



JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)

An International Scholarly Open Access, Peer-reviewed, Refereed Journal

VPN PROVIDER MONITORINGSYSTEM

GANESH K, Dr. V.Kavitha

Hindusthan college of arts and science

CHAPTER 1 INRODUCTION

1.1 OVERVIEW

VPN stands for the virtual private network. A virtual private network (VPN) is a technology that creates a safe and secure connection over a less secure network, such as the internet. The main objective of developing this VPN related project in php is to connect local computer networks virtually. The web application is hosted as a LAN application in a local ip address. User can connect to the network through local ip address. User can access the web application only by connecting to the LAN. A Virtual Private Network is a way to extend a private network using a public network such as the internet. The name only suggests that it is a Virtual "private network" i.e. user can be part of a local network sitting at a remote location. It makes use of tunnelling protocols to establish a secure connection. User login time and logout time will be calculated and stored in database. Based on network usage user will be charged. These network usage charges are updated by the admin. If any unauthorized login attempts done by the user by specifying wrong username and password, it will be stored in separate table.

1.2 MODULAR DESCRIPTION

The Centralised Management System consists of a login screen and 3 modules There are

basically 3 modules

- Administration module
- Marketing module
- Training module

Administration module

- Office details
- Staff details

Office details

- Enquiry
- Student Registration
- Course and Fees Details
- Salary details

Staff Details

- Staff attendance

Marketing module

- Adding Clients
- Client list
- Placement details

Training Module

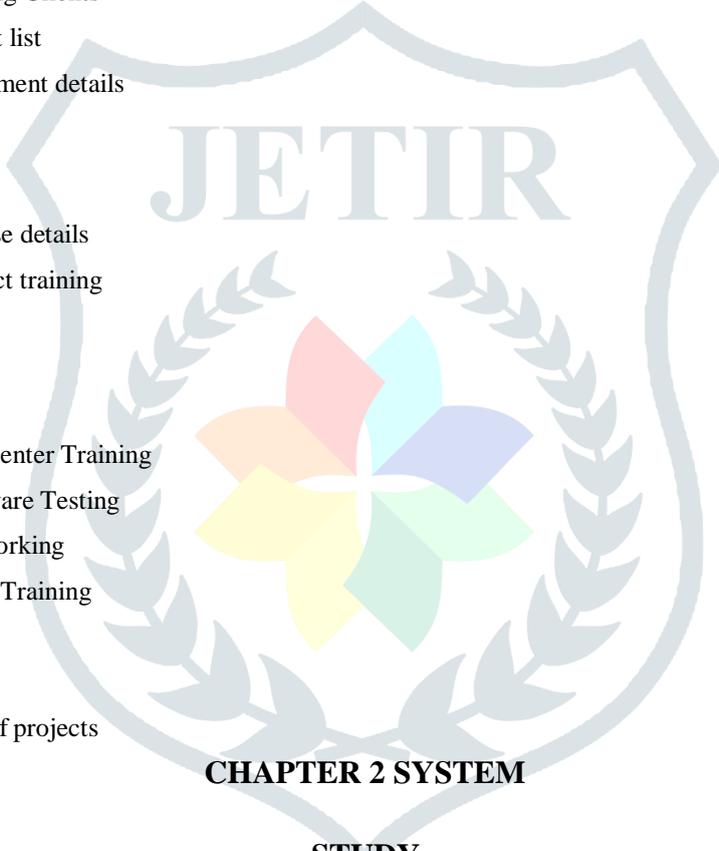
- Course details
- Project training

Course Details

- Call center Training
- Software Testing
- Networking
- J2EE Training

Project Training

- List of projects

The logo is a shield-shaped emblem. At the top, the word "JETIR" is written in a large, serif font. Below the text is a stylized flower with five petals in different colors: red, cyan, purple, yellow, and green. The flower is surrounded by a laurel wreath. The entire logo is rendered in a light gray color, serving as a watermark.

JETIR

CHAPTER 2 SYSTEM

STUDY

2.1 EXISTING SYSTEM

In order to prevent the disclosure of private information in the system, there must be certain concrete security provision. So, this networking software allows only the authenticated or certified remote access to the system. The Virtual Networking system ensures the security in the system by utilizing tunnelling protocol via security procedure such as encryption, and other. Confidentiality, authentication and integrity are the measures of VPN security model. You can find the detailed description regarding security in the documentation of this project.

2.2 PROPOSED SYSTEM

The need of using a VPN is to provide the service of internet in a highly secure way. This process a router, ATM switch and internet to connect too or more LAN or WAN network topologies located at various sites. In order to establish this we have built our own software. This software is divided into two the Server side or the Head Office program and the Client side or the Branch Office program. The Client comprises of the “Data Collecting Forms” and the Server side

comprises of the “Report Box” wherein the data sent get appended for each transaction.

SOFTWARE ENVIRONMENT

PHP

PHP stands for Hypertext Preprocessor. PHP scripts run inside Apache server or Microsoft IIS. PHP and Apache server are free. PHP code is very easy. PHP is the most used server side scripting language. PHP files contain PHP scripts and HTML. PHP files have the extension “php”, “php3”, “php4” or “phtml”.

USING PHP

- Generate dynamic web pages. PHP can display different content to different user or display different content at different times of the day.
- Process the contents of HTML forms. We can use a PHP to retrieve and respond to the data entered into an HTML form.
- Can create database-driven web pages. A PHP can insert new data or retrieve existing data from a database such as MySQL.

Working of PHP

PHP is a standard HTML file that is extended with additional features. Like a standard HTML file, PHP contains HTML tag that can be interpreted and displayed by a web browser. Anything we could normally place in an HTML file Java applets, Blinking text, server side scripts .we can place in PHP. However, PHP has three important features that make it unique.

- PHP contains server side scripts.
- PHP provides several built-in objects.

HYPER TEXT MARKUP LANGUAGE (HTML)

HTML is an application of the Standard Generalized Markup Language (SGML), which was approved as an international standard in the year 1986. SGML provides a way to encode hyper documents so they can be interchanged.

SGML is also a Meta language for formally describing document markup system. Infact HTML uses SGML to define a language that describes a WWW hyper document’s structure and inter connectivity.

Following the rigors of SGML, TBL bore HTML to the world in 1990. Since then, many of us have it to be easy to use but sometimes quite limiting. These limiting factors are being addressed but the World Wide Web Consortium (aka W3c) at MIT. But HTML had to start somewhere, and its success argues that it didn’t start out too badly.

DATABASE

A database is simply a collection of used data just like phone book. MySQL database include such objects as tables, queries, forms and more.

TABLES

In MySQL tables are collection of similar data. With all tables can be organized differently, and contain mostly different information- but they should all be in the same database file. For instance we may have a database file called video store. Containing tables named members, tapes, reservations and so on. These tables are stored in the same database file because they are often used together to create reports to help to fill out on screen forms.

RELATIONAL DATABASE

MySQL is a relational database. Relational databases tools like access can help us manage information in three important ways.

- Reduce redundancy
- Facilitate the sharing of information
- Keep data accurate.

FIELDS

Fields are places in a table where we store individual chunks of information.

PRIMARY KEY AND OTHER INDEXED FIELDS

MySQL use key fields and indexing to help speed many database operations. We can tell MySQL, which should be key fields, or MySQL can assign them automatically.

CONTROLS AND OBJECTS

Queries are access objects us display, print and use our data. They can be things like field labels that we drag around when designing reports. Or they can be pictures, or titles for reports, or boxes containing the results of calculations.

