can help to join the fans of badminton under one roof. Hence a system which will broadcast real time information is needed to deliver the information to the users in real time.

1.1.2 Objectives

There are several objectives to be achieved in this project:

i. To develop a system that will update the users about current status of on-going badminton tournaments in real time and upcoming events.
ii. To ensure the badminton fans, who are registered to the system, receives alerts regarding the match schedule and results.
iii. To create a discussion board for the users of the system to deliver their point of view or comment with people who are in same interest.

1.1.3 Scopes

The scopes of this project:

i. This system is will have the updates and news for all users. Only registered users are eligible for news alerts.

ii. Users will get update only after the system administrator updates the information and trigger the alert system.

iii. The updates and results are assumed to be taken from reliable sources at that time.

iv. The accessibility of the system depends on the stability of hardware and technologies used.

v. Some functions might be available for certain group of users due to the scale of this prototype.

1.2 Existence case study

This subtopic briefly describes the review on existing techniques related with sports tournament live scoring system. This topic includes the introduction to live score and review of existing related works or research.

1.2.1 Live Score - Introduction

The term "live score" means the deliverability of scores or results to the targeted users or customers instantly. Live score can be any form of score information that is delivered to the users or customers in mean time then other information sources. Live score service widely offered by many sports-related websites and broadcasters as well as online sports betting operators. It is an idea of updating fans and sport enthusiasts the updates in real time when the game is going on. Live scores are usually free and very popular among sports enthusiasts and critics, as they allow viewing collected data on many sports events.

The most common sports that is popular in live score is soccer. Most major news and sports sites offer a live score service. Some sites, such as the BBC, provide up-to-the-minute details of latest scores, scorers, bookings, sending offs, injuries and

attendances from the FA Premier League right way down to non-league divisions. Some sites provide additional information, such as a player list, card details, substitution and an online chat where sports fans can gather and discuss the current event [1]. Several sports organizations such Major league baseball and the National Football League have set up their own networks to deliver live scores via mobile phones [2].

Example of websites, programs, and broadcasting networks providing live scores:

i. ESPNcricinfo
ii. Eurosport
iii. Eurosport News
iv. Goal.com
v. The Goal Rush
vi. Soccer Saturday
vii. LiveScore.com

1.2.2 Related Existing Systems or Research

i. System and Method for Providing Live Scoring Information and Statistical Data [3].

This system was invented and patent by Pat Tocci, Jordon Griffith, Jim Harkless, Joseph Keer and Micheal Moyer from United States. The system was patented in January 7, 2011. The invention relates to a system and method for a school or team to manage information about a wrestling team, and provide live scoring information and up-to-date and real –time statistical data at a wrestling meet and thereafter.

This system comprises:

a) A scorebook system and related methods for receiving optimal performance and weight classification data for wrestlers of any age and background.

b) Providing live scoring and real time statistical data at a wrestling meet and thereafter.

c) Analysing and reporting statistical information about the meets, teams and wrestlers.

d) Compiling and providing media information about a wrestling meet.

The system and methods are described in the context of wrestling, particularly at a high school or college level; they also may be applied to any sport or activity.

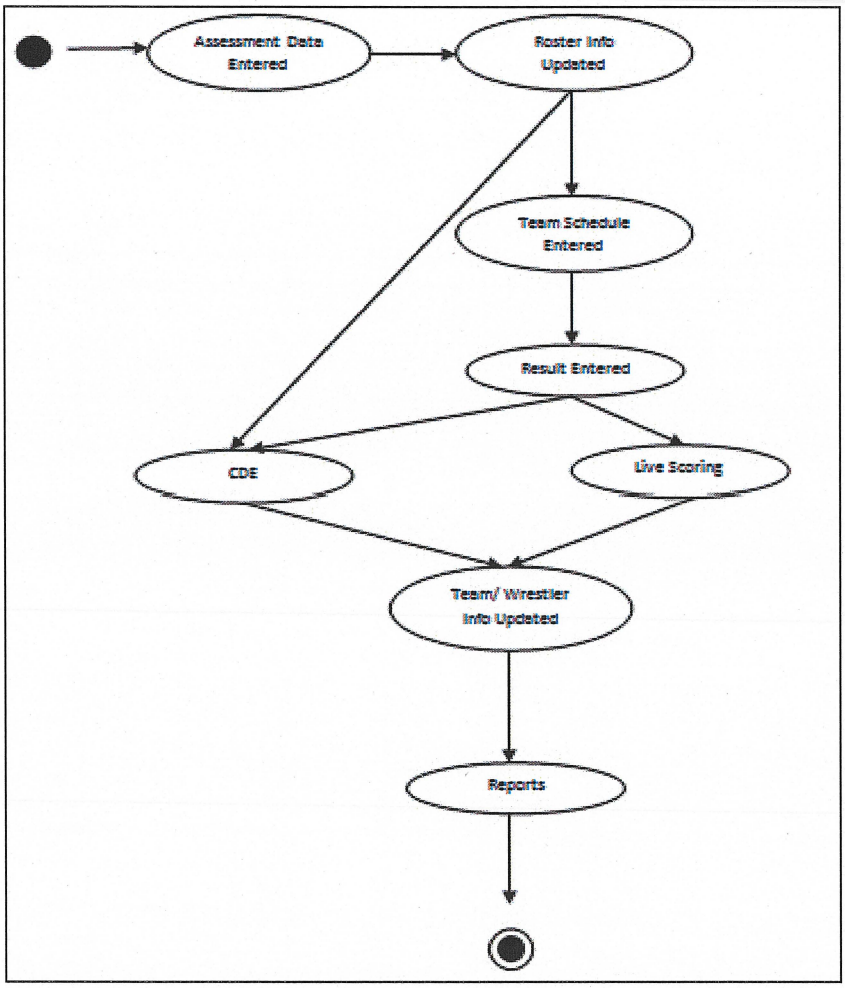


Figure 1.2.1 System overview of Live Scoring Information and Statistical Data

The scorebook system is a computer-based application, and may be accessed through the internet. As shown in Figure 1.2, the scorebook system receives assessment data and roster information of every assessed wrestler for a school or team. Competitions may be entered through the Team Schedule Component. Results of competitions may be entered after competition through Competition Data Entry (CDE) component or live through Live Scorebook Component. Results are used to update Team Information and Wrestler Information pages.

ii. Digicel Cricket Live Score SMS Alerts

The system is provided by Digicel, a mobile telecomunication company which covering parts of Oceania, Central America, and the Caribbean regions. The company is incorporated in in Bermuda, and based in Jamaica. It provides live score alerts through social networks like twitter and through sms alerts. Their service includes football and cricket. Live SMS score alerts will be provided to Digicel customers across the region each day of play. The users can subscribe for sms alerts through WAP portal that has been provided by Digicel.

Provided Services:

a) Member registration: - Users can sign up through Digicel WAP or send subscription SMS to Digicel to sign up and subscribe SMS alerts.

b) Manual Alert: - Users can text to the code each time that they would like a score alert, and they will receive a SMS afterwards with the information. The user will be charged per text received.

c) Automatic Alert:- he user can register for daily updates. The system will send the alerts automatically each time the scores update on our system. The user will be charged per text received.

Country	Price (USD)
ANGUILLA	**$ 0.19**
ANTIGUA AND BARBUDA	**$ 0.24**
ARUBA	**$ 0.27**
BARBADOS	**$ 0.17**
BERMUDA	**$ 0.15**
BONAIRE	**$ 0.28**
BRITISH VIRGIN ISLANDS	**$ 0.18**
CAYMAN	**$ 0.30**
CURACAO	**$ 0.28**
DOMINICA	**$ 0.20**
GRENADA	**$ 0.18**
JAMAICA	**$ 0.07**
ST KITTS AND NEVIS	**$ 0.19**
ST. LUCIA	**$ 0.18**
ST. VINCENT	**$ 0.17**
TURKS AND CAICOS	**$ 0.20**

Table 1.2.1 Rate sheet for SMS alerts according to region

The users will be charged by Digicel for the SMS alerts. The charge rate is shown in Figure 1.2.2. The system is only applicable for Digicel users in the given region. In other words, users who are not Digicel customers are not eligible for this SMS alerts. All Digicel customers, including postpaid, prepaid, dual and hybrid customers are qualified to participate in the promotion.

To unsubscribe from this system, user should send a text message to Digicel. The scores are sent at each innings break and at the end of the game. Every time, two

alerts for T20 Cricket matches, two alerts for ODI matches and four alerts for Test matches.

1.3 Current System and Limitation

The system that is proposed to broadcast real time information is Badminton Tournament Live Score System. The system will comprise:

i. Live score update in web portal: - to update the portal users about the on-going badminton tournaments or matches
ii. An alert system in emails and SMS: - to alert subscribed users about the upcoming badminton matches and update the results in real time.
iii. Discussion board or forum: - provide a platform for users to discuss or deliver their opinions in the forum according to category.
iv. Results and live commentary lines about the game: - auto refresh the web portal to provide the results and live commentary in real-time.

The Badminton Tournament Live Score System's Limitations:

i. The web portal service and alert system is depends on stability and accessibility of the hardware and software used and required.
ii. The alert system is only services registered customers.
iii. The SMS alert is considered as in development phase and it is in beta testing phase.
iv. The forum services online only for registered customers to discuss about badminton sports.

1.4 Methods of Approach

Different ways and techniques will be used to develop this system to full fill the functional requirement of the system. The hardware, techniques and services are:

i. The web server
ii. The development language and software and database
iii. The email auto responder technique
iv. Auto-refresh technique
v. Third-party bulk SMS service

The web server for the development phase and testing phase of this system is provided by Faculty of Computer Systems and Software Engineering, Universiti Malaysia Pahang, Malaysia under their registered domain.

Html 5, PHP and Java are the preferred development languages. MYSQL database will be used to develop this system and software like Adobe® Dreamweaver®, Adobe® Photoshop® will be used to assist the development process of this online portal.

Automatic email replying technique or Auto-responder technique will be used to trigger the email responds from system server to the customers. This technique will be used to send subscription confirmation email and email newsletters.

Auto-refresh technique will be implemented in this system to provide updates in real time through the web portal. The web portal will automatically refresh and reload to provide most recent updates in a pre-configured period.

Third-party bulk SMS service will be used to send SMS to registered customers about the badminton games that they subscribed.

1.5 Scope and Limitation of the Badminton Tournament Live Score System

The scopes and limitations of the developed system:

i. This system is will have the updates and news for all users. Only registered users are eligible for news alerts because it is not possible to cover all the badminton fans throughout the world. This is due to the required information for the alert system. The registration process will gather those required information such as email and phone number of users.

ii. Users will get update only after the system administrator updates the information and trigger the alert system. This updates is limited because the news and updates have to be provided manually to the system for it make it functional.

iii. The updates and results are assumed to be taken from reliable sources at that time. The system administrators are not responsible for the validity of data obtained from the system because the information need to be gathered for third-party sources to full fill the scope of this system and to cover all the customer needs.

iv. The accessibility of the system depends on the stability of hardware and technologies used. The hardware and technologies might be unstable or malfunction since most of the web scripting techniques are in development and maintenance phase.

v. Some functions might be available for certain group of users due to the scale of this prototype. This limitation is due to the available resource for the development and testing process.

1.6 Outline of the Outcome

The Badminton Tournament Live Score System that has been proposed will be developed according to functionality specified above. The system might comprise additional functionality that might be added during development phase. The system can be expected as the fully functional system according to the specifications and will serve the targeted users by broadcasting information in real time. Badminton Tournament Live Score System will be the solution for the problem statement stated above and functions as existing live score systems and will have additional functions.

CHAPTER 2

REPORT BODY

This chapter includes the user requirements, methods and materials used, technical results and comparison with previous works, discussion and analysis of materials and testing plan and results.

2.1 User Requirement

User Declaration

The system of Badminton Tournament Live Score is a free idea system which initiated by the developer. The systems users are termed to be general users who use the system as it is. Hence, there is no user specified requirement for this system. Further requirement of the system is documented in Software Requirement Specification (SRS) for Badminton Tournament Live Score System as shown in APPENDIX D.

2.2 Design Description

The design description is documented in Software Design Description (SDD) for Badminton Tournament Live Score System. The SDD can be referred in APPENDIX E.

2.2.1 Methods and Materials

(i) Method

To develop this system, agile software development methodology is chosen. The development phase is comprised of separate development of the features modules. Each module is assumed to be completed, integrated and tested before starting the development of the following modules.

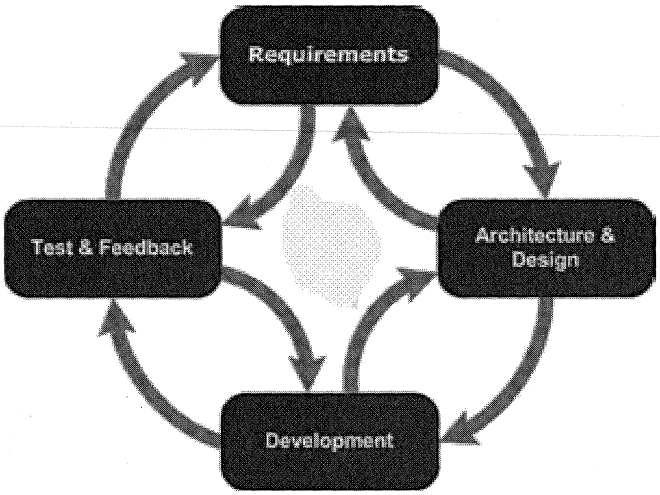


Figure 2.2.1 Agile Software Development

(ii) Materials

Several hardware software and services will be used to develop this system. The required hardware, software and services are listed in the table 2.3.1 below.

Hardware	Software	Language & Service
Domain to host system	Adobe® Dreamweaver®	HTML, Java, PHP, SQL, AJAX
Network connection	mySQL database	Bulk SMS service
Configured SMTP port	Apache server module	-
-	Xampp	-

Table 2.3.1 Materials

2.3 Development plan

The development phase is planned to follow agile software development method. Each functional module is developed separately. At the completion of development of each module, the component testing is conducted by the developer. Then the development process started with next module. The development of other modules is started after the successful integration of completed modules. The development follows an order of 'required modules first' to ensure effective and easy development.

The order of 'required modules first' is:

i. Database (required for all the basic operation of the system)
ii. Web Layout (uniform layout for all the interfaces)
iii. Registration component (needed to differentiate client and administrator)
iv. Live Score module (client side and admin side)
v. SMS module (admin side)
vi. Email module (admin side)
vii. Discussion Board (forum)
viii. Non-proposed additional features

By following this order, the errors and bugs in each module can be identified easily. The testing can be carried out along with the development phase. SRS and SDD are the guidelines to be followed in developing this system. The development environment consists of a local server and software. The local server is where the components are going to be developed and deployed initially. The local server is providing a development environment which imitates the real server where the system will be published. The local server carries all the functionalities that is required to develop the system except for the Email module. The required services like 3rd party SMS service are subscribed in the development phase. The completed components are then deployed on real server.

2.4 Implementation

This section carries detailed description of development phase that has been implemented.

2.4.1 Database

This system uses mySQL database to store all the information. In development environment the database is provided by XAMPP® Server. This includes the phpMyAdmin – a GUI management of mySQL database. The exact copy of the database is created in real server for easy integration. The database and real server is provided by 2FREE HOSTING (http://www.2freehosting.com). Only one database is used in this system which is named as *btls*. The same name is used for real server database.

In total five tables are created to be used in this system, named *user*, *match*, *categories*, *topics* and *posts* as shown in Figure 2.4.1. The functions of each database is explained in related sections below.

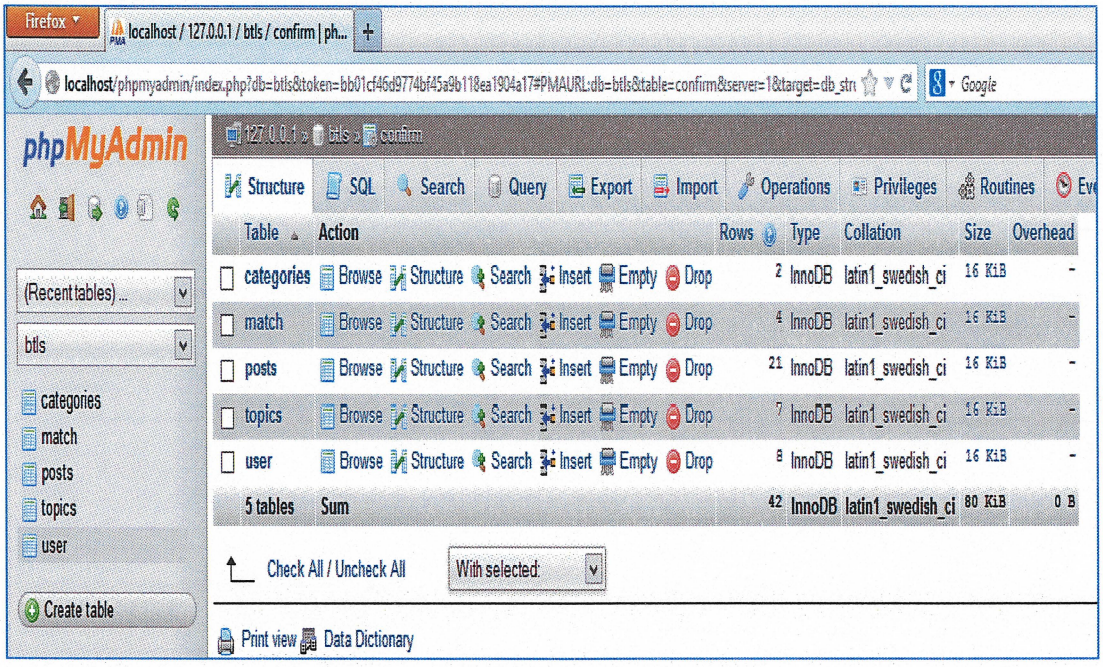


Figure 2.4.1 Database Structural View

A PHP file is created to hold the details of database connection. The 'conection.php' file holds the server, username, password and database name which needs establish a connection between database and system. The "connection.php" is called whenever the system needs to communicate with the database as shown in Figure 2.4.2. By creating this file, the repeating connection statement is avoided.

```php
<?php

$hostname = 'localhost';    // MySQL hostname
$dbname   = 'btls';         // database name.
$username = [redacted];     // database username.
$password = [redacted];     // database password.

// connect to host
mysql_connect($hostname, $username, $password) or DIE('Connection to host is failed, perhaps the service is down!');
// Select the database
mysql_select_db($dbname) or DIE('Database name is not available!');

?>
```

Figure 2.4.2 connection.php(localhost)

The *connection.php* file simplifies the process of connecting database. Since it is the only file that holds the connection between system and database, any changes in the database connection details can be made easily by modifying this file. The transfer process of the system from local server to real server is done easily by just altering this file.

The *connection.php* file of the real server is shown in the figure below.

connection.php

```php
<?php

$hostname = 'mysql.2freehosting.com';    // MySQL hostname
$dbname   = 'u296010602_btls';           // database name.
$username = [redacted];                  // database username.
$password = [redacted];                  // database password.

// connect to host
mysql_connect($hostname, $username, $password) or DIE('Connection to host is failed, perhaps the service is down!');
// Select the database
mysql_select_db($dbname) or DIE('Database name is not available!');

?>
```

Figure 2.4.3 connection.php(real server)

2.4.2 Web Layout

The web layout for this system is designed in Adobe® Dreamweaver®. 3-column layout is designed for all user interfaces except for forum. For admin panels the layout made in much simpler form, considering the network traffic and loading time constraints. The client side layout consists of header, article and footer section. Article section is the content body of the system uses 3 columns. External cascading style sheets used to styles the layout. The admin panels consist of headers, body and footers. The layout for admin panels are kept uniform and simpler, for easier and lesser network load.

