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ACKNOWLEDGEMENT

I will like to place on record my deep sense of gratitude to Mr. Jawid Mowahid, HOD-Dept. of BCS, Aria University, Afghanistan for his generous guidance, help and useful suggestions.

I express my sincere gratitude to Mr. Dr. Yama Ramin, Dept. of BCS, Aria University, Afghanistan for his stimulating guidance, continuous encouragement and supervision throughout the course of present work.

I also wish to extend my thanks to all my teachers and other colleagues for attending my seminars and for their insightful comments and constructive suggestions to improve the quality of this project work.

I am extremely thankful to Mr. Abdul Majid Nasratyar, Director, Aria University, for providing me infrastructural facilities to work in, without which this work will not have been possible.

Ali 1-07-1391-02-54

ABSTRACT

This project is a simple web based chat room application, which means users have to use it through browsers. It has simple user interface and mediocre design. Right now it is capable to work on LAN networks and support singular chat.

This application created by using of five web based programming language. HTML and CSS are used to design the interface of application and JQuery and JQuery UI is also combine with them to add some animation, beautiful tabs and other functionalities. PHP is used as server side language to connect application with server and database, and make the application a fully dynamic program. And at end MySQL is used as database of the application and store all the data of the application.

Like all other chat room application first user has to create an account for him/her self by filling the registration form, which is the first page of the application. After filling the form completely or at least required field, user can sign up (create his account). After account created successfully user will go to the login page automatically and use his/her user name and password to login to the chat room. Then main page of application will appear which has three main parts. The left side of page is the place of displaying contacts profile and by clicking on each contact in contact list you can see his/her profile in here. Middle of page is the place of displaying messages and at its bottom write your messages. And in right side of page there is three taps, first one is home tap which include your contact list and recent contacts which display those persons you chat with them recently, second tab is add contact which enable user to searches for new contact by its name or last name and sends him/her a friend request, third tap is group which enable user to create a group from persons in his/her contact list and have a group chat with all of them.

By clicking on profile link in top-right of the page user can see his/her profile and update its information. User also enables to change the background of the chat room anytime he/she wants, by clicking on one of four choices at the bottom of the page. Finally by clicking on Logout link user will leave the chat room and go back to the login page.

ABBREVIATIONS

HTML	HyperText Markup Language
CSS	Cascade Style Sheets
PHP	PHP HyperText Preprocessor
LAN	Local Area Network
WAMP	Windows Apache MySQL PHP
LAMP	Linux Apache MySQL PHP
MAMP	Mac Apache MySQL PHP
AMPPS	Apache MySQL PHP Perl&Python Softaculous
API	Application Programming Interface,
CPU	Central Processing Unit
RAM	Random Access Memory
HDD	Hard Disk Drive
GB	Giga Byte
GH	Giga Hertz
DOM	Document Object Model
CGI	Common Gateway Interface
CLI	Command-Line Interface
PC	Personal Computer

1 Introduction

In this era which is known as a communication era, establishing connection with help of new technologies is very simple and easy. Humans are able to communicate with each other in everywhere of the world and exchange data so easily and fast, and in majority cases importance of this issue is undeniable. For example banks and different kind of organizations need to have a connection with all of their branches to perform their tasks and it is a vital issue, by using new technology they can achieve this ability and grow their businesses very fast. Also as an ordinary person all of us use technology to do our daily jobs. For establishing connection with others and use this ease, every day we use different kind of services like E-Mail and Chat application which has a close relationship with our daily life and enable us to have this live connection with others.

Because of importance and abundant usage of chat applications, I decide to develop a simple chat application which at minimum can be used to establish connection in LANs. This application can solves problem of those LANs that don't have access to internet and want to have a live connection inside the LAN. The benefit of this application is that it can implements easy and fast and also its usage is too simple. By using this chat application you are able to text chat only. It is true that this application has a lot of limitations, because it is the first version of this application, but Insha Allah it will develop and enhance in next versions and other features will be added to the program like sending files, voice chat and group chat.

This application is a web based application. It means users can use it inside their browsers, and there is no need to install any other program for clients. The only need for implementing this application is to have a web server inside your LAN, which can achieve by installing a free WAMP server on one of your Windows computers or MAMP on one of your Macintosh computers or LAMP on one of your Linux computers to act as a web server inside your LAN and provides service to other computers as client. Clients inside LAN can connect to the webserver and use the chat application, this chat application work in most of famous browsers like Google chrome, Mozilla Firefox, Internet explorer and Opera.

For developing this application five web based programming languages are used. HTML5, CSS3 and JQuery1.11.1 are used in front end of the application and PHP5.5.12 is

used in back end of the application and MySQL5.6.17 is used to develop the database of the application. Also in some part of application JQuery UI is used to design tabs, dialog boxes.

PHP offers three different APIs for connection to MySQL. The API is used in development of this application is (mysqli extension) which introduced in PHP5.0. It is recommended to use either the mysqli or PDO_MySQL extensions. It is not recommended to use the old mysql extension for new development, as it was deprecated in PHP 5.5.0 and was removed in PHP 7. One of the benefits of using PHP mysqli extension is its security, because in this API queries are send to database indirectly and it prevent SQL injection, and also it support most of new features.

1.1 System Analysis

In this version of application functionality of program isn't standard in transition of data, because users should do query and retrieve new information from database and it will cause a lot of load on server when users are too much. Also this approach will cause delay on sending and receiving messages or friend request. This approach is inefficient and it is the weak point of the application.

Instead of using this approach program should use a method that server send the new data to the clients and prevent unnecessary requests to server. Like push back notification which sends new data to clients and clients don't request for new data. One of the most relevant way for doing this action is using XMPP programing which needs more resources like XMPP server and knowledge of programing in this language. But by using this method program will be standard and more efficient, also other features could be add to the application like checking the status of users and find out they are connect with server or not and show them in chat room as online or offline.

According to assessment this application should change the method of data transition and improve it to new method XMPP programing.

1.2 Feasibility Study

Technically necessary equipment for development of this application are free and available in internet for everyone, and because this application is web based it is possible to use it with different operating systems if you can use your browser.

Exchanging of data inside a LAN without any network connection is a difficult job and it can be time consuming and expensive or from other hand if company have internet connection only for chatting or sending and receiving data it will cost too much and also it will cause our employee use internet unnecessary and postpone their jobs. Using this application in LANs will be cost effective and it will save your time. It is designed for this purpose.

Using this application is very easy because of friendly user interface and simplicity. Like all other chat application users only need to create an account for their selves, then login to the application and start finding friends and chat with them. So simple and fast for everyone.

2 System Requirement

To use every kind of applications you need to have minimum software and hardware requirement of that application and if you don't have that minimum requirement you can't use the application. For using this application users also must to have some requirement but one positive point of this application is that it needs very simple requirement and users can achieve this requirements very easy.

2.1 Software Requirement

Because this application is a web based application the only software it needs is a browser for client sides. This application can run on most of famous browsers but for using all of its feature users should consider the minimum version of their browser. This is the list of browsers and their versions which is compatible with this chat application.

Browser	Version
• Google Chrome	45
• Internet Explorer	10
• Mozilla Firefox	43
• Opera	34
• Safari	9

For using this chat application inside a LAN there is a need to a web server. Each LAN could have its own web server by installing a program to providing the web service. This is the list of programs which provide the web service for different kind of operating systems.

- WAMP 2.5 For Windows operating systems
- AMPPS 3.4 For Linux operating systems (also it can use in windows and mac OSs)
- MAMP 3 For Mac operating systems

2.2 Hardware Requirement

Because this application is accessible through the server it doesn't have too much load on client side computers and a computer which can open a browser with the minimum version as mention it before, can use the application. But for servers consider to number of users it can be variant. But minimum requirement is as follow:

- CPU Core 2 Duo or Dual Core 2.4 GHz
- RAM 2GB
- HDD 5GB

3 Code Description

This chapter describes all programming languages that used in development of the application and each file of the application and its functionality inside the application.

3.1 HTML

HyperText Markup Language, commonly referred to as HTML, is the standard markup language used to create web pages. Along with CSS, and JavaScript, HTML is a cornerstone technology, used by most websites to create visually engaging web pages, user interfaces for web applications, and user interfaces for many mobile applications. Web browsers can read HTML files and render them into visible or audible web pages. HTML describes the structure of a website semantically along with cues for presentation, making it a markup language, rather than a programming language.

HTML elements form the building blocks of all websites. HTML allows images and objects to be embedded and can be used to create interactive forms. It provides a means to create structured documents by denoting structural semantics for text such as headings, paragraphs, lists, links, quotes and other items.

The language is written in the form of HTML elements consisting of tags enclosed in angle brackets (like `<html>`). Browsers do not display the HTML tags and scripts, but use them to interpret the content of the page.

HTML can embed scripts written in languages such as JavaScript which affect the behavior of HTML web pages. Web browsers can also refer to Cascading Style Sheets (CSS) to define the look and layout of text and other material.

HTML files of this application are written in HTML5 which is the last published recommended standard of this language, in October 28 2014 by W3C. This application has three HTML files which described as follow.

3.1.1 index.html

This is the first page of the application. It consists of registration form which divided in to three parts and user can go to the next part or come back to the previous part by using buttons in bottom of the form. The registration form consists of fourteen fields about personal information of users and seven of them are required for creating an account. There is also a link for going to the Login page, for those who already have an account. There are also four options in the bottom left corner of the page to changing the background of the page.

3.1.2 login.html

This is the login page of application. This page has two fields, user name and password and button for login; also there is a link in bottom of the form to going back to the registration page “index.html” and background selection option is also available.

3.1.3 UpdateProfile.html

This is the user profile page which displays the user personal information and his/her photo. The name and last name of user is display on top of the page and his/her user name under it. User is able to change all of his/her personal information which provided in registration page in this page except user name. For changing photo there is a link under the user’s photo which enable user to choose another photo from his/her computer and see its preview before updating profile. For changing password user can use the “change password” link and under these links there is a form for updating the rest of profile and finally update and cancel buttons are located at the bottom of the page to updating the new entered data or canceling the process.

3.2 CSS

Cascading Style Sheets (CSS) is a style sheet language used for describing the presentation of a document written in a markup language. Although most often used to set the visual style of web pages and user interfaces written in HTML and XHTML, the language can be applied to any XML document, including plain XML, SVG and XUL, and is applicable to rendering in speech, or on other media. Along with HTML and JavaScript, CSS is a cornerstone technology used by most websites to create visually engaging webpages, user interfaces for web applications, and user interfaces for many mobile applications.

CSS is designed primarily to enable the separation of document content from document presentation, including aspects such as the layout, colors, and fonts. This separation can improve content accessibility, provide more flexibility and control in the specification of presentation characteristics, enable multiple HTML pages to share formatting by specifying the relevant CSS in a separate CSS file, and reduce complexity and repetition in the structural content, such as semantically insignificant tables that were widely used to format pages before consistent CSS rendering was available in all major browsers. CSS makes it possible to separate presentation instructions from the HTML content in a separate file or style section of the HTML file. For each matching HTML element, it provides a list of formatting instructions. For example, a CSS rule might specify that "all heading 1 elements should be bold", leaving pure semantic HTML markup that asserts "this text is a level 1 heading" without formatting code such as a `<bold>` tag indicating how such text should be displayed.

This separation of formatting and content makes it possible to present the same markup page in different styles for different rendering methods, such as on-screen, in print, by voice (when read out by a speech-based browser or screen reader) and on Braille-based, tactile devices. It can also be used to display the web page differently depending on the screen size or device on which it is being viewed. Although the author of a web page typically links to a CSS file within the markup file, readers can specify a different style sheet, such as a CSS file stored on their own computer, to override the one the author has specified. If the author or the reader did not link the document to a style sheet, the default style of the browser will be applied. Another advantage of CSS is that aesthetic changes to the graphic design of a document (or hundreds of documents) can be applied quickly and easily, by editing a few lines in one file, rather than by a laborious (and thus expensive) process of crawling over every document line by line, changing markup.

The CSS specification describes a priority scheme to determine which style rules apply if more than one rule matches against a particular element. In this so-called cascade, priorities (or weights) are calculated and assigned to rules, so that the results are predictable.

The CSS used in this application is CSS3.

3.2.1 style.css

This file contains all the interface design of the application except those belongs to the JQuery UI which has their own CSS file. This is the core style file of the application and it is linked to all files represent the user interface of application like registration page, login page and main chat room page.

3.3 JQuery

JQuery is a cross-platform JavaScript library designed to simplify the client-side scripting of HTML. JQuery is the most popular JavaScript library in use today, with installation on 65% of the top 10 million highest-trafficked sites on the Web. JQuery is free, open-source software licensed under the MIT License.

JQuery's syntax is designed to make it easier to navigate a document, select DOM elements, create animations, handle events, and develop Ajax applications. JQuery also provides capabilities for developers to create plug-ins on top of the JavaScript library. This enables developers to create abstractions for low-level interaction and animation, advanced effects and high-level, theme-able widgets. The modular approach to the jQuery library allows the creation of powerful dynamic web pages and Web applications.

JQuery files of this application are written in JQuery1.11.1 which is published in January 24 2014. This application has five JQuery files include the main JQuery1.11.1.js which describe as follow.

3.3.1 signupValidation.js

This file is connected with index.html and it does all validation to make the registration prefect, different functionality of this file is described as follow:

First of all it checks the value of all fields in registration form and if they were empty their border will became red as a warning to user and if they had a valid value their border will became green as an assuredness to user, also it checks that all required fields of registration form are filled.

Second it checks availability of requested user name instantly, if user name is available user can continue registration but if requested user name is already taken by someone else browser will display a message and force user to choose another user name. Also it checks the similarity of password and confirm password fields and if confirm password doesn't match with password its border will remain red and the signup button will be disabled.

Forth this file checks email address format and if the entered email address doesn't have standard format, browser will display a message and force user to reenter the email address. Meanwhile it checks the uploaded file for user profile photo, it should has one of jpg, jpeg, bmp or png formats and if file doesn't have one of these formats again browser will display a message and force user to choose another photo.

Finally it checks the length of text in emotion field to not exceed from 100 characters, and if it goes more than 100 characters it will cut the rest of words. Beside all of this validations this file provide two other functionality, first it limits the tab order in each part of registration form in forward or backward mood and second it provides background selection by choosing one of four options in left-bottom of the page.

3.3.2 loginValidation.js

This file is connected with login.html file and like signupValidation file it checks the value of fields inside the form and if they were empty their border will became red and if they have value their border will became green, also the background selection feature is available in this page.

3.3.3 chatApplication.js

This file is connected with chatApplication.php file and it is the biggest JQuery file of the application; this file does lots of activity in the main page of chat room application which describe as follow.