QUERIES AND DYNASTS

Queries are request to information. When access responds with its list of data, that response constitutes a dynaset. A dynamic set of data meeting our query criteria. Because of the way access is designed, dynasts are updated even after we have made our query.

FORMS

Forms are on screen arrangement that make it easy to enter and read data. we can also print the forms if we want to. We can design form our self, or let the access auto form feature.

REPORTS

Reports are paper copies of dynaset. We can also print reports to disk, if we like. Access helps us to create the reports. There are even wizards for complex printouts.

PROPERTIES

Properties are the specification we assigned to parts of our database design. We can define properties for fields, forms, controls and most other access objects.

CHAPTER 3 SYSTEM

SPECIFICATIONS

3.1 HARDWARE SPECIFICATION

PROCESSOR : Intel i3 Processor 2.5GHZ
DISK CAPACITY : 400 GB
MONITOR : 15 "SAMTRON MONITOR
MEMORY CA : 4 GB
KEYBOARD : LOGITECH OF 104 KEYS
CPU CLOCK : 1.08 GHz
MOUSE : LOGITECH MOUSE

3.2 SOFTWARE SPECIFICATION

OPERATING SYSTEM : WINDOWS 7 FRONT END
: PHP
BACK END : MYSQL



CHAPTER 4 SYSTEM

DESIGN

4.1 DATA FLOW DIAGRAM

The first step is to draw a data flow diagram (DFD). The DFD was first developed by Larry Constantine as a way of expressing system requirements in graphical form.

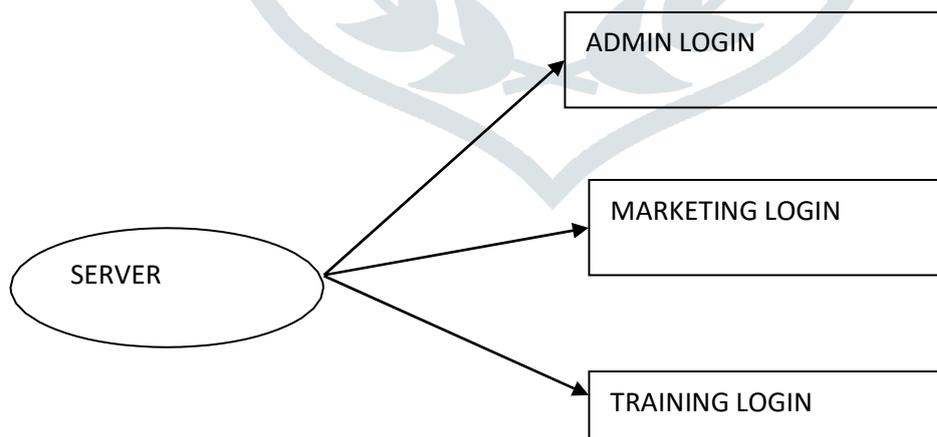
A DFD also known as a “bubble chart” has the purpose of clarifying system requirements and identifying major transformations that will become programs in system design. So, it is the starting point of the design phase that functionally decomposes the requirements specifications down to the lowest level of detail. A DFD consists of series of bubbles join by the data flows in the system.

The purpose of data flow diagrams is to provide a semantic bridge between users and systems developers. The diagrams are:

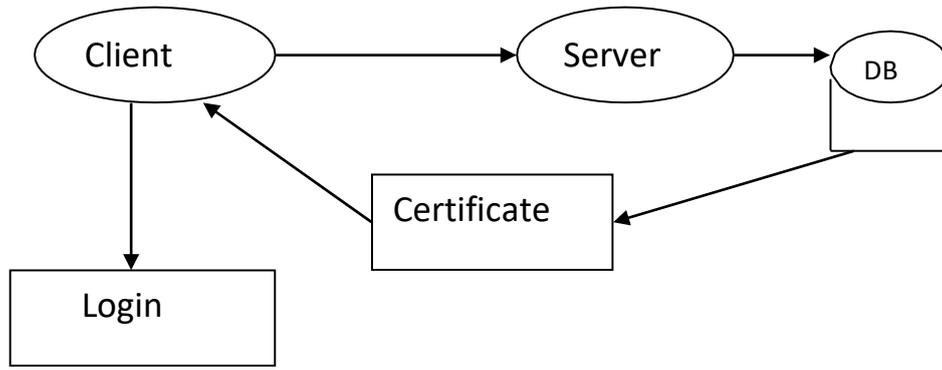
- Graphical, eliminating thousands of words;
- Logical representations, modeling WHAT a system does, rather than physical models showing HOW it does it;
- Hierarchical, showing systems at any level of detail; and
- Jargon less, allowing user understanding and reviewing.

The goal of data flow diagramming is to have a commonly understood model of a system. The diagrams are the basis of structured systems analysis. Data flow diagrams are supported by other techniques of structured systems analysis such as data structure diagrams, data dictionaries, and procedure-representing techniques such as decision tables, decision trees, and structured English.

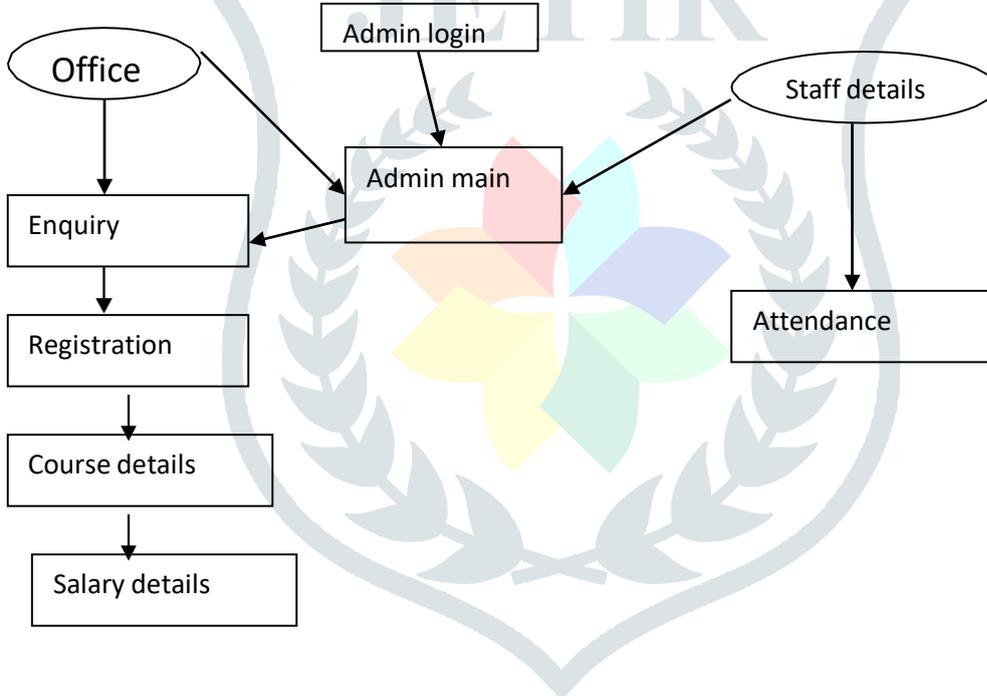
LEVEL 0:



