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Description of Dr. Sellapan's Proposed Title

Title Proposed :

WEB-BASED COUNSELING SYSTEM

Deficiencies in our educational systems

Currently, there is lack of proper counseling services in the educational institutions in the country. There are thousands of schools, polytechnics, colleges and universities in the country. However, together they employ very few qualified, competent, and professional counselors. Some institutions have no counselors at all while others may have at most one or two counselors to service hundreds if not thousand of students. Very often, these counselors are actually teachers but they double up as counselors.

The reason for this state of affairs is because the owners or sponsors of these institutions (such as the government) cannot afford to employ so many professional counselors as the services of these counselors are often expensive. There is a lack of professional counselors to meet the needs of all the institutions in the country. Some of them may not even want to work in institutions of learning. Thus the students are not given professional counseling services. And this several implications:

- Lack of counseling services often in "square pegs in round holes" – a mismatch between individual interests of students and their fields of study. This results in students branching to fields of studies that they are not naturally gifted or interested. And if the students are not gifted or interested, they will not excel in their fields of studies. That is, they will not properly developed, their contribution to the nation and society will not be optimal and this will result in the nation becoming poorer.

- Lack of counseling services often lead to social problems such as lack of motivation and poor performance, depression, poor interpersonal relationships, lack of career guidance, drug abuse, violence, sexual abuse and vandalism. Not only the students suffer, but also the parents, teachers, communities and the nation as a whole. This is certainly undesirable. The social cost is extremely high if these problems are not minimized.

- Cost of hiring professional counselors is very expensive.

- Even if all institutions can afford to employ professional counselors (which is almost impossible), not all students will make use of their services. Personal counseling can be threatening for some students. They would rather prefer to be counseled confidentially or anonymously. They don't want others to know about their problems.

Acknowledgement

I would like to extend my sincere thanks to my supervisor Dr. Sellapan for giving me this topic which was one of his main project and showing me the guidelines and the most effective way to produce this system .

Secondly , I would like to thank Mr. Bala for assisting me in finding ideas and books needed for my thesis . I also wish to thank to my lecturers who have guided and poured some wonderful ideas for my thesis.

Finally I would like to thank my friend Kiruban who has given a lot encouragement and support for me to complete and produce a good thesis report.

Lastly,not forgetting to my family and god for the blessings and support during this entire project.

Yours truly,

Avinash Prathap

WEK 98256

Abstract

As we know that the advancement of information technology and increasing numbers of users getting connected to the Internet, different promotional methods are employed on the World Wide Web (www). Providing sufficient information, so as to entice to user to visit the property. Effects of the technological developments in the counseling scope and the fruits of applied technology with the main factor of economic force.

Profit motives that are always behind the scenes regulating the flows and rates of implementation has shape the relative popularity and growth patterns of competing , usually interdependent and products.

Therefore value added services such as providing the online counseling services for students or users will be beneficial to the institutes , colleges, varsities and schools . This project will be focused on developing a web based counseling system that will be deployed within the website of institutes or educational, organizations in the Internet as to provide the service an value added service feature and the capability in an online schools, varsities, colleges systems that has not been developed such a feature but still practicing the conventional way. The main consideration in this project is implementing the easy way of counseling which could ease of use, cost minimizing and it would be personal and manageability.

INTRODUCTION

Project Overview

Globally, counseling is a common term and important service for people, basically to improve and assist people to overcome their difficulties. Counseling, basically the objectives is to find courage and confidence in facing their problems and guide them towards self-reliance.

Counseling has many different scopes, which is divided into 6 main approaches: -

1. **Person-centered**

   A way of working in counseling that puts the client at the center of the activity, and has the belief that the client knows best how to solve their problems.

2. **Eclectic**

   Any counseling theory or practice that uses and combines beliefs, findings and techniques selected from a wide range of theoretical systems.

3. **Psychodynamic**

   A general term for approaches to counseling heavily influenced by the work of Sigmund Freud.

4. **Transactional Analysis**

   Therapeutic work with individuals and their relationships originating in the work of Eric Berne.

5. **Gestalt**

   A humanistic psychotherapy approach based on the work of Fritz Perls.

6. **Psychotherapy**

   Psychotherapy means working on problems using psychological methods. Depending on the question, the approach used may be through counseling, listening, relaxation, dream-work, fantasy work, story telling and many other techniques, all with the aim of assisting your deeper self to help you to achieve beneficial change.

Thus, counseling thru out the scope has many different criteria, services, dimension, theories and guidelines.

As we know there are many organizations, schools, educational centers and higher learning institutes offers various counseling help. In accordance to the objectives these organizations are also involve in many programs to develop a very good relationship to solve and help those who needs help.

Definition

A Web based Counseling is web-based informative application. It provides very useful information on counseling aspects for the users especially youths. This will be guidance to the youths to know what are the proper guidelines and supportive assistance they could find in solving their problems.

The user can retrieve the information on their issues, provided assistance, answers, required information and common questions related accordingly to the issues, guidance of the professional counselors and a lot more. User can get the information directly by clicking the appropriate icons. Users can also demand for any additional information through e-mail and voice their views through feedback postings. Forum section will be provided where users can interact with the counselors to discuss further about their problems.

The main objective of the site is to feed the requirement and solve the issues on the site itself without further links and help from the other channel as stated above.

This will be more useful and effective to the users in order to minimize their time, cost and others, which could be easily, handle without much procedures and work limit.

Project Motivation

Undoubtedly Internet has emerged as an effective communication channel in the late 20 century. With the introduction of browser such as Mosaic and Netscape, which features graphical user interfaces, the www has become readily accessible]. Organization, universities and schools rushed to become wired in order to provide information to of Internet usage among users.

This project has been suggested to study and develop a WEB BASED COUNSELLING INFORMATION SYSTEMS. In order to assist the target users especially the youths to tackle and overcome their problems, based on the different

criteria of the issues. These criteria, for example, can be parental crisis, academic achievement, social problems and others.

Based on the preliminary research, current web based counseling in global does not have suitable solutions to help or assist youths to reconstruct and develop till the maximum of their capital.

This project is definitely feasible for implementation with the following reasons:

Internet has become a cheap mean of publicity and disseminating information. Nowadays, we can get access cost as well as low hardware cost. Therefore, it is wise to develop a web based counseling information system for youths.

Information can be acquired through and solutions in different prospect could be solved immediately.

Objective

The main objective of WEB BASED COUNSELLING SYSTEMS by maximizing human capital is to provide effective solution and information that is developed based on the needs of youths. Providing feedback and services for the youths will ensure this. This project also aims to develop a fulfilled information and requirement containing all required solutions for the problems. This web-based application should be effective in presenting information to the users. By this project youth should be able to find accurate and positive outcome of their problems.

Expected Outcome

A web-based counseling used to provide variety information on problems solving. Users can also give suggestion and request for additional information of their choice. They can send their comments regarding to this system. The system will ensure the *interactive* among the users to *maintain* and ever growing counseling system.

Task

This project is basically divided into two different scopes which is constructed by two person, where tackling the roots of the problems, designing, implementing, tracking

the path of the problems and solving to minimize the youth capability in facing the outcome. This is dual person project.

Project Team

Project Supervisor

Dr. P. Sellappan
Associate Professor
University of Malaya

Programmers

Avinash Prathap *WEK98256*

- Tackling (physiology), designing, constructing.
- Web-site development
- Debugging

Kiruban Poovan *WEK98273*

- Interface, constructing, implementing, Integration
- Back-hand development

Basically combination of the workload is the conclusion in implementing the project.

Literature Review

Overview

In the process of developing a web-based counseling system, researches have been done to understand the non-computerized and computerized system. Studies in this project also involves the field of multimedia development, its evolution as well as various new concepts, which focus on the implementation of new application.

Basically the systems that we are working out conclude a very big scope, which we are only concentrating on counseling youth's directly different compare to the existing systems. Basically to create the proper solutions the first step taken to understand youths problems mainly understanding the physycology and extra human capabilities.

The Definition

Research had been done globally to get some information and ideas to construct the systems. According to ***Professor Gill Jackman*** from United Kingdom who runs a centre for counseling, it is a big task to develop a systems that could tackle the youths problems practically without proper understandings, feelings, positive treatment and many others.