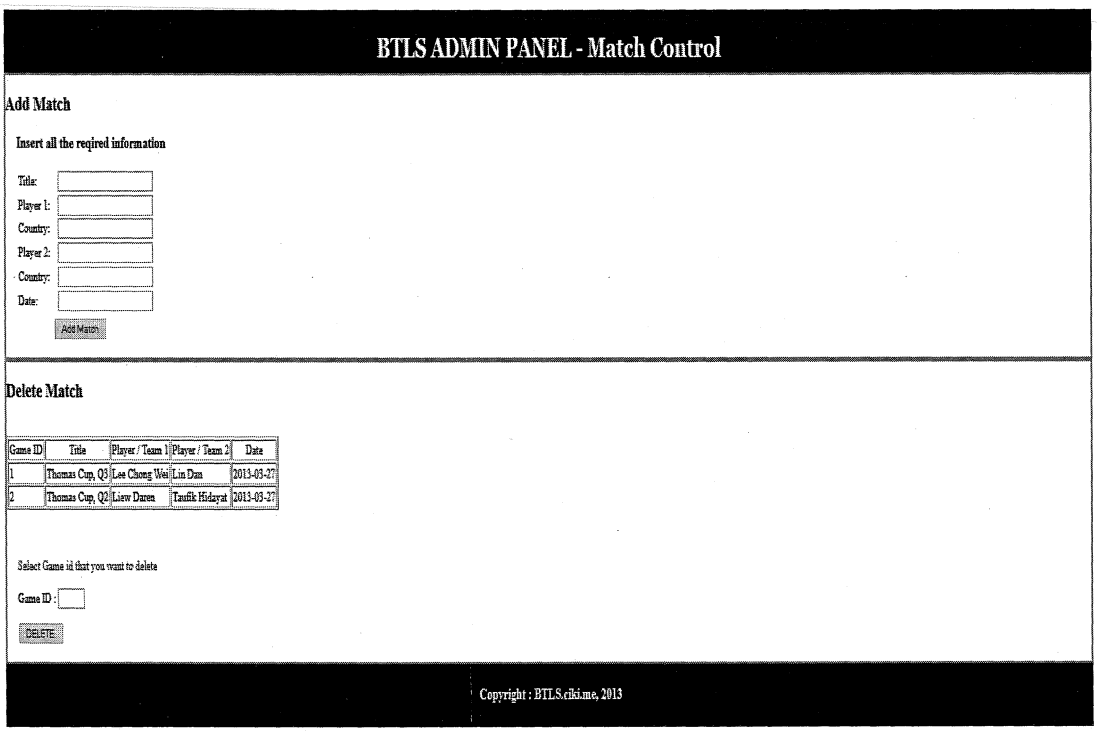


Figure 2.4.4 Web layout (Admin Panel)

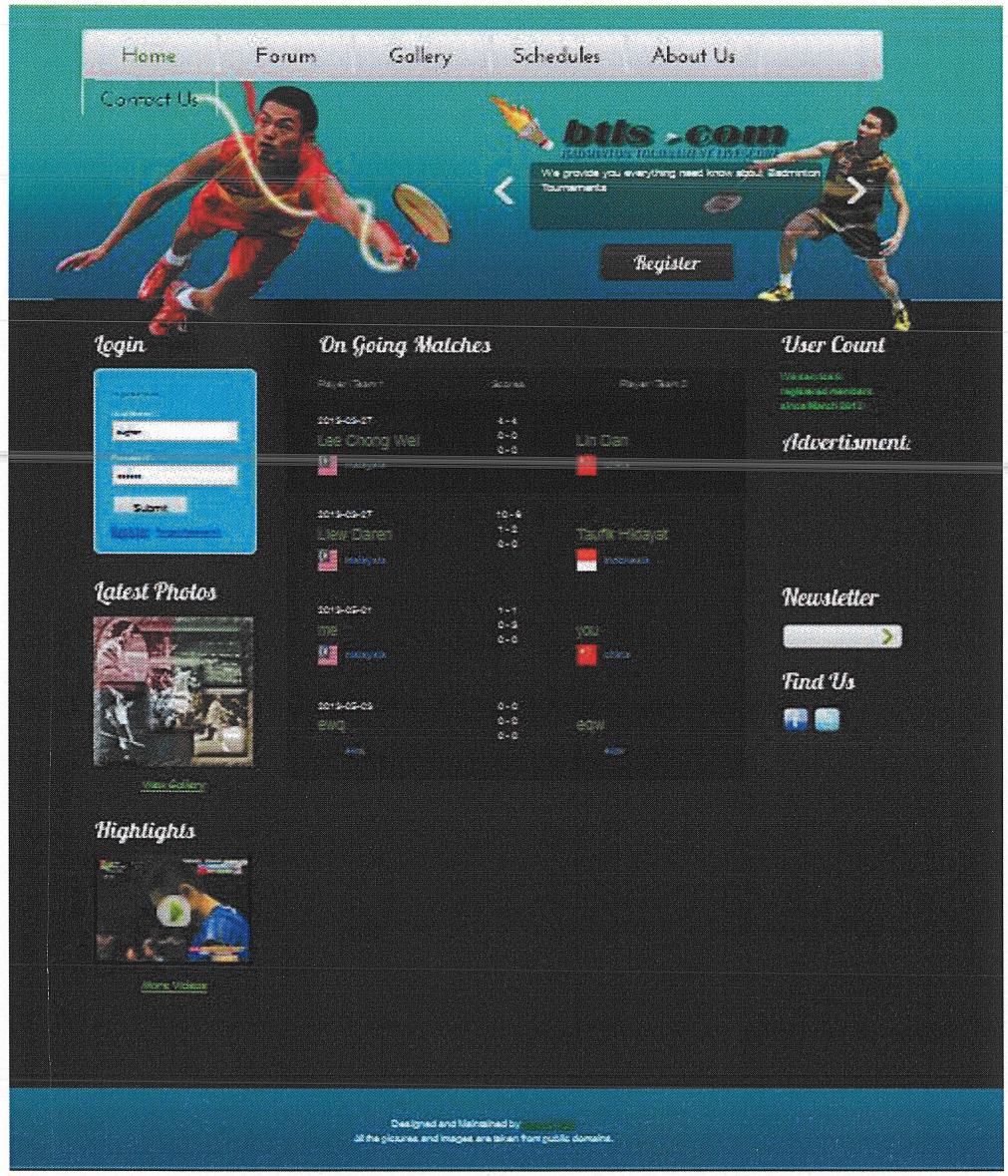


Figure 2.4.5 Web layout (Client Side)

There are two cascading style sheet (CSS), 'style.css' and 'layout.css' which holds the styles and layout information for the basic web layout.

2.4.3 Login and Registration Component

(i) Registration

The registration form is available on this system to register users and subscribe them to our services. As shown in figure 2.4.6, Users have to provide their first name, last name, username, email, password and mobile number. The registration form uses error handling to obtain required input. Successful registration will be recorded in *user* table in the database. Figure 2.4.10 shows structure of *user* table. An activation mail will be sent to users for verification as shown in figure 2.4.7. Their account will be inactive until they activate it by the link provided in the mail. Registered users are automatically subscribed to our SMS and Email notifications.

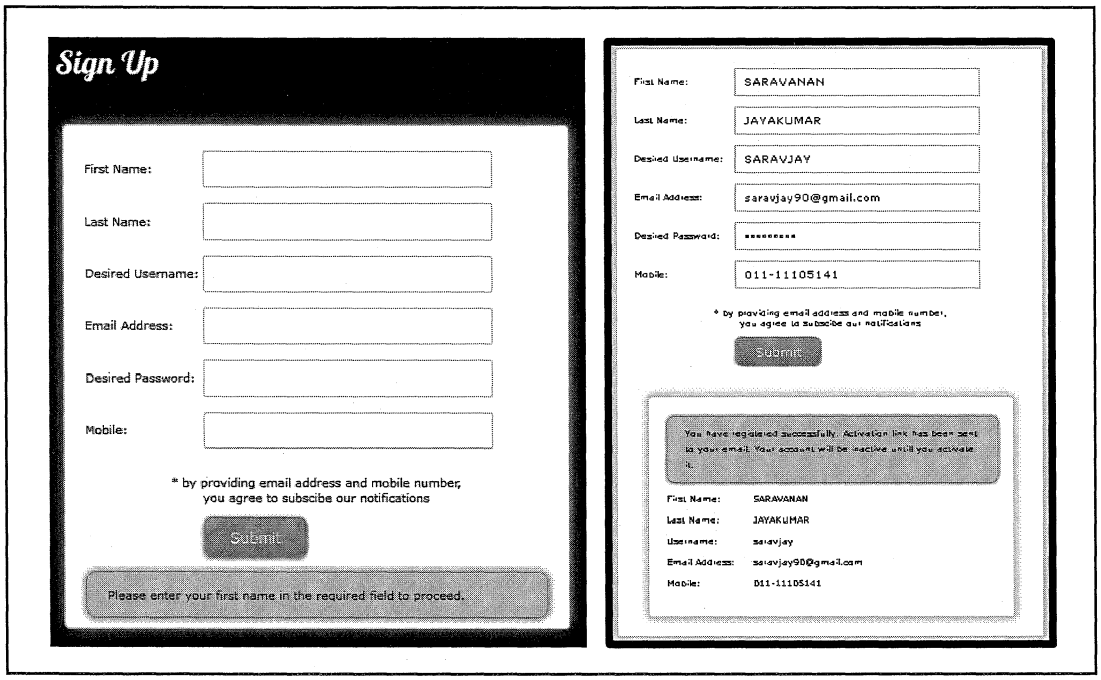


Figure 2.4.6 Registration (Error Handling and Successful registration)

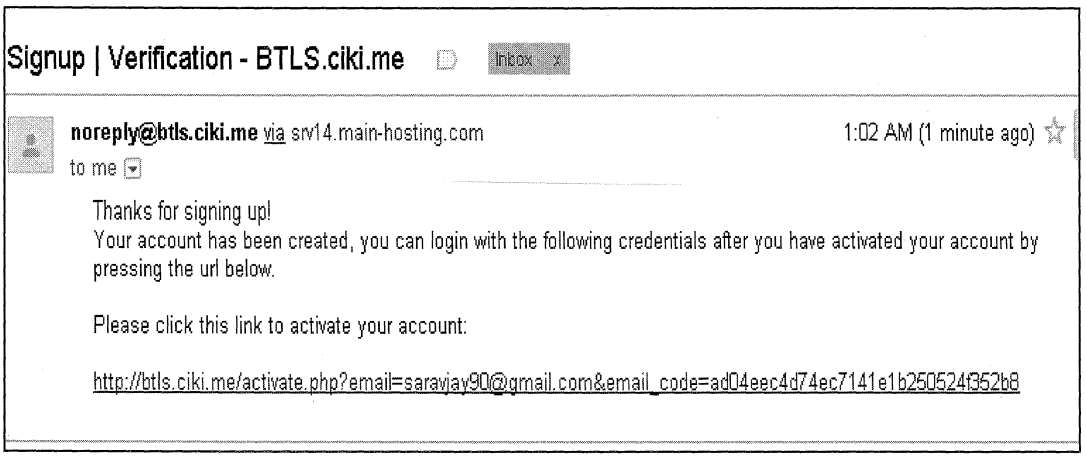


Figure 2.4.7 Activation Mail

The registration component, encrypt the user password to MD5 before send it and store it in the database. Besides activation mail, this is another security measure that is implemented in this system.

(ii) Login

The registered users can use their username and password to login to the system. The login component uses many error handling methods (Figure 2.4.9) to differentiate between admin, activated members, non-activated members and non-registered users. This enforces the security of the system and eliminates unauthorised access for the certain part of the system. The login component is shown in figure 2.4.8.

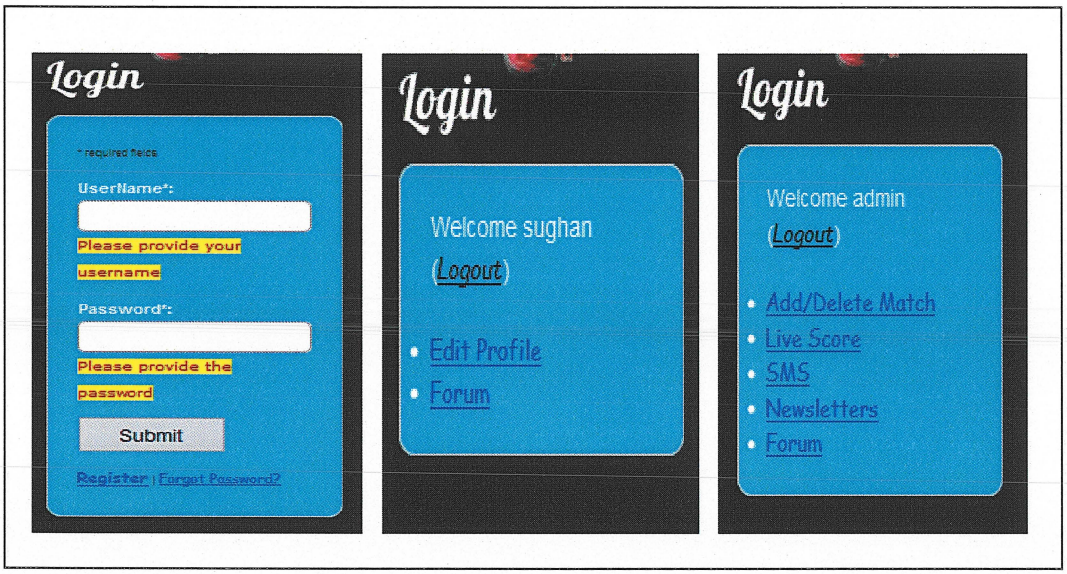


Figure 2.4.8 Login Component

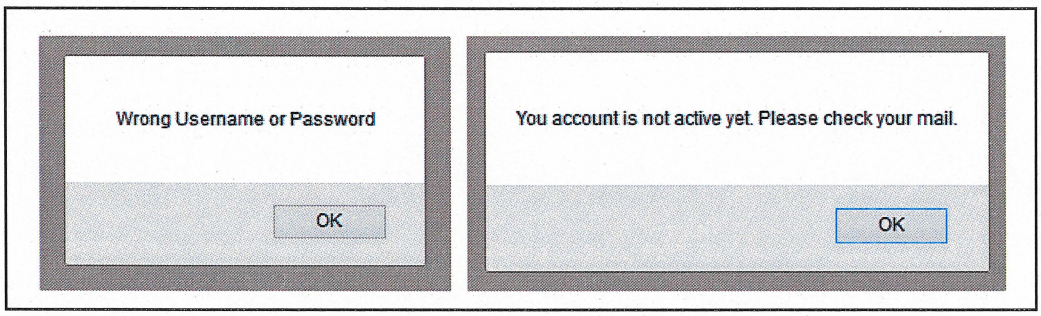


Figure 2.4.9 Login error handling

#	Name	Type	Collation	Attributes	Null	Default	Extra
1	user_id	int(11)			No	None	AUTO_INCREMENT
2	username	varchar(255)	latin1_swedish_ci		No	None	
3	password	varchar(255)	latin1_swedish_ci		No	None	
4	f_name	varchar(32)	latin1_swedish_ci		No	None	
5	l_name	varchar(32)	latin1_swedish_ci		No	None	
6	email	varchar(250)	latin1_swedish_ci		No	None	
7	email_code	varchar(32)	latin1_swedish_ci		No	None	
8	newsletter	int(1)			No	1	
9	mobile	varchar(12)	latin1_swedish_ci		No	None	
10	sms	int(1)			No	1	
11	active	int(1)			No	0	
12	forum_notification	enum('0', '1')	latin1_swedish_ci		No	1	

Figure 2.4.10 Structural View of *user* table

2.4.4 Live Score Module

Live score module have four major components. The major components are:

- *match* table in database
- The web portal
- Admin Panel - Score panel
- Admin Panel - Match control

The *match* table stores the details of the match, such as game id, title, player details, score and match date. Refer figure 2.4.15 for *match* table. The client side homepage displays the matches stored in database and scores in real time. Partial page rendering technique is used to update a portion of scores in real time. The client side is coded to send request and obtain the changes in the score from database in pre-configured periods. HTTP is a "connectionless" protocol, which means the connection between the server and client side will be terminated once the page is fully loaded. Hence, it is necessary to send request from client site to obtain the scores in real time.

```
<script type="text/javascript">
    $(document).ready(function(){
      refreshTable();
    });

    function refreshTable(){
        $('#tableHolder').load('scoreboard.php', function(){
           setTimeout(refreshTable, 5000);
        });
    }
</script>
```

Figure 2.4.11 Real-time update script

The script in figure 2.4.11 is used to update a portion of the homepage which displays the scores. In providing real time update, the information's load need be considered in first place. Hence, other contents of the page will remain static at client side to reduce the load since the system is loading the scores in an interval. PPR is explained by figure 2.4.12.

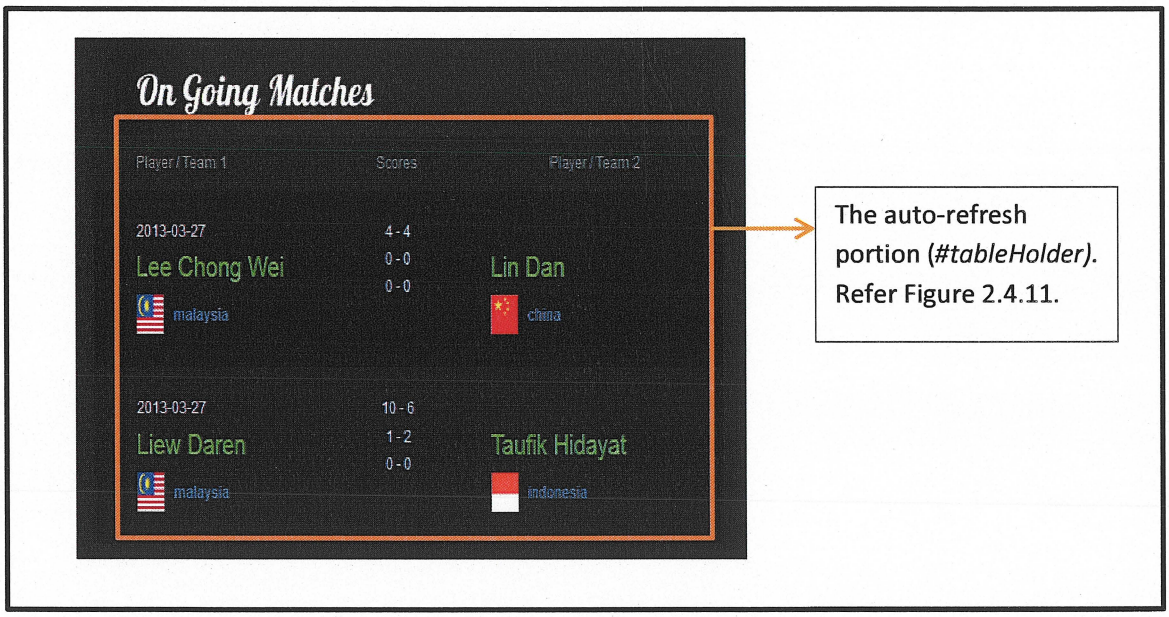


Figure 2.4.12 Score portion

Meanwhile, the score changes are controlled by the administrator. There are two admin panels which control the Live Score module. Admin need to add or remove the matches in the table. The match control panel controls the matches that will be displayed at client homepage. The score panel change the stored scores in database which will update at the client site.

(i) Admin Panel – Match Control

The page contains minimalistic design to reduce the load since it will be reloaded again and again. It has two features, add match and delete match. The add match feature is a form that will store the match details from the user input. The delete match feature loads the matches that are stored in database. The user can delete the match by inserting the game id of the match that they want to delete. Figure 2.4.13 shows *match control* page.

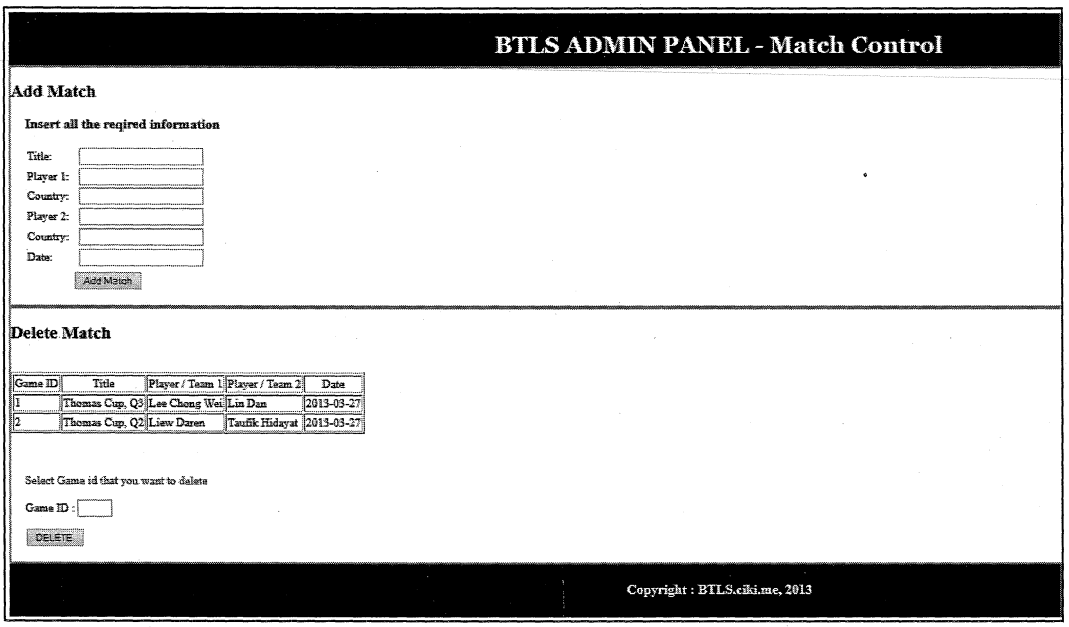


Figure 2.4.13 Match Control

(ii) Admin Panel – Score Panel

The score panel controls the score changes in the system. Admin trigger the input by inserting values into the fields of respective matches. Each match that is stored in the database will be displayed in the score panel with unique game ids, score input fields and update buttons. At the press of update button, the score is updated in the match table respective to the game id. Minimalistic design and elements reduces the load of this page. Figure 2.4.14 show *score panel* interface.