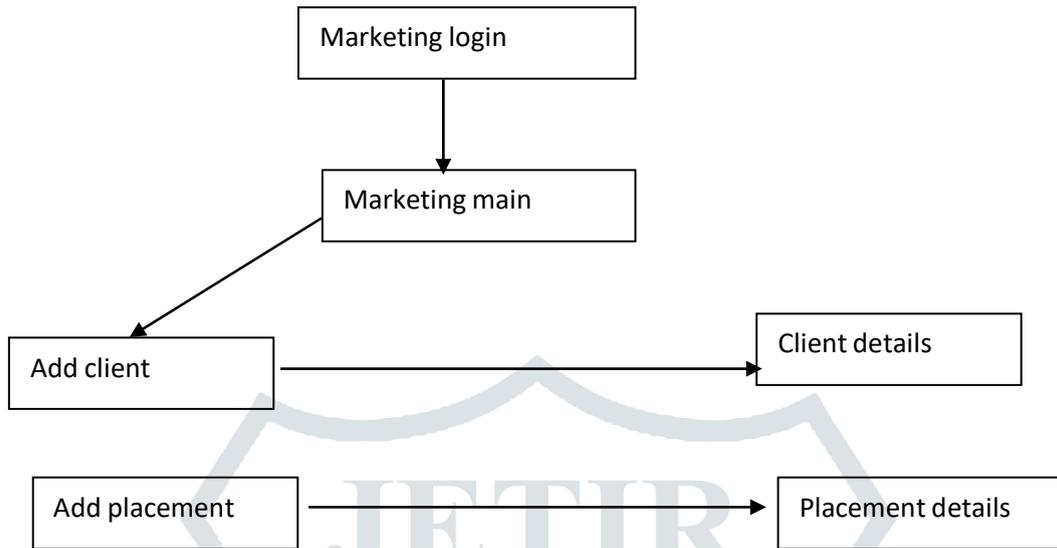
USER MODULE



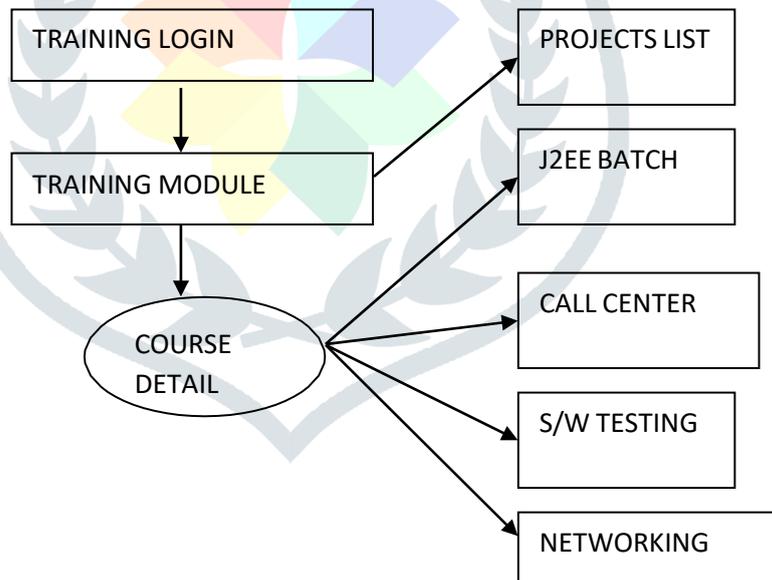
ADMIN MODULE



MARKETING MODULE



TRAINING MODULE



4.2 DATABASE DESIGN

A table is made up of trpws and columns. A row is also called a record (or tuple). Database design is a collection of interactive data store. An effective method of defining, store and retrieving the information in the database, multiple application and use the data contained in the database.

TABLE NAME : CLIENT TABLE & ENQUIRY TABLE

Description : The table is used to store client details

: This table is used to report the issues faced by the user

PRIMARY KEY : ID

FIELD	TYPE	NULL	DEFAULT
ID	INT(11)	YES	PRIMARY KEY
USERNAME	VARCHAR(50)	YES	NULL
PASSWORD	VARCHAR(15)	YES	NULL
ADDRESS	VARCHAR(120)	YES	NULL
MOBILE	INT(12)	YES	NULL
E-MAIL	INT(50)	YES	NULL
QUALIFICATION	TEXT(40)	YES	NULL
COURSE	TEXT(40)	YES	NULL

TABLE NAME : REGISTRATION TABLE

DESCRIPTION : The table is used to register All the details.

PRIMARY KEY : REG NO

FIELD	TYPE	NULL	DEFAULT
ID	INT(15)	YES	PRIMARY KEY
NAME	VARCHAR(10)	YES	NULL

ADDRESS	VARCHAR(10)	YES	NULL
MOBILE	INT(12)	YES	NULL
E-MAIL	VARCHAR(10)	YES	NULL
COURSE	VARCHAR(10)	YES	NULL
STARTDATE	VARCHAR(10)	YES	NULL
DURATION	VARCHAR(10)	YES	NULL

4.3 INPUT DESIGN

Input design is the process of converting the user-oriented. Input to a computer based format. The goal of the input design is to make the data entry easier , logical and free error. Errors in the input data are controlled by the input design. The quality of the input determines the quality of the system output.

All the data entry screen are interactive in nature, so that the user can directly enter into data according to the prompted messages. The user are also can directly enter into data according to the prompted messages. The users are also provided with option of selecting an appropriate input from a list of values. This will reduce the number of error, which are otherwise likely to arise if they were to be entered by the user itself.

Input design is one of the most important phase of the system design. Input design is the process where the input received in the system are planned and designed, so as to get necessary information from the user, eliminating the information that is not required. The aim of the input design is to ensure the maximum possible levels of accuracy and also ensures that the input is accessible that understood by the user. The input design is the part of overall system design, which requires very careful attention. If the data going into the system is incorrect then the processing and output will magnify the errors.

The objectives considered during input design are:

- Nature of input processing.
- Flexibility and thoroughness of validation rules.
- Handling of properties within the input documents.
- Screen design to ensure accuracy and efficiency of the input relationship with files.
- Careful design of the input also involves attention to error handling, controls, batching and validation procedures.

Input design features can ensure the reliability of the system and produce result from accurate data or they can result in the production of erroneous information.