In order to the statement, below is his written feedback about the systems:

Perhaps the short answer is:

"That therapy or counseling is usually about problems that people have in relating to other people. Therefore the real work or healing of that problem also comes about through relating directly to people. In this case, the therapist. If you assume that 'the problem' is the equivalent of some measurable scientific equation then perhaps it could be 'solved' but for me, people are not problems to be solved. However, exploration and the raising of awareness about who we are as individuals and even how we relate could, Potentially be opened up using the methods you describe. This would not necessarily is a good thing as, unless there is a professional to talk to who will provide the necessary caring needed, clients using solely software, as clients using self help books, can easily get hold of the wrong end of the stick and dig themselves an even deeper hole in their thinking. Therapy is about encouraging people to feel, and that needs someone who cares and understands to be around. Someone who was solely a cognitive therapist would probably find it the most useful. Cognitive therapy is an analysis of how a client is thinking, an identifying of that and a replacing with more positive or

constructive way, depending on person's aims. It probably holds the greatest parallels with computer programming; particularly something called neuro linguistic programming. However, we are more than just our thoughts so unless there was also a real, trustworthy and professional relationship around, I'd consider this to be quite limited in its long-term effect."

Comparison

The system is developed with full specs and requirement where users could totally rely with one stop solution based which is differs from the others where the other website Offers services like:

- Online counseling
- Fixing an appointment with counselors
- Definition and understanding of counseling.

The systems requirement is hi-techly done with all the psychology and therapy concepts, which is the real medicine for the systems to work.

INTRODUCTION TO INTERNET

Definition of Internet

Internet is a network of organizational internal computer networks. Organizational internal computer networks can be a hospital computer system, corporate computer system and others. Each participative computer network such as personal computer and LAN, WAN is called a **node**. A node may include several other networks. Computer system or network (node) is connected to Internet by TCP/IP. TCP/IP is a communication protocol.

History of Internet

The internet was initiated in 1969 as a project of the U.S Department of Defence, to test the feasibility of a wide area computer network over which researchers, educators, military personnel and government agencies could share data, exchange messages and transfer files. Today internet is used over 30 countries by governments, universities and private individuals and organizations. Common internet services are:

- Information retrieval services (Ftp & Gopher)
- Information search services (Archie, Veronica)
- Communication services (E-mail, Telnet)
- Multimedia information services (World Wide Web)

Open Systems Interconnection

OSI is a seven-layer model of protocols for computer - to - computer communication. Initially presented in 1979 this layered approach was an attempt provides interpretability among computers. The benefits are:

- Network software and hardware engineers can allocate tasks among network resources more easily and effectively.
- Network managers can assign responsibility within their departments more effectively.
- Seven layers of OSI are, Physical, Data, Network, Transport, Session, Presentation and Application.

TCP/IP

The TCP/IP protocols were introduced in 1974 during the development of the predecessor of the Internet, ARPANET (Advanced Research Projects Agency Network). The developers were Vint Cerf and Bob Kahn (Cerf joined MCI in 1982). ARPANET was constructed so researchers could share information with university, military and defense contractors to study how communications could be maintained during disasters. Four layers of TCP/IP are application, host-to-host, internet and network access.

World Wide Web (WWW)

The World Wide Web is a client-server technology that uses the Internet (and the TCP/IP network protocol) as a communication tool to easily and inexpensively disseminates customizable documents and other information on a worldwide basis.

The Internet (or the National Information Highway) is a mechanism to transport message packets between users. In the same way that busses, cars, and trucks travel the Interstate Highway System, the World Wide Web describes a specific type of vehicle that transports message packets on the information highway.

HTTP

Hypertext Transport Protocol (HTTP) is used to transfer Hypertext Markup Language (HTML) documents across the Internet. These protocols were based on a proposal by Tim Berners-Lee at CERN (The European Particle Physics Laboratory) in 1989. HTTP provided a means of transparently moving from document to document and indexing within a document.

HTTP is an application-level protocol that enabled what is commonly referred to as the World Wide Web. HTTP is a generic, stateless, and object oriented service that can be used to transfer data independently of the system.

HTTP is also used for communication between user agents and various gateways, allowing hypermedia access to existing Internet protocols and designed to allow such gateways, via proxy servers, without any loss of the data conveyed by those earlier protocols.

Steps to build a web page

There are four main processes to build a web page. These are

- Creating Image

There are a lot of software that can assist us in this image creating, such as CorelDraw, Adobe Photoshop and other software that is based on user friendly and easy to use.

- Create a layout for web base

This would be a child play with the help of Microsoft Front page 98, Adobe Pagemill, Netscape Composer and other software's.

- Upload web base

This process will be easy by using software like Jgaa's War FTP Daemon, Winsock FTP, Win FTP, Cat Soft's Serv-U .

- Getting an URL and connection for search engine

This is the last process. We can connect to some popular search engine like yahoo, AltaVista and other search engines. This will enable the user come across our system when they are looking for any medical system.

What is a good web page

- Quality of information
- Quality of Image, colors, graphics,
- Quality of user friendliness

COMPUTER BASED INFORMATION SYSTEM

A computer-based information system (CBIS) is composed of hardware, software databases telecommunications, people and procedures that are configured to collect, manipulate, store and process data into information [Ralph, 1996].

Management Information systems

One branch of CBIS is Management Information System. The primary purpose of an MIS is to help an organization achieve its goals by providing managers with insight into the regular operations of the organization so that they can control, organize and plan more effectively and efficiently. If short an MIS provides managers with information used to provide feedback to various business operations. In doing so an MIS supports the value -added process of an organization.

A manufacturing MIS for example can help managers monitor a manufacturing a process that adds value raw materials by assembling them into finished products. The MIS accomplishes for the most part this through various summary reports output. These summary reports can be obtained by filtering and analyzing the highly detailed data contained in transaction processing database and presenting the result to managers in a meaningful way. These reports support managers by providing them with data and information for decision making in a form and fashion they can readily use.

The primary difference between the reports generate buy the transaction processing system or TPS and those generated by the MIS is that MIS reports support managerial decision making at higher levels of management, where the decisions themselves tend to be less structured and less routine. While a TPS most often supports organizational efficiency, an MIS supports managerial effectiveness.

One important role of the MIS is to improve effectiveness by providing the right information to the right person in the right fashion at the right time.

DATABASE

Traditional approach to data management produced many problems like data integrity, data redundancy, and multi-user access and so there was a desire to develop a more efficient and effective means of organizing data. The result was the database approach to data management. A database approach is one in which a pool of related data is shared by multiple application programs. Rather than having separate data files, each applications use a collection of data files that are either joined or related together in the database.

The database approach can offer significant advantages over the traditional file-based approach. For one by controlling data redundancy, the database approach can use storage space more efficiently and increase data integrity [Ralph, 1996]. The database approach can also provide an organization with increased flexibility in the use of data. Because data once kept in two files is now located in the same database, it is easier to locate and request data to be processed in a number of ways. A database also offers the ability to share data and information resources. This can be a critical factor in coordinating organization -wide responses across diverse functional areas of a corporation.

In order to use the database approach to data management, additional software database management system (DBMS) is required. DBMS consists of a group of programs that can be used as an interface between a database and the user or the database and application programs. Typically, this software acts as a buffer between the application programs and the database itself.

The most important condition for high quality information system is Relational Database. Relational database uses data stored in tables, which simplifies the data maintenance and simple query language to request information. Relational databases are easily portable to other hardware platforms. Benefits using relational database:

- Easy set up
- Simple maintenance
- Easy definition of relations
- Structured query language
- Speed
- Flexibility and portability
- Support great number of hardware platform

CLIENT -SERVER COMPUTING

Client-Server computing is one of the most dominant paradigms of IT and has developed as the computer industry moved from a centralized shared logic-based systems to a network of workstations and servers. Client-Server involves providing an application architecture that enables a computerized process to be broken up into two or more less complex tasks with a communication mechanism for these sub-processes to co-operate. The key notion of breaking up the problem is to provide designated layers of functionality that can be written and deployed across multiple machines in an optimized manner.

The development of separate layers needs careful design and an accurate definition of the distinct boundaries to ensure that logic within the different layers is not intertwined. Encapsulating the logic in this fashion ensures that future changes can be implemented with minimal impact on the other layers and enables both reusability and reliability.

Client-Server is regarded as an enabling technology that can implement systems across an organization in a modular and flexible manner, It allows for the distribution of applications away from single machines located in isolated departments to an implementation across the enterprise. The investment in client-server systems had been accelerated by the rapid advances in hardware technology, the appearance of powerful client-server development tools and the decrease in prices of implementing these smaller but faster platforms.

In usual client-server model, one server is activated and awaits clients request. Typically multiple client programs share the services of a common server program. Both client programs and server programs are often part of a larger program or application.

Two-Tier Architecture

The first generation of client-server systems is an evolution for the file sharing applications. With these applications, the central file server is replaced with a specialized relational database management systems (RDBMS). Such databases can offer high transaction rates at a fraction of the cost associated with mainframes. When the client (a workstation application typically using a GUI) needs to act upon data, it makes request via a network to the database server – the database then processes the request and returns just the data appropriate the client's needs.