First of all when user logged in to the chat application this file loads the contact list of user from database - with help of some PHP files - and displays it in contact list of user and makes everything ready for user to start its work. With help of JQuery UI this file provides a tab able part in right side of page which enable user to navigate between different parts of the chat room like user contact list, add new contact or group chat, also makes all contacts in these list selectable. When user clicks on one of his/her contacts in the contact list this file loads the profile information of selected contact and displays it in the left side of page and also loads all previous messages between user and selected contact and displays them in message area. When user wants to send a message this file recognizes the pressed key in type message area and if it was enter key, it will sends the written message to database or if user click on the send button. Beside of contact list this file also provides a Recent Contact tab which consist of the latest contacts that user chat with them.

For receiving messages from database this file sends a request to server every 3 seconds and displays new messages between user and selected contact in contact list, also for informing user from new messages from other contacts, it sends another request every 7 seconds to check database and if there was a new message from other contact that user doesn't chat whit him/her, that contact in contact list will highlight to inform user that he/she has a new message from the highlighted contact. Beside of these two requests to server there is one another request which check the new friend requests and it runs every 10 seconds, if someone send a friend request to user, after 10 seconds when this request run, it will displays that person at the end of user's contact list. This is the weak point of the application that the user sends request to server to receive new data rather than server sends new data to user automatically.

This file does some processes when user wants to select someone in contact list. When user selects someone in contact list it sends a request to database to receive an update status of that person then it checks the contact is an approved contact or not, if contact is approved it means that both side can chat and type message area is enable. But if contact isn't approved, there are two other states; first the contact in the contact list is a person that user sends request

to him/her but he/she doesn't accept it yet, and second, the contact in contact list is a new person who sends a friend request to user. If the first state is true the application displays a message to user and says that the contact doesn't accept his/her request yet and if the second state is true application displays a message to user and asks him/her to accept or deny the request, if user accept the friend request a query will run and update database and makes that person as an approved contact and if user deny the request another query will run and delete the request from database, and in both state type message area is disable.

This file also provides search feature which enable user to search inside the contact list according to name and last name of contacts, when the list is too long. There is also another search box to find new contacts and send them friend request, when user searches for someone in add contact tab and sends request to him/her, this file call a query to checks that is the selected contact already in user's contact list or not, if contact which request is sent to him/her is already in user's contact list, application will display a message and inform user that the selected contact is already in your list and if selected contact isn't in user's contact list then it sends the request to database.

Finally like two other pages this file also provides background selection at the bottom left of the page, meanwhile in this page user is able to choose its desired image as background.

3.3.4 updateProfile.js

This file is connected with updateProfile.html and like other JQuery files does some validation to make sure user's update profile process complete correctly.

First of all it loads user's profile form with user's personal information from database. Then it does some validation like those in registration form such as checking the format of uploaded file for user profile photo. Also in here application checks the emotion field text length to not exceed 100 characters. There is one more feature which enable users to choose a photo and see it before updating the form.

Last thing this file control is changing password process. When user click on the change password link application will displays a dialog box to user for entering the old password, new password and confirm new password, when user filled all the text boxes and click on update button, first application checks the new password and confirm password similarity, if they

don't match it will displays a message and inform the user, but if they much it will checks the old password in database to see is it the current user's password or not, if the old password field doesn't match with password in database, browser will displays a message and says your old password is wrong and if they match it will changes the password.

3.4 JQuery UI

JQuery UI is a collection of GUI widgets, animated visual effects, and themes implemented with jQuery (a JavaScript library), Cascading Style Sheets, and HTML. According to JavaScript analytics service, Libscore, jQuery UI is used on over 197,000 of the top one million websites, making it the second most popular JavaScript library. Notable users include Pinterest, PayPal, IMDb, The Huffington Post, and Netflix.

Both jQuery and jQuery UI are free and open-source software distributed by the jQuery Foundation under the MIT License; jQuery UI was first published in September 2007.

The JQuery UI used in this application is JQuery UI 1.11.4 which is the last stable release of JQuery UI on March 11 2015.

3.5 PHP

PHP is a server-side scripting language designed for web development but also used as a general-purpose programming language. Originally created by Rasmus Lerdorf in 1994, the PHP reference implementation is now produced by The PHP Group. PHP originally stood for Personal Home Page, but it now stands for the recursive acronym PHP: Hypertext Preprocessor.

PHP code may be embedded into HTML code, or it can be used in combination with various web template systems, web content management system and web frameworks. PHP code is usually processed by a PHP interpreter implemented as a module in the web server or as a Common Gateway Interface (CGI) executable. The web server combines the results of the interpreted and executed PHP code, which may be any type of data, including images, with the

generated web page. PHP code may also be executed with a command-line interface (CLI) and can be used to implement standalone graphical applications.

The standard PHP interpreter, powered by the Zend Engine, is free software released under the PHP License. PHP has been widely ported and can be deployed on most web servers on almost every operating system and platform, free of charge.

The PHP used in development of this application is PHP 5.5.12. This application has 30 PHP files which describe as follow.

3.5.1 classes.php

This file is the most important file of the application and it is the core file of other PHP files. This file has five main classes that provides all functionality of the application, and all other PHP files are connected with this file. These five important classes are describe as follow.

3.5.1.1 Base Class

Because majority of variables used in the functions of the application are same, all of them are placed in one big class to reduce coding and easier troubleshooting and maintenance. This class defines all the variables which will be used during the application process and all the functions to assign them value and get their values. All other classes inside the classes.php file inherit from this class to use variables for their functions.

3.5.1.2 User Class

This class has all the functions belong to users like user registration, user login and check user name availability. These functions will call in different part of application to do necessary processes about users.

3.5.1.3 Chat Class

This class is consisting of functions about messages. Totally this class has five main functions which control all processes related to messages, like send user's message to database, display new messages or mark displayed messages and so on.

3.5.1.4 Contacts Class

This class includes twelve functions for controlling and completing all related processes of user's contacts. Everywhere in application when user interacts with contacts one of these functions will be called, like searching in contact list, sending friend request or accepting or denying a request and so on.

3.5.1.5 Profile Class

This class belongs to user's profile and containing functions for displaying user's profile and updating user's profile.

3.5.2 connection.php

This file establishes connection with database and it is a required file for each PHP file which has some interaction with database.

3.5.3 regUser.php

This file will be called when user submits the registration form, first it will checks that the required fields aren't empty, and if they were empty browser will displays a message and inform the user, then it saves the information given by user in registration form in variables and calls the "regUser" function in user class. The function inserts data in database as user's personal information and creates a user account for him/her, and directs user to login page.

3.5.4 checkingUserName.php

After user enters the username and goes to the next field in registration form this file will be called. It sets the entered username in a variable and calls the “checkUserName” function in user class. This function searches database for entered username and if it finds the username it means someone else selected this username before, so it returns the result and browser will displays a message and inform the user that the requested username isn’t available and force him/her to choose another username.

3.5.5 userLogin.php

This file will be called when user click on login button in login page, it will set the username and password in variables and calls the “login” function in user class. The function checks the provided user name and password in database and if they were correct, first it will direct user to chat room page, and then in userLogin.php file, name and user name of user will store in session for later use. And if username or password doesn’t match with database it will displays a message and inform user that its username or password is wrong.

3.5.6 chatApplication.php

After user passes the login page successfully, he/she will come to this page which is the chat room main page. This file is mixture of HTML and PHP which result of all functions will display in it and it doesn’t have any functionality except of forming chat room interface.

3.5.7 displayContact.php

When user logged in to the chat room, this file will be called and set the username in a variable from session and calls the “displayContacts” function in contacts class. The function

will selects all the contacts from contact table according to the username, and by help of JQuery it will displays them in contact list of user in chat room page.

3.5.8 fullContactInfo.php

This file will be called when user selects one of contacts in contact list, JQuery will sends the username of selected contact to this file and this file set that username to a variable, and also to session for later use, and call the “fullContactInformation” function in contacts class. This function will selects all information from users table according to the username and by help of JQuery this information will be displayed in contact information part in left side of page.

3.5.9 displayMessage.php

By selecting a contact in contact list beside of “fullContactInfo.php” this file also will be called. This file sets the username of user from session to a variable and sets username of selected contact to another variable which comes from JQuery function which calls this file, and calls the “displayMessage” function from chat class. This function selects all messages between user and selected contact in contact list and by help of JQuery displays them in show message area.

3.5.10 insertMessage.php

When user clicks on the send button or press enter key, this file will be called. This file sets username of user and username of contact in two different variables from session and set the message in another variable from JQuery post which calls this file, and finally calls the “insertMessage” function from chat class. This function inserts the message and usernames into messages table in database.

3.5.11 displayNewMessage.php

After user selects a contact and starts to chat, this file will be called every three seconds and set username of user and username of selected contact in two different variables from session, and calls “displayNewMessage” function from chat class. This function selects those messages which weren’t displayed to user, and by help of JQuery appends them in show message area. User can be the sender of these messages or receiver of them.

3.5.12 markDisplayedMessage.php

After “displayNewMessage.php” file is called, in continuance this file will be called and it sets username of user and username of selected contact in two different variables from session and call the “markDisplayedMessage” function from chat class. This function updates the table and marks all messages which displayed by “displayNewMessage” function as displayed, so next time when the “displayNewMessage” function runs it will not select these messages again.

3.5.13 newMessage.php

When user logged in to the chat room this file will be called every seven seconds. This file set the username of user in a variable from session and calls the “newMessage” function from chat class. This function selects those contacts who send new message to user, and by help of JQuery highlight them to inform user that he/she has a new message from those contact.

3.5.14 displayNewContact.php

When user logged in to the chat room this file will be called every ten seconds. This file sets the username of user in a variable from session and calls the “displayNewContact” function from contacts class. This function selects those contacts from database that don’t approved by user, which means they are new requests, and by help of JQuery appends them in the contact list of user.

3.5.15 markDisplayedContact.php

After “displayNewContact.php” file, this file will be called. This file sets the username of user in a variable from session and calls the “markDisplayedContact” function from contacts class. This function mark all contacts “displayed”, so next time they will not select as a new contact.

3.5.16 removeContact.php

When user clicks on remove contact button in contact information part in left side of page a dialog box will be displayed and ask user that does he/she wants to delete this contact or not, if user clicks on yes button this file will be called. This file set username of user in a variable and set the username of selected contact to another variable and calls the “removeContact” function in contact class. This function will delete the selected user in contacts table.

3.5.17 searchContact.php

This file will be called when user wants to use search box in contact list. This file sets the username of user in a variable from session and sets the searched characters in another

variable and calls the “searchContact” function from contacts class. This function will searches the database according to the username and searched characters and filter the user’s contact list.

3.5.18 answerToRequest.php

If user clicks on a contact and that contact wasn’t approve this file will be called. This file is a message which has user’s name and contact’s name that comes from session. By help of JQuery UI this message will display like a dialog box to user and ask him/her to accept or deny this friend request.

3.5.19 acceptReques.php

If user clicks the accept button in the new friend request dialog box this file will be called. This file sets the user’s username in a variable and sets the new contact’s username in another variable and calls the “acceptRequest” function from contacts class. This function updates the contact table according to the variables and makes that contact as an approved contact.

3.5.20 denyRequest.php

If user clicks the deny button in the new friend request dialog box this file will be called. This file sets the user’s username and contact’s username in two different variables and calls the “denyRequest” function from contacts class. This function deletes the records in contacts table according to the variables.

3.5.21 recentContact.php

When user clicks on the recent contact tab in home tab, this file will be called. Like other files this file also sets the username of user in a variable from session and calls the “recentContact” function from contacts class. This function selects contacts in database according to date that user chat with them in descending mood.

3.5.22 searchNewContact.php

When user clicks on right side of chat room page on the second tab which is add contact tab and tries to search someone, this file will be called. This file sets the searched character in a variable and calls the “searchNewContact” function from contacts class. This function will search database according to the searched characters and by help of JQuery result will be displayed on chat room page.

3.5.23 checkRequest.php

When user find the desired person and selected, and clicks on send request button to send him/her a friend request, this file will be called. This file sets the username of user and username of selected contact in two different variables and calls the “checkRequest” function from contacts class. This function will check the contacts table according to variables to ensure that the selected contact isn’t already in user’s contact list. If selected contact is already in user’s contact list it will display a message and inform user that he/she has this contact in his/her contact list.

3.5.24 pendingRequest.php

After “checkRequest.php” file find out that the selected contact for sending friend request isn’t in user’s contact list this file will be called. This file sets the username of user and

username of selected contact in two different variables and calls the “pendingRequest” function from contacts class. This function sends request to database according to variables and save it as an unapproved request.

3.5.25 checkContactStatus.php

Because statuses of contacts are change repeatedly, and it is not a good idea to load contact list repeatedly too, this file is use to decrease load of server. This file will be called after clicking on contacts in contact list. It sets the username of user and username of selected contact in two different variables and calls the “checkContactStatus” function from contact class. This function selects two value from contacts table (approved and request) and returns sum of them which can be used to indicate status of contact. For example when sum of these values are 2 it means approved contact, when it is 1 it means user’s request is in pending and it’s not accepted yet, when it is 0 it means a new request and when it is empty it means that contact delete user from his/her list.

3.5.26 myProfile.php

When user clicks on profile link and go to the Update Profile page this file will be called. This file sets the username of user in a variable from session and calls the “myProfil” function from profile class. This function selects all user’s information from users table and by help of JQuery displays it in Update Profile page.

3.5.27 checkOldPassword.php

When user click on Change Password link in profile page, a dialog box will display to user for changing password, after filling the form and clicking on update button this file will be called. This file will sets the provided old password in dialog box in a variable and sets the username of user in another variable and calls the “checkOldPassword” function from profile

class. This function checks the users table for correctness of provided password according to the username, if provided password doesn't match with database it will displays a message to user and inform him/her that the provided password is wrong, and if provided password match with database it will let changing password process to proceed.

3.5.28 changePassword.php

After provided password pass from "checkOldPassword" file successfully this file will be called. This file sets username of user in a variable and new password in another variable and calls the "updatePassword" function from profile class. This function will update old password whit new password according to the username.

3.5.29 updateMyProfile.php

When user clicks on update button to submit profile form this file will be called. First this file checks that all required fields are filled, and if they were empty it will displays a message and inform user, after that sends all the information to database and update the users table according to the username of user, and close the update profile page.

3.5.30 logout.php

When user clicks on log out link in top left corner of page this file will be called. This file unset session values and then destroys the session, after that direct user to the login page.

4 Diagrams

A diagram is a symbolic representation of information according to some visualization technique. Diagrams have been used since ancient times. The term diagram in its commonly used sense can have a general or specific meaning, for example Lowe (1993) defined diagrams as specifically "abstract graphic portrayals of the subject matter they represent".