ADMIN LOGIN

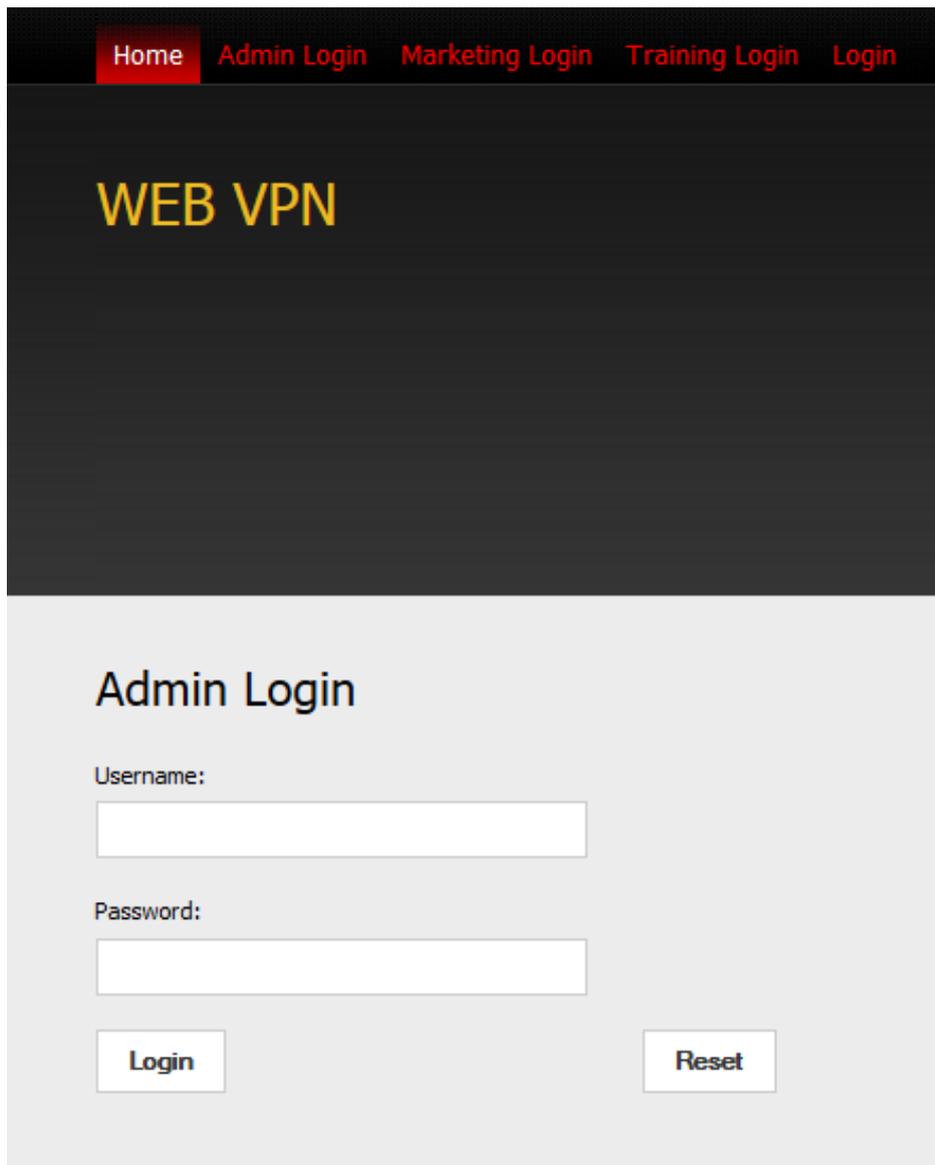


Figure 4.3.1 homepage of the website

This is the homepage of the project VPN provider monitoring system. It will shows all the login options on the title menu bar, first we are in the admin login page, to enter this page we have to enter admin username and password. Then it will login automatically.

MARKETING LOGIN SCREEN

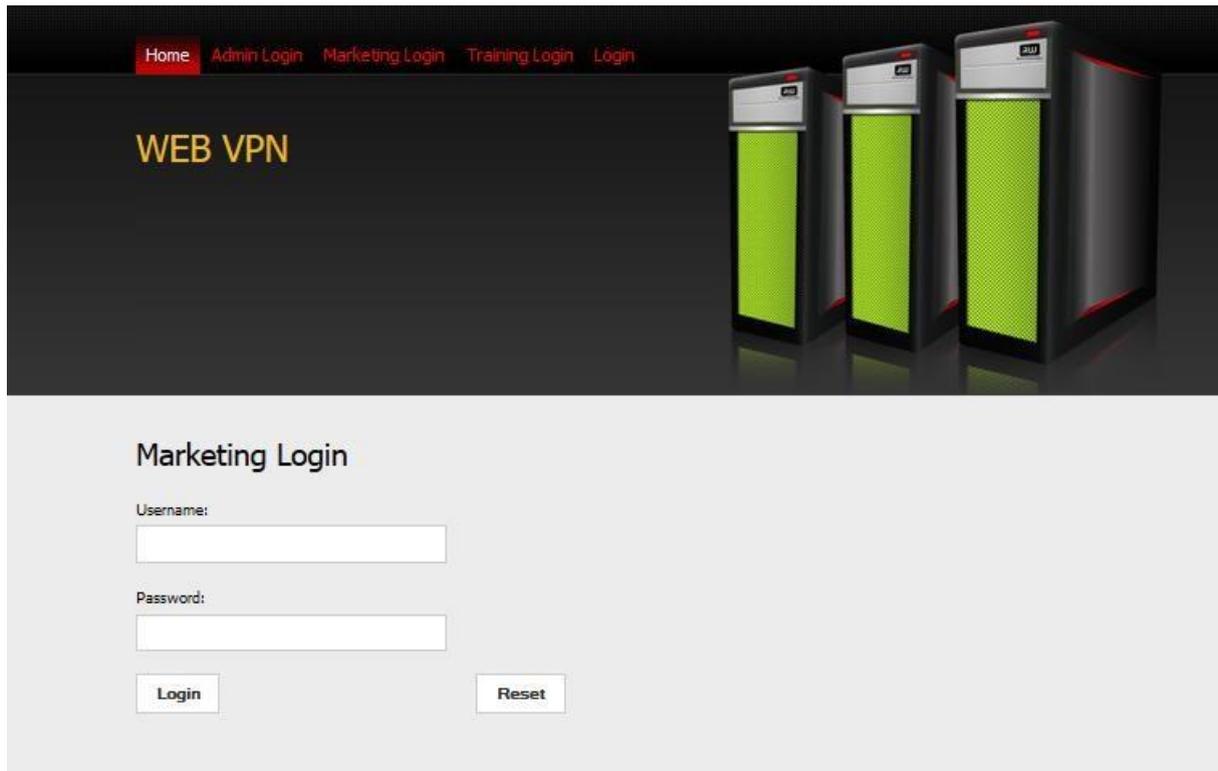


Figure 4.3.2 marketing login page

This is marketing page login screen, enter the username and password to login this page. It will show information about the marketing details such as clients and companies