When compared to the file sharing applications (which returned the complete file), this client-server architecture dramatically reduces network traffic. In addition, today's databases provide many features that enable the development of sophisticated multi-user applications. Because the processing is split between distinct layers- the workstation and the database server – such architectures are referred to as being two-tier client-server.

Three-Tier Architecture

In the three-tier architecture, an additional middle tier was added between the user system interface client environment and the database management server environment. The client communicates with the middle tier, using standard communications protocols such as TCP/IP. The middle tier provides basic message switching and contains the business rules of the application, It is responsible for:-

- ✓ Action upon client requests, applying business logic and invoking database requests.
- ✓ Handling the database responses, applying for further business logic and generating a client-response.

The three-tier client-server architecture has been shown to improve performance for groups with a large number of users (in the thousands) and improves flexibility when compared to the two-tier approach. Flexibility in partitioning can be as simple as "dragging and dropping" application code modules onto different computers in some three-tier architecture. A limitation with three-tier architectures is that the development environment is reportedly more difficult to use that the visually orientated development of two-tier applications. Recently ,mainframes have found a new use as servers in three-tier architectures.

Multi-Tier Architecture

A further extensions to three-tier solutions is the multi-tier or as it is sometimes called, ***n-tier***. These solutions are the most flexible and scalable and build on all the advantages of the three-tier architecture. In a multi-tier client-server solution, the business logic is partitioned and distributed over several machines. As requirements change during a systems lifetime, this partitioning and deployment can be reviewed and amended with minimal impact. Furthermore, additional tiers are included tiers are included to support multiple databases and other services such as message switches, legacy systems, data warehouses, communication channels and so on. By enabling the distribution of the workload over many CPU's (using either symmetric multiprocessing or massively parallel clustered technology), it is obvious how scalability – with the aim of 'no limits' – can be achieved. Sometimes the distribution of the logic over separate geographical regions can be considered to achieve optimum performance.

System Analysis / Methodology

The objective of this chapter is to discuss about the methodologies, techniques and tool that we have adopted to develop this web-based counseling system. This chapter will be divided into four major sub topics, which include:

3.1 System Methodology

3.2 Information Gathering Techniques

3.3 Requirements Analysis

3.3.1 Functional Requirements

3.3.2 Non Functional Requirements

3.4 System Requirements

3.3.3 Software requirements

3.3.4 Hardware requirements

System Methodology

A methodology may be defined as a collection of procedures, techniques, tools and documentation aids. The procedures, techniques, tools and documentation aids help the software developer to speed up and simplify the software development process.

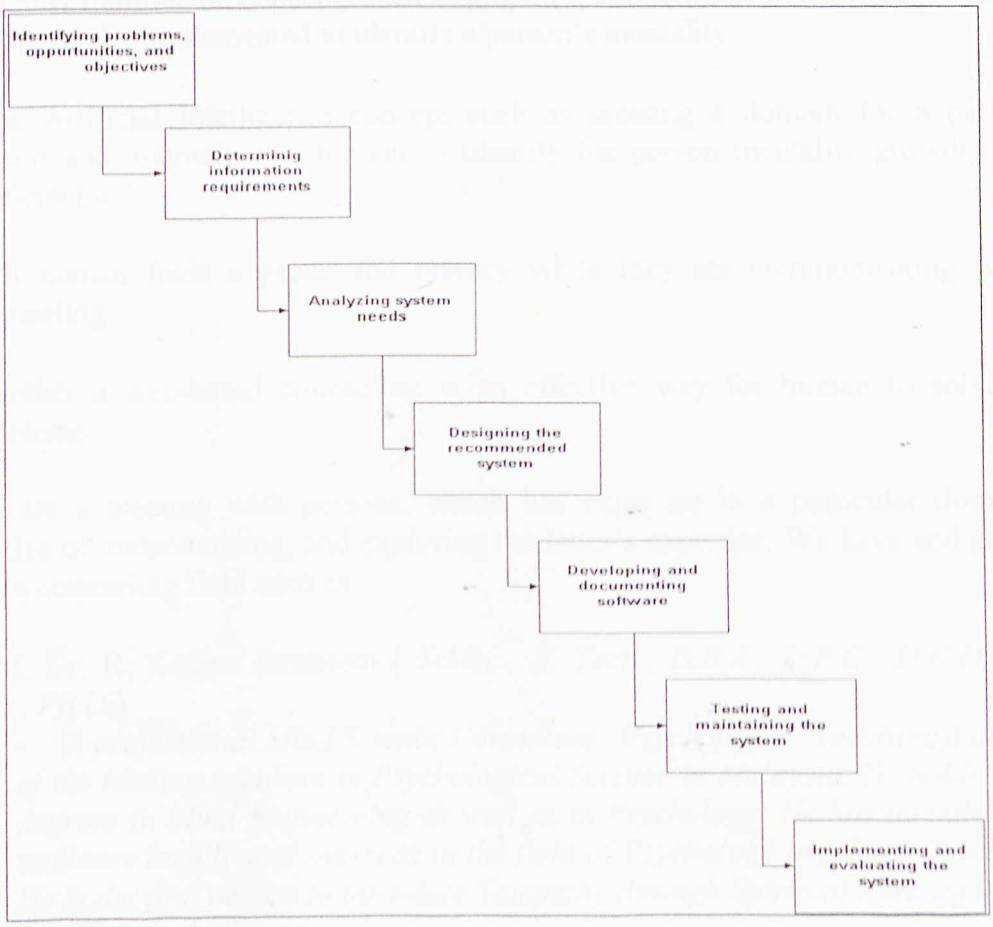
A methodology is a way of doing things. The main objectives of a methodology includes the following:

- Record accurately the requirements
- Provide a systematic method of development so that progress can be monitored
- Provide an appropriate time limit and an acceptable budget
- Produce a system that is well documented and easy to maintain
- Provide an indication of needed changes as early as possible in the development process
- Provide a system that is user-friendly

In order to select an appropriate methodology, a system developer must first know the requirements of the system. After a study that we have conducted, we have chose ***Structured Systems Analysis and Design Methodology*** to be the base for our web-based counseling system.

Structured Systems Analysis and Design Methodology is a systematic approach that analysts take to analysis and design the information systems. Much of this embodied in what is called the systems development life cycle or SDLC.

Although this systematic approach sub phases is laudable, we generally divided the cycle into seven major phases, as shown in Figure 3.0.



Information Gathering Techniques

Information gathering techniques or data collection include interviews, observations, documentation review, questionnaires, and research. It is not a mandatory to use all these techniques in order to obtain a very good data. We have to choose appropriate techniques according to the system we are developing because certain techniques such as interviews may be prejudice.

In order to develop the prototype of web-based counseling, we have decided to use research and interviews approach to understand in depth about our system that upon to be develop. Why we

chose research and interviews because: Counseling is an area that so wide to be understood because it involves understanding of a complicated creature that is human being. Everything in this world becoming electronic. Everything prefixes *'e'*. This makes people demand for more, better and faster service. So, integrating computer technology into counseling is very challenging job.

We have to identify how computer can help to be the solution or supplement for problem solving for everyday humans problems. How research and interviews can be very helpful in designing this e-counseling or web-based counseling. Research is *a careful search or inquiry into subject to discover facts by study or investigation.* Objective of our research are:

- Whether multimedia concepts such as graphics, animation, colors or combination of colors can be implemented to identify a person's mentality
- How Artificial Intelligence concept such as creating a domain for a particular person and maintain the domain to identify the person mentality growth can be implemented
- Will human finds a peace and privacy while they are communicating with e-counseling
- Whether a web-based counseling is an effective way for human to solve their problems

Interviews are a meeting with persons, which has expertise in a particular domain of subject with a motive of understanding, and exploring the latter's expertise. We have and going to interview experts in counseling field such as:

- Prof. Dr. R. Kadeer Ibraheem (*MMsc., B. Tech., D.B.A., D.P.C., D.N.D., A.D., Psy., Ph.D.*)
  - *A professional Mind Science Consultant., Psychologist, Nutritionist and one of the leading speakers in Psychological Science In Malaysia. He holds honors degrees in Mind Engineering as well as in Psychology. He has attended many seminars locally and overseas in the field of Psychology and Para Psychology. He is the first person to introduce Telepathy through Spiritual Aura and Colour Theraphy in Malaysia.*

- Mr. Sivasubramaniam (*Master In Business Administration*)
  - *A consultant with expertise in business and human physiology. He has proven track record for developing CACHE SDN BHD from "0" capital to RM 1,000,000 capital worth company. CACHE is the pioneer company in software development specializing in Tamil language type setting and their evergreen product called "MURASU" which is well popular all around the world. He his pursuing his PHD on Artificial Intelligence in Business Decision Making.*

- G. SuryaMoorthi
  - *An expert in mind mapping techniques*

Using both of these techniques, we strongly believed that we would reach to certain understanding of how computer and counseling will work together to serve the human in a very effective and friendly way.