This application has three types of diagram, Entity Relationship Diagram, Data Flow Diagram and Flow Char which are described as follow.

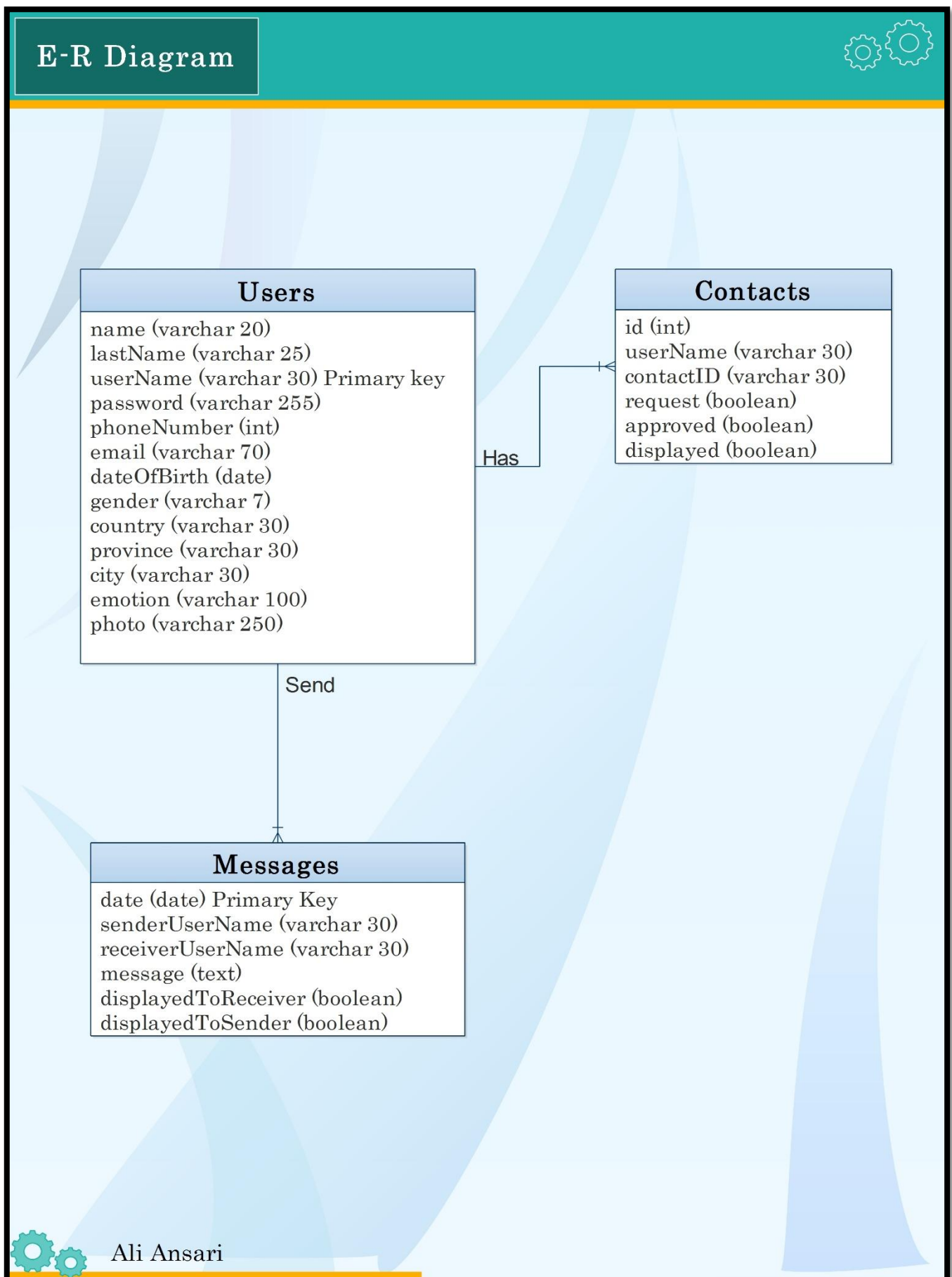
4.1 Entity Relationship Diagram

In software engineering, an entity–relationship model (ER model) is a data model for describing the data or information aspects of a business domain or its process requirements, in an abstract way that lends itself to ultimately being implemented in a database such as a relational database. The main components of ER models are entities (things) and the relationships that can exist among them. Entity–relationship modeling was developed by Peter Chen and published in 1976.

An entity–relationship model is the result of using a systematic process to describe and define a subject area of business data. It does not define business process; Only visualize business data. The data is represented as components (entities) that are linked with each other by relationships that express the dependencies and requirements between them, such as: *one building may be divided into zero or more apartments, but one apartment can only be located in one building*. Entities may have various properties (attributes) that characterize them. Diagrams created to represent these entities, attributes, and relationships graphically are called entity–relationship diagrams.

Following diagram is Entity Relationship Diagram (E-R Diagram) of this chat application.

4.1.1 E-R Diagram



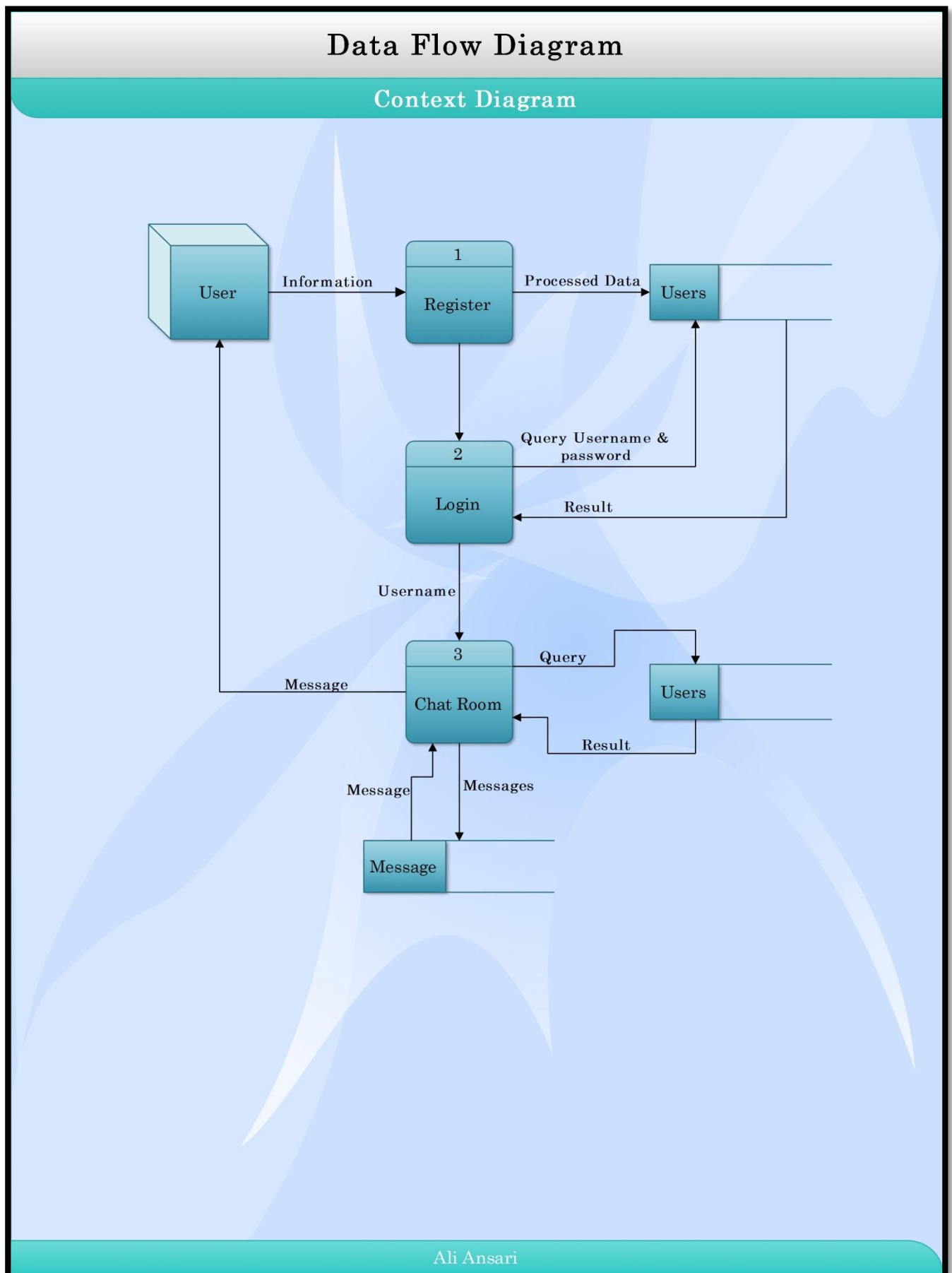
4.2 Data Flow Diagram

A data flow diagram (DFD) illustrates how data is processed by a system in terms of inputs and outputs. As its name indicates its focus is on the flow of information, where data comes from, where it goes and how it gets stored.

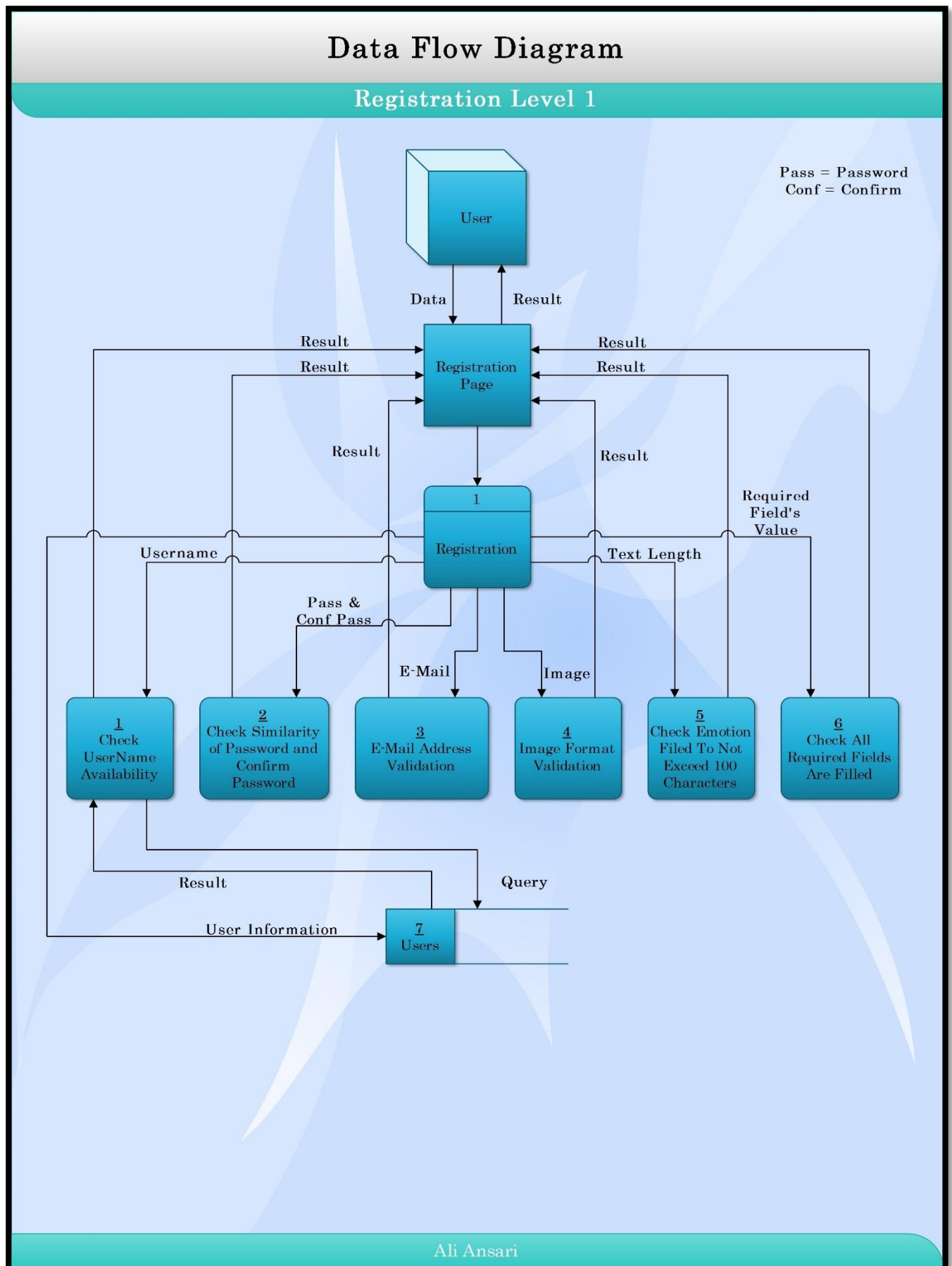
Data flow diagrams became popular in the 1970s in software development. They were first described in a classic text about Structured Design written by Larry Constantine and Ed Yourdon. Yourdon & Coad's Object Oriented Analysis and Design (OOA/OOD) was a way of visualizing software systems before UML diagrams.

Following diagrams are Context, Level 1 and Level 2 Data Flow Diagrams of this chat application.