TRAINING LOGIN SCREEN

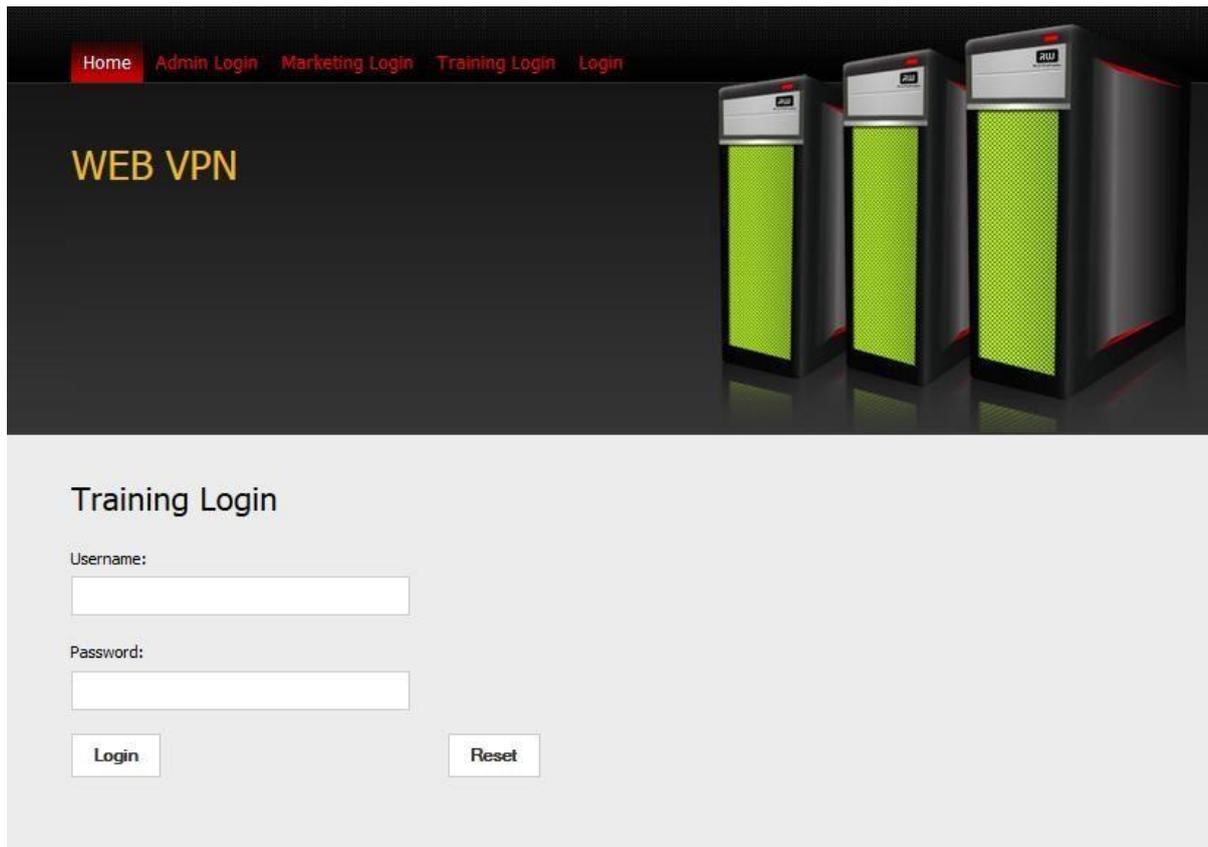


Figure 4.3.3 training login screen

This is training login screen, it will show up the information of students what they are studying which course they selected and much more.

4.4 OUTPUT DESIGN

The output form of the system is either by screen or by hard copies. Output design aims at communicating the results of the processing of the users. The reports are generated to suit the needs of the users. The reports have to be generated with appropriate levels. In our project outputs are generated by asp as html pages. As its web application output is designed in a very user-friendly this will be through screen most of the time.

CODE DESIGN

The main purpose of code design is to simplify the coding and to achieve better performance and quality with free of errors. The coding is prepared in such a way that the internal procedures are more meaningful validation manager is displayed for each column. The coding of the variables is done in such a way that one other than person who developed the packages can understand its purpose.

To reduce the server load, the project is designed in a way that most of the Validation of fields is done as client side validation, which will be more effective.

DATABASE DESIGN

The database design involves creation of tables that are represented in physical database as stored files. They have their own existence. Each table constitute of rows and columns where each row can be viewed as record that consists of related information and column can be viewed as field of data of same type. The table is also designed with some position can have a null value.

The database design of project is designed in such a way values are kept without redundancy and with normalized format.

ADMIN OUTPUT SCREEN

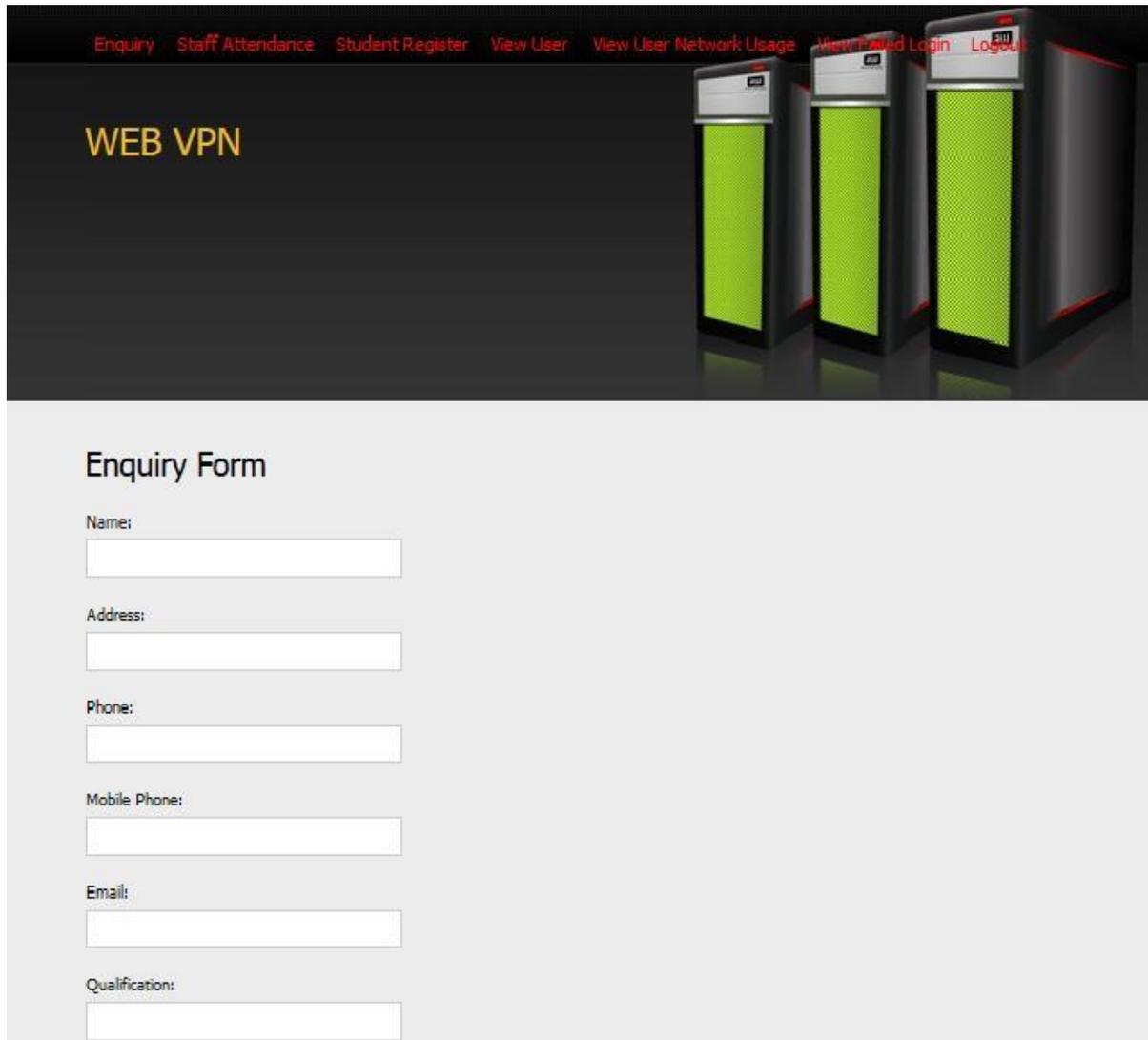


Figure 4.4.1 admin output screen

It will shows lots of options, at first it opens an enquiry form, and check staff attendance, and checking theregistration of students and viewing the user and their network usage etc.