Requirements Analysis

A *requirement* is a feature of the system or a description of something the system must to do in order to achieve the objectives of the system. Basically system requirements fall into two major categories:

- Functional Requirements
- Non functional requirements

Functional Requirements

Functional requirements are those requirements that are directly needed by the system. For web-based counseling, the ultimate aim of this system is to bring the user to certain stage where the user fully understand the root of their problems and able to make a decision by their own self. The functional requirements for web-based counseling are as listed below:

- To provide a screen or a layout which gives the user a piece of mind.
  - This is very important because, even though how good the technology it is, all is depend on how the technology is "directed".
- To provide total guides to user to go through a several question and answer session
- To provide a wizard where the user can obtain a global view of his/her problem

Non Functional Requirements

Non-functional requirements are those requirements that are not directly needed by the business but are nevertheless important. Looking into this, there is vast number of non-functional requirements for web-based counseling. The non-functional requirements for web-based counseling are as listed below:

- A good security measure to maintain the privacy of each user's particulars
- A constant update of new physiology methodology to our system
- The web page should be accessible round the clock all the time

System Requirements

System requirements can be divided to two major requirements, that are hardware requirements and software requirements to build this web-based counseling system. The hardware requirements are:

- Windows NT web server and sufficient web server space must be made available for the project and ongoing maintenance of the system.

The software requirements are:

- The nature of the project requires using several software to develop the web-based Application. A research has been made to evaluate the types of database and programming language to be used, and we found that Microsoft Access Database 2000 Jet Engine, Microsoft Active Server Pages, Microsoft Internet Information Server, Microsoft FrontPage 2000, Microsoft Visual Basic 6.0 and Adobe Photoshop are required to build the web-based Application rapidly. In addition to that, the web-based Application requires the Database to be hosted on the Web Server.

System Design

The objective of this chapter is to discuss about the system design of this web-based counseling system. This chapter will be divided into:

4.1 System Architecture

4.2 Database Design

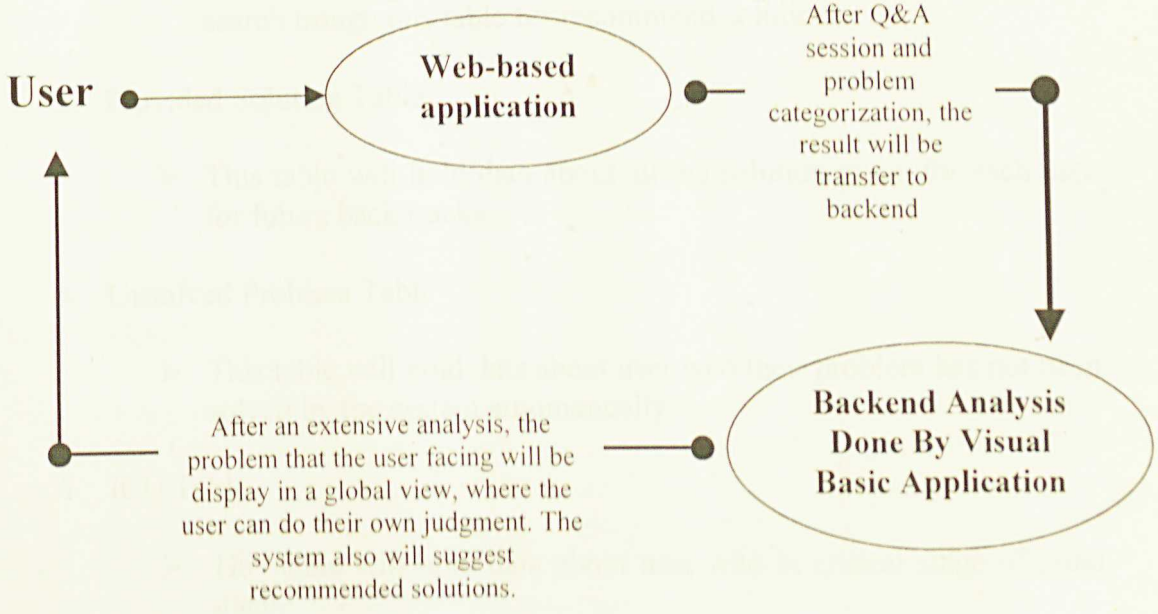
4.3 Interface Design

4.4 Design Methods

4.5 Program Design

System Architecture

Basically, this web-based counseling system will be divided into two major phases which is web-based application which will extract and study the characteristic of the user and will pass this result to the backend system which will be Visual Basic application to do a extensive analysis of the users problem. The result from the analysis will transferred to the web-based application for the user display. Below is graphical representation of above explanation.



Database Design

This involves identifying the business entities, their attributes and their relationships. Other business rules (validation rules, triggers) can also be added. Below is description of the database design for web-based counseling system.

1. User Table
   - This table will hold all the information about the user, including the most intimate information about the user.
2. Identified Problem Table
   - This table is for hold all the possible problems. This table will extract the problem that a user facing from the "User Table", and categorize all the user base on the problem that they are facing.
3. Transaction Table
   - This table will hold all the data about the user checking in and out of this web-based counseling system
4. Problem Solution Table
   - This table will hold all the problem with the solution. This data will be organized in a such a way that the backend application will search trough this table for recommend solutions
5. Provided Solution Table
   - This table will hold data about all the solution given for each user for future back tracks.
6. Unsolved Problem Table
   - This table will hold data about user who their problem has not been solved by the system automatically.
7. ICU Table
   - This table will hold data about user who in critical stage of mind stage.

8. Geographic Location Table

   - This table will hold data about all the location information of Malaysia

DATABASE STORAGE

Access 2000 database will be used to manage tables, records, and product information. ActiveX Data Objects (ADO) and Active Server Pages (ASP) are the keys tool to manipulate data in Access 2000 to generate dynamic web pages for the Intranet Application. The following is the database general specifications.

Attribute	Maximum
Microsoft Access database (.mdb) file size	2 gigabytes. Total size is limited only by available storage capacity.
Number of objects in a database	32,768
Modules (including forms and reports with the Has Module property set to True)	1,000
Number of characters in an object name	64
Number of characters in a password	14
Number of characters in a user name or group name	20
Number of concurrent users	255

Interface Design

Interface design is the most crucial and important aspect that will carry the overall weight of this web-based counseling system. This is because, this web-based system will adapt to new approach of colour therapy to evaluate the user mind set. For this purpose, interface design will take concern about the usage of colours, layout design and animation in order not to disturb the users attentions. The interface also will be design in such a way to reduce the download time to a maximum level. The fundamental layout of the web-based counseling system will be base from Dr. R. Kadeer Ibraheem's research, which is colour theraphy.

The development of this web-based counseling system interface will be guideline by six major general human engineering factors, which are:

- *The screen should be formatted so that the various types of information, instructions, and messages always appear in the same general display area.*
- *The user should always be aware of what to do next*
- *Use display attributes sparingly*
- *Messages, instructions, or information should be displayed long enough to allow the system user to read them*
- *Anticipate the errors that users might make*
- *Default values for fields and answers to be entered by the user should be specified*

The interface design will avoid several deadly sin interface design, which are:

- *Extensive usage of computer jargons*
- *Usage of synonyms for same action such as EDIT and MODIFY*
- *Complex language such as NOT CORRECT instead of INCORRECT*
- *Grammatical error which might confuse the user*

Design Methods

We will use the very latest technology in designing the web-based counseling system. Following is a brief description of the major tools and languages we will use.

JavaScript

HTML is fairly restrictive, so we use JavaScript to fill in the gaps. Older browsers do not support much of today's technology, so we use JavaScript to determine the visitor's browser type and then provide only the supported features. This enables us to use the latest technology without creating problems for older browsers.

Active Server Pages (Windows NT only)

Active Server Pages is Microsoft's server side scripting tool used to develop dynamic and interactive content sites. It is exactly what's needed to attract the visitors and advertisers attention with the aim of building the dynamic website rapidly without abandoning current CGI scripts or custom components.

HTML 3.0 & 4.0

We currently code to HTML 3.0 and 4.0 standards and are committed to a strict update policy, ensuring we stay on top of this rapidly developing language. Combined with our scripting, this ensures the Web-based counseling system take full advantage of the very latest available technology.