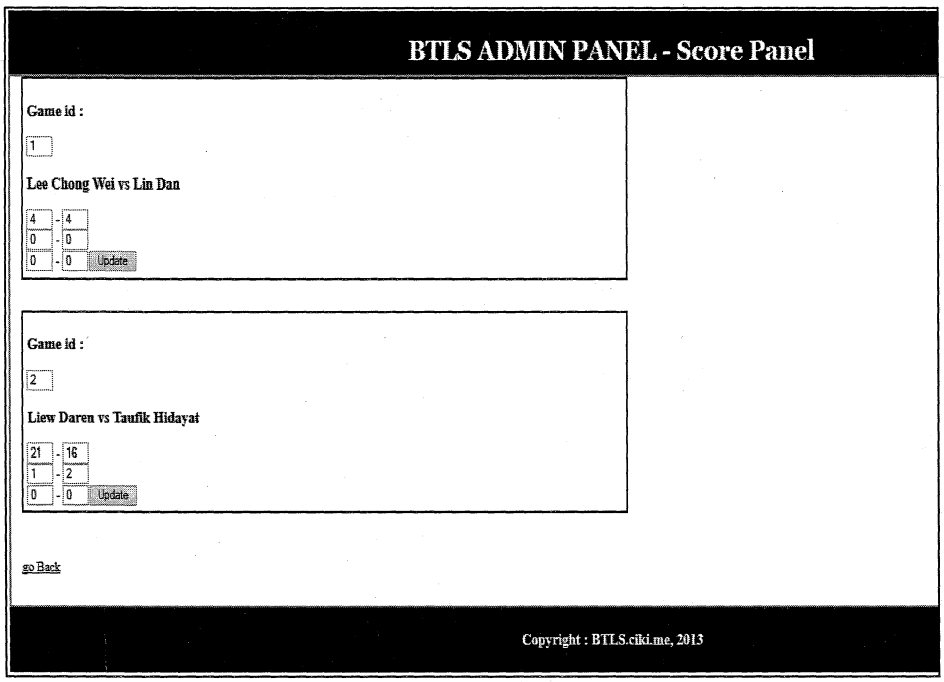


Figure 2.4.14 Score Panel

The data of live score module are stored in the *match* table in the database. This table provides information for live score at client side, match control for admin panel and receives data or changes from match control and score panel.

#	Name	Type	Collation	Attributes	Null	Default	Extra
1	**id**	int(11)			No	*None*	AUTO_INCREMENT
2	**title**	varchar(255)	latin1_swedish_ci		No	*None*	
3	**player1**	varchar(30)	latin1_swedish_ci		No	*None*	
4	**player2**	varchar(30)	latin1_swedish_ci		No	*None*	
5	**date**	date			No	*None*	
6	**p1g1**	int(2)			No	0	
7	**p2g1**	int(2)			No	0	
8	**p1g2**	int(2)			No	0	
9	**p2g2**	int(2)			No	0	
10	**p1g3**	int(2)			No	0	
11	**p2g3**	int(2)			No	0	
12	**country1**	varchar(30)	latin1_swedish_ci		No	*None*	
13	**country2**	varchar(30)	latin1_swedish_ci		No	*None*	

Figure 2.4.15 Structural view of *match* table

(iii) Overall Functional Structure of Live Score Module

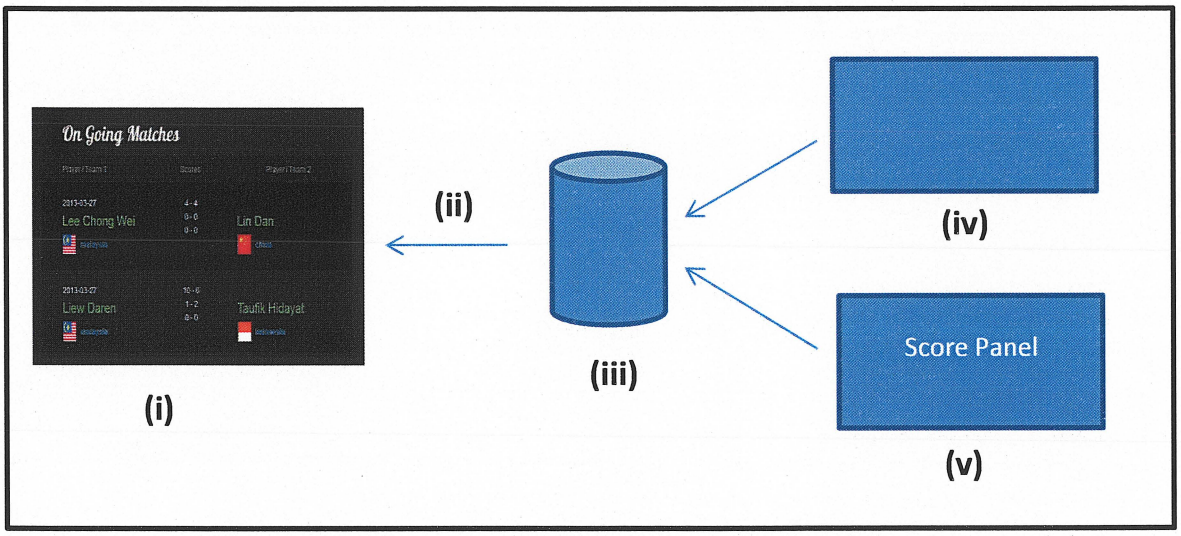


Figure 2.4.16 Functional Structure of Live Score Module

Description of Figure 2.4.16

(i) The Web portal which auto refresh to display scores according to the real time update script.
(ii) Real time update script (Figure 2.4.11) which update the scores from the database *match* table.
(iii) The *match* table which stores all the match details.
(iv) Admin Panel – Match control which controls the add match, delete match functions.
(v) Admin Panel – Score Panel which update the scores to the database.

2.4.5 SMS Module

SMS module sends multiple SMS alerts to registered recipients. This service is an integrated service from a third party service provider. This service is subscribed from isms.com.my (MobiWeb Sdn Bhd, Web ASP Sdn Bhd), one of the leading online SMS marketing and bulk SMS service provider in Malaysia. Currently for testing purposes 500 SMS credits are bought. This service can be altered to reverse charging which is profitable or the admin. For now, SMS alerts are sent at zero cost for recipients. When reverse charging is implemented, users pay for each SMS that they receive.

SMS module has one interface and an integrated API from isms.com.my. The messages will be sent through URL to isms.com.my server and then will be sent from their SMS gateway to the recipients. Hence, SMS Notification admin panel (figure 2.4.17) plays role in obtaining recipients mobile number from database and encode the message typed by admin. Then it composes an URL which will be sent to the SMS gateway.

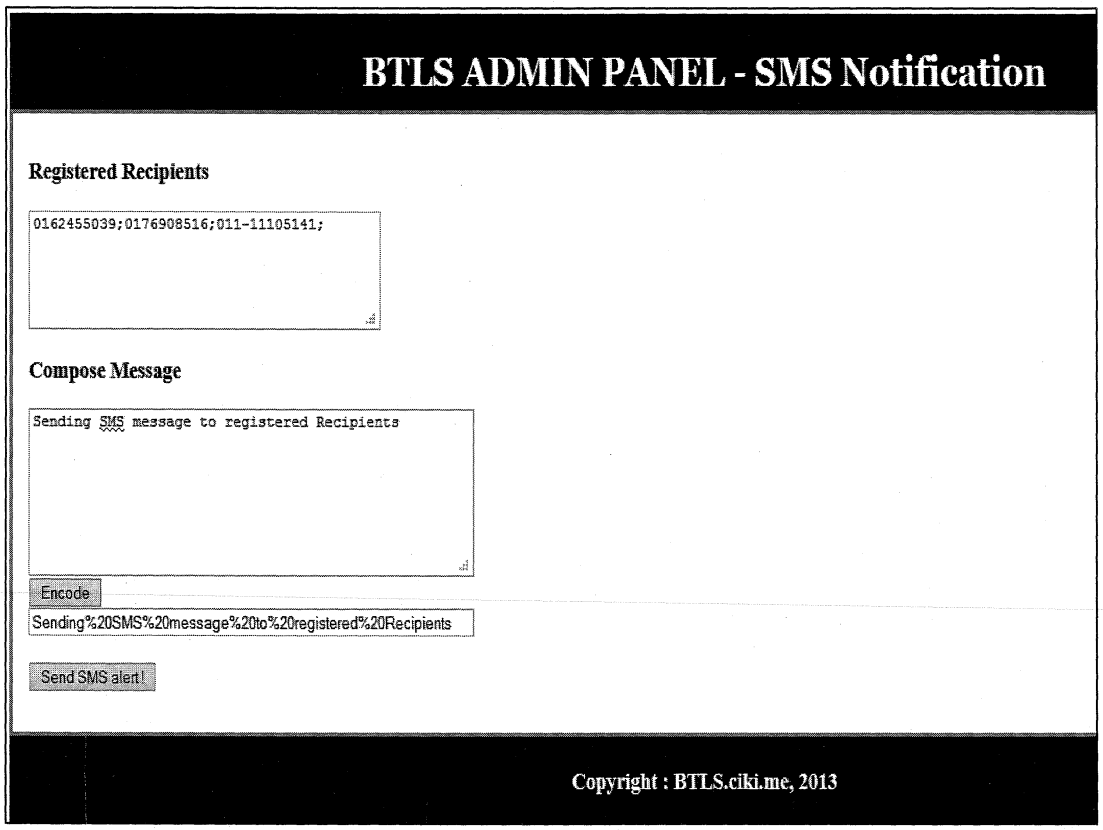


Figure 2.4.17 SMS Notification Panel

Sending data over the URL is not likely normal data transfer. The normal text from the text field needed to be encoded to URL string form. A special script (figure 2.4.18) is implemented to encode the message input by admin. Pre-coded messages are not cost effective since the length of text message is considered in charging. Hence, a text area is provided for admin to input and reconstruct their messages to be short and cost effective.

```
<script>
(function(){
    var base = document.getElementById("app_url_encoder_base");
    var decoded = document.createElement("textarea");
    decoded.style.cssText = "display:block; width:33%; height:10em";
    base.appendChild(decoded);
    var encode = document.createElement("input");
    encode.type = "button";
    encode.value = "Encode";
    encode.onclick =
    function() {
                encoded.value = encodeURIComponent(decoded.value);
                };
    base.appendChild(encode);
    var encoded = document.createElement("input");
    encoded.type = "text";
    encoded.setAttribute("name", 'message');
    encoded.style.cssText = "display:block; width:33%; margin:0;";
    base.appendChild(encoded);
}());
</script>
```

Figure 2.4.18 URL encoding script

Overall Functional Structure of SMS Module

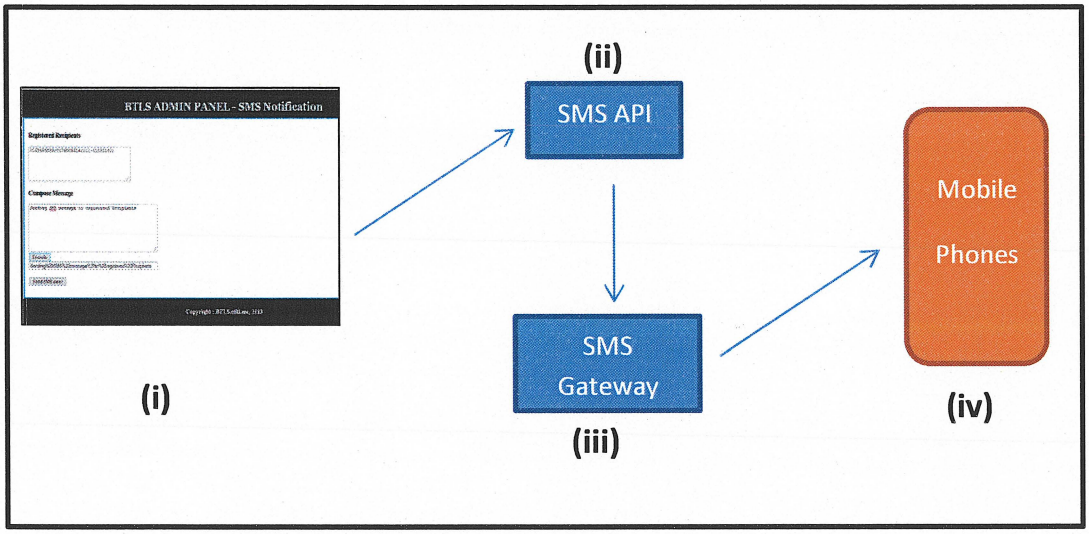


Figure 2.4.19 Functional Structure of SMS Module

Description of Figure 2.4.19

(i) The Admin Panel – SMS Notification interface which retrieve recipient numbers from database, compose message and encode it to URI format.
(ii) Encoded URI message is sent to the SMS API through URL which contains SMS API username, password and encoded message.
(iii) SMS API obtains the information from the system and sends it to SMS gateway.
(iv) SMS gateway sends the message to client's mobile number.
(v) Mobile Phones receive the SMS message from the system.

2.4.6 Email Module

Email module has two functions in this system. This module is used to send activation email from server to email address provided by users who register. An auto-generated email will be sent to the users with the headers of "FROM: noreply@btls.ciki.me" This email will contain an auto-generated activation link which verifies the user and turns their account to active.

```
$to      = $email_address; // Send email to our user
$subject = 'Signup | Verification - BTLS.ciki.me'; // Give the email a subject
$message = '

Thanks for signing up!
Your account has been created, you can login with the following credentials after you have activated your account by pressing
the url below.

Please click this link to activate your account:

http://btls.ciki.me/activate.php?email='.$email_address.'&email_code='.$email_code.'

'; // Our message above including the link

$headers = 'From:noreply@btls.ciki.me' . "\r\n"; // Set from headers
mail($to, $subject, $message, $headers); // Send our email
```

Figure 2.4.20 Auto-generating activation mail script

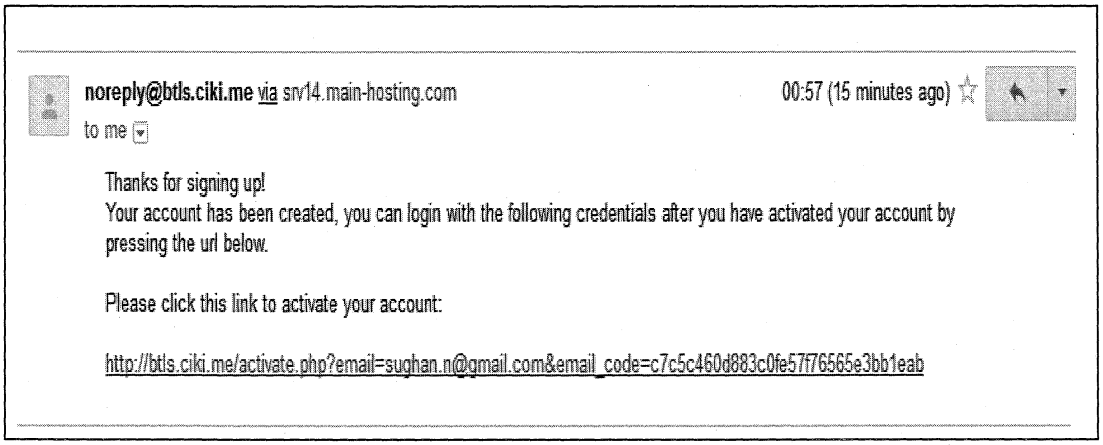


Figure 2.4.21 Sample of activation email

There is another admin panel interface as Email System, which sends messages from admin to registered recipients. This panel consist of two sections. Recipients' email addresses are obtained from the database when the system loads and the second section is for the user to compose their email messages. The composed message will be sent to recipients with the header *FROM: noreply@btls.ciki.me*.

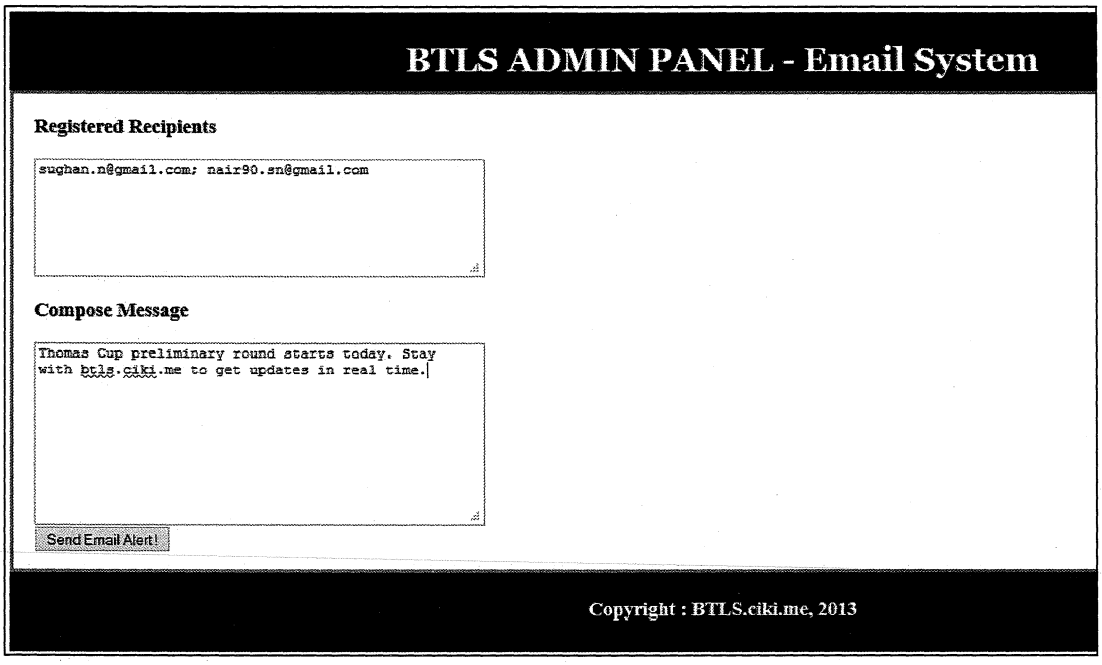


Figure 2.4.22 Email System admin panel

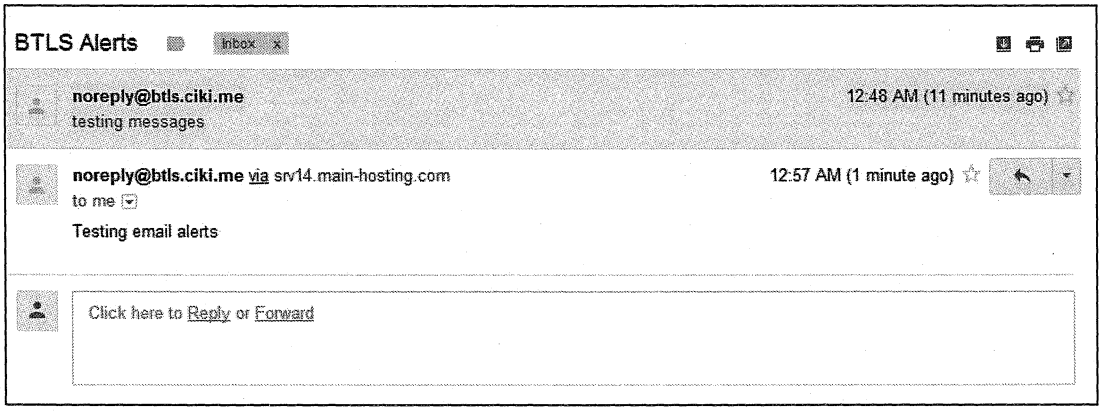


Figure 2.4.23 Sample of email alerts

All the admin panels are protected with session identification. Users that are not admins are not allowed to visit any of the admin panels. A blank page will be displayed and they will be redirected to homepage as shown in figure 2.4.24.

Figure 2.4.24 Unauthorised access.