MARKETING OUTPUT SCREEN

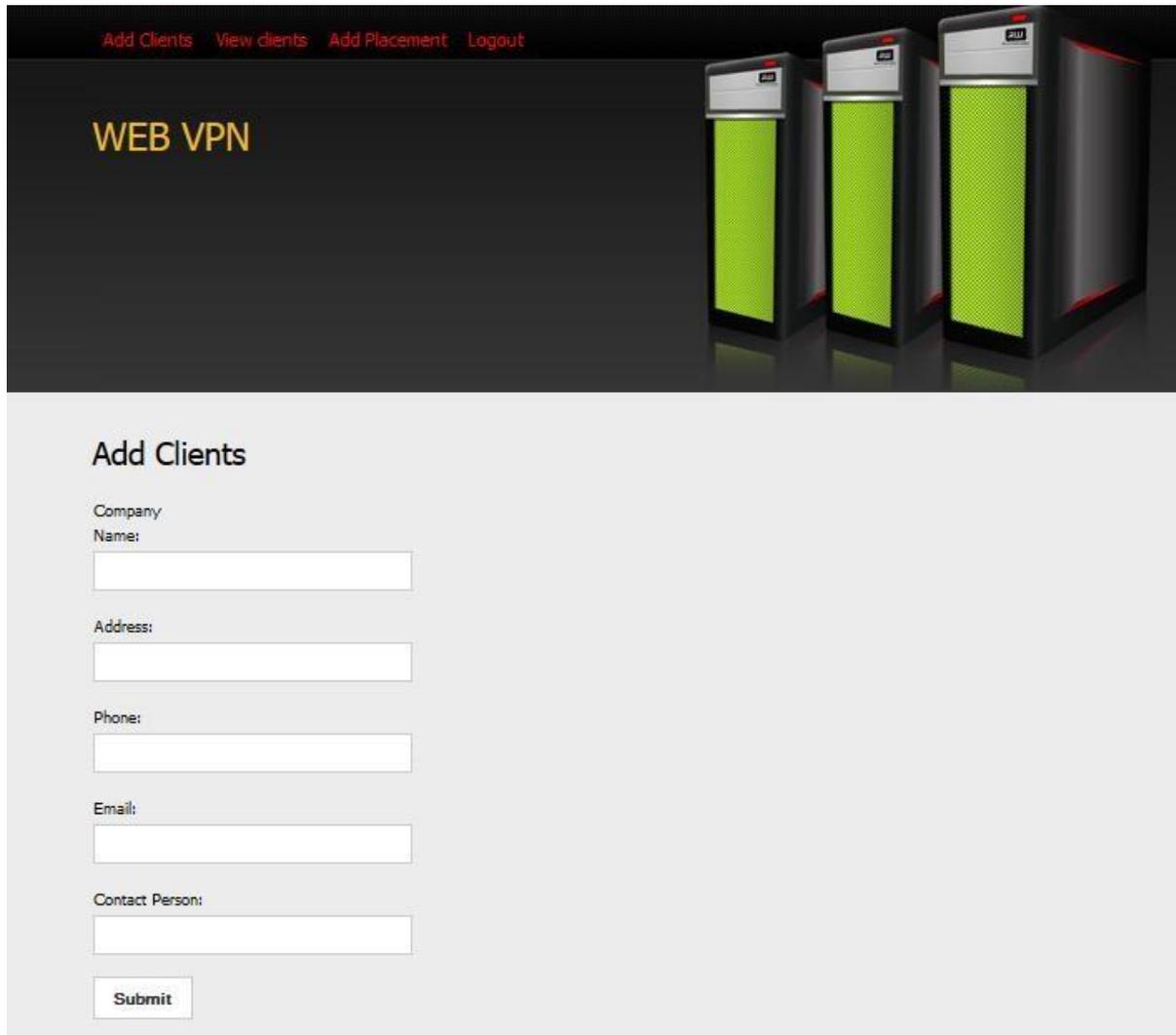
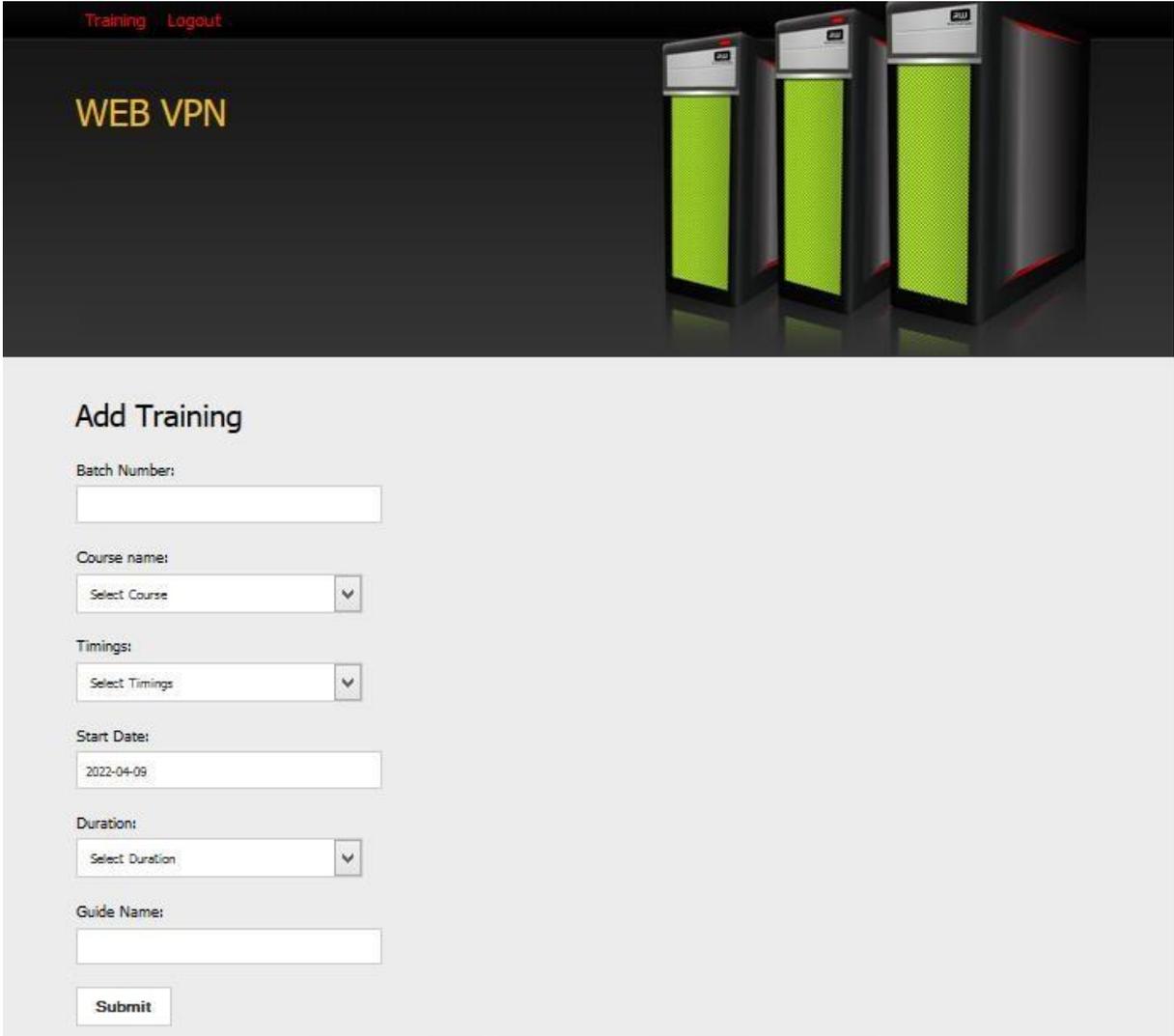


Figure 4.4.2 marketing module output screen

In this section we add the placement details of students and adding and viewing clients.

TRAINING OUTPUT SCREEN



Training Logout

WEB VPN

Add Training

Batch Number:

Course name:

Timings:

Start Date:

Duration:

Guide Name:

Figure 4.4.3 training output screen

It will show the details of students of their register number, and shows what course they select on which date and who is the guide allotted to them.

External Entity

An external entity is a source or destination of a data flow, which is outside the area of study. Only those entities, which originate or receive data, are represented on a business process diagram. The symbol used is an oval containing a meaningful and unique identifier.

Process

A process shows a transformation or manipulation of data flows within the system. The symbol used is a rectangular box, which contains 3 descriptive elements: Firstly an identification number appears in the upper left hand corner. This is allocated arbitrarily at the top level and serves as a unique reference. Secondly, a location appears to the right of the identifier and describes where in the system the process takes place.