Cascading Style Sheet

Third generation website uses Cascading Style Sheet to produce a better-looking site. Cascading Style Sheet work in similar fashion, but it is more powerful and subtle at controlling web interface. We will use Cascading Style Sheet standards to enhance **the web-based counseling system.**

Unique Artwork

We will use and design graphics that are unique to our web-sites. We will create unique artwork and graphics for each layout, in theme with the particular area of business and to their specific requirements.

Optimized Images

We will minimize graphics size to accommodate bandwidth requirements. Because bandwidth is the enemy of all site designers it can cause a trade-off between image qualities and download time. We will reduce complex graphics to small file sizes, while maintaining the quality of the original images. This in return, the Web-based counseling system will load faster.

Program Design

Web-based counseling system will consist of the following:

Web Based User Information

View, delete and update user information, around-the-clock, around-the-globe.

Web Based Counseling Methodology

To develop vivid, colorful, up-to-date counseling methodology and make it available 24 hours a day. To produce effective web based counseling methodology

Web based Search Administration

To develop comprehensive search engine based on name, description, or any other criteria to retrieve handle number, release schedules, and other relevant information instantaneously. Users information can be easily modified through simple forms on the system and immediately sent to all users. Staff can make modifications to the forms and

database on the central server and from there reach all users.

Web based user management
Provide administrative functions to manage user details and contacts.

Solution Provider
Provide administrative functions to review solution given and quick access to detailed descriptions for each users stage.

Reports
Provide extensive reports over the web for the staff.

Printable Reports
Provide simple and custom made forms to print reports from the web page.

Downloadable Reports into Excel CSV Format
Provide administrative functions to download reports into Excel CSV format for review.

Help Desk/FAQ Application
To develop sub module application and accommodate relevant answers for frequently asked questions.

E-mail Notifications
To provide email notification functions for each batch update and transaction.

Admin Area
Provide a login menu so that admin can log in and use several functions provided

What's New Area
Provide a bulletin board so user can receive news, memo and notification from different counselor.

Web Security
The Web-Based Counseling System will provide relevant application security to prevent fraudulent access to website. These include the proper method to allow registered user, administrative functions to prevent illegal access and login to the system.

Chapter 5: Systems Implementation

Coding Objectives

The coding step translates a detail design representation of software into a program language realization

Choosing the Programming Language

As a result, ASP (Active Server Pages) was chosen a language to develop this online hospital management system.

- ✓ **Tools to create application forms**

  ASP is a database or in a more specific sense a ADO connectivity based application which that enables developers to access or input information in the database just by coding basic SQL (Sequential Query Language) commands as part of the codes and instils connectivity to database within commands in the forms.

- ✓ **Support Database Connectivity**

  Database connectivity, is configured basically by setting up ODBC Connection which is part of the system 32 in Windows .In this case ASP application will act as a front-end tool for the users to add, modify, delete and view the contents of the database.

- ✓ **Tools to generate tables**

  ASP helps a user integrate HTML (Hypertext Mark-up Language), which allows the programmer to generate tables in HTML form. This can be done, by using ASP pages; just by slipping in some HTML codes between the ASP codes.

- ✓ **Easier to learn ASP compared to other powerful Web languages**

  ASP codes are basically based basic SQL commands which can be used to access databases, commands that allows you execute other commands and a few simple universal variables which you most programming languages have. For programmers who have done major application orientated languages like C or C++, maybe even web languages like Perl, ASP will be a piece of cake for them.

Coding Style

Web pages or design is done by using an "architectural approach that consist of three different layers which is the user interface layer, data layer and the transaction layer. A layered paradigm has many benefits that help meet objectives in application development. The following is a short list of these benefits:

- ✓ **Maintainability**

  Codes are organized in recognized manner. Task-Orientated code is centrally located.

- ✓ **Reusability**

  Task-Oriented codes are easily developed for reuse, specifically for tasks that cross application boundaries.

- ✓ **Testability**

  Modular can be tested easily. Modularisation breaks up the code coverage task into smaller, manageable units.

- ✓ **Speed**

  Modular codes can sagely be optimised without affecting the calling procedures.

User Interface Layer

The User Interface (UI) layer is the only portion of the application responsive to user interaction. It is where all data is presented to the user via window objects. The UI layer is also there where all inputs or modifications to a data are made via window objects. The UI layer includes all "event handlers" or "events". These are subroutines that are called upon in response to some user interaction (mouse click), during change in status of windows object (page resizing), or as callback procedures (SQL, Error). It also includes those procedures that either fill controls with data or retrieve data from controls. In short, the UI layer performs the following:

1. Displaying all application data or information via window objects
2. Responding to the changing states of window objects
3. Initiating all users request

Data Layer

The data layer supplies all data to the UI layer for display in window objects and all to the data transaction layer. The data layer includes any routine that will perform operations on an application's data. Its responsibilities should include operations such as the following:

1. Validating the data in the structure.
2. Formatting of the data for display in the UI layer.
3. Formatting of the data to be used in the transaction layer
4. Sorting the data in arrays or structures.

5.3.3 Transaction Layer

The transaction layer uses the data layer as its application data repository and transfers or manipulates all data o and from an external data source. The transaction layer includes operations such as the following:

1. Initiation or building of all queries
2. Handling violation of external database access rules
3. In control of all transactional logic

Program Optimisation

Program optimisation is a process of improving the efficiency of the system. Most wed design is a GUI (Graphical User Interface) based application, the speed as which information appears on the screen often gives user a impression on how well the program will perform. Therefore, enhancement of speed in processing is advised to be implemented. There are two ways to enhance speed, the first is to increase the execution speed of the program and the second is to decrease the amount of memory the program needs to run.

Increasing Execution Speed

Some of the steps taken to increase the execution speed are as follows:

- ✓ Avoid using variant data types because they require additional internal program standards to identify the information being stored.
- ✓ Minimize the amount of program initialisation. This makes the user perceive that the program is running faster.
- ✓ Use image control whenever displaying bitmap(BMP) images in the program

Decreasing Program Size

The steps taken to reduce the program size are :

- ✓ Reviewing codes for unused variables, constant and "dead-code" and remove it from the program codes.
- ✓ Assigning the string variable to a zero-length string, if it is no longer needed.

Chapter 6 : System Testing

Software testing is a critical element of software quality assurance and represents the ultimate review of specification, design and coding. Rules that can serve well as testing objectives are :

- ✓ Testing is a process of executing a program with the intent of finding an error.
- ✓ A good test case is one that has a high probability of finding a yet to be discovered error.
- ✓ A successful test is one that uncovers a yet to be discovered error.

IS has undergone 3 three stages of testing before a system can be considered as a complete system. They are Unit Test, Integration Test and System Test.

Unit Testing

Historically, quality software relies solely on testing each function, module or class (especially in an object-orientated programming). This practice is called Unit Testing. But this procedure is extremely time consuming and labour – intensive. Using the detail design description as a guide, important control paths are tested to uncover errors within the boundary of the module. The relative complexity of tests and errors detected as a result is limited by the constrained scope established for unit testing. Unit testing is also referred to as module testing, and is usually performed by the software developer.

For IS, Unit Testing is done during coding phase. After the source of module had been developed, reviewed and verified for the correct syntax, unit testing case is designed. The module is tested to ensure that it operates correctly.

Integration Test

Testing a specific feature together with other newly developed features is known as integration testing. Testing the interface of two components explorers how components interact with each other. Integration testing inspects the variables passed not only between two components, but also the global variables. This test phase assumes the components and the objects they manipulate have all passed their local unit tests.

Previously captured unit tests scripts can be combined to create a variety of integration test cases, with minimal effort. For instance, a unit test script that tested an ADD function can be scheduled with other tests for DELETE and COPY to create an integration test of the entire File Maintenance features with little framework.

Incremental integration approach was applied during the development of IS. IS was constructed and tested in small arguments, where errors were easier to isolate and correct. Error will be corrected before proceeding to the next integration.

System Testing

System testing is designed to reveal bugs that cannot be attributed to individual component, or to the interaction among components and other objects. Systems tests studies all the concerns issue and behaviours that can only be exposed by testing the entire integrated system or a major part of it. System testing includes testing includes testing for performance, stress, security, accountability, configuration sensitivity, usability, data integrity, start-up and recovery. IS undergone three types of system testing:

i) Security Testing

Verify the protection mechanism built into the IS that will protect it from improper penetration.

ii) Integrity Test

This is a test to make sure that when data is manipulated , the most updated version is always stored back into the database

iii) Stress Test

This is to determine whether a program fulfils the requirements defined for it. It is equally important is to make sure that a program works as it should , even under extreme conditions. In order to perform Stress Test, executes IS in a manner that demands resources in abnormal quantity , frequency or volume.