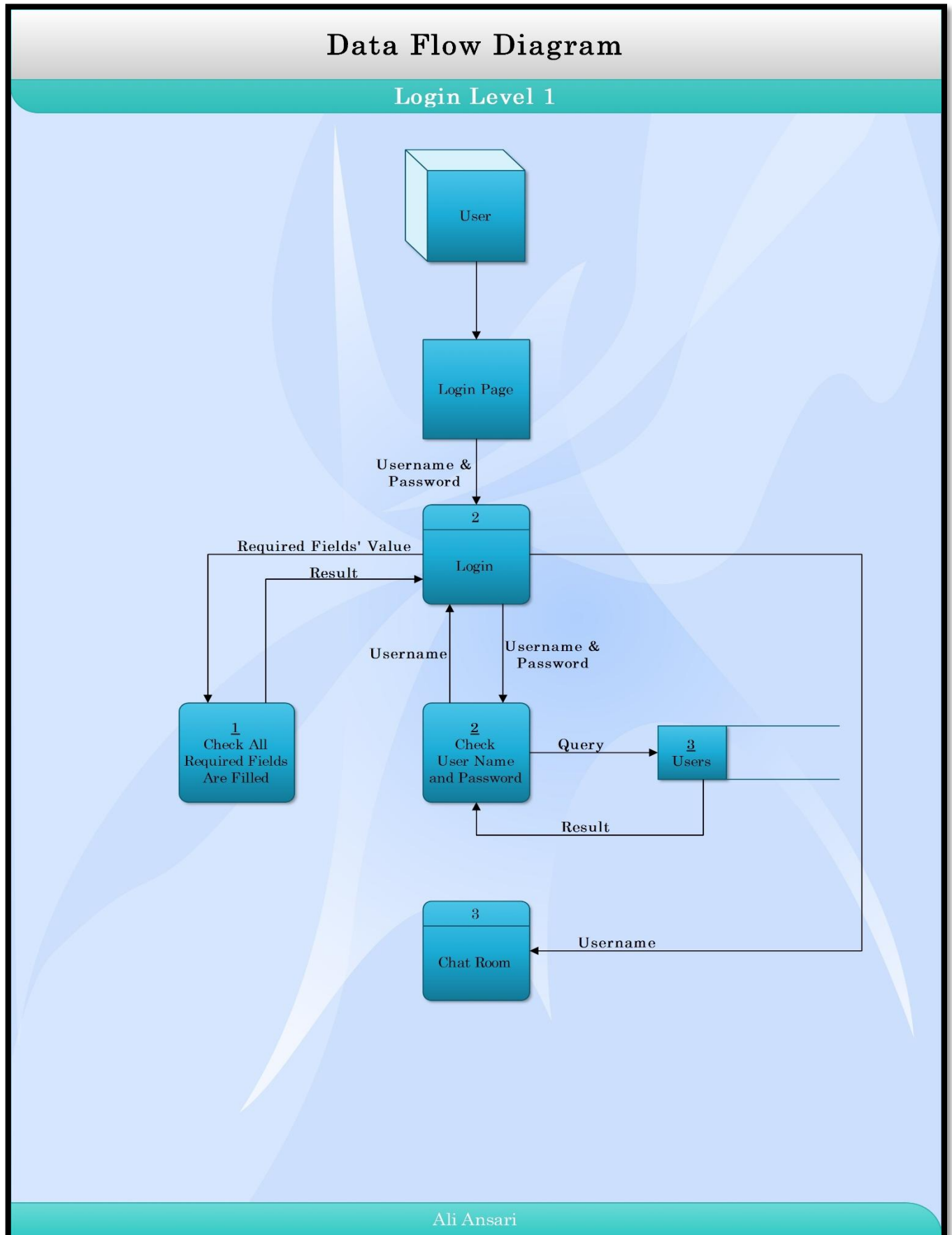
4.2.1 Context Diagram



4.2.2 Registration Level 1

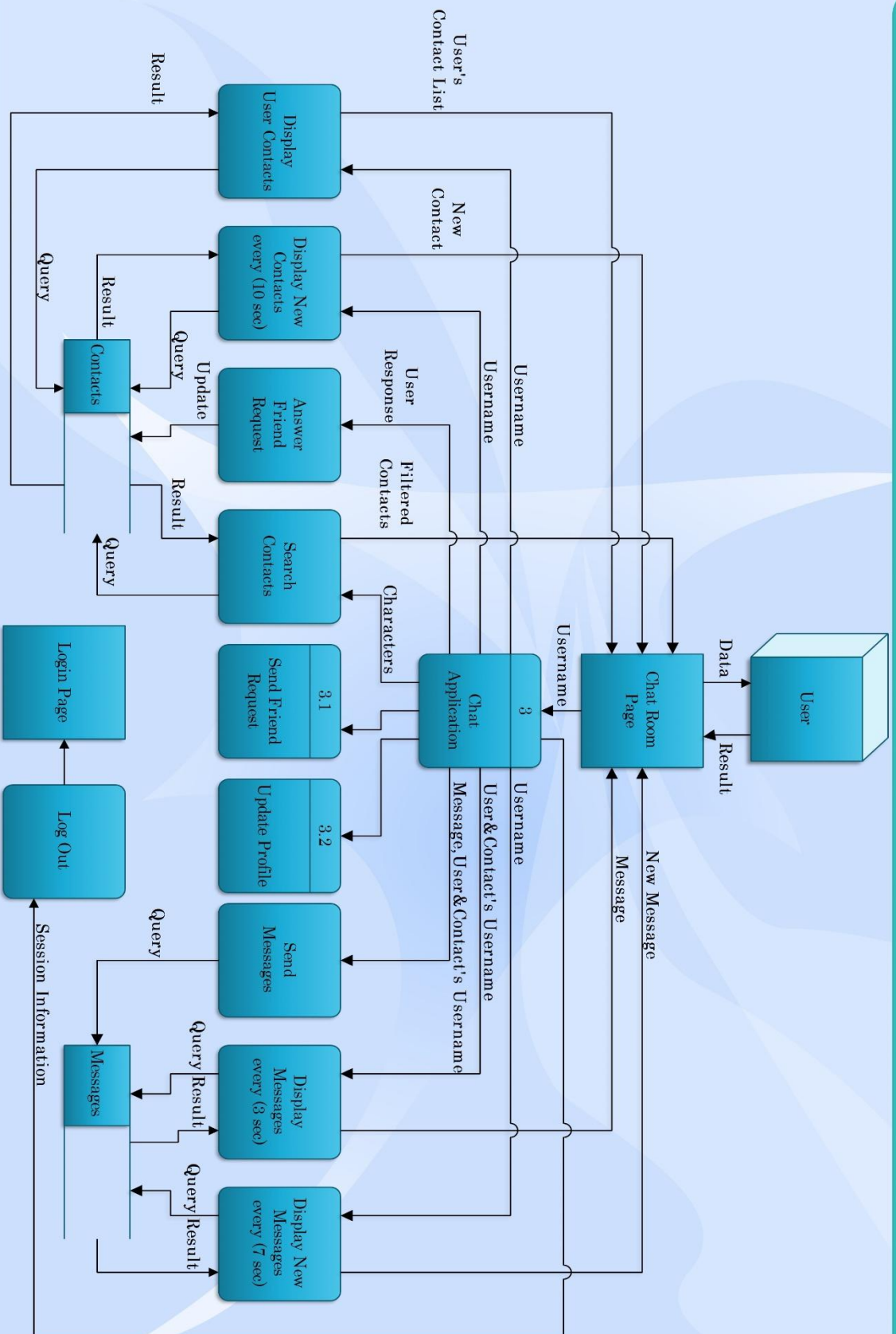


4.2.3 Login Level 1

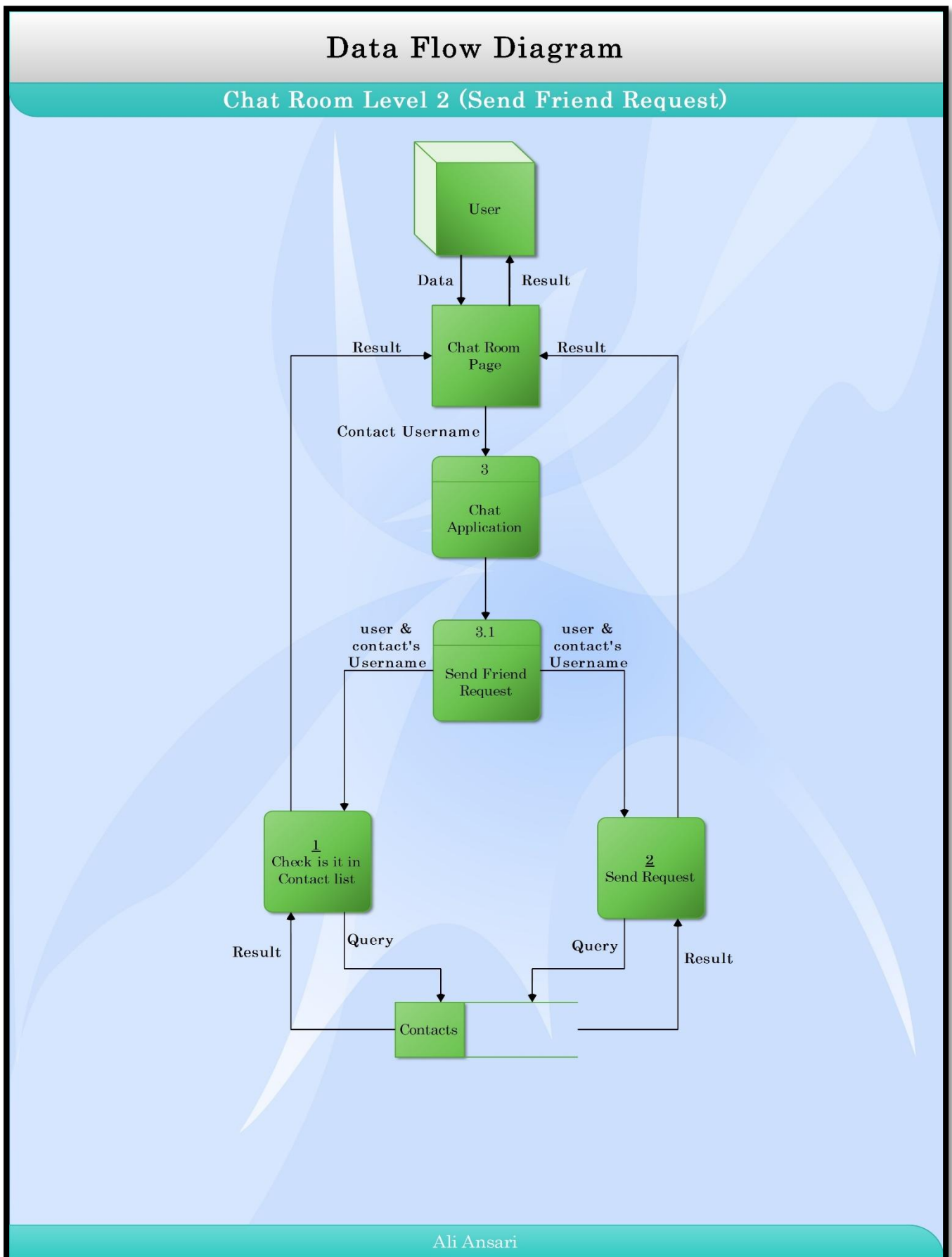


Data Flow Diagram

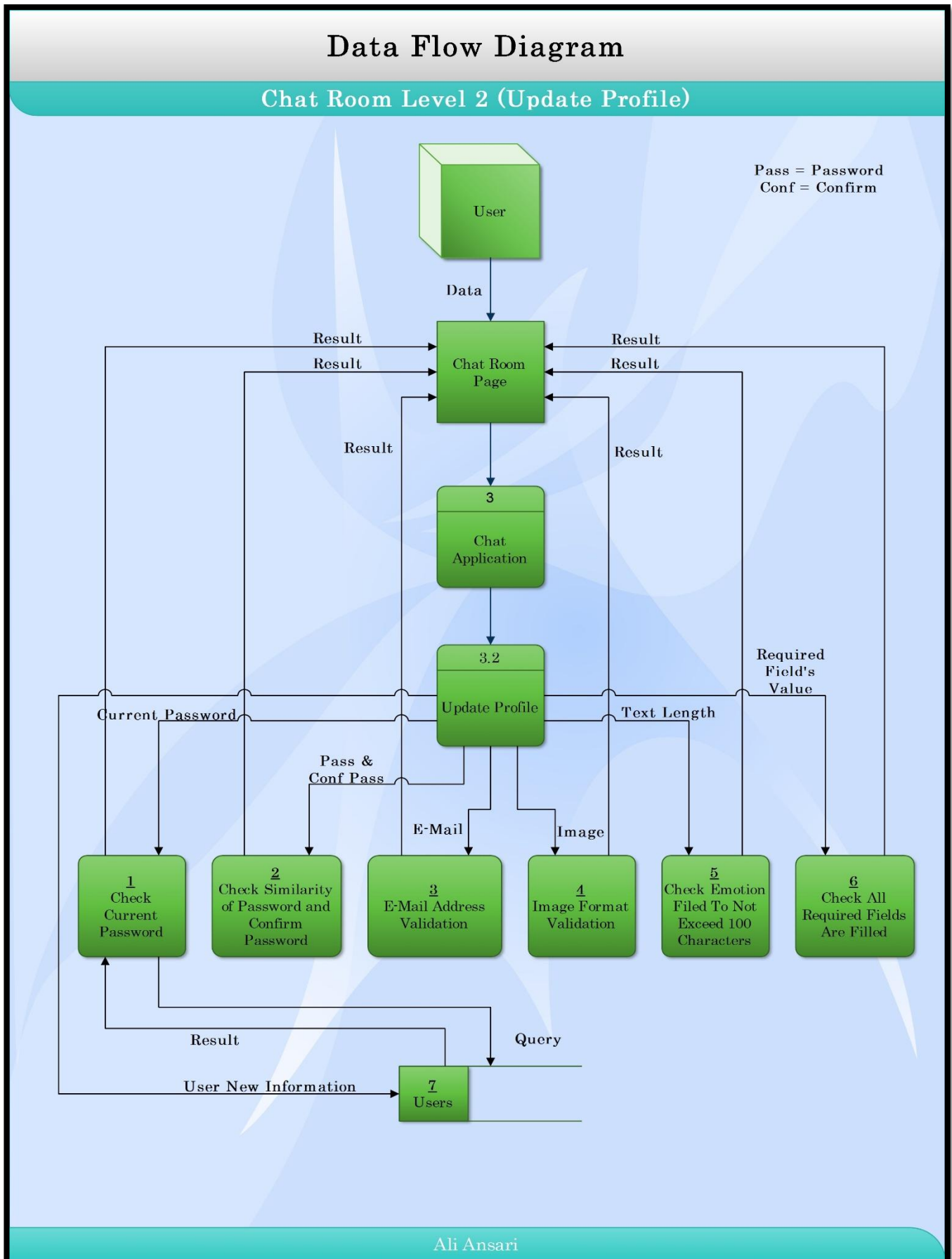
Chat Room Level 1



4.2.5 Chat Room Level 2 (Send Friend Request)



4.2.6 Chat Room Level 2 (Update Profile)



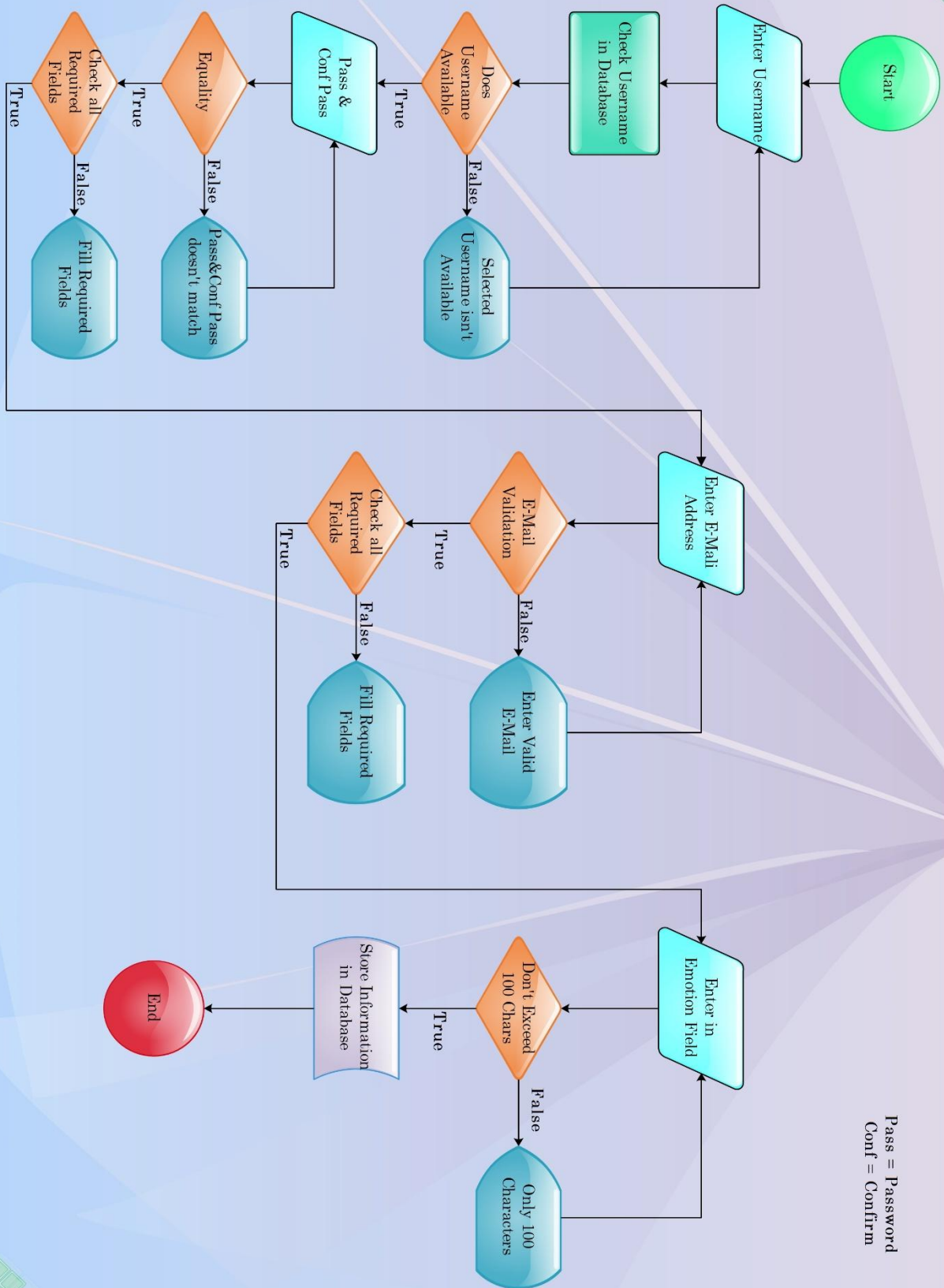
4.3 Flow Chart

A flowchart is a visual representation of the sequence of steps and decisions needed to perform a process. Each step in the sequence is noted within a diagram shape. Steps are linked by connecting lines and directional arrows. This allows anyone to view the flowchart and logically follow the process from beginning to end. A flowchart is a powerful business tool. With proper design and construction, it communicates the steps in a process very effectively and efficiently.

Flowchart has different shapes. These shapes are known as flowchart symbols. There are dozens of symbols that can be used in a flowchart. It's important to know what they represent before using them. Just as word usage conveys a certain message, flowchart symbols also have specific meaning.