(i) Overall Functional Structure of Email Module

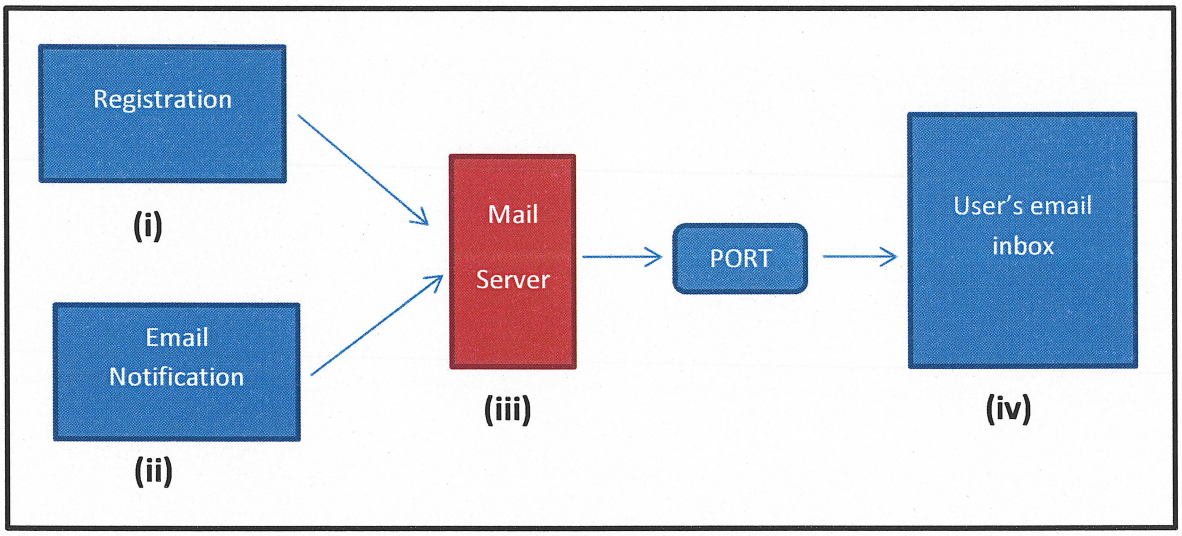


Figure 2.4.25 Functional Structure of Email Module

Description of Figure 2.4.25

(i) Registration process generates activation email with secret activation code.
(ii) The Email Notification interface which compose email alerts for the users.
(iii) Composed emails are handled by SMTP mail server.
(iv) SMTP port of the server sends mail to users.
(v) User's mail client receives emails from the system.

2.4.7 Forum

Forum features enable users to discuss about their opinions on interested topics. Only registered users have access to the forum. This is just to encourage users to register on our system. This system has a simple forum, which have categories started by admin. Users are allowed to create new topics under any category. The numbers of views are recorded each time someone visits a topic. Under each topic, users are allowed to add reply to the topics. This creates a discussion environment for badminton.

Three database tables are used to store the data for forum. *categories*(figure 2.4.26), *topics* (figure 2.4.27) and *posts* (figure 2.4.28) are the tables used. There is and interaction between these tables. Each data carries category id, post id and topic id which enable the identification and display of the forum.

#	Name	Type	Collation	Attributes	Null	Default	Extra
1	id	int(4)			No	None	AUTO_INCREMENT
2	category_title	varchar(150)	latin1_swedish_ci		No	None	
3	category_description	varchar(255)	latin1_swedish_ci		No	None	
4	last_post_date	datetime			Yes	NULL	
5	last_user_posted	int(11)			Yes	NULL	

Figure 2.4.26 Structural view of *categories* table

#	Name	Type	Collation	Attributes	Null	Default	Extra
1	id	int(11)			No	None	AUTO_INCREMENT
2	category_id	tinyint(4)			No	None	
3	topic_title	varchar(150)	latin1_swedish_ci		No	None	
4	topic_creator	varchar(150)	latin1_swedish_ci		No	None	
5	topic_last_user	int(11)			Yes	NULL	
6	topic_date	datetime			No	None	
7	topic_reply_date	datetime			No	None	
8	topic_views	int(11)			No	0	

Figure 2.4.27 Structural view of *topics* table

#	Name	Type	Collation	Attributes	Null	Default	Extra
1	id	int(11)			No	None	AUTO_INCREMENT
2	category_id	tinyint(4)			No	None	
3	topic_id	int(11)			No	None	
4	post_creator	varchar(150)	latin1_swedish_ci		No	None	
5	post_content	text	latin1_swedish_ci		No	None	
6	post_date	datetime			No	None	

Figure 2.4.28 Structural view of *posts* table

The forum uses a single column web layout for a wide display. Only logged-in users are allowed to view forum section. Otherwise they will be redirected with a warning as show in figure 2.4.29.

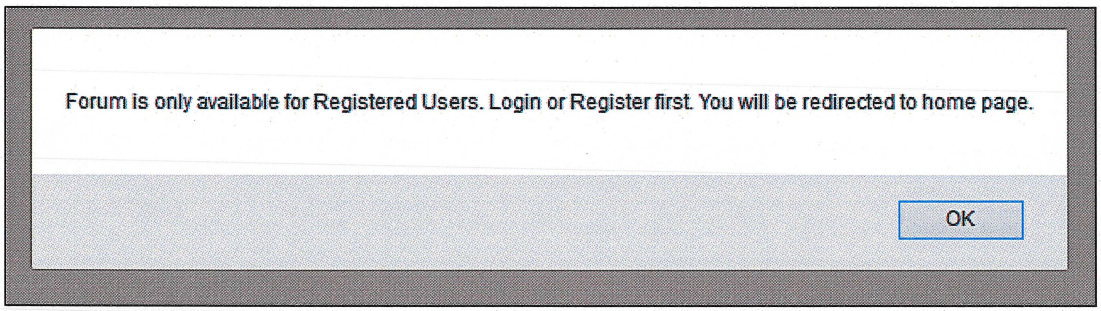


Figure 2.4.29 Unauthorised forum access

The main page of forum is the categories page. Shown in figure 2.4.30. Users are not allowed to add or change the predefined categories. They can choose the category to view and the topics under the category will be loaded.

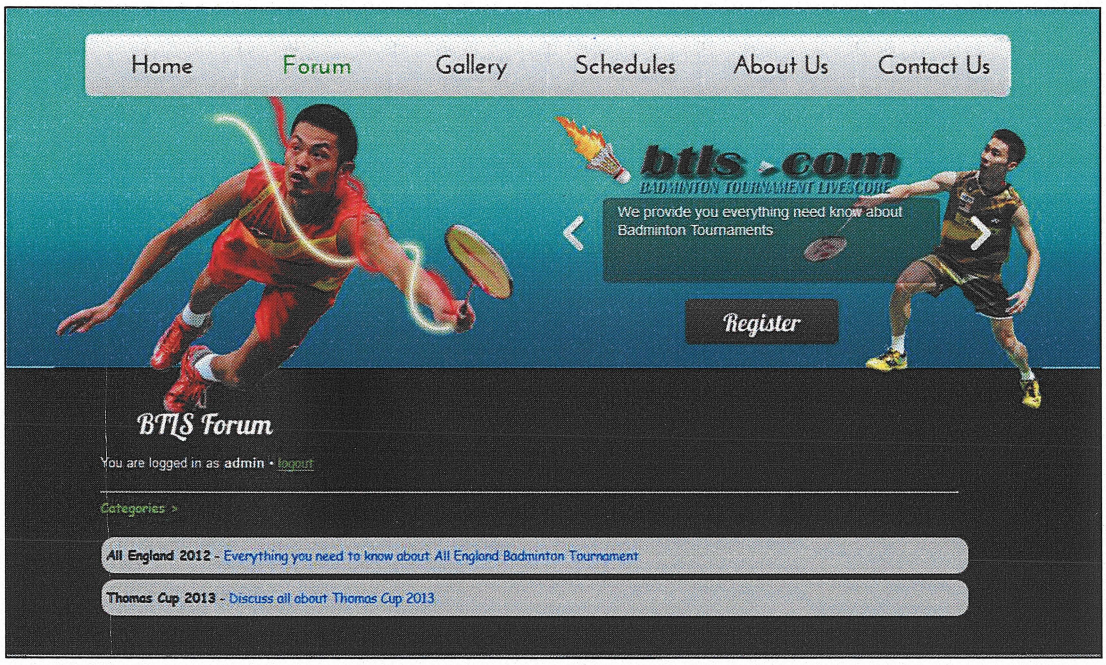


Figure 2.4.30 Forum Category

Users are given options in the forum to logout from the system. By clicking they will be redirected to home page and restricted to forum, unless the log-in back.

The category chosen by the users will lead them to the topics page (figure 2.4.31) that related to category. The category id is passed through the URL to the topics page, which identifies the category id and load related topics form the database. The users can create topics inside the category. By clicking the create topic link, they will be redirected to an interface which records the user input and store it to the topics table in the database.

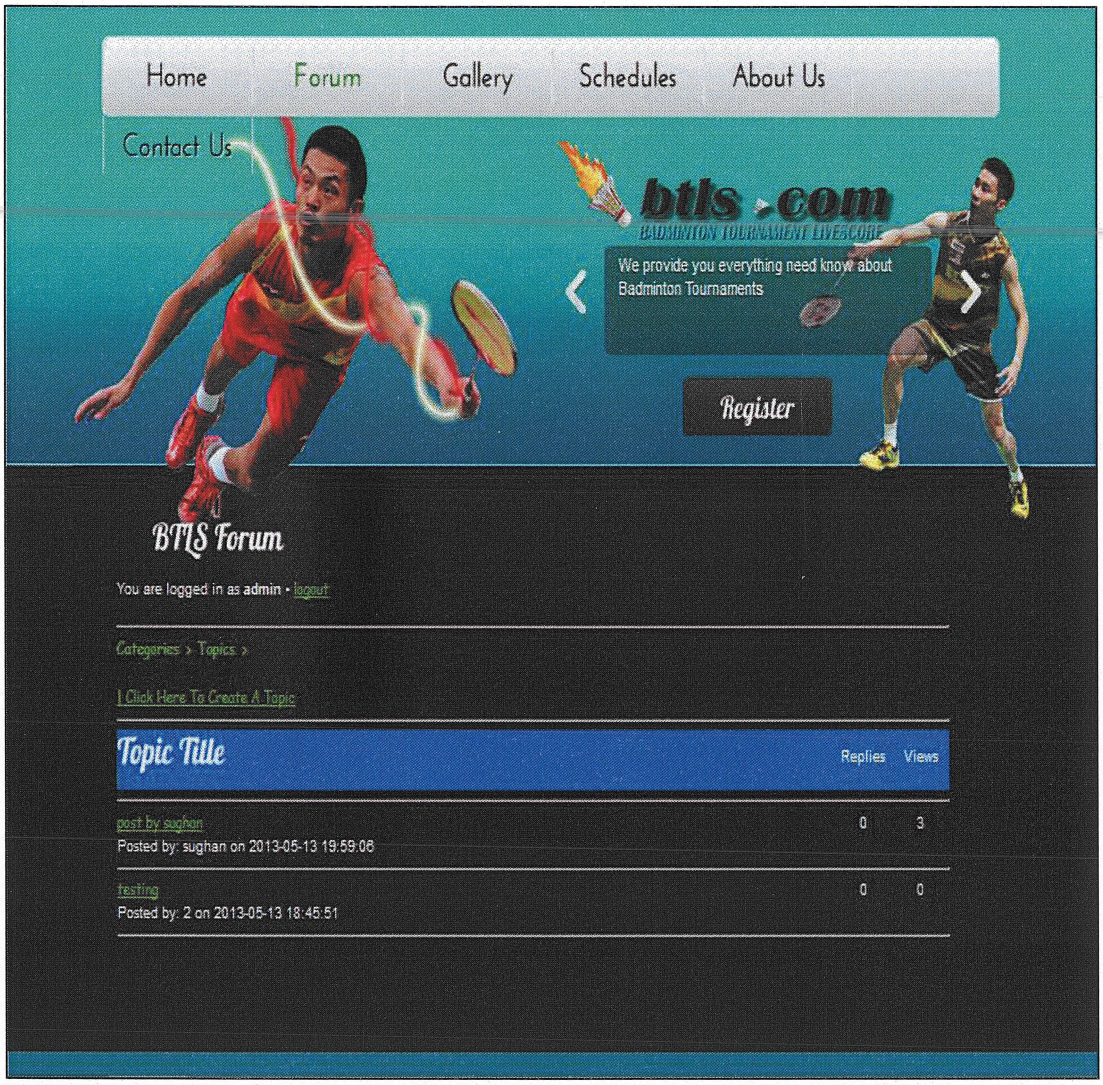


Figure 2.4.31 Forum Topics

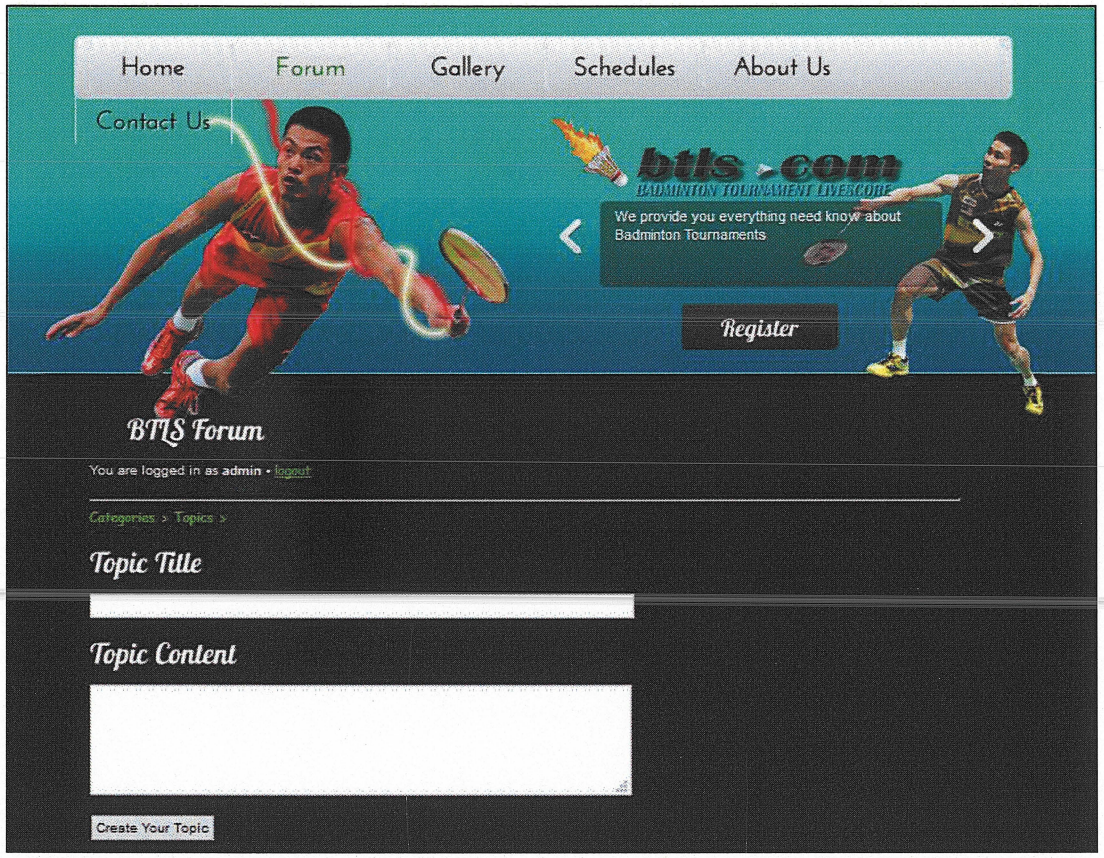


Figure 2.4.32 Create forum topics

Once user created a forum topic from the interface shown in figure 2.4.32, they will be redirected to the particular topic's post section. In the post section users are allowed to add reply to any topics of anyone. The can add reply to the post by clicking 'Add Reply' button. Each time a topic is opened to be read, the number of views increases by one. It is recorded in the database. User can identify the popular topics easily.

Add Reply brings users to an interface (figure 2.4.34) where it has the content input area only, unlike the create topic section which has and extra input to add topic title. This explains each topics has one title and can have many replies known as posts. This enables the system to list the topics in the topics section and the replies to the post only available once a topic is selected.

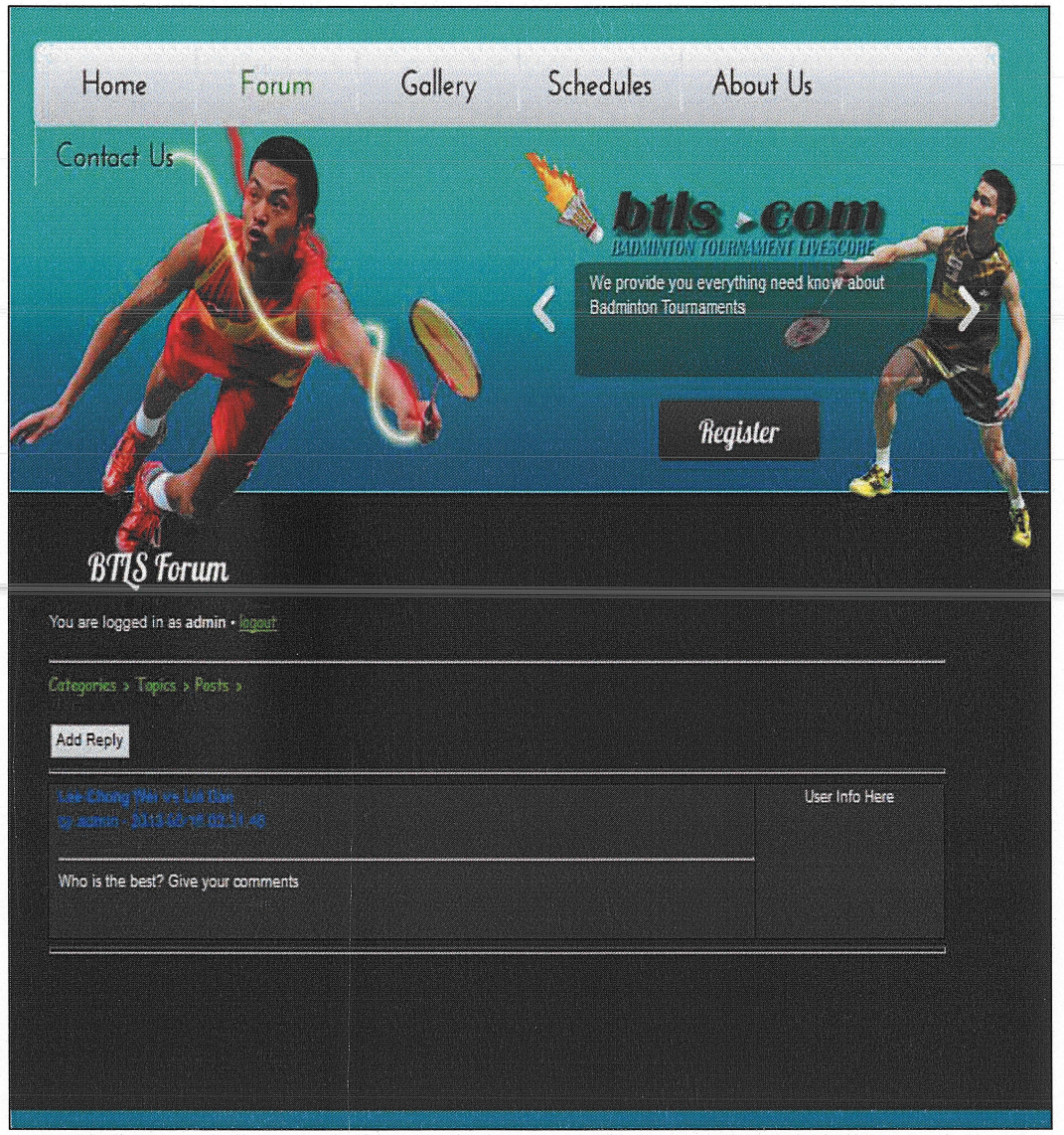


Figure 2.4.33 New topic created

Every topics and replies by the users and recorded with their username. The username and time of posting also will be shown for every post.