Data Flow

A data flow shows the flow of information from its source to its destination. A data flow is represented by a line, with arrowheads showing the direction of flow. Information always flows to or from a process and may be written, verbal or electronic. Each data flow may be referenced by the processes or data stores at its head and tail, or by a description of its contents.

Data Store

A data store is a holding place for information within the system: It is represented by an open ended narrow rectangle. Data stores may be long-term files such as sales ledgers, or may be short-term accumulations: for example batches of documents that are waiting to be processed. Each data store should be given a reference followed by an arbitrary number.

Resource Flow

A resource flow shows the flow of any physical material from its source to its destination. For this reason they are sometimes referred to as physical flows. The physical material in question should be given a meaningful name. Resource flows are usually restricted to early, high-level diagrams and are used when a description of the physical flow of materials is considered to be important to help the analysis.

CHAPTER 5

SYSTEM TESTING AND IMPLEMENTATION

5.1 SYSTEM TESTING

It is the process of exercising software with the intent of finding and ultimately correcting errors. This fundamental philosophy does not change for web applications, because web based system and applications reside on network and inter-operate with many different operating systems, browsers, hardware platforms and communication protocols. Thus searching for errors is significant challenge for web applications.

TESTING ISSUES:

1. Client GUI should be considered.
1. Target environment and platform considerations
2. Distributed database considerations
3. Distributed processing consideration

5.2 TEST CASES AND REPORTS

System testing is the state of implementation, which is aimed at ensuring that the system works accurately and efficiently as expect before live operation, commences. It certifies that the whole set of programs hang together System testing requires a test plan that consists of several key activities and steps for run program, string, system and user acceptance testing. The implementation of newly design package is important in adopting a successful new system

Testing is important stage in software development. System test is implementation should be a confirmation that all is correct and an opportunity to show the users that the system works as they expected It accounts the largest percentage of technical effort in software development process.

Testing phase is the development phase that validates the code against the functional specifications. Testing is a vital to the achievement of the system goals. The objective of testing is to discover errors. To fulfill this objective a series of test step such as the unit test, integration test, validation and system test where planned and executed.

UNIT TESTING

Here each program is tested individually so any error apply unit is debugged. The sample data are given for the unit testing. The unit test results are recorded for further references. During unit testing the functions of the program unit validation and the limitations are tested.

Unit testing is testing changes made in a existing or new program this test is carried out during the programming and each module is found to be working satisfactorily. For example in the registration form after entering all the fields we click the submit button. When submit button is clicked, all the data in form are validated. Only after validation entries will be added to the database.

Unit testing comprises the set of tests performed by an individual prior to integration of the unit into large system. The situation is illustrated in as follows

Coding-> Debugging ->Unit testing -> Integration testing

The four categories of test that a programmer will typically perform on a program unit

1. Functional test
1. Performance test
2. Stress Test
3. Structure test

Functional test involve exercising the code with nominal input values for which the expected results are known as well as boundary values and special values.

Performance testing determines the amount of execution time spent in various parts of unit program through put and response time and device utilization by the program.

A variation of stress testing called sensitivity testing in same situations a very small range of data contained in a bound of valid data may cause extreme and even erroneous processing or profound performance degradation.

Structured testing is concerned with a exercising the internal logic of a program and traversing paths. Functional testing, stress testing performance testing are referred as “black box” testing and structure testing is referred as “white box” testing

VALIDATION TESTING

Software validation is achieved through a serious of testes that demonstrate conformity with requirements. Thus the proposed system under consideration has been tested by validation & found to be working satisfactory.

OUTPUT TESTING

Asking the user about the format required by them tests the output generated by the system under consideration

.It can be done in two ways, One on screen and other on printer format. The output format on the screen is found to be correct as the format designed n system test.

SYSTEM TESTING

In the system testing the whole system is tested for interface between each module and program units are tested and recorded. This testing is done with sample data. The securities, communication between interfaces are tested

System testing is actually a series of different tests whose primary purpose is to fully exercise the computer based system although each test has a different purpose all work to verify that all system elements properly integrated and perform allocate function.

It involves two kinds of activities namely

1. Integrated testing
2. Acceptance testing

INTEGRATED TESTING

Integrated testing is a systematic technique for constructing tests to uncover errors associated with interface. Objective is to take unit tested modules and build a program structure that has been dictated by design **ACCEPTANCE TESTING**

Acceptance testing involves planning an execution of a functional test, performance test and stress test to verify that the implemented system satisfies the requirement.

The acceptance testing is the final stage of the user the various possibilities of the data are entered and the results are tested.

VALIDATION TESTING

Software validation is achieved through a series of test that demonstrates the conformity and requirements. Thus the proposed system under consideration has to be tested by validation and found to be working satisfactorily. For example in customer enters phone number field should contain number otherwise it produces an error message similarly in all the forms the fields are validated

TESTING RESULTS

All the tests should be traceable to customer requirements the focus of testing will shift progressively from programs Exhaustive testing is not possible To be more effective testing should be which has probability of finding errors

The following are the attributes of good test

1. A good test has a probability of finding a errors
2. A good test should be “best of breeds”
3. A good test to neither simple nor too comple

SYSTEM IMPLEMENTATION

Implementation is the stage in the project where the theoretical design is turned into a working system. The most crucial stage is achieving a successful new system and giving a user confidence in that the new system will work efficiently and effectively in the implementation stage. The stage consist of

- Testing a developed program with sample data
- Detection and correction of error

- Creating whether the system meets a user requirement.
- Making necessary changes as desired by users.
- Training user personal

IMPLEMENTATION PROCEDURES

The implementation phase is less creative than system design. A system design may be dropped at any time prior to implementation, although it becomes more difficult when it goes to the design phase. The final report of the implementation phase includes procedural flowcharts, record layouts, and a workable plan for implementing the candidate system design into a operational design.

USER TRAINING

It is designed to prepare the users for testing & converting the system. There is several ways to trail the usersthey are:

- 1) User manual
- 2) Help screens
- 3) Training demonstrations.

1) USER MANUAL:

The summary of important functions about the system & software can be provided as a document to the user. User training is designed to prepare the user for testing and convening a system

The summary of important functions about the system and the software can be provided as a document to the user

1. Open http page
 1. Type the file name with URL index .php in the address bar
 2. Index. php is opened existing user the type the username and password
 3. Click the submit button

2) HELP SCREENS:

This features now available in every software package, especially when it is used with a menu. The user selects the “Help” option from the menu. The System success the necessary description or information for user reference.

3) TRAINING DEMONSTRATION:

Another user training element is a training demonstration. Live demonstration with personal contact is extremely effective for training users.

MYSQL

MySQL Server is a powerful database management system and the user can create application that requires little or no programming. It supports GUI features and an entire programming language, Phpmyadmin which can be used to develop richer and more developed application. There are quite a few reasons, the first being that MySQL is a feature rich program that can handle any database related task you have. You can create places to store your data build tools that make it easy to read and modify your database contents, and ask questions of your data. MySQL is a relational database, a database that

stores information about related objects. In MySQL that database means a collection of tables that hold data. It collectively stores all the other related objects such as queries, forms and reports that are used to implement function effectively.

The MySQL database can act as a back end database for PHP as a front end, MySQL supports the user with its powerful database management functions. A beginner can create his/her own database very simply by some mouse clicks. Another good reason to use MySQL as backend tool is that it is a component of the overwhelmingly popular Open source software.