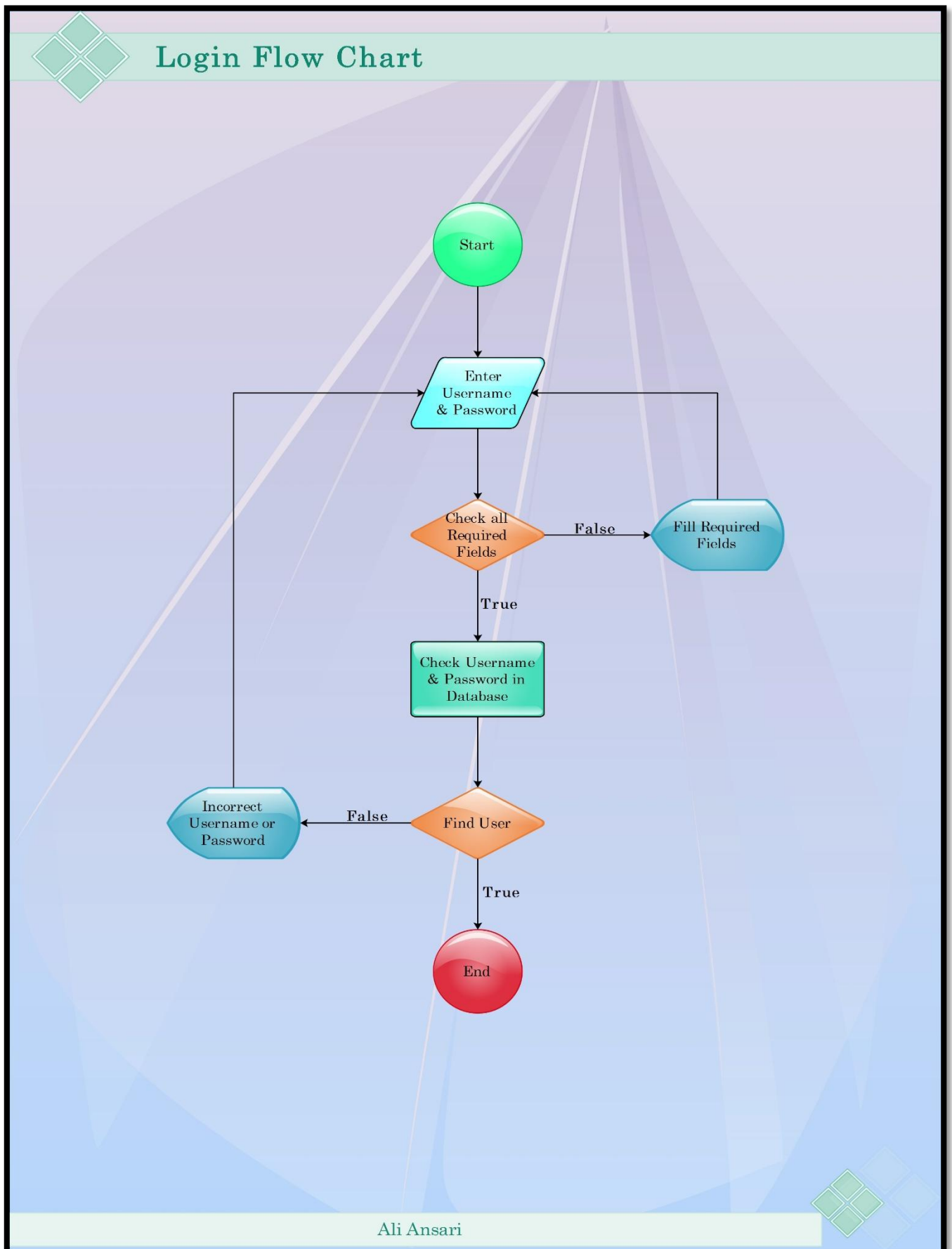
Today, flowcharts are used for a variety of purposes in manufacturing, architecture, engineering, business, technology, education, science, medicine, government, administration and many other disciplines.

Registration Flow Chart

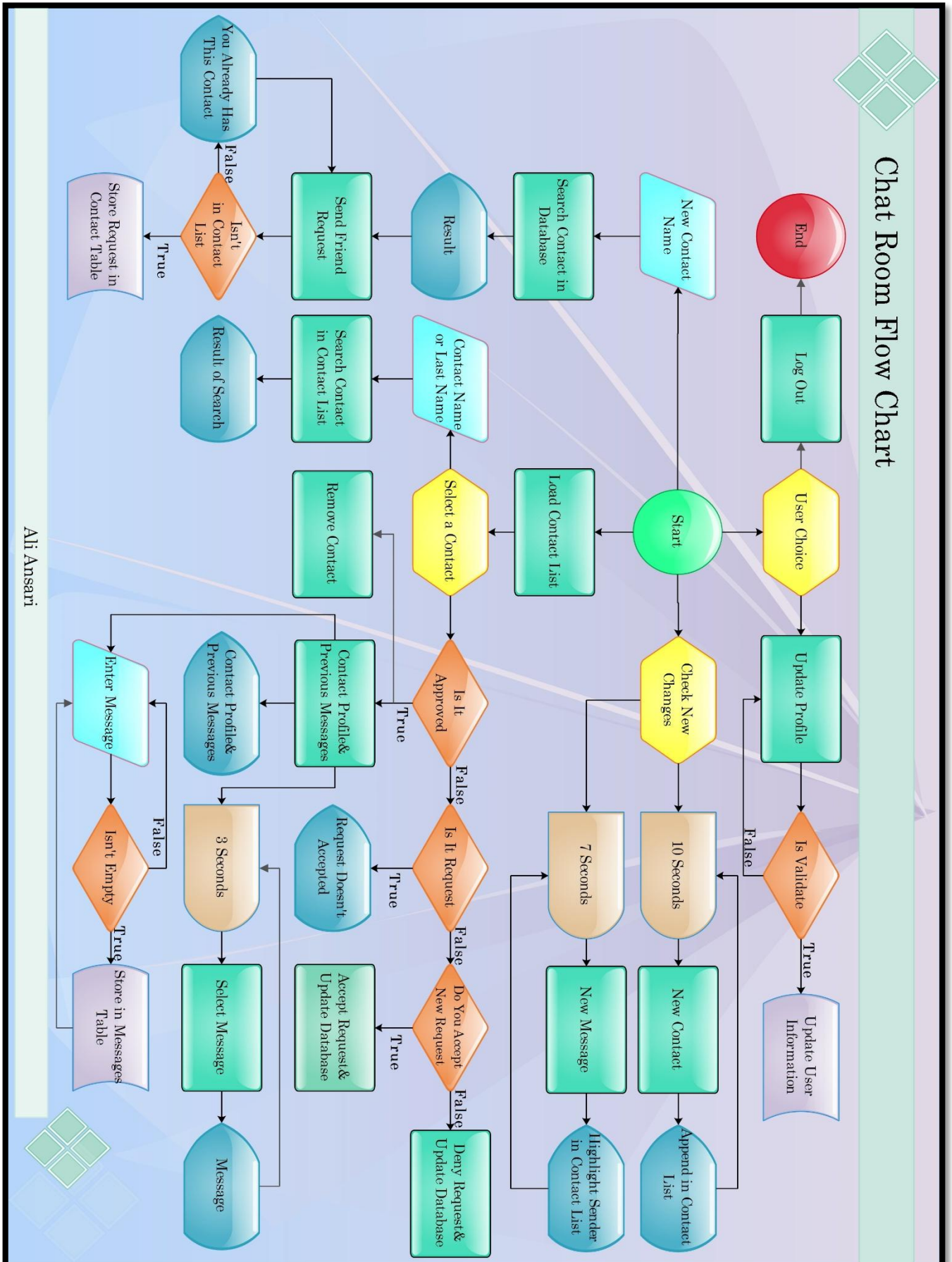


4.3.1 Registration Flow Chart

4.3.2 Login Flow Chart



4.3.3 Chat Room Flow Chart



5 Manual

In this chapter you will learn how to implement this application inside your LAN as an internal chat room. This process has two parts, first preparing a computer as a web server to provide service to other computers as client, and second connecting client computers to web server and creating account for them to use chat room. These two parts will describe in detail in following sections.

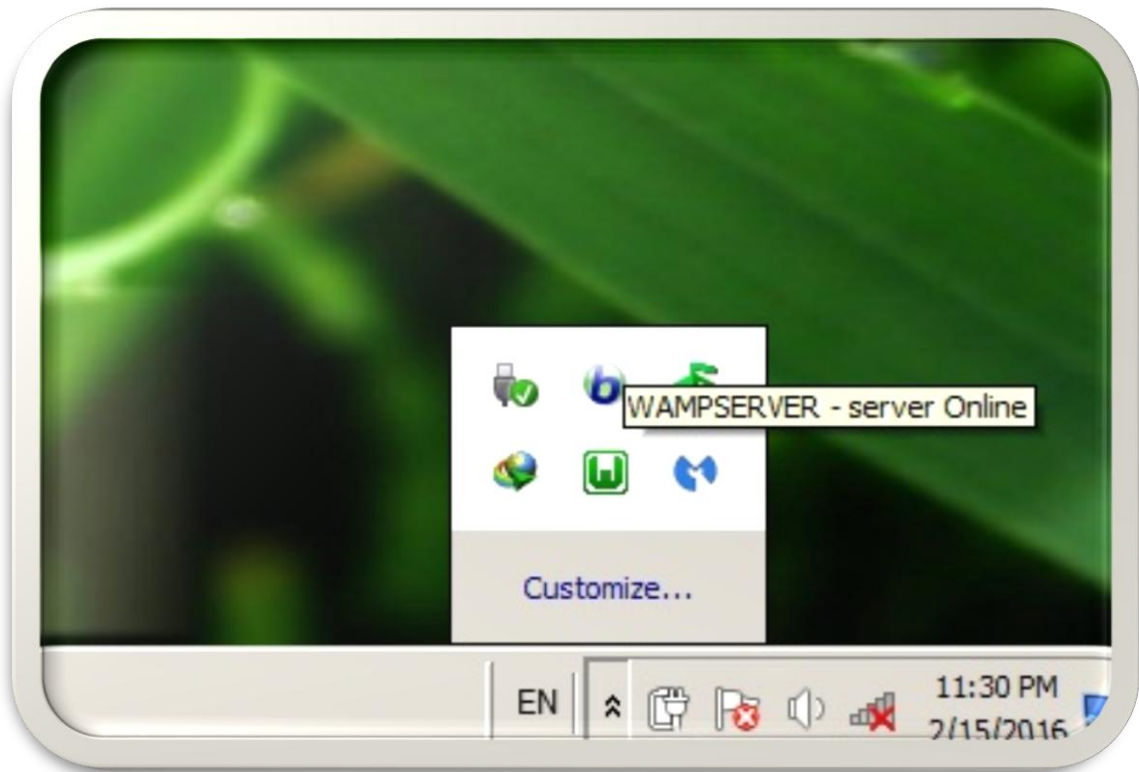
5.1 web server implementation

For using this application you need a web server to provide service to clients. You can have your own web server inside your LAN or even inside your PC, by installing one of the following programs according to your operating system. You can download your necessary program for implementing your web server from following links.