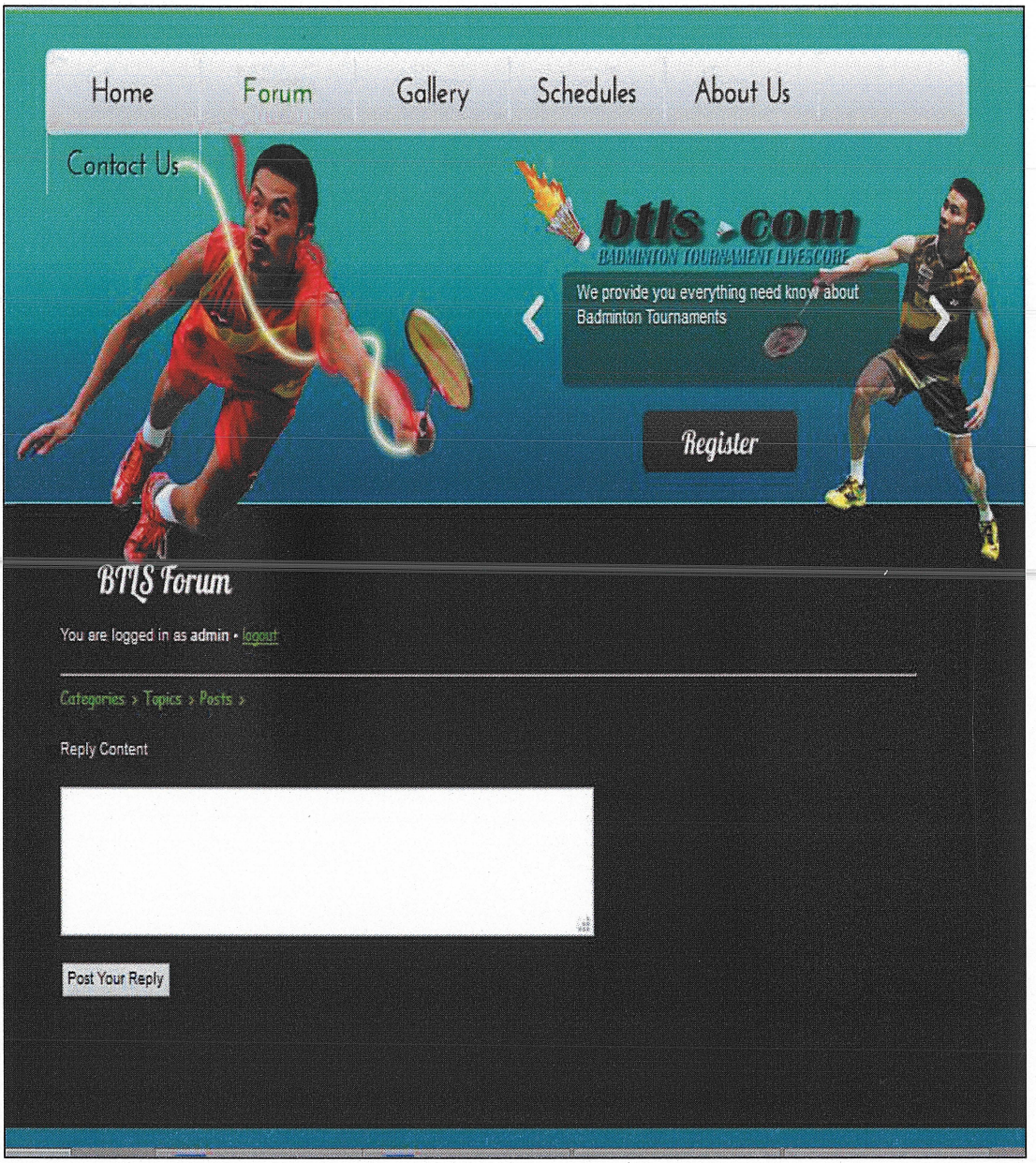


Figure 2.4.34 Add reply interface

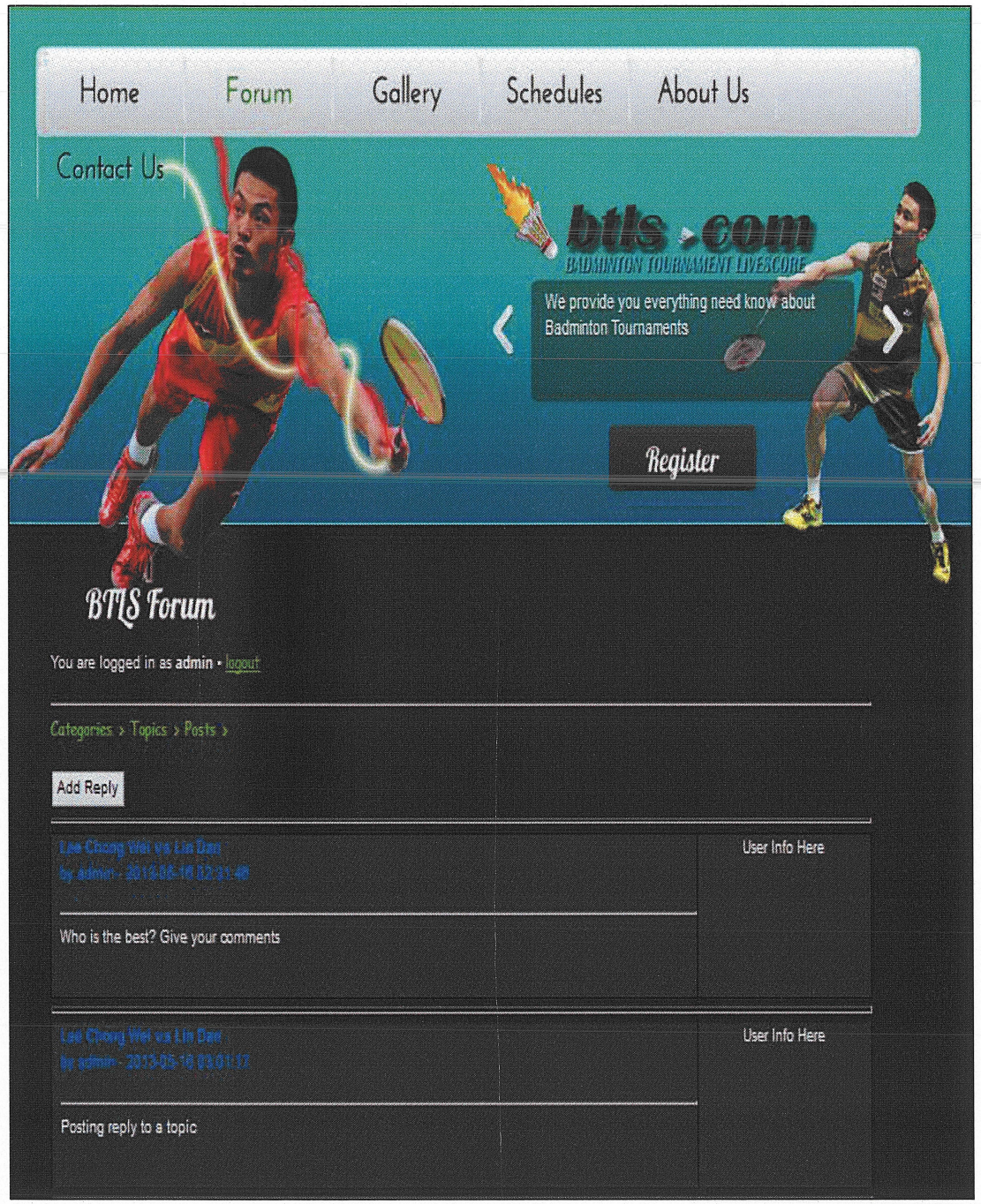


Figure 2.4.35 Reply added

Because of the resource constraints like server space and bandwidth allocation the forum doesn't have the profile pictures for users. This constraint will be solved in next versions of the system.

2.4.8 Non-proposed additional features

The system has some additional features which are not proposed in the initial plan. These features are added by developer to make the system more interactive. This section explains and describes some additional features. Since they are non-proposed features, the integration and development time doesn't include these features. It's integration is depends on the developer.

(i) Picture Gallery

This system will have a picture gallery of the players, tournaments and any badminton related images. This feature is just to make the system more interactive and it does not affect any of the proposed features. It is still under development phase.

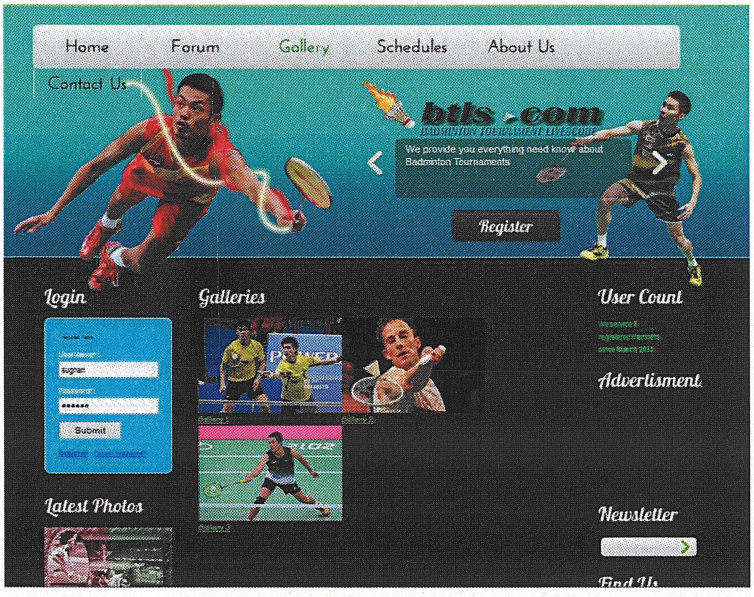


Figure 2.4.36 Picture Gallery

(ii) User Counts widget

'User counts' is a widget that is created to publish total number of registered users who are subscribing this system. It blinks on the client site to notify how many users are the registered on this system. Developed and integrated on the system.

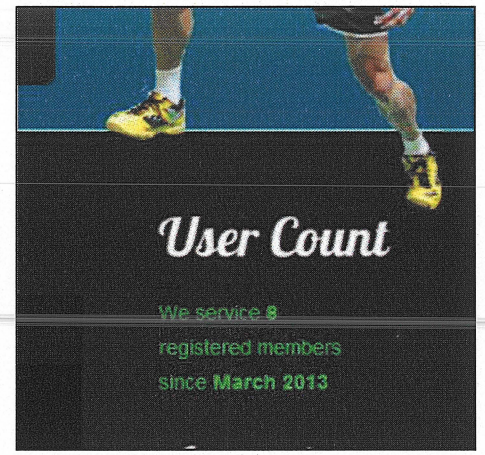


Figure 2.4.37 User Count Widget

(iii) Contact Us

Interface to get feedback of users about the system. The feedbacks will be recorded in the database. Developed and deployed on this release. It needs a feedback replying module which will be added on future release.

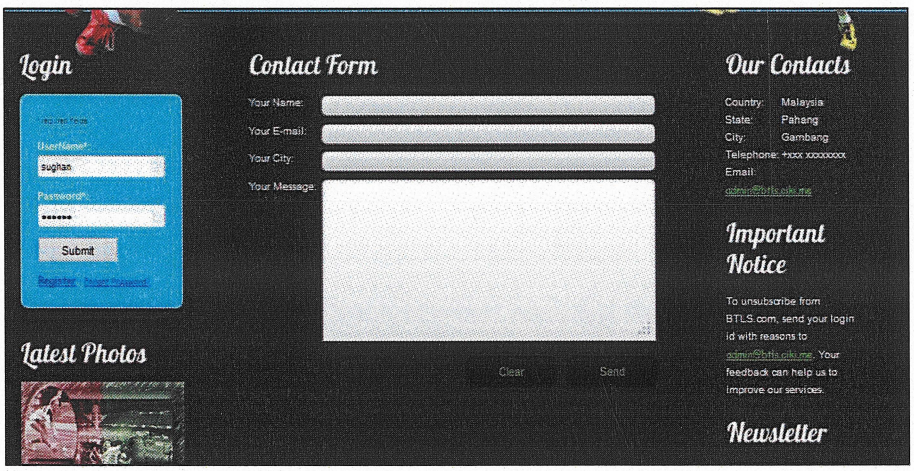


Figure 2.4.38 Contact Us interface

(iv) Schedules

In this release, the system only have a static schedules page which might have tables or pictures taken from public domain. A content management system is needed to be developed to provide more functional features on this schedule section.

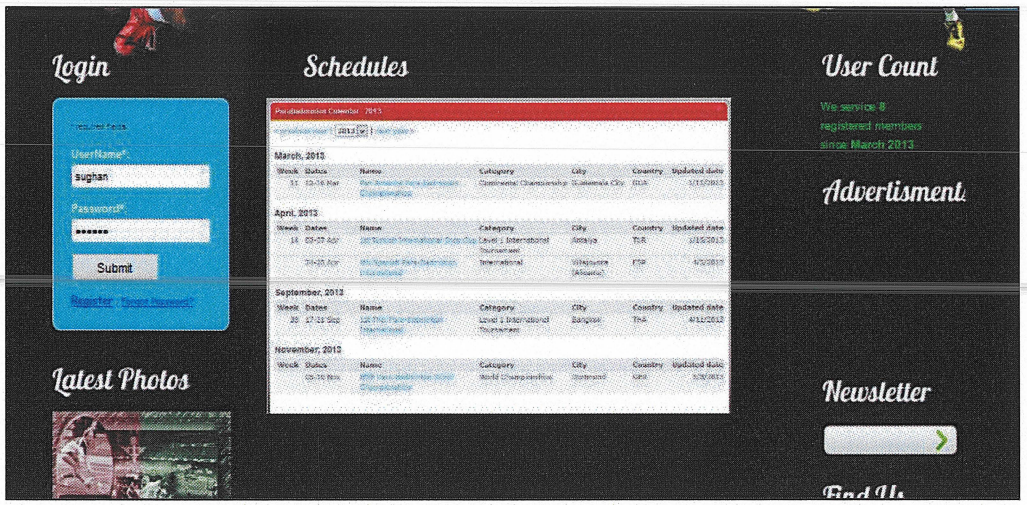


Figure 2.4.39 Schedules interface

(v) Video Highlights

Highlight videos will be available on this system and can be viewed in pop-up video player.

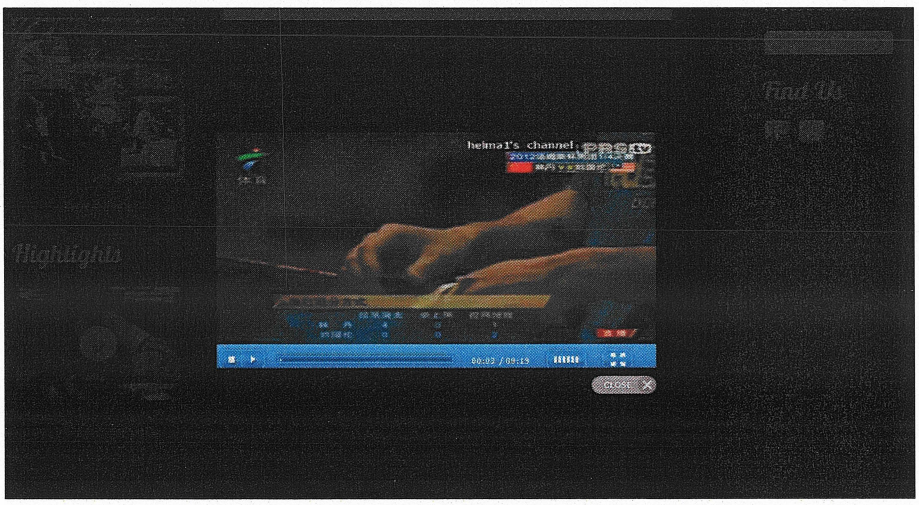


Figure 2.4.40 Video Highlights interface

2.5 Testing plan

The testing process will be carried out along with the development process as we follow agile software development method. The testing process is divided according to the development plan. The divisions of testing plan are:

i. Unit/Component testing (testing separate modules)
ii. Integration testing (integrating completed modules)
iii. System testing (testing complete system)
iv. User acceptance testing (testing using real users)

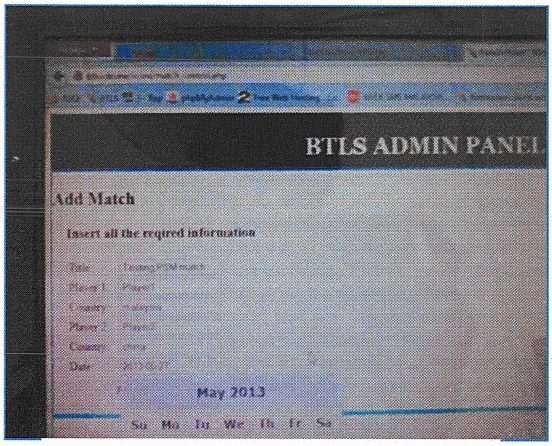
All the testing divisions will be carried out twice, in development environment and after deployment in real server. Each completed modules undergoes unit testing. Completed modules will be integrated in development phase and integration testing will be carried out. Completed system is tested in real environment. User acceptance testing is to get the feedback from real users.

2.5.1 Unit Testing

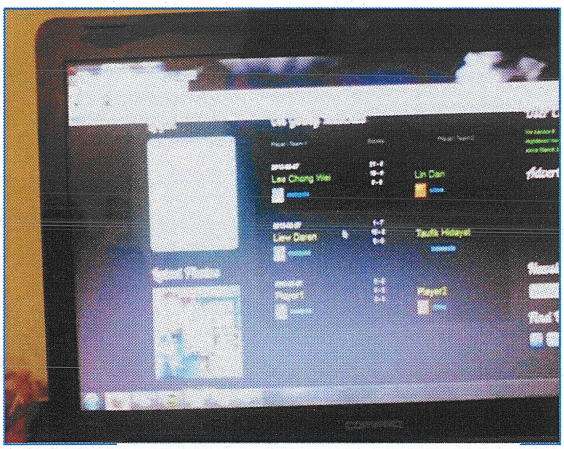
Live Score Module

Live Score module is tested with two laptops, one as admin and another one as portal end user. Admin account adds and deletes matches and input live score for matches. Two interfaces are tested in Live Score module; Match Control interface and Score Panel interface.

(i) **Interface:** Match Control
(ii) **Function:** Add Match



Admin Panel – Match Control



Portal BTLS (end user)

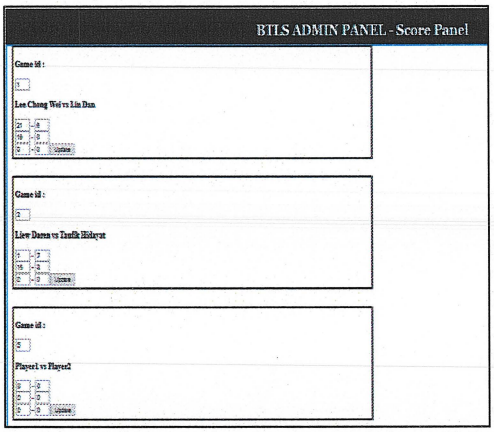
- Time taken for changes: ~5.2 seconds
- Efficiency: 96%

(i) **Interface**: Match Control
(ii) **Function:** Delete Match

Admin Panel – Match Control

- Efficiency: 100%

(i) **Interface:** Score Panel
(ii) **Function:** Input Scores



Admin Panel – Score

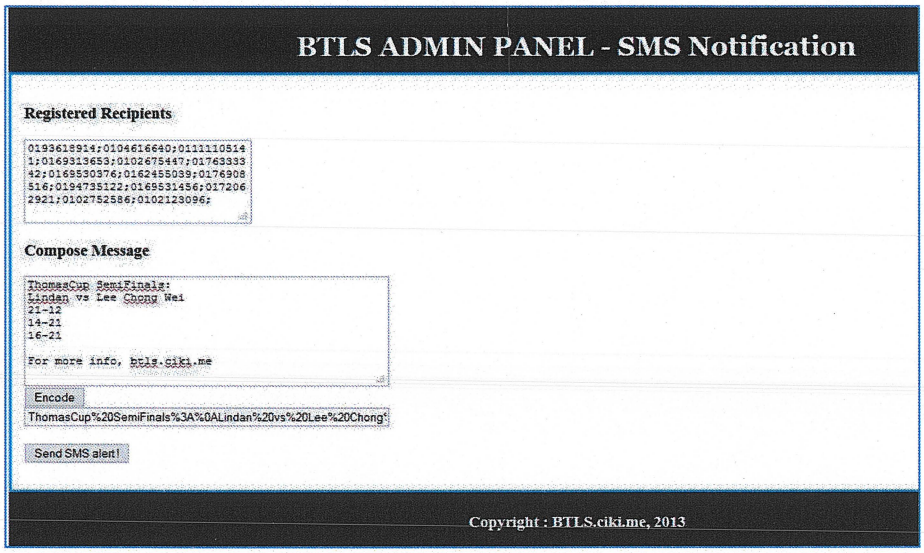
Portal BTLS (end user)

- Time taken for changes: ~5.2 seconds
- Efficiency: 96%

SMS Module

SMS module is tested by loading registered phone numbers from the database, composing message, encoding message and send it through SMS API.