CHAPTER 6 ADVANTAGES AND DISADVANTAGES

ADVANTAGES:

- **SECURE YOUR NETWORK**

The benefits of using a VPN are vast. One of the most important is the fact that businesses can effectively secure their network. Without your knowledge, an application or website can keep track of your activity online. They can then analyze the data they collect and use it to try to target you with ads. Without a VPN, you may experience an influx of pop-up ads that can interrupt your browsing experience and be a general nuisance.

If you use a VPN, it can stop people, software, and web browsers from gaining access to your connection. This keeps the information you transmit and receive secure and anonymous.

- **PREVENT DATA THROTTLING**

Data throttling occurs if you have consumed a selected amount of your to be had records, and your net service provider (ISP) then comes to a decision to slow your service down. If you have a VPN, you may quickly find one of the advantages of VPN is the ability to avoid a records cap, particularly because now not even your ISP can see how much information you're using. This may be specifically beneficial for employees who've to use information plans on their clever devices at the same time as accessing the net while on the road.

- **NETWORK SCALABILITY**

Even as a private network can help your enterprise get off the floor, the value of increasing the network may be prohibitive. If you use a VPN server, you can provide get right of entry to to many employees and remote people concurrently. You may also run key programs in a cloud surroundings and provide them get right of entry to through the comfortable tunnel of the VPN.

This could encompass some thing from e-mail to full-blown packages that you would normally run on a computer computer. Whilst employees connect with the VPN, they gain access to another pc which you use to run the software they need. Every worker with a login can get entry to the VPN and therefore the software. Adding extra personnel is best a count number of presenting greater bandwidth, if vital, and the login credentials to each new group member.

DISADVANTAGES:

- **LOW INTERNET SPEED**

The encryption technique a VPN undergoes as it secures your statistics takes time, and this can negatively impact your on-line revel in. The trouble is greater mentioned with sure VPNs than with others, so it is vital to check the specifications earlier than you settle to apply the provider.

VPN blockers can negate the effectiveness of a VPN. Some web sites, or even a few international locations, block people who use VPNs from gaining access to websites and content material. This occurs in several countries, which include Iran, Iraq, Turkey, and Oman. Normally, this is performed to save you their citizens from consuming content material they sense is beside the point, such as news websites, amusement, and anything else from other international locations that they sense ought to negatively effect their residents.

- **COMPLEX CONFIGURATION**

VPNs have a few moving parts that can be difficult to understand. If you do not have much exposure to networking terminology, you may be better off choosing a VPN provider equipped with the support services necessary to get you up and running.

You can also look into and gain the background knowledge necessary to understand the basic terms and function of VPN technology. It is important to make sure your VPN is properly configured, whether you do it yourself or get assistance. Otherwise, your communications could be left exposed to hackers, malware, or other threats.

CHAPTER 7

REASONS WHY EVERYONE SHOULD USE A VPN MONITORING SYSTEM

SECURITY ON PUBLIC WI-FI

Public Wi-Fi is convenient but comes at the expense of security. When you're answering emails at a local coffee shop or absent-mindedly scrolling through social media at the airport, someone may be tracking your online activity.

Using a VPN protects your data while you are on other networks, hiding your browsing history, banking information, account passwords and more from ill-intentioned internet strangers.

DATA PRIVACY FROM YOUR INTERNET SERVICE PROVIDER

While connected to your home Wi-Fi, you are less likely to be attacked by strangers than on a public connection. However, your data is still vulnerable.

Your ISP or internet service provider—Comcast, Spectrum, Verizon or other company who you pay for Wi-Fi each month—can access all your internet data. Your ISP can see when, where and how you browse.

This data can be collected and sold to advertisers even if you're using the "private" browsing function, and it can be dangerous in the wrong hands in the case of a data breach. A VPN can help obscure your IP address from your own ISP.

DATA PRIVACY FROM THE APPS AND SERVICES YOU USE

Your ISP isn't the only potential liability that you've brought into your own home. Unfortunately, many of our favorite apps and internet services have been called out for the way they've used the data of their users.

A VPN will prevent apps and websites from attributing your behavior to your computer's IP address. It can also limit the collection of your location and browser history.

DATA PRIVACY FROM YOUR GOVERNMENT

While many ISPs, apps and internet data hubs suggest they don't sell your browsing data to governments, the information nonetheless finds its ways into their hands—even in the U.S.

Since 2013, when Edward Snowden first revealed that Verizon had been selling users' internet and phone data to the NSA, Americans have become more aware of the different ways the government surveils and collects their data. Following the Snowden leaks, and subsequent outrage, several laws were enacted to curb government surveillance.

However, as recently as January of this year, the Defense Intelligence Agency bypassed a law demanding that government agencies produce warrants before compelling phone companies for their user data by paying third-party data brokers for that same data, according to the *New York Times*.

If you have qualms about governmental overreach, a VPN is a good investment in protecting your data.

ACCESS TO ANY CONTENT IN ANY PLACE

While Hulu may frown upon your use of a VPN to stream the latest *Criminal Minds* episode in a country where the content isn't offered, this VPN usage is not illegal (in the U.S. and in most countries), and it helps provide a useful workaround to content restrictions.

VPNs spoof your location, making it seem as if you are browsing from another place. That means you can get your *Criminal Minds* fix even if it's not available locally.

SECURITY WHEN WORKING REMOTELY

One benefit of a VPN is its data encryption features. Encryption, or putting data into a coded format so its meaning is obscured, allows you to keep confidential information safe.

If you are an individual thinking about investing in a VPN for your company, one benefit is that workers can connect to your office network and look at sensitive materials on their own devices while away from the office. As remote work seems a possibility even after the pandemic ends, a VPN is a helpful investment to keep confidential material safe off-site.

ADAPTABLE TO NUMEROUS SMART DEVICES

While many of us may first try a VPN on a company-loaned laptop, many VPN services also protect other smart devices such as your phones, tablets and desktop computers. Each VPN company may offer slightly different protection plans and have different capacities to protect different devices, but many providers offer plans that help keep you safe on multiple devices.

SMART SAVINGS

If you are willing to put in a little research, a VPN can help you save money via its location spoofing capabilities. Many types of businesses, such as subscription services and airlines, offer the same amenities or products for different prices. If you change the appearance of your location to a place where services are offered cheaper, you can end up with big savings.

CHAPTER 8

CONCLUSION

The "Virtual Private Network (VPN)" has emerged as one of the leading technologies at present and has attracted the attention of many organizations looking to both expand their networking capabilities and reduce their costs.

This paper deals with the upcoming technology, VPN - Virtual Private Network which has proved itself to be lot reliable in transferring data between remote places via a secured network thus paving way for **Data Security**

The VPN has the ability of providing connection between the user (client) & the server of the organization not within the workplace itself but from home too with the data being transferred & received in a highly secured way.

Digital certificates are used in a **network security** system to guarantee that the two parties exchanging information are really who they claim to be. A certificate authority keeps a complete list of all certificates it has ever issued and information on their status: valid, expired, or revoked.

CHAPTER 9 FUTURE

ENHANCEMENT

Future scope Following the rise in a number of emerging trends such as Bring Your Own Device (BYOD) and the Internet of Things, we can now expect virtual private networks to become ubiquitous. VPNs were initially created to provide remote access to network resources. From there, the VPN industry is now undergoing a shift in its focus to make privacy a core

focus. In future new encryptions can be incorporated, VPN technologies coming to market in the next five years are likely to become more and more privacy-focused. It will increase the number of VPN providers and competition on VPN market will continue to grow. In today's world, one of the main problems is that each device in one way or another collect data for different purposes. Services for communication such as Skype, WhatsApp, Gmail, Facebook, also mean the transfer of data to a third party and of course people are not comfortable with that.

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