WAMP	for Windows OS	http://www.wampserver.com/en/
MAMP	for Mac OS	https://www.mamp.info/en/
AMPPS	for Windows, Mac and Linux OS	http://ampps.com/download

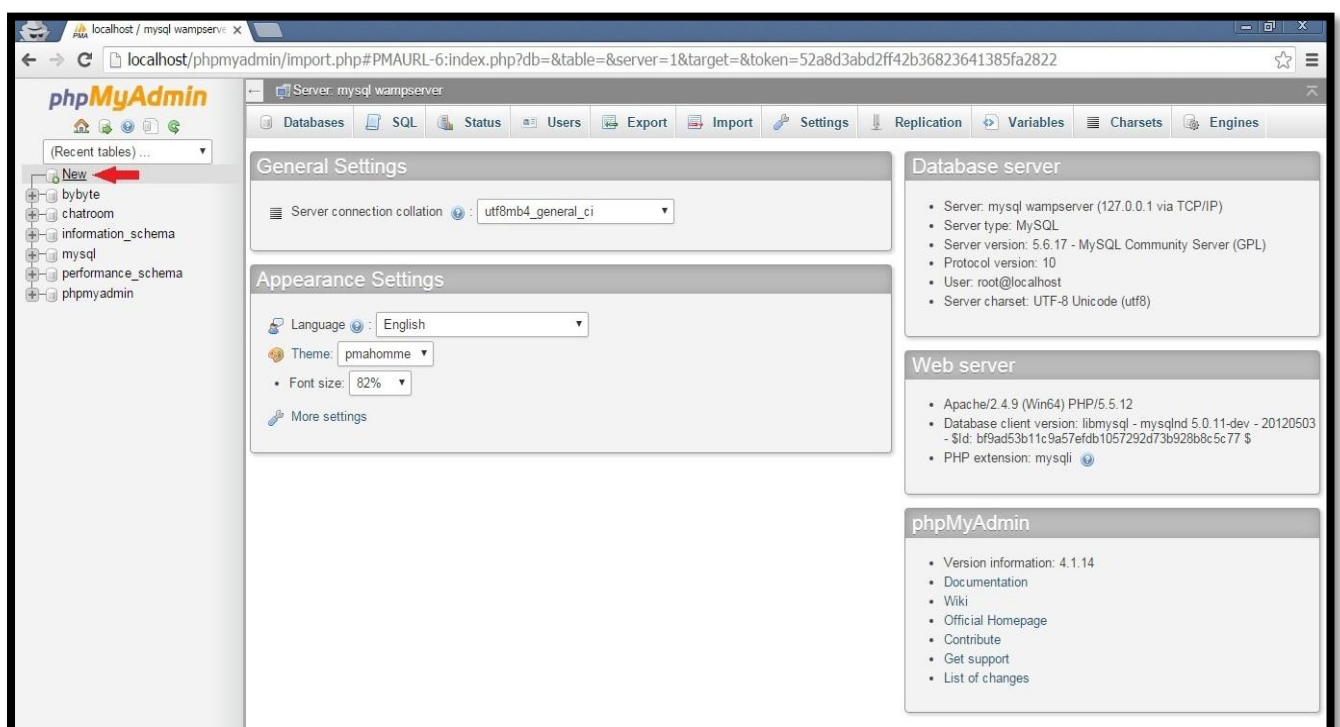
In this tutorial you will learn how to install WAMP server on Windows operating system, and configure its required settings for providing service to clients. For other two servers, installation and configuration is approximately same as WAMP server.

First, download WAMP server from provided address according to your OS type (32bit or 64bit), then run the exe file and install it in your server's system drive. Make sure that other web application like Skype aren't open, because they can use some ports that WAMP server needs them to provide service, after that run the WAMP server as administrator and make sure it is appear inside system tray and its color is green like image 1.

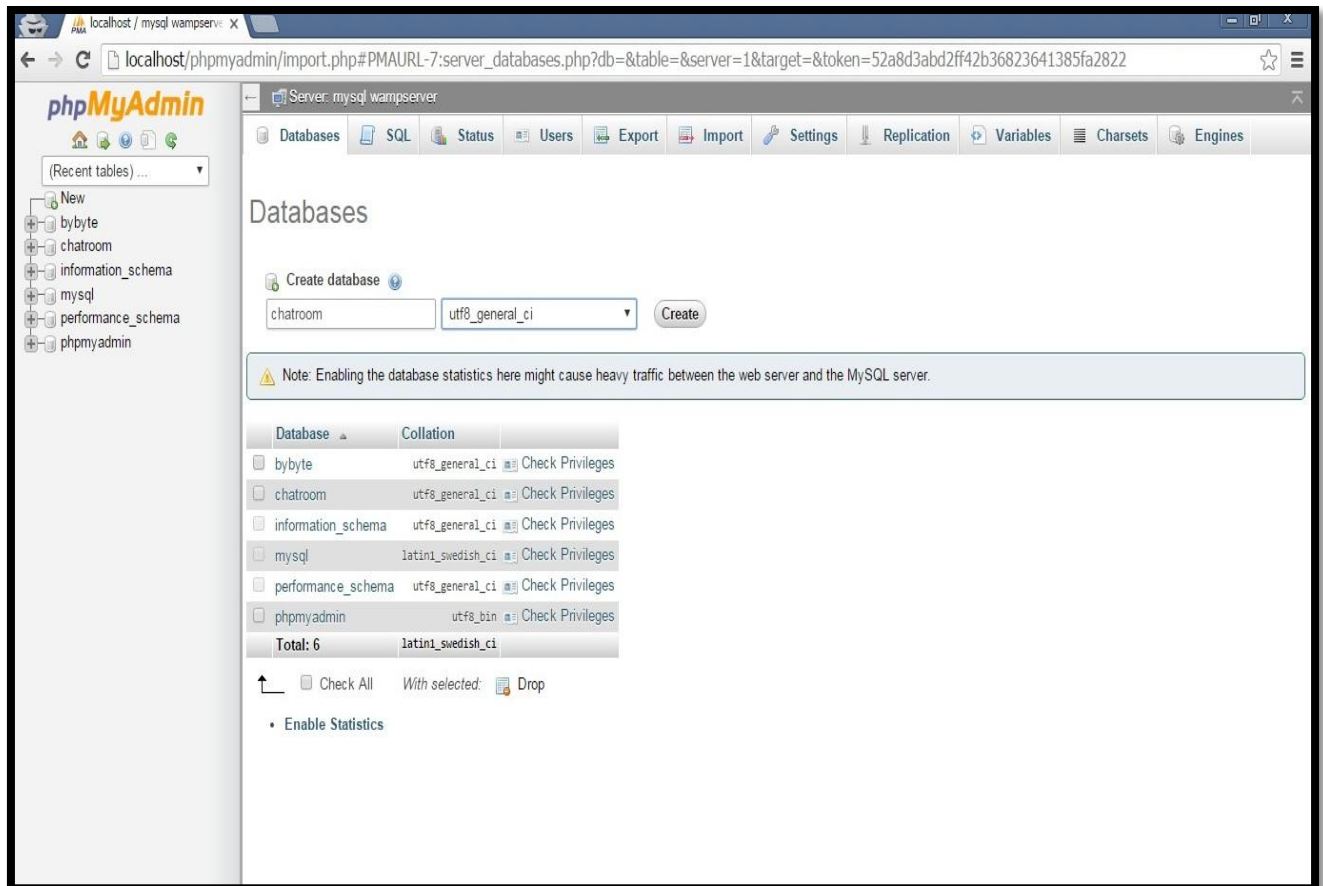


If your WAMP server isn't online left click on WAMP server icon in system tray and click on "put online" to make it online.

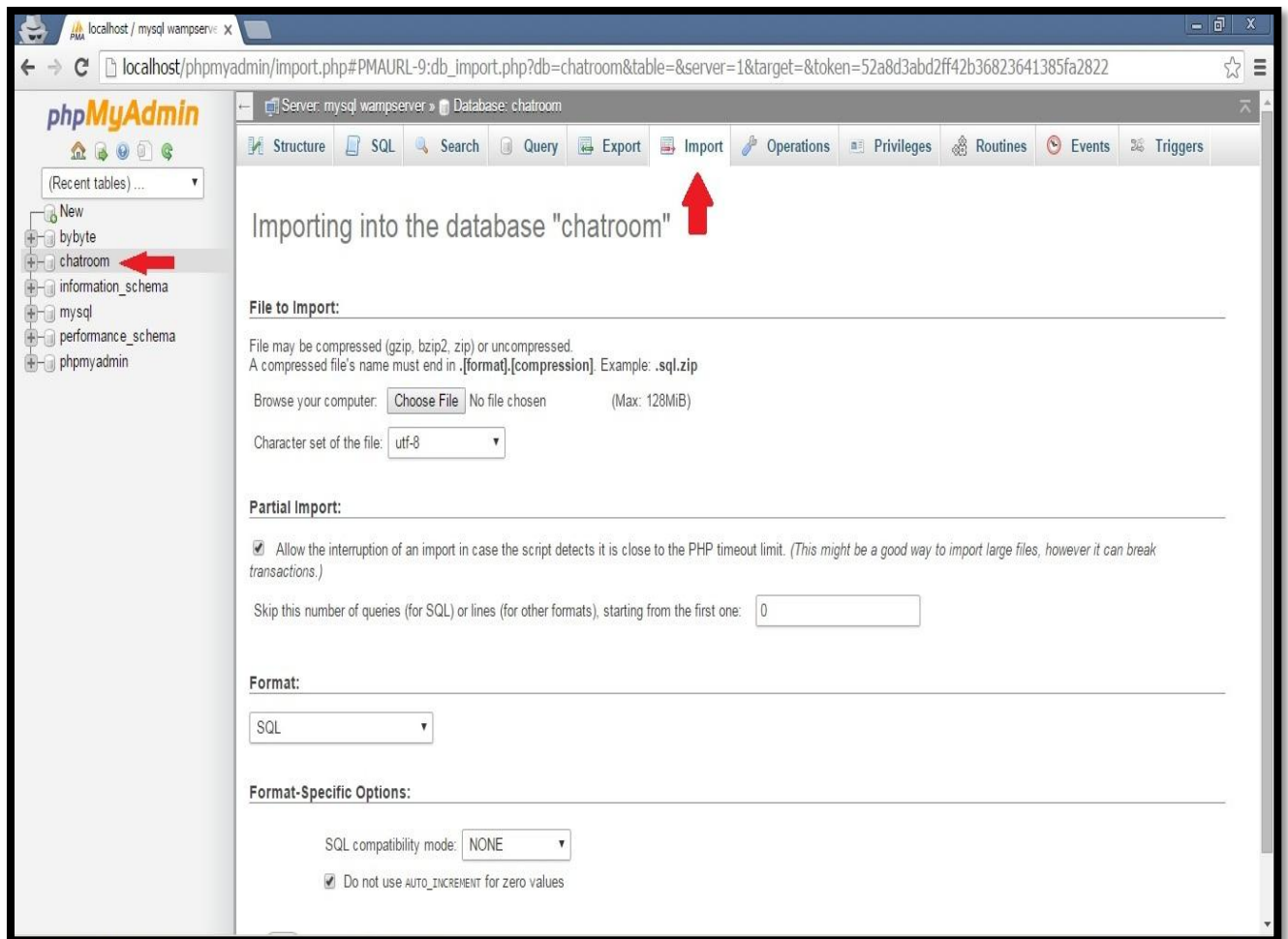
After your WAMP server become online and active left click on it and then click on phpMyAdmin, a new page in your browser will open which is the phpMyAdmin page. In here you can create and control chat room database. In phpMyAdmin page click on *New* in top left corner of page to create a database for chat room like image 2.



Inside the new page which comes after clicking on “New” link, you should specify your database name and its collation. Like image 3 type “chatroom” for your database name and select “utf8_general_ci” for your collation and click on create button.



After creating the database it is time for creating tables, because crating table could be time consuming and tricky there is a file that help you in this job. The only thing you should do is to import that file and phpMyAdmin will create all the tables for you. For doing this first select your created database from left side of page and then click on the import tab like image 4.



In this page click on choose file button and select “chatroom.sql” file from database folder inside chat application folder and click on go button at the bottom of the page. If file imported successfully it will display a green message and say import was successful and it will create all necessary tables for chat application. Now you have chat application database and you need to do one more step to complete web server for using by chat application.

After creating database in phpMyAdmin, you need to copy all chat application files from *application files* folder inside chat *application* folder to *www* folder of your WAMP server folder. Copy all files and go to your system drive then in *wamp* folder and then in *www* folder and past all file in here, make sure that the “index.html” isn’t inside of any other folder.

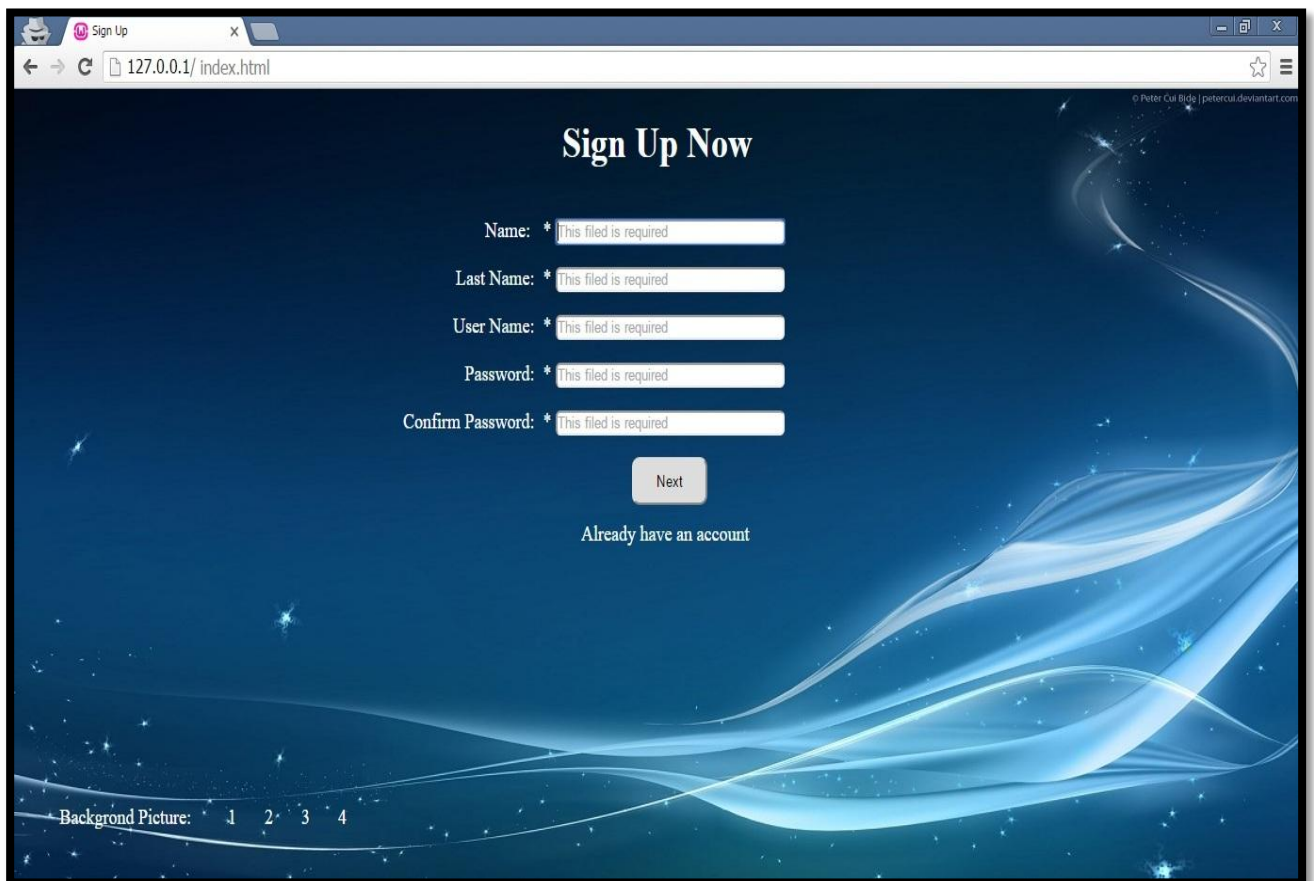
Now in your server computer open browser and in address bar type “localhost/index.html” and you should see the registration page of chat application.