(i) **Interface:** SMS Notifications
(ii) **Function:** Send SMS
(iii) **Efficiency:** 100% for all Malaysian Mobile operators



SMS Notification

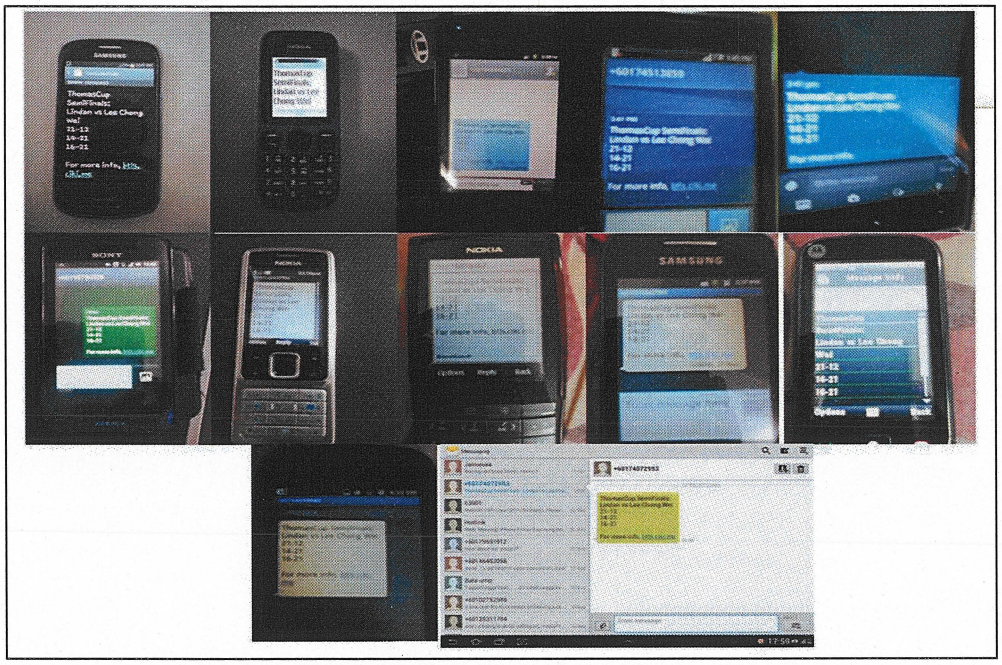
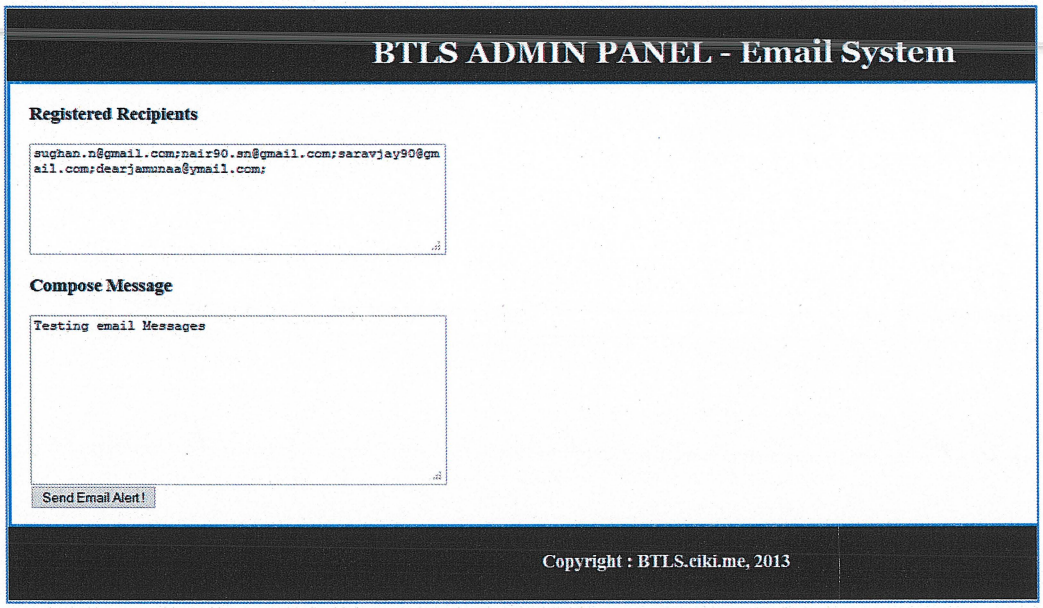


Figure 2.5.1 SMS Testing

Email Module

Email module consists of automated activation mail and Email notification interface. Activation mail is tested by registering new users, generate activation link and send it to user mail address. Email Notification is tested by send test emails to registered users.

(i) **Interface**: Email System
(ii) **Function:** Send Email
(iii) **Efficiency**: Depends on the mail server. 100% tested and working



Email System

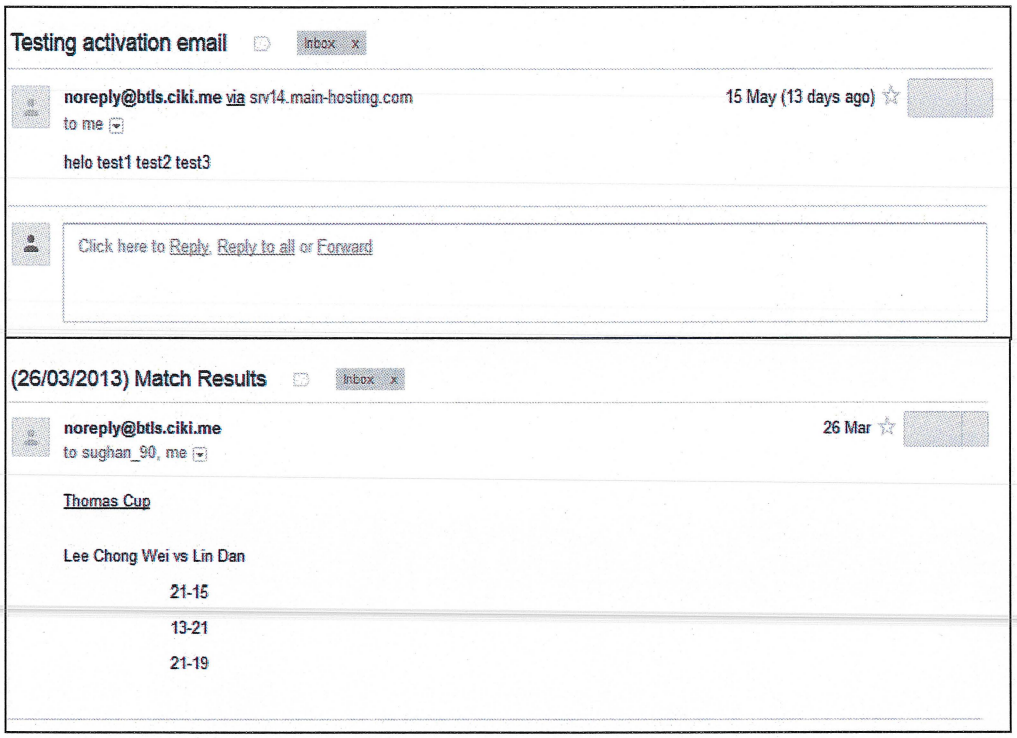
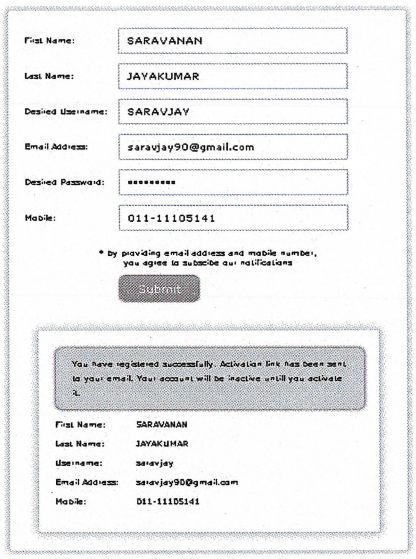


Figure 2.5.2 Email alert testing

Interface: Registration

Function: Send Activation Mail

Efficiency: Depends on the mail server. 100% tested and working



Registration System

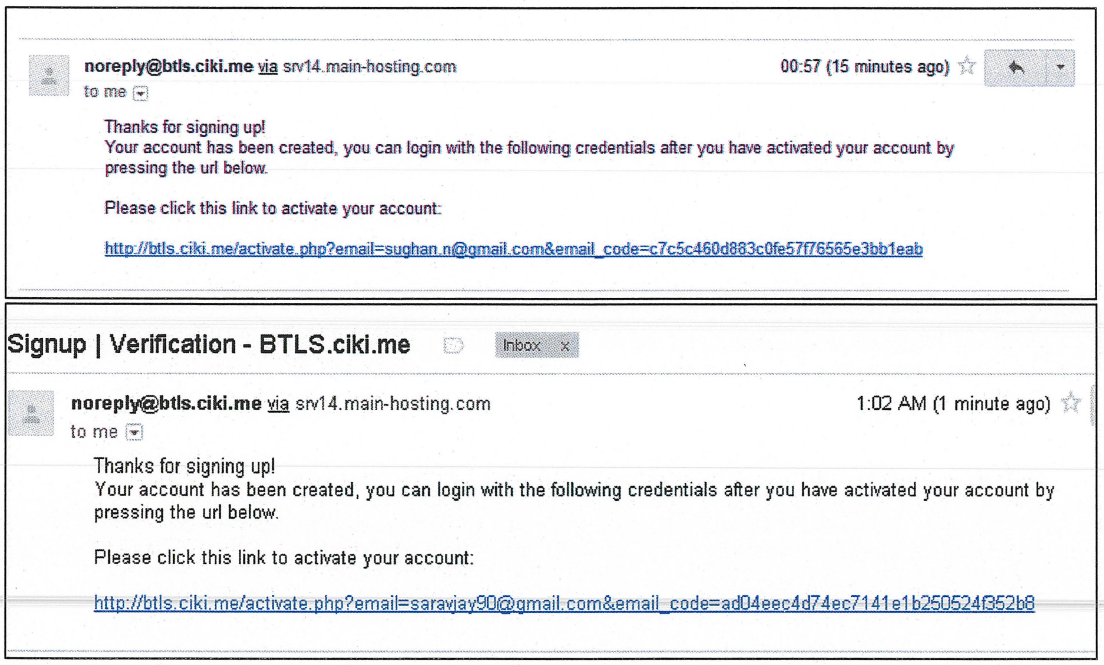


Figure 2.5.3 Activation email testing

2.5.2 Integration Testing

Integration Testing is conducted by integrating all three separate units to create interfaces of normal users and admin.

Figure 2.5.4 Integration of admin interface

Figure 2.5.5 Integration of registered user interface

2.5.3 System Testing

System Testing is conducted by moving the integrated system to real server provided by 2freehosting.com. The system is transferred from its development environment to real server. btls.ciki.me is the URL of the system.

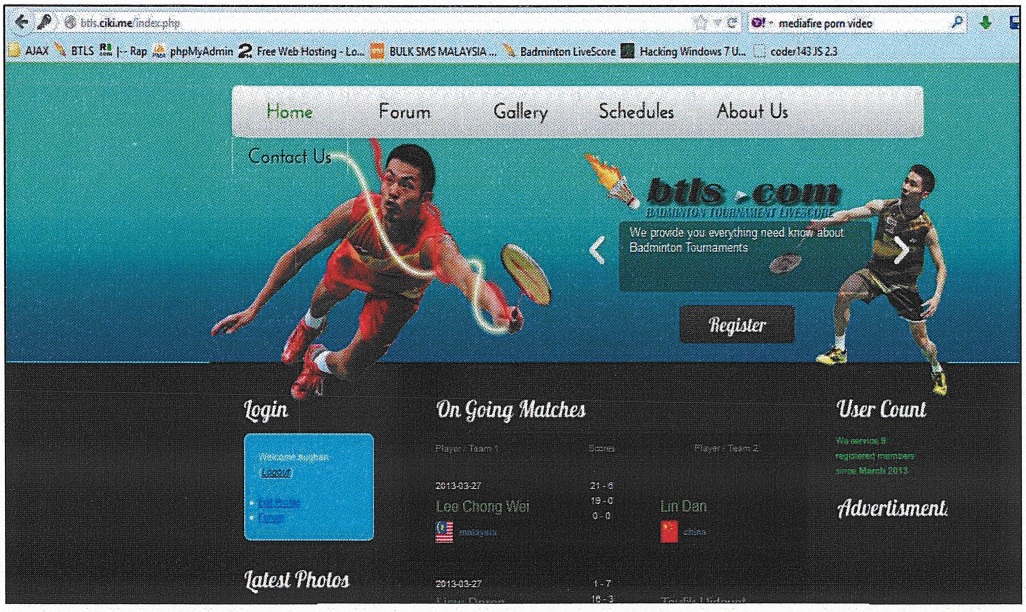


Figure 2.5.6 Real server testing

2.5.4 User Acceptance Testing

A Charity Badminton Tournament under program MY CRAZY IDEA FOR THE NATION 2013 will be held on November 2013. This program is organised by Universiti Malaysia Pahang Student Representative Council. The organising committee agreed to use BTLS for their tournament. A testing is conducted by the organising committee and their feedback is recorded. The feedback will be taken as reference for customizing the system to fulfil their requirement in future release.

[APPENDIX B]

CHAPTER 3

CONCLUSION

This chapter discusses the advantages, disadvantages, assumptions, constraints and overall conclusions. The features that are developed in this system are discussed into advantages and disadvantages while the assumptions made for the system to functions properly and the constraints of current system will be discussed flowingly.

3.1 Advantages and Disadvantages

3.1.1 Advantages

The advantage of Badminton Tournament Live Score System (BTLS) is, it is more convenient for the badminton fans all over the world to get scores of their favourite matches in real time. Besides that, for those who cannot access BTLS online, they can get update in real time via their mobiles. SMS alerts of BTLS will ensure the updates reach the users in anyways. BTLS also provides email notification service which will send user verification system and email alerts to the registered users. This system also comes with secured, session activated admin panels which prevent unauthorised access to the system's protected files. Additional features makes the system is interactive to users. Minimalistic design in admin level ensures lesser load in order to achieve real time performance.

3.1.2 Disadvantages

There are few disadvantages in current release because of time and resource constraint. Noted disadvantages, reasons and suggested solutions are explained below.

i. The Badminton Tournament Live Score System (BTLS) is a static website. Unlike content management based sites, BTLS needs a webmaster with at least moderate level web programming knowledge to alter or modify contents.

ii. The development environment and real server which is used in this system has some limitations. The email service is not available in development server. In real server the availability of email services falls below 50% since it is an unreliable free hosting. The email functionality of the system is tested and proven working. Hence, if the system moved to reliable resources, all the features will work efficiently.

iii. Since, the system provides real time information; the unnecessary bandwidth loss is unavoidable. This loss is reduced by implementing partial page rendering techniques and minimalistic design. This system still needs improvised bandwidth control methods to reduce the loss even more. The solution for this problem will be implemented in future releases.

3.2 Assumptions

In order to full-fill requirements as mention earlier, some assumptions have to be made regarding the system.

i. The proposed functionalities will work efficiently, provided system required resources are available.

ii. The client computers use updated web browsers and plugins like java to get the system works.

iii. There is uninterrupted internet connection between the users (admin & normal users) and the server.

iv. All other basic requirements matching or higher than the system requirement.

3.3 Overall Conclusion

In conclusion, since Internet becomes inevitable element of life; it can play important role in providing real-time information. Beating the traditional method of watching TV to get sports related information; BTLS providing a solution with its live score, SMS and email notifications by feeding real time information right to the badminton fans.

In the completion of live score module, SMS module, Email module and discussion forum the proposed objective of the project is achieved. Achieved objectives are:

i. To develop a system that will update the users about current status of on-going badminton tournaments and upcoming events.

ii. To ensure the badminton fans, who are registered to the system, receives alerts regarding the match schedule and results.

iii. To create a discussion board for the users of the system to deliver their point of view or comment with people who are in same interest.

Since, all the pre-defined objectives are achieved BTLS provides solution for the identified problem statement of this project.

REFERENCES

1. Doorley, John and Garcia, Helio Fred (2006). Reputation Management: The Key to Successful Public Relations and Corporate Communication, p. 113. Taylor & Francis

2. Murray, Scott (2010). Football For Dummies, p. 268. John Wiley & Sons

3. Pat Tocci et al (2011). System and Method for Providing Live Scoring Information and Statistical Data, U.S. Patent No. 13/385,584. Washington, DC: U.S. Patent and Trademark Office.

4. (n.d.). Digicel Cricket Live SMS Score Alerts. Retrieved October 12, 2012, from http://cwc.digicelcricket.com/sms-alerts

5. Brandon (2013). Reload Browser Based on innerHTML Contents. http://stackoverflow.com/questions/15726059/reload-browser-based-on-innerhtml-contents

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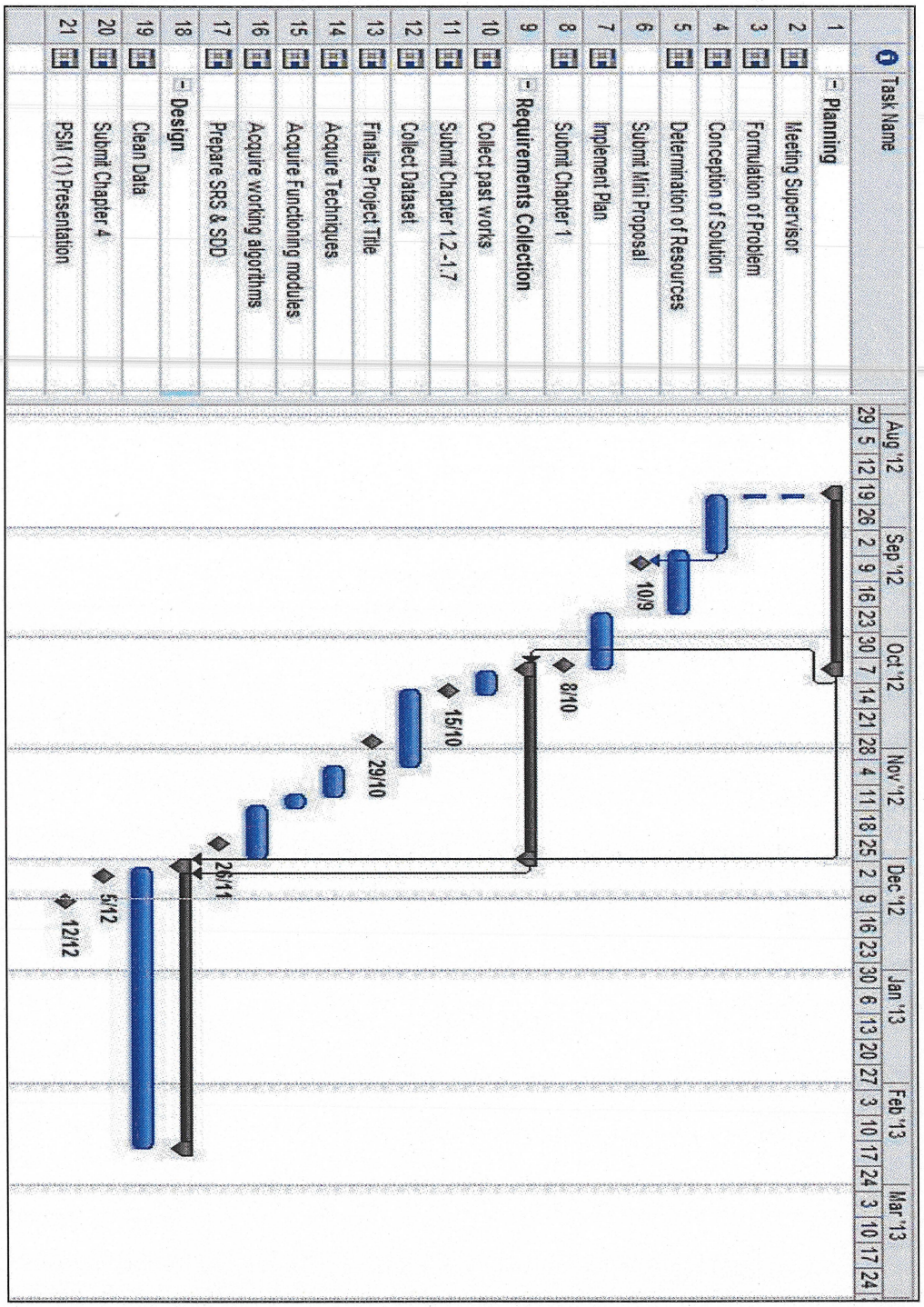
10. (n.d). Datepicker Widget. Retrieved on May 10, 2013, from http://api.jqueryui.com/datepicker/

APPENDIX

APPENDIX A

GANTT CHART



APPENDIX B

User Acceptance Feedback Form

User Acceptance Feedback Form (BTLS)

Section A: User Details

Name : _____

Designation : _____

Section B: Feedback

1. **Rate Live Score module based on easy to use criteria**
   ☐ User Friendly ☐ Easy ☐ Acceptable ☐ Hard to use
2. **Rate Live Score module based on its effectiveness**
   ☐ Very Effective ☐ Moderate ☐ Acceptable ☐ Not Effective
3. **Rate SMS module based on easy to use criteria**
   ☐ User Friendly ☐ Easy ☐ Acceptable ☐ Hard to use
4. **Rate SMS module based on its effectiveness**
   ☐ Very Effective ☐ Moderate ☐ Acceptable ☐ Not Effective
5. **Rate Email module based on easy to use criteria**
   ☐ User Friendly ☐ Easy ☐ Acceptable ☐ Hard to use
6. **Rate Email module based on its effectiveness**
   ☐ Very Effective ☐ Moderate ☐ Acceptable ☐ Not Effective
7. **Your overall assessment on BTLS**
   ☐ Fulfil Requirement ☐ Acceptable ☐ Rejected

Section C: Preferred Customization or Comments

_____

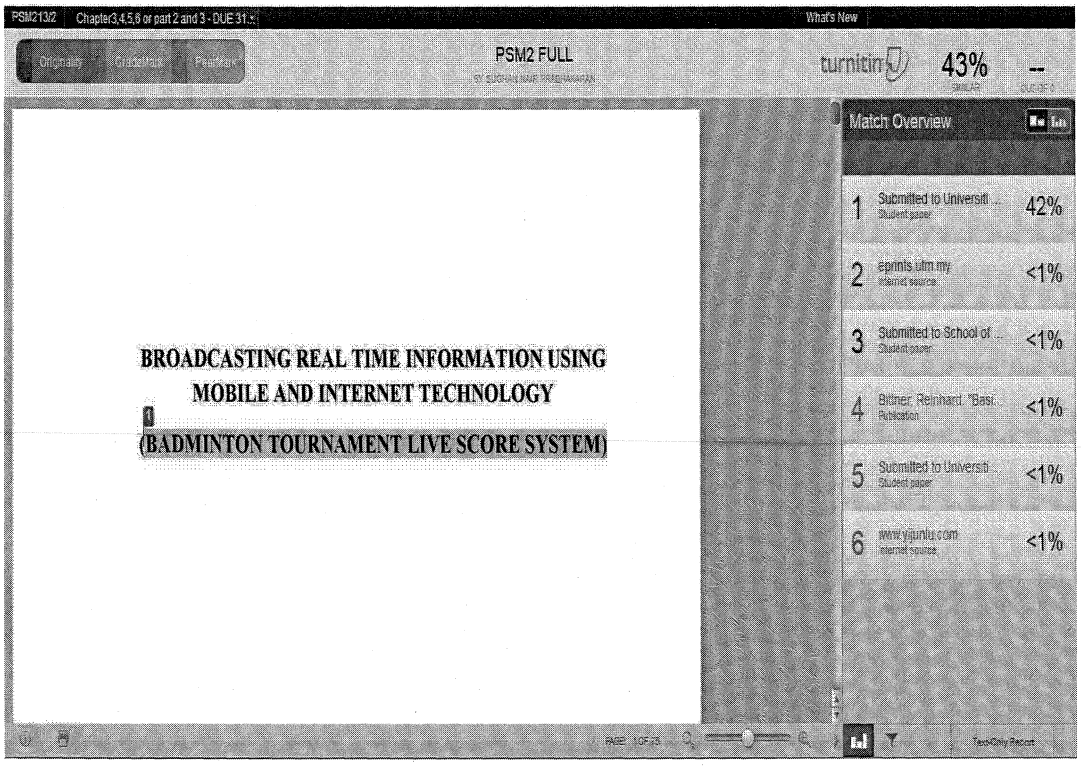
_____

_____

_____

APPENDIX C

Turnitin Plagiarism Report



- Note: 42% similarity is from the version 1(PSM1) of this document. Hence, plagiarism of the final report is 1%.