Validation Testing

At the culmination of integration testing, software is completely assembled as a package, interfacing errors have been uncovered and corrected, and final series of software tests- *validation testing* – may begin. Validation can be defined in many ways, but a simple (albeit harsh) definition is that validation succeeds when software functions in a manner that can be reasonably expected by the customer. Software validation is achieved through a series of black box tests that demonstrate conformity requirements. A test plan outlines the classes of tests to be conducted and a test procedure defines specific test cases that will be used to demonstrate conformity with requirements. Both the plan and procedure are designed to ensure that all functional requirements are attained, documentation is correct and, human-engineered and other requirements are met.

Chapter 7: Limitation and Future Enhancement

Generally, an Web Based Counselling system had achieve most of its basic objectives. However, there is still some work that could be done to further enhance the system. These facts also reflect the constraints or limitations of an Web based Counselling Systems . Examples of a few future enhancements:

- ✓ More perspective and problems should be added with more options therefore users have better options to identify quickly their need.
- ✓ This Web Based Counselling Systems system should include more capacities, which allow other users not only the students to utilise the systems with more objectives and answers.
- ✓ Should also a include an electronically generated prescription based on the counsellors solution and answers too.The special features that should be included in module for appointments are:

1. Complete set of printouts available.
2. Able to search counselling database on extra information regarding on counselling terms like Dilemma,. Conflict, Problems and many others.

- ✓ In addition, An Web based Counselling system should be able to provide for more advanced analysis needed by the users . The data would definitely be of help in the area of research by the systems or the counsellors. In addition, it should also be able to provide for the comparison of users data.
- ✓ As the database grows bigger, yearly housekeeping would be an essential feature in the future Web based counselling system. This is because the records of those users who not visited the site for more than a few years should be printed out and kept in other database. This would help to prevent data corruption as bigger files tend to be more easily corrupted in addition it helps to save the storage space and thus, increase the performance of the system.

Chapter 8: Conclusion

In conclusion, an Web Based Counseling system is indeed a feasible system solution for the counselling of general for students in schools, colleges, universities and learning institutes, due to several reasons below :

i) There are many benefits that could be derived from a Web Based Counselling system.

ii) These is basically an answer or some guidance for the users to retrieve some feedback and solution faster and easier without going for a long counselling sessions. It provides guidelines and objective where users will feel free and comfortable.. Therefore, there should be no problem of usingor learning how to go about with the system.

iii) The availability of counsellers is not necessary due to this systems which could save the cost and time by hiring them where this systems could provide and fullfil the task.

However, computer utility in the counselling field should be considered as a contemporary effort and not as a final answers for the users as the systems could not produce or help the users fully as sometimes complex problems would occur . This systems should be considered as aids rather that substitute to counsellers and teachers.

Besides that, the development of an these system has also been most beneficial to me. I have successfully developed a comprehensive and feasible system within the given months from July 2001 to Aug 2001. During this development period, I was able to apply the knowledge I have gained and the theory learnt during lecturers. Furthermore, I have acquired the knowledge of a new programming language using the object orientated approach. In addition, I have also learned to be more independent, resourceful and confident. These values are very important for our future.

About This Manual

This manual will provide the guides for the following area:

- Hardware & Software Requirements
- Compatibilities
- Configuring Web Based Counseling System
- Tour Guide Through Web Based Counseling System

Hardware & Software Requirements

Hardware Requirements

Listed below are the minimum hardware requirements to run the web based counseling system:

- Pentium 133 Mhz or Above (*Runs well in AMD processor also*)
- Minimum 16MB RAM
- Other Basic requirement of desktop computer

Software Requirements

Web Based Counseling System runs well in:

- Windows 98 Second Edition – Operating System
- Internet Explorer 4 & Netscape 4 & Above – Browser (**Web Based Counseling Is Not Browser Dependant*)
- Personal Web Server

Test Your Observation

- This section will examine users degree of observation.

Illusion

- This section is a imitation of meditation techniques which lead the user to a certain degree of concentration.

Motivation

- This section is basically, a PowerPoint presentation which presented in eye catching method to motivate the user.

Relax

- This section will provide a tongue twister text that will entertain the user and indirectly will recorded the text to his sub conscious mind. This is wonderful psychology mixed text that carries a lot of meaning.

Bored

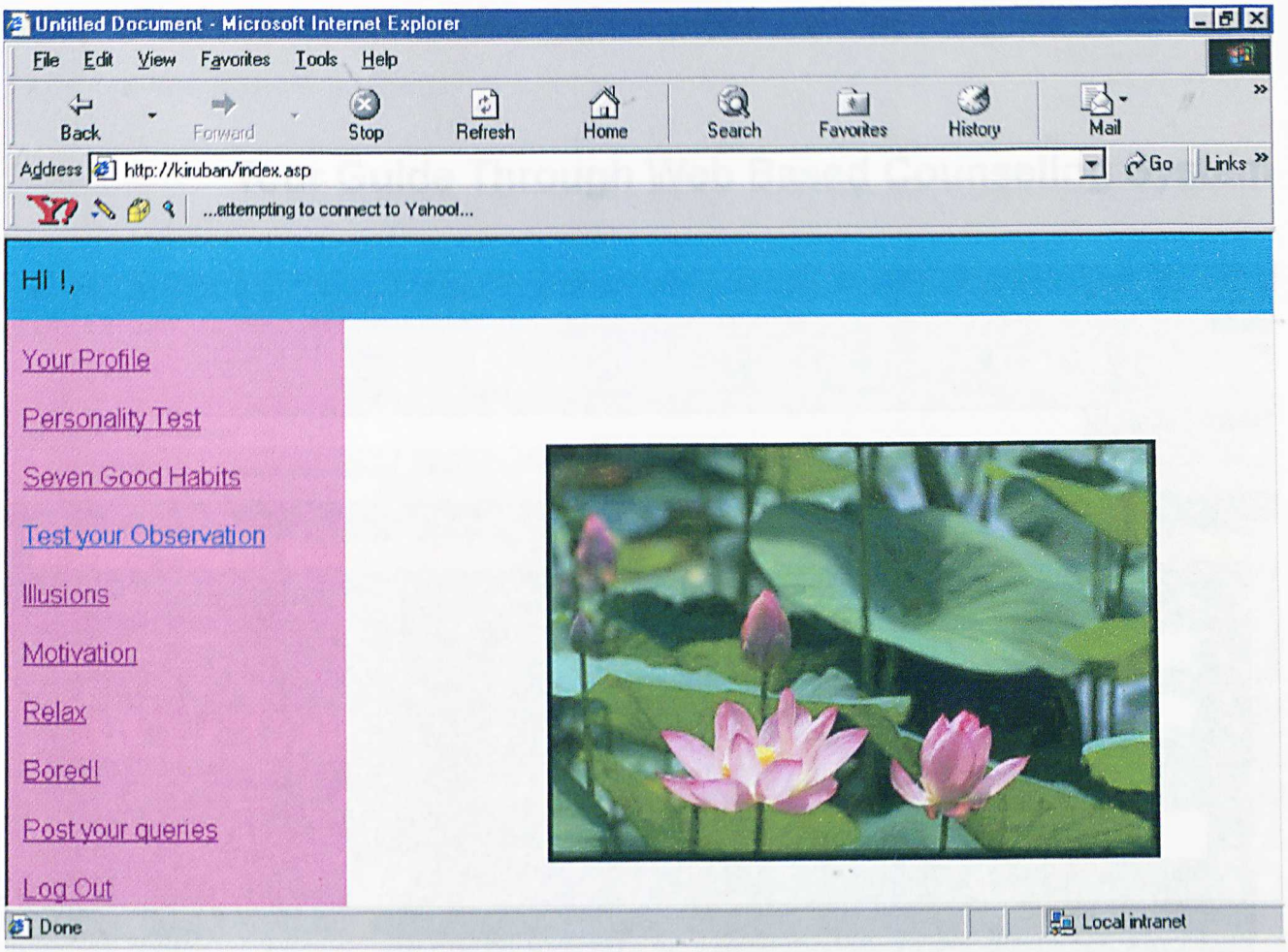
- Here, user can relax their mind with a wonderful flash game.

Post Your Queries

- Here, the user can post their suggestion to the webmaster.

Log Out

- The user will be logged out from web based counseling system.



This is the main page displayed when user login. Left hand side frame is the navigation bar from one module to the another. Below are the explanation for each module:

Your Profile

- Is where user can edit their own profile and change their login password.