For clients, they should write IP address of server in browser address bar followed by index.html like (192.168.1.1/index.html) to access the chat application.

5.2 User Manual

For using this chat application first of all you need to connect to your web server inside your LAN which provide web service. Then you need a web browser on your computer, for informing about best versions of web browsers which could support all the features of this application refer to software requirement.

After connecting with web server, open your web browser and in address bar type your server's IP address follow by *index.html*. Like image 1 you should see registration page in your browser.

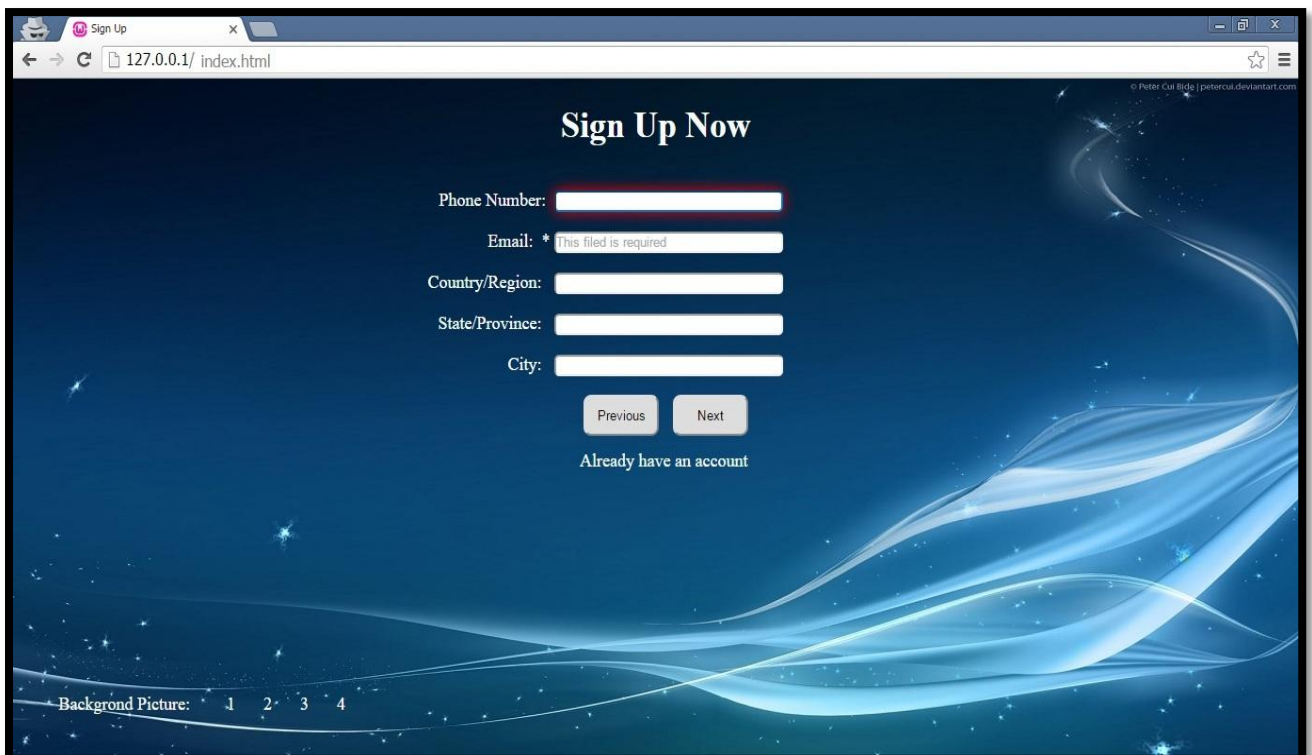


The screenshot displays a web browser window with the title 'Sign Up' and a single tab. The address bar contains '127.0.0.1/index.html'. The main content area features a 'Sign Up Now' heading. Below it, there are five input fields: 'Name:', 'Last Name:', 'User Name:', 'Password:', and 'Confirm Password:'. Each field is marked with an asterisk and has a placeholder text 'This field is required'. A 'Next' button is positioned below the 'Confirm Password' field. Below the button is a link that says 'Already have an account'. At the bottom left, there is a 'Background Picture:' label followed by four numbered options (1, 2, 3, 4). The background of the page is a dark blue gradient with light blue wavy patterns and small white stars. In the top right corner, there is a small copyright notice: '© Peter Cui Bido | pitercui.deviantart.com'.

This is the first page of registration, like all other chat application, first you need to create an account for using this chat application. For creating an account you need to fill the registration form which is designed in three parts. Those fields which have a star mark are mandatory and you have to fill them. There is also a link for those who already have an account to direct them to login page. In bottom left-corner of page you have four choices for background and you can change the background of application. For creating an account you should consider some issues that describe as follow.

First you should fill all required fields correctly, when you fill a textbox correctly and go to the next one its border will turn green and if you leave a textbox empty or type incorrect information its border will turn red to inform you about problem. When you type your desired username in user name textbox and go to the next textbox, application will check the username and if that username is already chosen by someone else, browser will shows a message to you and inform you and suggest you to choose another username. When you type your password you must re-typed in confirm password textbox too, to make sure you type your desired password correctly, confirm password textbox will became green only when typed password in it match with the password you type in password textbox. If confirm password didn't turn green the sing up button at the end of form will be disabled and you can't create your account, until you solve the problem. If you leave only one required field empty and try to go to next part browser will display a message to you and inform you to fill all the required fields and don't let you to go to the next part.

In second part of registration page you will face with five other fields which only one of them is required, the email address, the entered email address will check by application to have a standard format like *example@gmail.com*, if your email address doesn't have standard format, browser will displays a message and inform you that the entered email address isn't correct. You can leave other fields empty but it is recommended to fill all the textboxes to have a complete profile. Whenever you want you can go to the previous part by clicking on previous button.



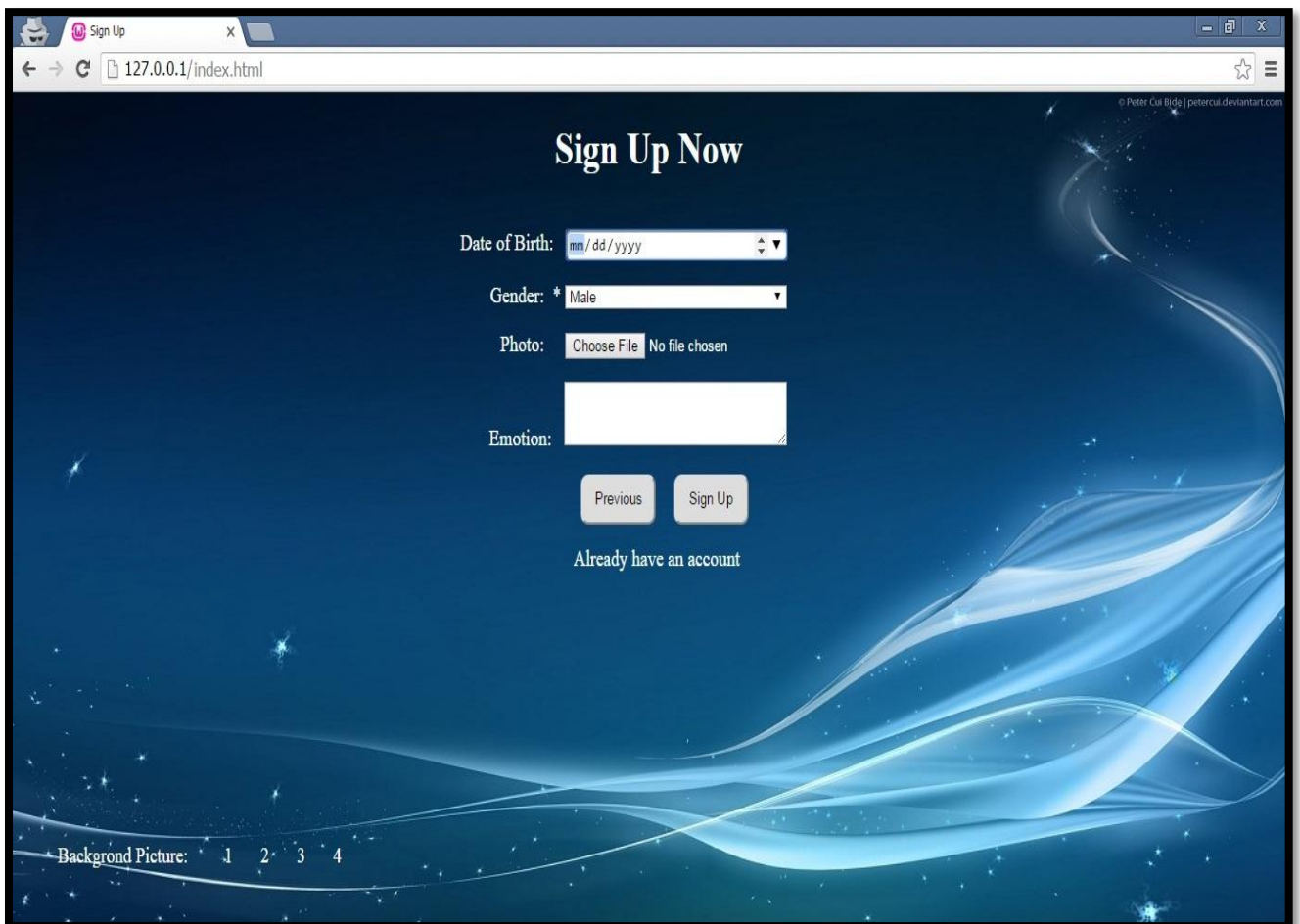
The screenshot shows a web browser window with the address bar displaying "127.0.0.1/ index.html". The page title is "Sign Up" and the main heading is "Sign Up Now". The form contains the following fields and elements:

- Phone Number:
- Email: * (with a red border and a tooltip message "This field is required")
- Country/Region:
- State/Province:
- City:
- Navigation buttons: "Previous" and "Next" (disabled)
- Link: "Already have an account"
- Footer: "Background Picture: 1 2 3 4"

The background of the form is a dark blue space-themed image with white light trails and stars. A small copyright notice "© Peter Cui Bide | petercui.deviantart.com" is visible in the top right corner of the form area.

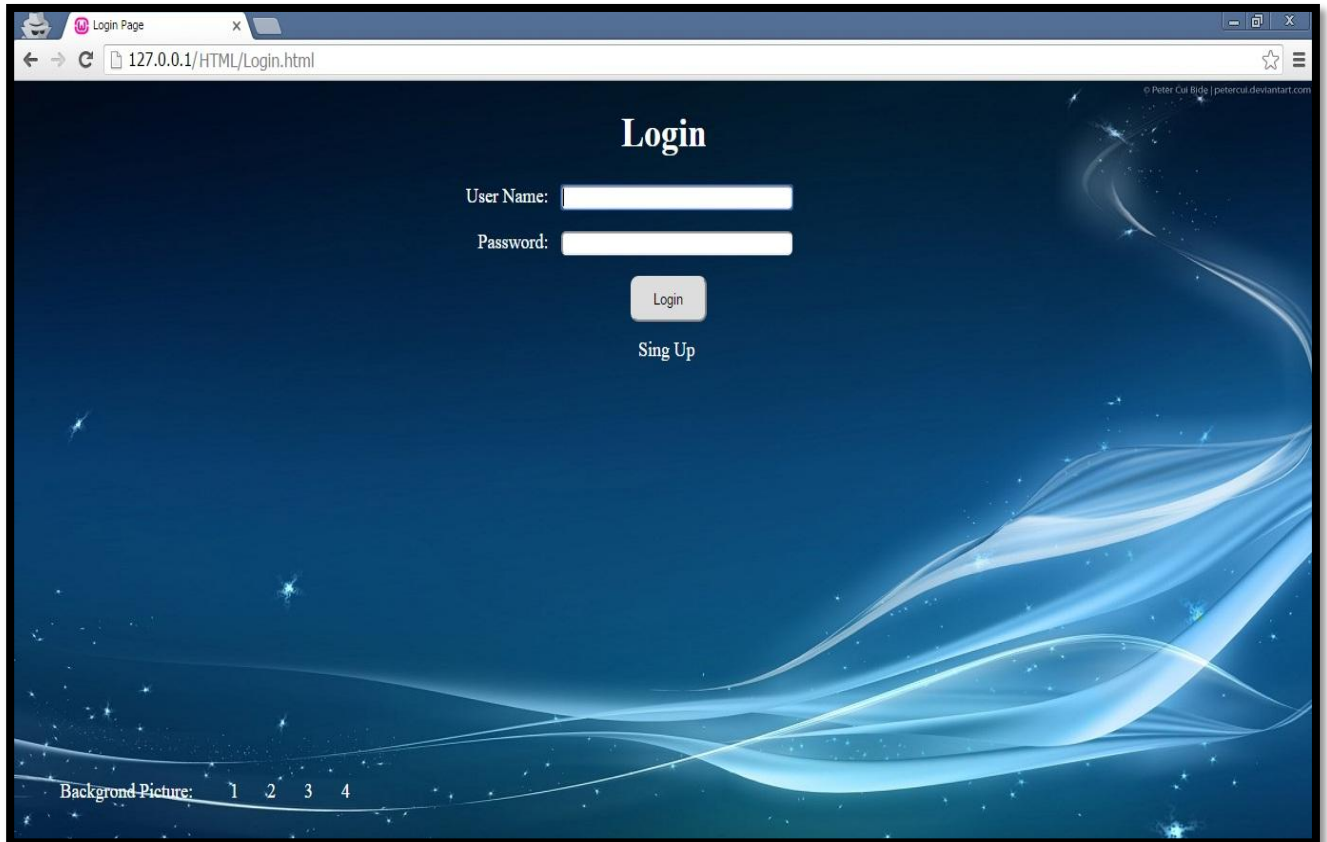
In third part of registration page you will see the last fields of form. If your browser supports HTML5 you can use date picker field to choose your birthdate and if it doesn't support you will see an ordinary field for date of birth like other fields of form. In this page you can choose a photo for your profile, but make sure that the image has one of these formats jpg, jpeg, bmp or png, if selected image doesn't has one of these formats browser will display a message which mention that the image should has a specific format and suggest you to choose another image. In emotion textbox you can type something about yourself or about your feeling, but you should consider the length of your text because you can't type more than 100 characters in this field.