APPENDIX D

Software Requirements Specification

For

Badminton Tournament Live Score System (BTLS)

Version 1.0

SUGHAN NAIR A/L PRABHAKARAN

26 December 2012

1. Introduction

1.0 Purpose

This is the software requirement specification Badminton Tournament Live Score System. This document contains higher level requirement specification for Badminton Tournament Live Score System. Badminton Tournament Live Score System is a web portal which includes various functional components. Changes and updates that implemented on the system will be updated to revised version for this document.

1.1 Intended Audience and Reading Suggestions

This document is created to provide description of the system. Thus, this document will help people who are involved in .Thus the document will be useful for people who are involved in developing components for web portals, live score system, discussion forum and auto-responder mail, and SMS alerts. This document is prepared in a ordered way to satisfy all the readers. Readers who are in interest of understand the overall flow of the system can mainly refer to the chapter two which elaborates the overall functions. Developers and programmers who are working on similar system or component are advised to read the whole documents to get deeper understanding about the systems' functionality. Readers are also advised to read the non-functional requirement of the system to understand how the system responds.

1.2 Project Scope

The system is developed carrying a vision to provide an efficient, real-time and easy platform for users to get updates about badminton tournaments. In the beginning, the system focuses on the motive of main functions in the system to achieve the vision. Hence, this document highlights the core functionality of the proposed system. The Badminton Tournament Live Score System is scoped to produce a platform for badminton sports related updates and alerts in real time. Besides that, the system also focuses the administrator's roles in triggering alerts and updates the system. The document also describes the function of discussion forum and news alerts. Some functions are small scaled due to the constraints and source of information is assumed to be taken from public sources.

1.3 References

- Doorley, John and Garcia, Helio Fred (2006). Reputation Management: The Key to Successful Public Relations and Corporate Communication, p. 113. Taylor & Francis.

- Pat Tocci et al (2011). System and Method for Providing Live Scoring Information and Statistical Data, U.S. Patent No. 13/385,584. Washington, DC: U.S. Patent and Trademark Office.

2. Overall Description

2.0 Product Features

Main features of the product can be listed as below.

1. Live Score –
   The system will display scores in real-time as it is triggered by Administrator.

2. News Alerts –
   System will generate different types of alerts for categorized users.

3. Discussion Board –
   A forum type discussion board will be included in the system.

2.1 User Classes and Characteristics

There are two types of users who are involved with this Online Badminton Tournament Live Score System. They are

1. Administrators
2. Normal Users
   i. Member
   ii. Non-Member

All the above specified users are assumed to have good command of English and basic browsing skills using latest browsers like Firefox, Chrome, Safari and Internet Explorer.

2.1.1 Use Case

1. Use case for Administrator

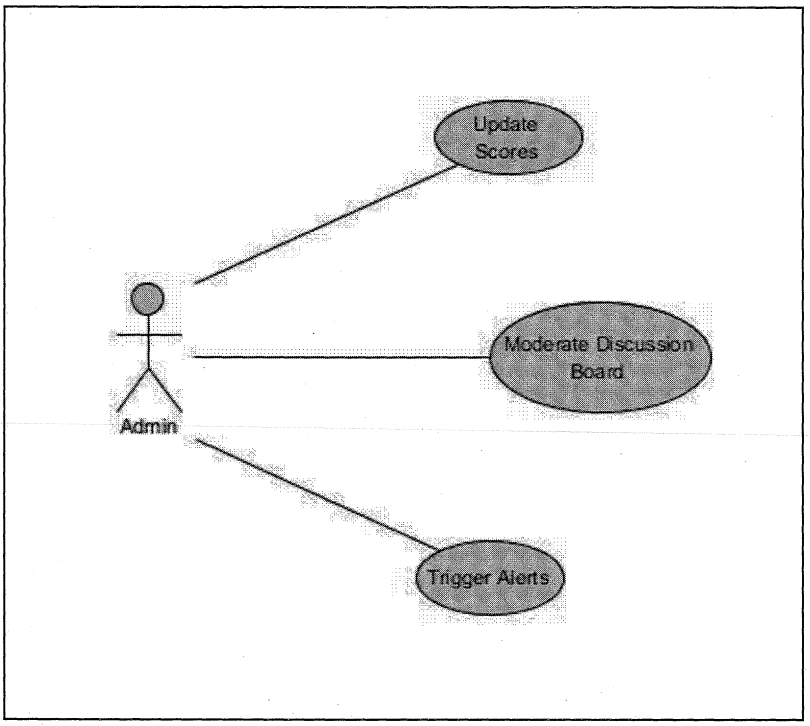


Figure 2.1 Use case diagram for Administrator

2. Use case for Member

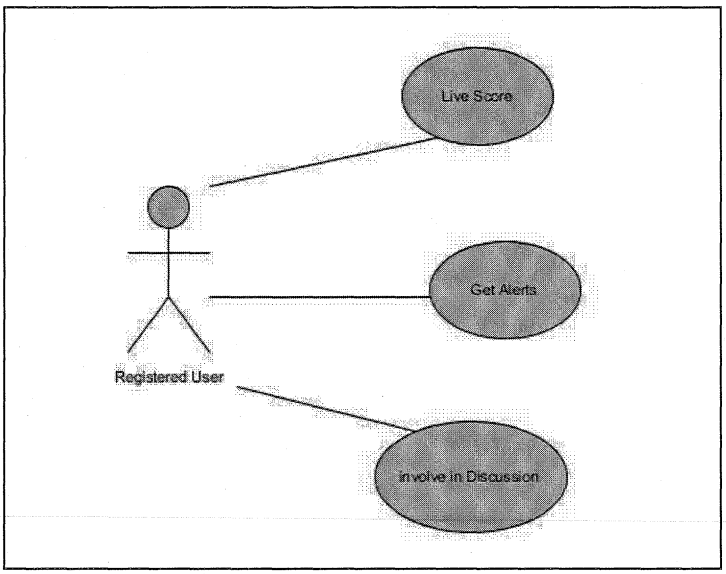


Figure 2.1 Use case diagram for Registered User

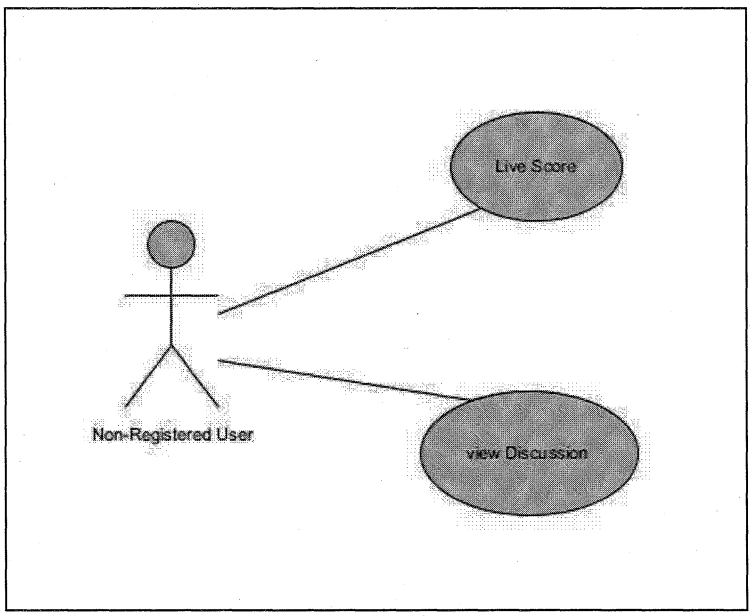


Figure 2.1 Use case diagram for Non-Registered User

2.2 Operating Environment

System: Running on provided high end server, which supports PHP, Java, HTML.

Database: mySQL

Client: No special environment is needed. Normal Computers with internet connection and latest web browsers

2.3 Design and Implementation Constraints

- Should have a server which can handle high network traffic.
- Should have an internet connection
- Other computers provided should have the following installed latest web browsers
- Should have a stable server and Administrator rights to trigger auto responding mails and news alerts.

2.4 Assumptions, Dependencies and Guidelines

2.4.1 Assumptions

- Users have their own hardware facility to access system
- There is a stable network between users and server

2.4.2 Dependencies

Open source software and languages. Such as: PHP, Java, HTML and mySQL.

2.6.3 Guidelines

The interfaces and source codes are structured and follows design rules for easy maintenance in future.

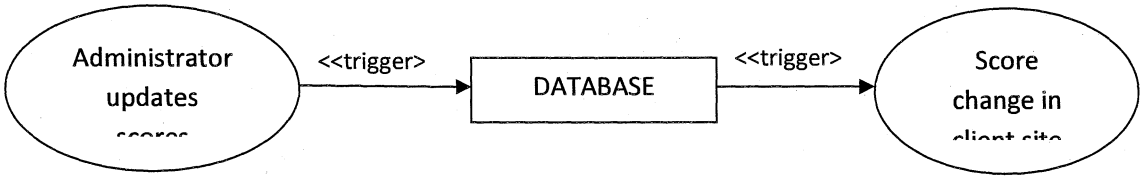
3 Specific Requirements

3.1 Live Score (Module 1).

3.1.1 Description

Live Score module is the basic and main requirement for this system. This module delivers the scores triggered by the Administrator to the client site. This transport of information will be in real-time. All the users; Administrator, member and non-member are part of this modules.

3.1.2 Stimulus & Responses



3.1.3 Event Sequence

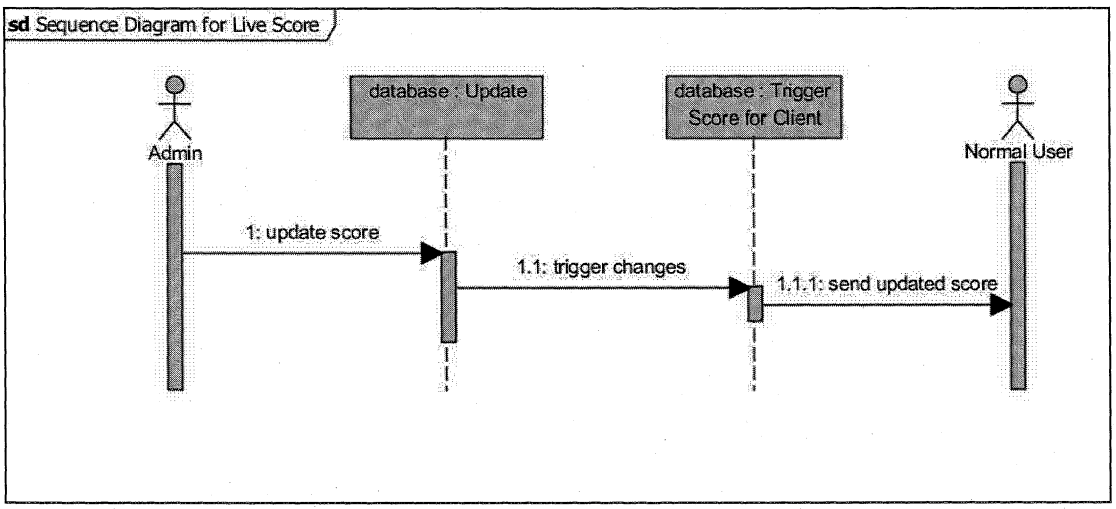


Figure 3.1 Sequence diagram for Live Score Module

3.1.4 Functional Requirements

1. All the users involved in this modules' event. Administrator and Normal Users are two poles of the event. The event takes place between the two ends.

2. The sequence is one-way and no responds for the event. Normal users are limited to read-only privilege; can view the score only.

3. The Administrator should have a stable connection with the database to update the score.

    a. Administrator privilege is needed to change the score in database.

    b. The database only accepts changes from Administrator and update the score.

    c. The changes of score made by Administrator, triggers and automatic score update form the database to the client site.

3.2 News Alerts (Module 2)

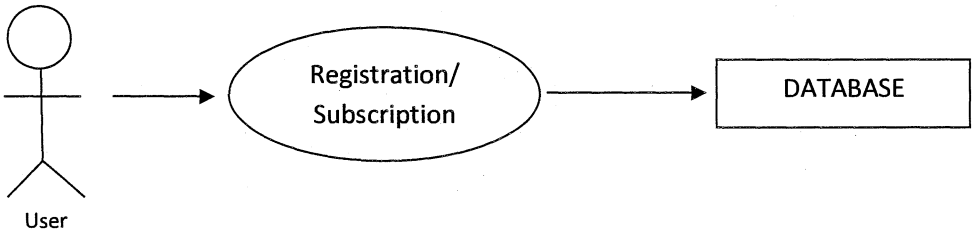
3.2.1 Description and Priority

This module is only applicable for registered members who subscribe to news alerts. The subscription phase of news alerts take place during member registration. This feature is constrained to dummy unless the system has a full control of the server to send email alerts. Another constrain of the system is the SMS alerts are only applicable if the system is allowed to use paid third party bulk SMS service.

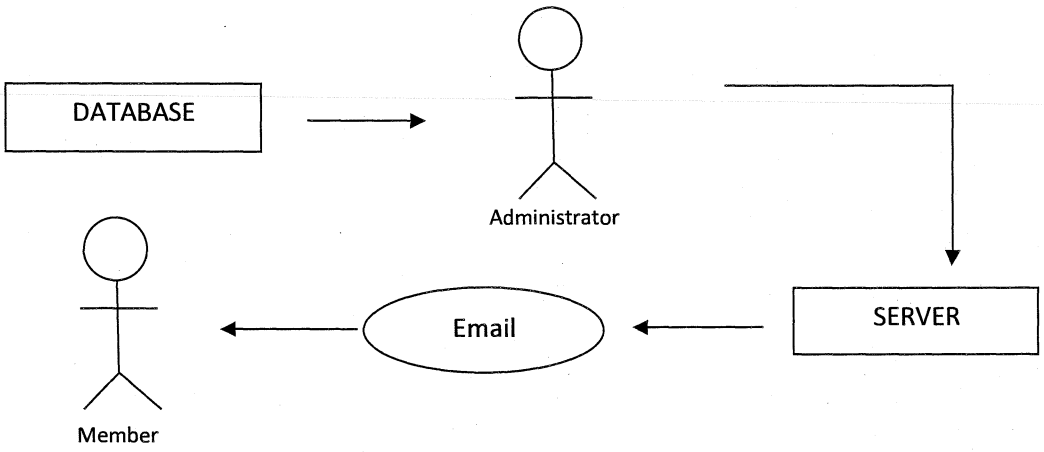
3.2.2. Stimulus & Responses

This event is driven by multiple stimulus and responses. The synchronization of the events completes the module. The module and related events explained detail in diagrams below.

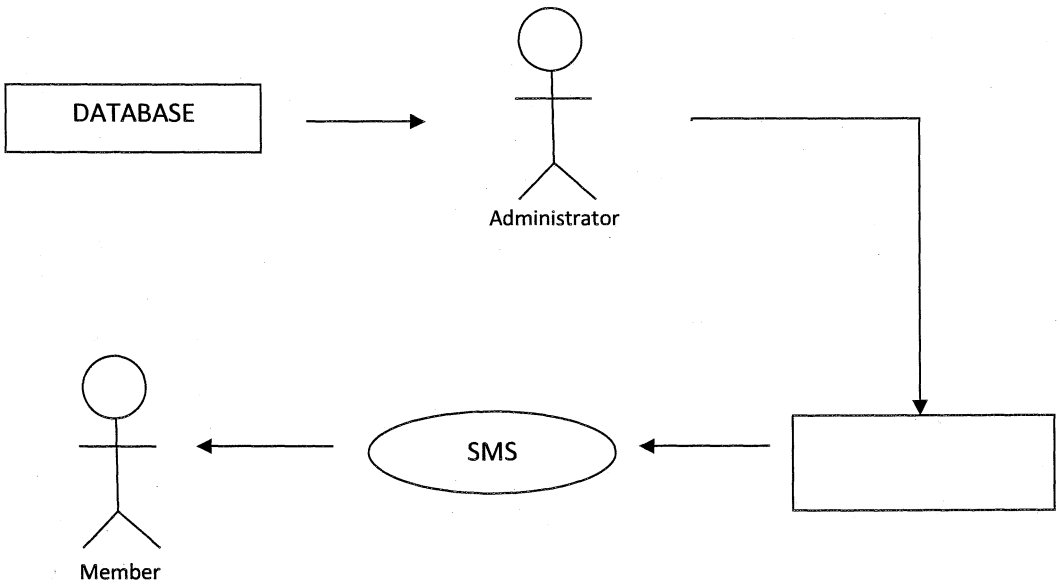
i. User registration and subscription for news alerts



ii. Administrator retrieves subscribed users and trigger E-mail alert.



iii. Administrator retrieves subscribed users and trigger SMS alert.



3.2.3 Event Sequence

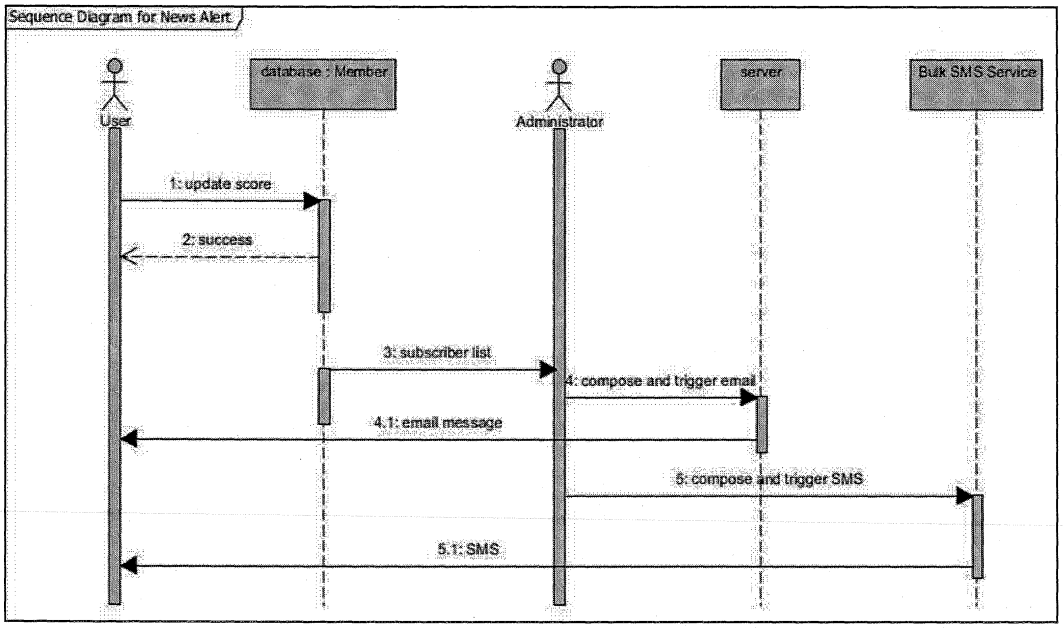


Figure 3.2 Sequence diagram for News Alert Module

3.2.4 Functional Requirements

1. In news alert module the system should be capable sending alerts in two ways.
   a. Email messages
   - Users are required to provide email address in the registration phase.
   - Administrator will retrieve the email address list of users from the database to compose the news alerts.
   - The server will be triggered by administrator to send mails to users.

   b. SMS
   - Phone numbers are provided by the users who wish to subscribe for SMS alerts.
   - Administrator will retrieve phone numbers from the database.
   - Recipient list and composed SMS will be sent to bulk SMS service providers
   - SMS service providers will send SMS to subscribed users

2. Users must be categorized according to subscription.

3. Server is configured and administrator has rights to send mail.

4. 3rd party bulk SMS service is applied and usable by the system.