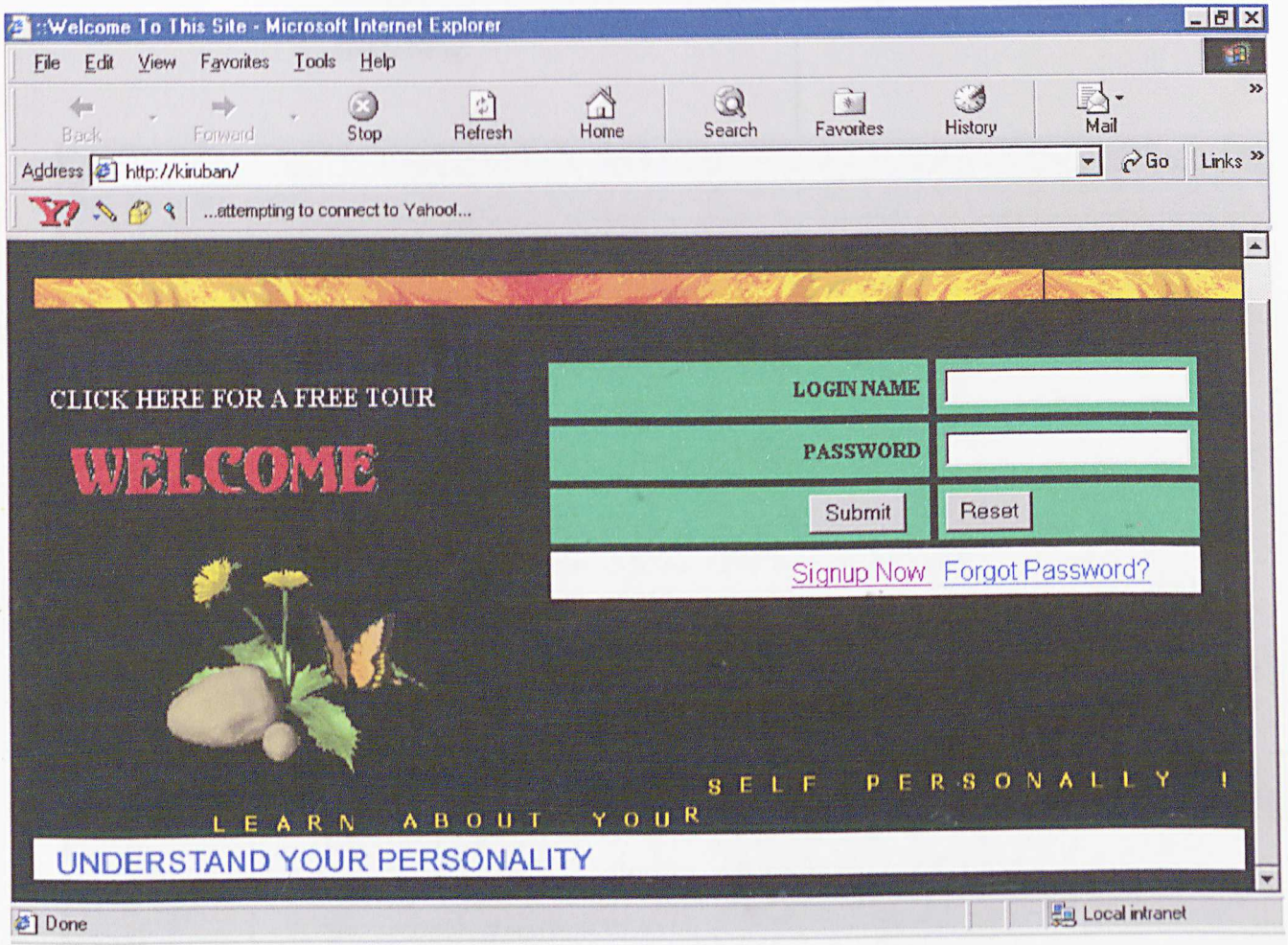
Personality Test

- In this module, there are three section which is divided to "Colour Test", "Temperant" and "Quiz". All this section is a proven psychological test that should be carried out by user in order for the system to understand the user characteristic and their belief system.

Seven Good Habits

- A text base tips for proven successful habits that can be practiced in everyday life.

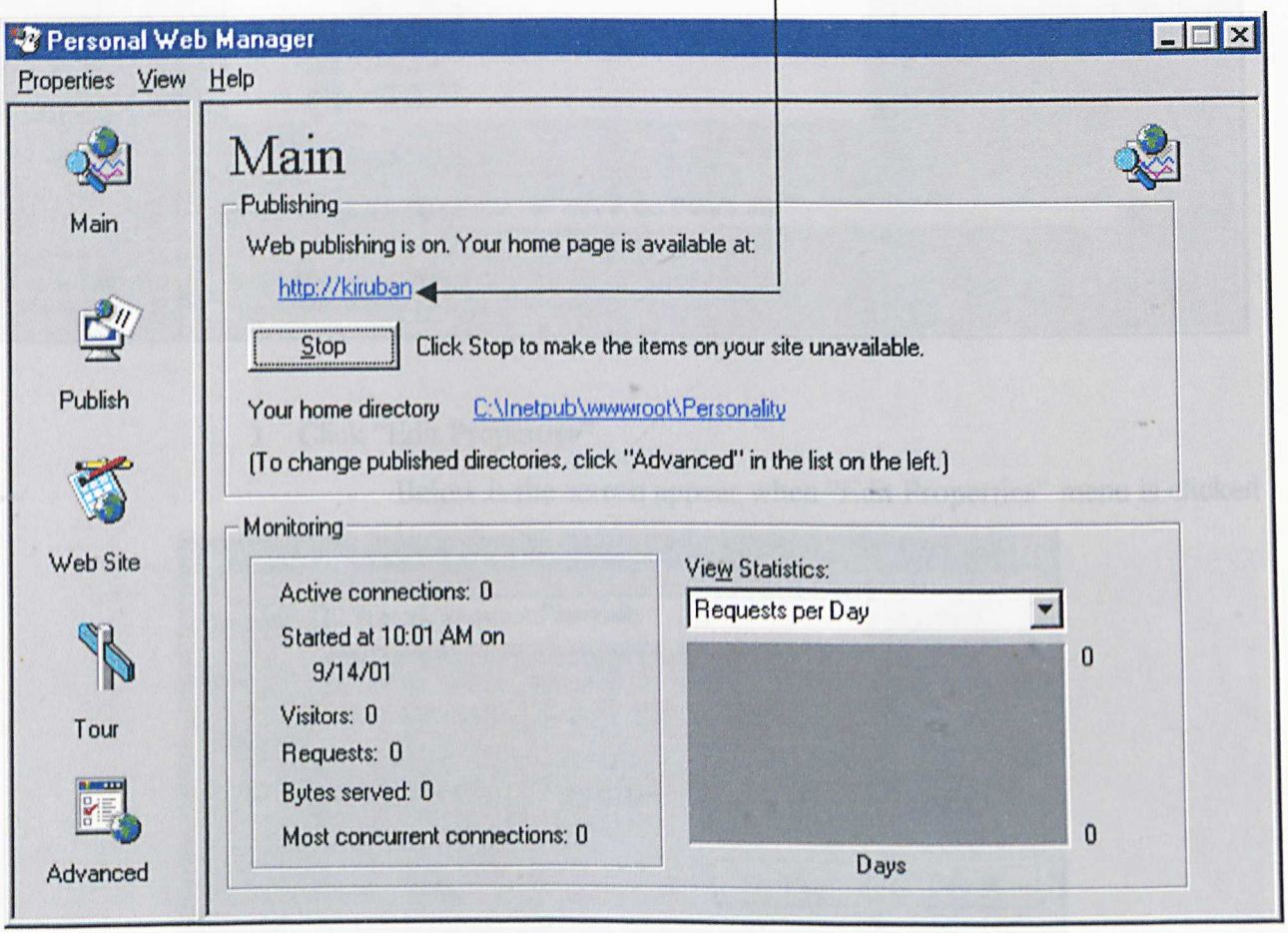
Tour Guide Through Web Based Counseling System



This is the startup screen of web based counseling system. Registered user can login using their login name and the password. For new user, they have registered themselves using "Signup Now" menu from the startup screen. After a successful login, user will brought to the main page as shown in below.