Finally when you complete the registration form click on sing up button to create your account, and if the sing up button is disable check your password and confirm password textboxes in the first part of registration form. If you fill the registration form correctly, after clicking on sing up button your account will be created and you will go to the login page.



The screenshot shows a web browser window with the title 'Sign Up' and the address bar displaying '127.0.0.1/index.html'. The main content area features a 'Sign Up Now' heading. Below the heading are four form fields: 'Date of Birth' with a date picker showing 'mm / dd / yyyy', 'Gender' with a dropdown menu set to 'Male', 'Photo' with a 'Choose File' button and 'No file chosen' text, and 'Emotion' with a text input field. At the bottom of the form are two buttons: 'Previous' and 'Sign Up'. Below the buttons is a link that says 'Already have an account'. The background of the page is a dark blue space-themed image with light blue wavy lines and stars. In the bottom left corner, there is a 'Background Picture:' label followed by four numbered options: 1, 2, 3, and 4. A small copyright notice '© Peter Cui Bide | petercui.deviantart.com' is visible in the top right corner of the page content.

In login page you only need to enter your username and password which you choose during registration. If you click on login button without typing anything in textboxes, browser will display a message to you and request you to fill the textboxes. If you enter wrong username or password browser will display a message and inform you that your username or password is wrong and you should try again.

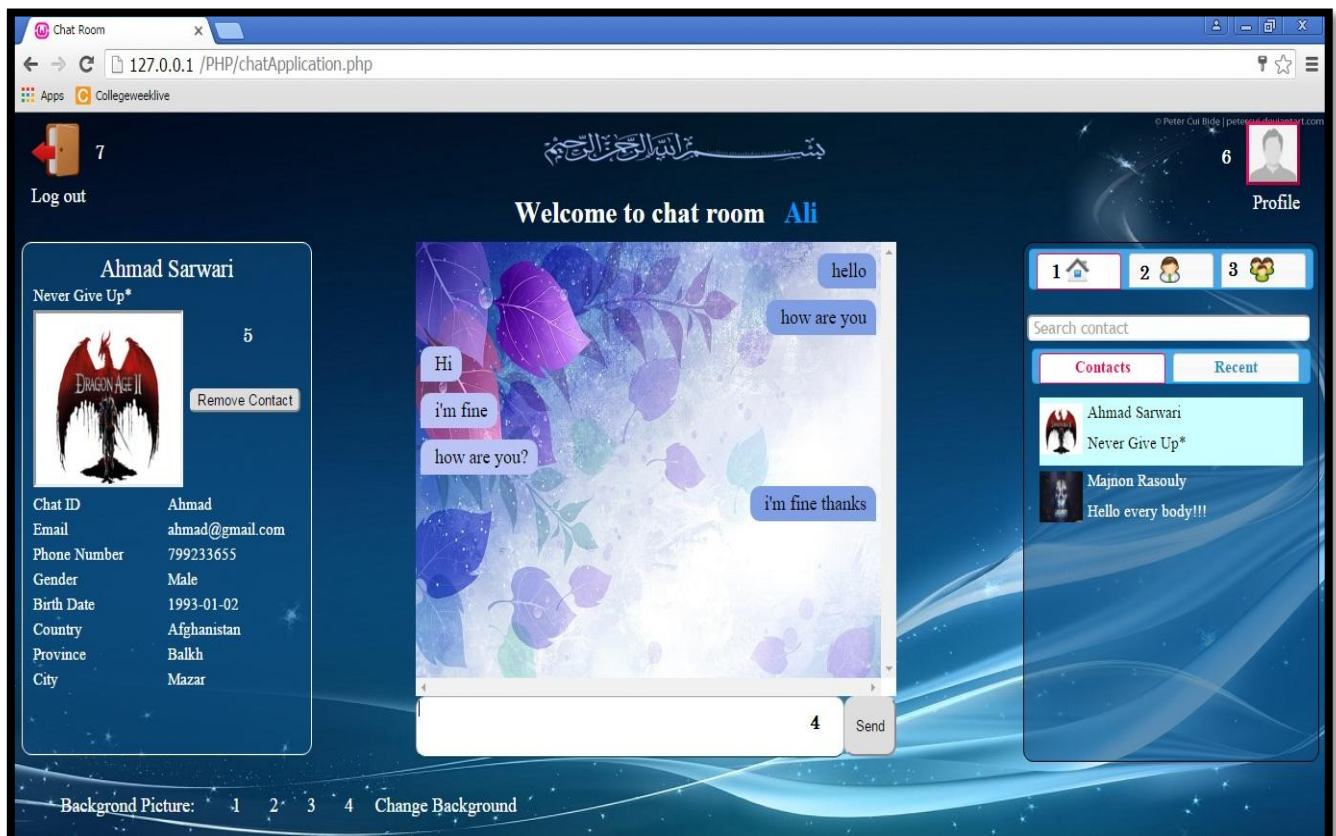


After pass the login page successfully, you will reach to the main page of application, chat room page, in this page you can chat with other people who are in your contact list. There is a short description about this page which is numbered for better understanding.

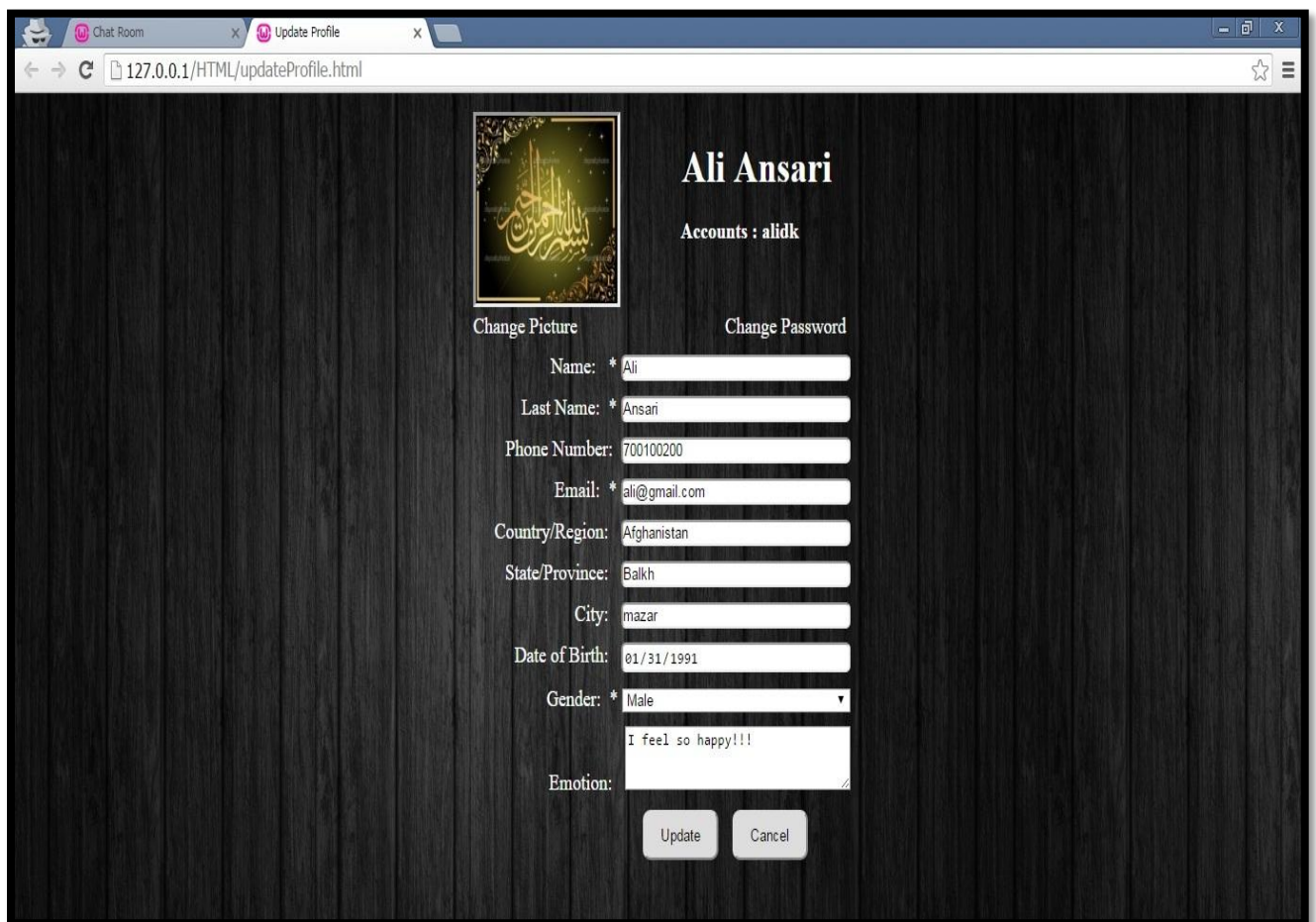
1. This is your **Home** tab which consists of your contact list and recent contacts. You can search between your contacts by using their names or last names; it could help you when your contact list gets too long. In **recent** tab you can see those persons you chat with them recently.
2. This is the **Add Contact** tab, in this tab you can search for someone and when you find that person you can select it and click the send request button to send him/her a friend request. But you can't send friend request for those persons who already are in your contact list, because application will check your request and if selected contact was in

your contact list it will display a dialog box and inform you that you already have this contact.

3. This is the **Group Chat** tab, in this version of chat application group chat isn't develop and it will come in next version and enable user to chat with multiple contact simultaneously.
4. This is the typing message box; you can type your message in here and send them by pressing the *Enter key* or click on send button. You can see your messages inside the above box, your messages will always appear in right side of box with dark violet background and your receiving messages will appear in left side of box with light violet background.
5. This part is for displaying contact profile, when you select someone in contact list its profile will display in here. When you want to remove someone from your contact list you can select him/her in contact list and in contact profile click on remove contact button, it will display a dialog box and ask you that are you sure to remove the contact and if you click on yes button the contact will delete from your contact list.
6. This is the user profile link, by clicking on this link you will go to a new page (your profile page) and you can update your profile.
7. This is the exit point of application, by clicking on log out link you will leave the chat room and go back to the login page.




In profile page you can see all the information that you provide during the registration. In this page you can change all those information except your username or account ID. In top of page you can see your name and last name and under them your username or account ID. For changing your photo click on *change picture* to open the file selection window, and select your desired image. For changing your password click on *change password*, it will display a dialog box to you and you should type your current password and then new password. If your old password doesn't match with database or your new password and confirm new password fields doesn't same, browser will display a message and inform you to correct your mistake. After you change your desired information, by clicking on update button your new information will set in database and profile page will close.



Chat Room x Update Profile x

127.0.0.1/HTML/updateProfile.html

 **Ali Ansari**
Accounts : alidk

Change Picture Change Password

Name: * Ali
Last Name: * Ansari
Phone Number: 700100200
Email: * ali@gmail.com
Country/Region: Afghanistan
State/Province: Balkh
City: mazar
Date of Birth: 01/31/1991
Gender: * Male
Emotion: I feel so happy!!!

Update Cancel

6 Future Scope

As a good program this chat application doesn't have all the features to fulfill all of our need, there is a lot of shortage in this application and also some weak points in designing and in performance. In fact this is a clear theme, that none of programs was perfect at first. They pass a long process and day by day became better and better. This application also is in the beginning of its way, and it could have lots of functionality to enhance users' job.

Like all other programs which has a future plan that imply their development process and give a bright image of next version of program, this application also has a future plan which indicate some of features that will be in the next version of this chat application. In the following there are features which will add in the next version of chat application.

6.1 Group Chat

In group chat user is able to select multiple contact and chat with them simultaneously. This is one of the important parts of a chat application which could save user's time by reducing message writing, it means instead of writing same message to multiple persons separately you can write it once and send it to all of them.

6.2 Sending File

Ability to sending files in chat room is a handy feature, which could save a lot of time and expenses. Instead of using UFDs to transmitting files or data, users can use this ability and send their documents through the chat room very fast and easy. This feature also could use with group chat for sharing information between multiple person at same time.

6.3 Voice Chat

For someone typing is a difficult job, and sending message via keyboard could take a long time. Voice chat is a solution for faster communication. It enables users to solve their problem in a minimum time and easier. Because voice chat needs extra resources,

implementing this feature could be difficult but I try to add this feature to the next version of the chat application.

6.4 Responsive Interface

Because this application is web based application and it can be used on any platform. It is necessary to have a responsive interface for easy use on smartphones and tablets which are the most using device between people. Responsive interface increase readability of application and also help users to work with application very easy in different screen size.

6.5 Animation

Animated pictures in chat rooms are the funny part of chatting, they could make chatting more interesting. Sometimes this picture could explain our emotion better than words. Using them could change our mood and prevent chatting to become tedious.

6.6 Blocking Contacts

Sometimes some contacts make us problem and waste our time, or there could be any other reason to compel us to block someone. However, sometimes blocking is a feature that could be only way to solve a problem and help us.

6.7 Performance

This part enhances performance of the application which is the most important part. The biggest problem of this application is that it doesn't follow a standard manner for data transition. In fact server is responsible to send new data to clients, and it could achieve by using some new technics like XMPP programing and other extra services. But in this version of application users send request to retrieve data from server which could bring a heavy load on server when number of user increase. In the next version of chat application it should have this standard and new methods must implement on it.

7 References

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