5. Users must use Malaysia's Mobile Networks to get SMS alerts.

3.3 Discussion Board (Module 3)

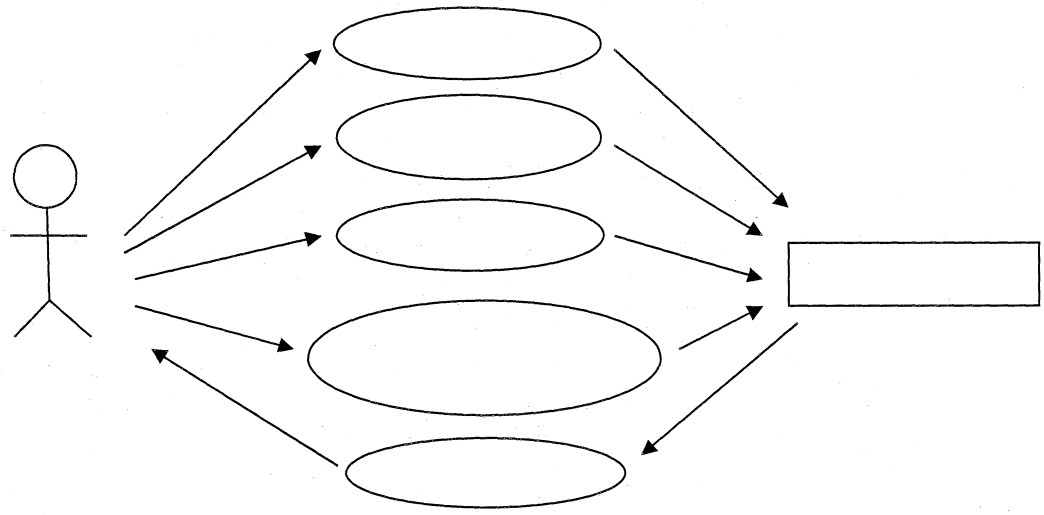
3.3.1 Description

The system provides a fully functioning discussion board or forum to provide a platform for users to discuss or share their thoughts. This feature is one of the major features of the system.

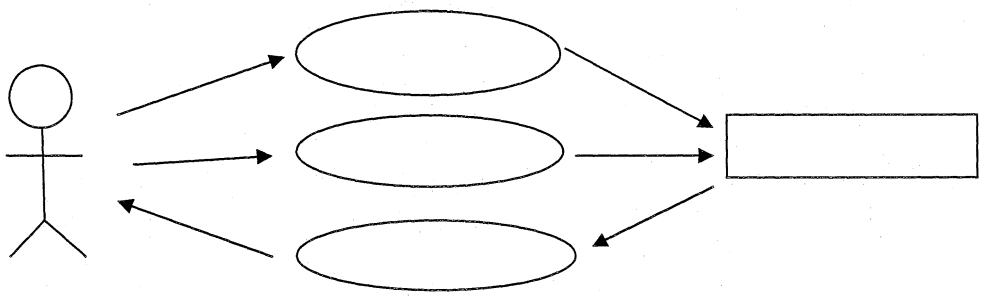
3.3.2 Stimulus & Responses

The event is driven by Administrator and Registered Users (members). Non-members are controlled to read-only privilege. It comprises of number of sequences.

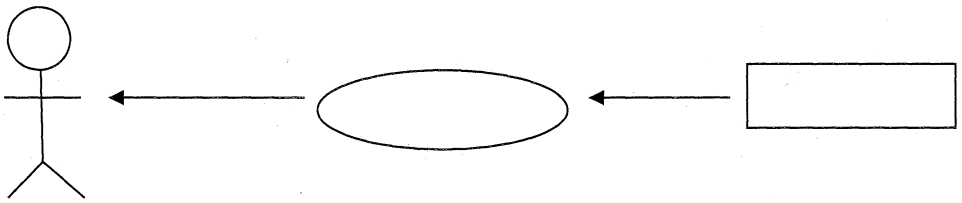
i. Administrator as forum moderator



ii. Registered Users or members as forum users



iii. Non-member as a viewer of the forum



3.3.3 Event Sequence

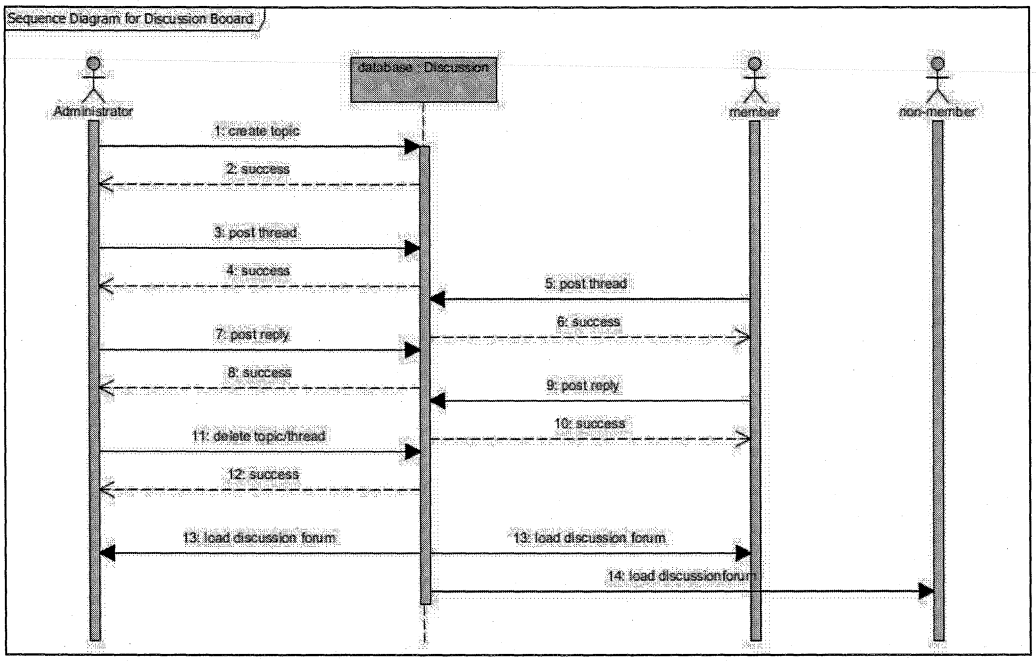


Figure 3.3 Sequence diagram for Discussion Board

3.3.4 Functional Requirements

1. The discussion board component is limited in,
    a. The privilege needed to complete the task.
    b. Character limit and table space allocation for posts.
2. Administrators and Members are the users of this module.
3. The Administrator has the privilege to create new discussion topic and delete thread.
4. Administrator and members have privilege to post threads, post reply and view discussion.
5. Non-members are limited to read-only the forum.

4. External Interface Requirements

4.1 User Interfaces

- There are several types of users in the system and they have different interests and usage of the system. Thus, the system should serve users in minimum effort.
- All the user interfaces will be presented using web pages. This will allow this product to be used in multiple platforms.
- User interfaces should be extremely user friendly and comprehensive. System should provide necessary information and guides at the same time not overloading pages with information.
- Each page in the interface should have navigation bar which indicates the place he is currently at. Also same navigation or other mechanism should allow him to easily go up and down the hierarchy.
- If the user is logged into the system it should be clearly displayed on the page. Also there should be a logout button in a clearly visible area for that user.
- The system should provide adequate warning and prompt and has an alternative for input errors.
- The styles used should supports by different platforms and browsers.

4.2 Software Interfaces

Connection to shared resources like databases should be done using the libraries provide in the core of the system. The connection to the shared resources should be easily includable. Also each module can have its own library functions which are specific to that module.

4.3 Communications Interfaces

System will make use of email facility or SMS to deliver the interaction between system and user. System might provide easy to manage and integrate module for the administrators to communicate with resources like database alternative to manual usage of database. Also, the modules should have communication among them for shared resources such as user name and login sessions.

5 Other Nonfunctional Requirements

5.1 Performance Requirements

- Every function provided by the system should be robust without slowing down the system or annoying the users.
- If there are more request queries on the system than it can handle, system should operate without crashing by limiting number of queries.
- Proper prompting and warning should be issued if the system cannot fulfill the queries or requests.
- Also at such a time system should provide priority for privileged users.

5.2 Safety Requirements

- Since the product is freely available to use, any kind of loss, damage or harm caused by use of the product will be a concern of the user.

5.3 Security Requirements

- All the data associated with the system should be secure and only the privileged users should have the access to the data.
- Write on the data should only be provided if there are required privileges. And only read only access should be grated for users who are viewing the data.
- The passwords and sensitive details should be encrypted before stored in shared resources
- The system should prevent security attacks and exploits. Secure data from SQL injection.

5.4 Software Quality Attributes

- System should be adaptable for badminton tournaments and provide the required service. System should have an availability of 99% when implemented.
- All the functionalities provided by the system should be checked for correctness with test data and should guarantee that these are within required standards before use.
- Modules developed for the system should be independent of other modules. They should be loosely coupled with the core of the system and flexible to changes.
- System should be used on any platform that support open technologies like java, html, PHP, HTML and high end browsers. Also it should be easily maintainable.
- Most importantly system should be easily usable. People should be able to work on the system with minimum training and higher level of comfort.

6 Other Requirements

-Not applicable since the users of the system are general and the requirement is set by the developer-

APPENDIX E

Software Design Description

For

Badminton Tournament Live Score System (BTLS)

Version 1.0

SUGHAN NAIR A/L PRABHAKARAN

26 December 2012

1.0 Introduction

1.1 Purpose

The purpose of this Software Design Description (SDD) document is to explain and elaborate design details, activities, architecture and activities in developing the Badminton Tournament Live Score System (BTLS). Design Specification includes,

- activity diagrams, to describe activities and flow of data
- sequence diagrams, to model object interactions arranged in time sequence
- distribute use case behaviour to classes
- state chart diagrams, to describe the dynamic behaviour of a system in response to external stimuli
- a conceptual model of the system in terms of entities and their relationships

1.2 Scope

The scope of this document is to explain in details the design elements that will be implemented into the BTLS.

- The basic architecture is a web server from a client system.
- The Administrator of the system will have full privilege against the system to make demanding necessary changes.
- The changes could include, but not limited to, updating system details, sending email if necessary add and remove details.

1.3 Glossary

Term	Description
Administrator	- The ultimate privilege holder for the system who involve in the whole function of the system.
Member	- The registered normal level user who has more privilege against the features of the system.
Non-member	- The viewer of the system who has read-only access to the whole system.
The System	- Refer to the Badminton Tournament Live Score System.
BTLS	- Badminton Tournament Live Score system.
Database	- A shared resources of the system modules to store data of the system
Server	- The hardware where the system is located.
SDD	- Software Design Description
CMS	- Content Management System

1.4 Overview

The remaining sections of this SDD and their descriptions are below.

- Section 2; describes architectural design of the system where the components and modules of the system is integrated to perform the required function.
- Section 3; concerns the Data Structure of the system, where it explains the data and variables of the system.
- Section 4; describe the use cases of the system.
- Section 5; Use case realization, where all the specified use cases described in related sequence.
- Section 6; contains Activity Diagram.
- Section 7; contain the User Interfaces.

2.0 Architectural Design

2.1 Client Server Model

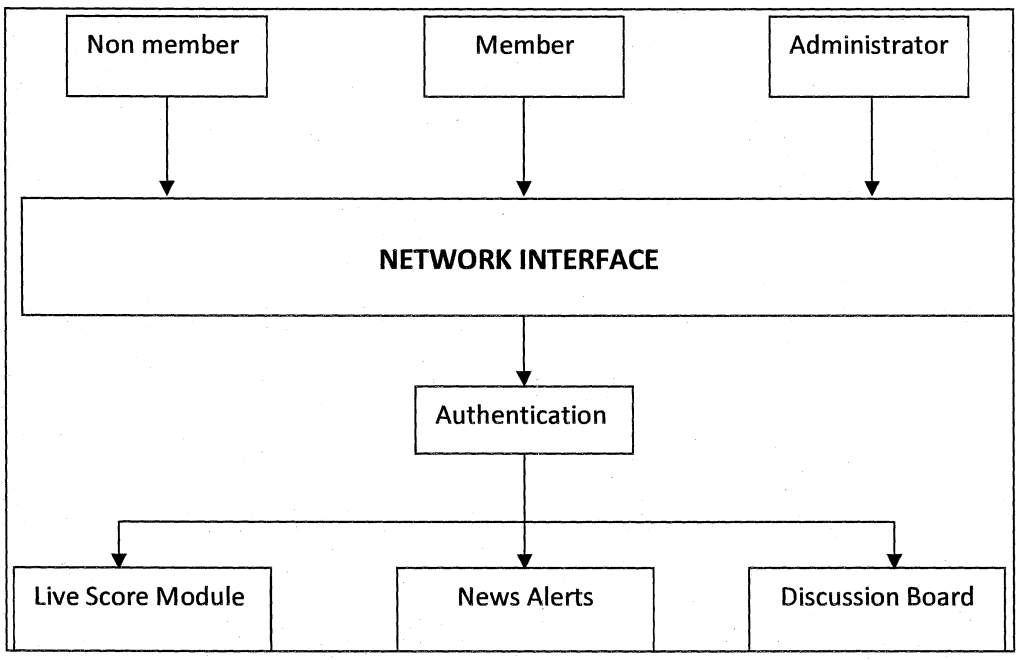


Figure 2.1.1 Client Server Model

2.2 Class Diagram

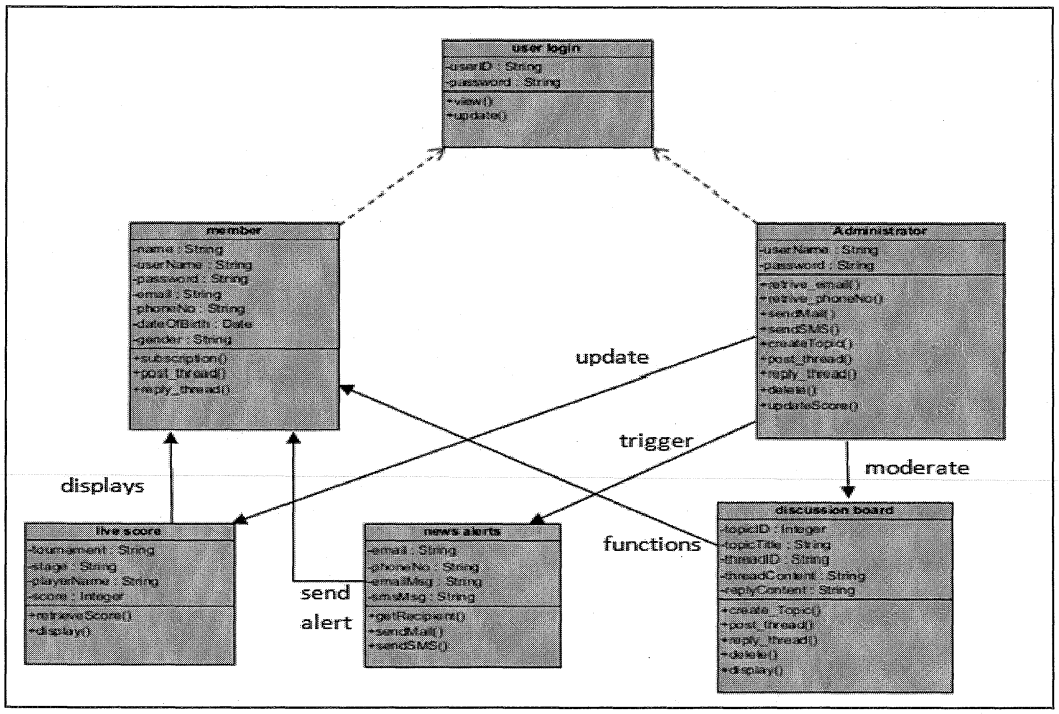


Figure 2.3.1 Class Diagram

3.0 Data Structures

The input value in the system, auto-generated values of the system are called data of the system. The database is used to store this data. The type of the data is assigned structured into corresponding tables in database. Some attributes are shared among the functional module.

3.1 Data field types and sizes

i. Administrator attributes:

Attributes	Type	Size
username	varchar	20
password	varchar	10

Table 3.1.1 administrator table attributes

ii. Member attributes:

Attributes	Type	Size
name	varchar	40
username	varchar	20
password	varchar	10
email	varchar	20
phoneNo	varchar	12
dateOfBirth	Date	-
gender	varchar	6

Table 3.1.2 member table attributes

iii. Live Score Attributes:

Attributes	Type	Size
tournament	varchar	50
stage	varchar	20
playerName	varchar	20
score	integer	2

Table 3.1.3 score table attributes

iv. News alerts attributes:

Attributes	Type	Size
email	varchar	20
phoneNo	varchar	12
emailMsg	varchar	600
smsMsg	integer	100

Table 3.1.4 alert table attributes

v. Discussion Board attributes:

Attributes	Type	Size
topicID	integer	6
topicTitle	varchar	12
threadID	varchar	6
threadContent	varchar	1000
replyContent	varchar	1000

Table 3.1.5 forum table attributes

4.0 Functional Architecture

4.1 Overall Functional Architecture

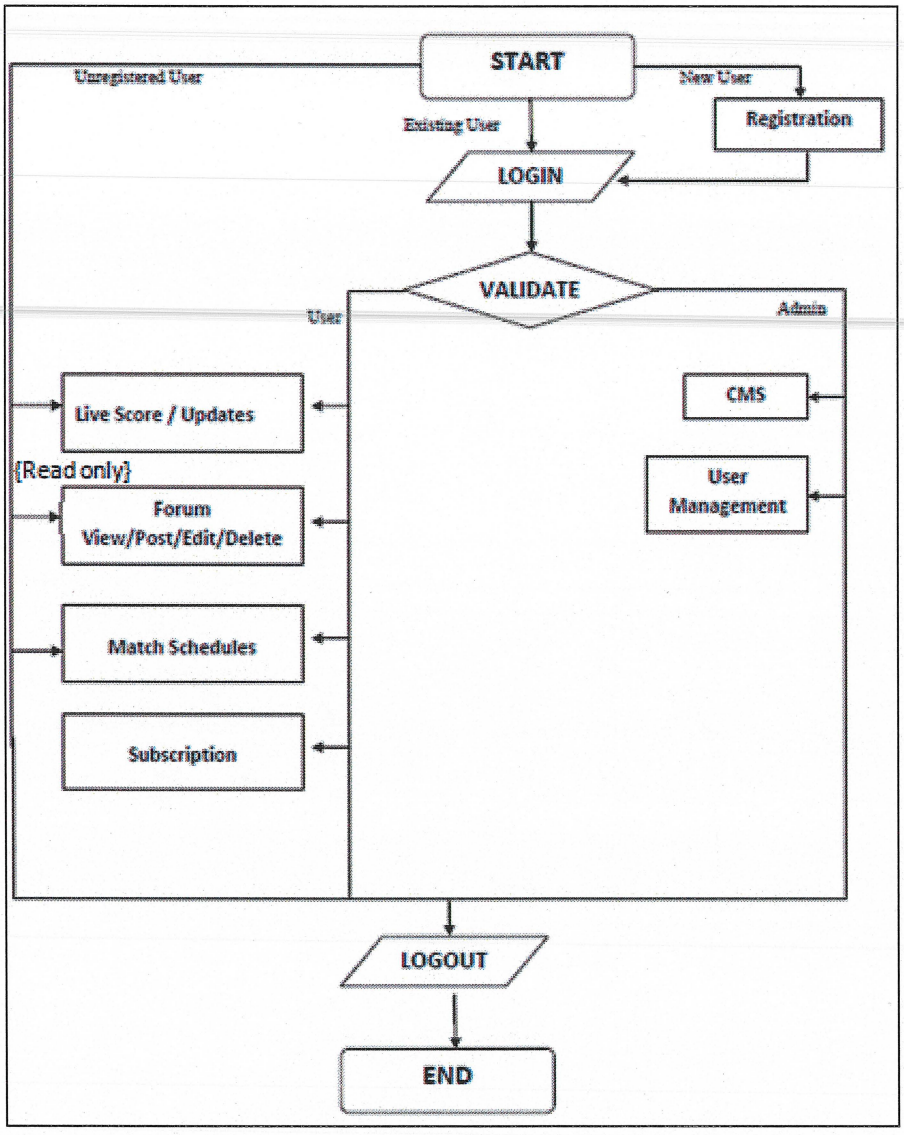


Figure 4.1.1 Overall functional architecture

Description

- The system validate the user login between member and Administrator
- Non-member can skip the login interface and access system features as below
    - Live Score
    - Discussion Board/ Forum – Read-Only
    - Match Schedules and other articles in page
- CMS- Administrators functionalities such as:
    - Update Score
    - Trigger news alerts
    - Moderate Discussion Board