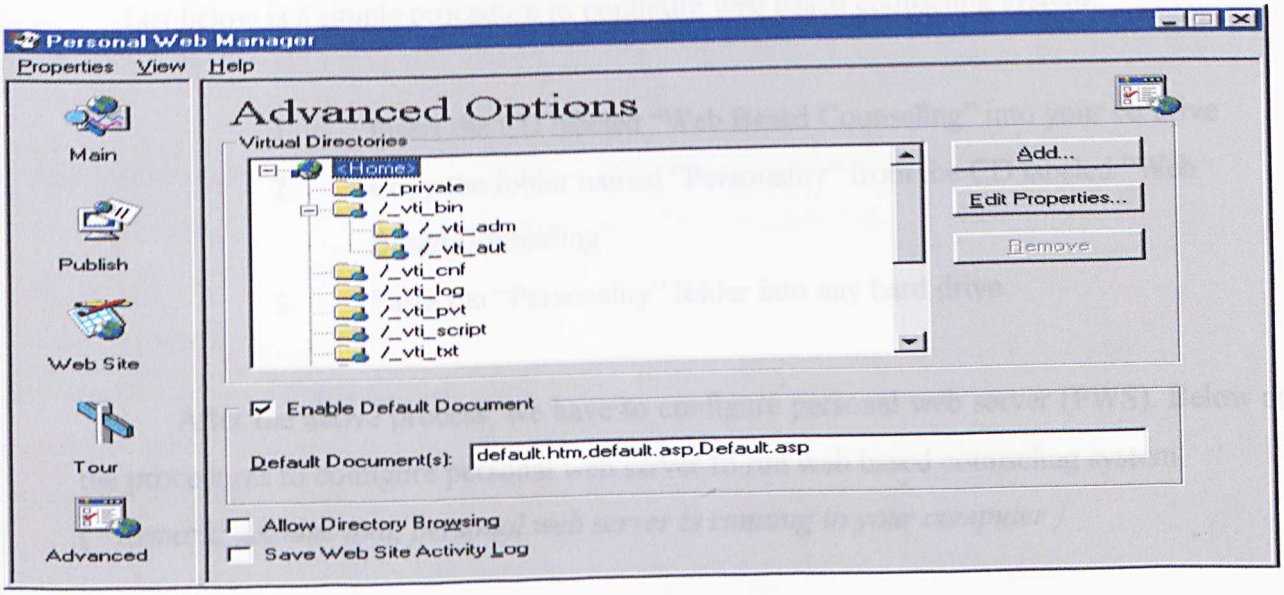
To Launch Web Based Counseling:

1. Just point your cursor as shown below. The URL varies from computer to computer. Click the URL displayed and it will launch web based counseling.

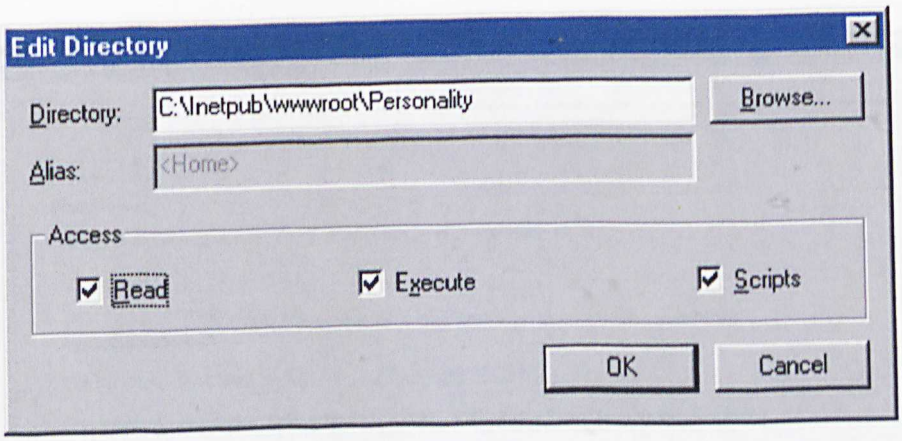


2. Default browser will open and display the web based counseling system.

2. Click "Advanced" menu
   - Below is the screen appear when "Advanced" menu is clicked



3. Click "Edit Properties"
   - Below is the screen appear when "Edit Properties" menu is clicked



4. Click the "Browse" button and locate where you copied the personality folder in your hard drive.
5. Please checked the "Enable Default Document"
6. In "Default Documents(s)" text box, please type, "default. asp" in the text box, if it not listed there.
7. Finally, just start button from the Main document from the Personal Web Server. Now, personal web server is successfully configured.

Configuring Web Based Counseling System

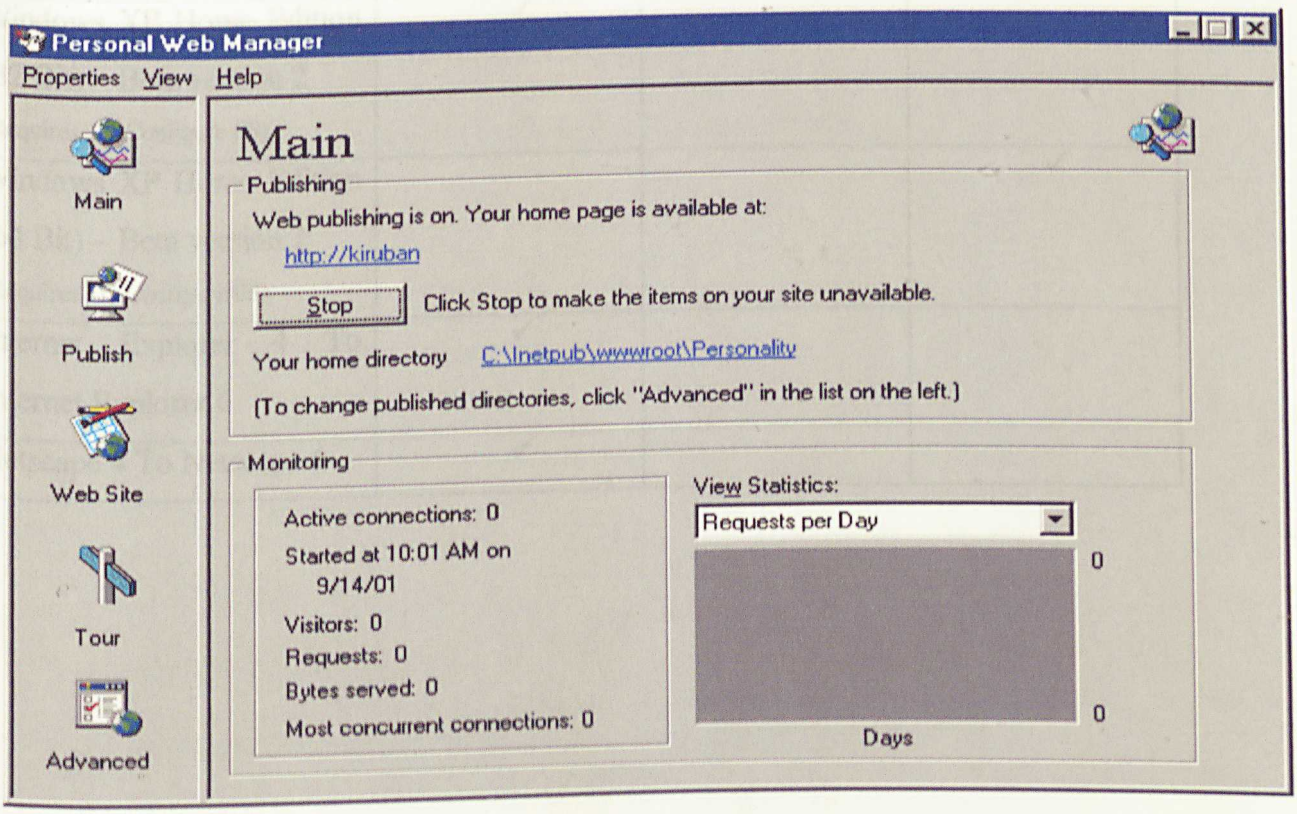
List below is a simple procedure to configure web based counseling system:

1. Insert the CD labeled "Web Based Counseling" into your cd drive
2. Copy the folder named "Personality" from the CD labeled "Web Based Counseling"
3. Paste the "Personality" folder into any hard drive.

After the above process, we have to configure personal web server (PWS). Below are the procedures to configure personal web server to run web based counseling system:

(**Remark: Assume that, personal web server is running in your computer*)

1. Start Your Personal Web Server
   - Below is the screen appear when PWS is started



Compatibilities

Web Based Counseling System has been tested in different platform of operating system. Below are the results of test conducted.

Operating System / Browser	WEB BASED COUNSELING SYSTEM		
	Compatible	Not Compatible	Not Tested
Windows 95 (Requires TO Configure PWS)	✓		
Windows 98 Second Edition (Requires TO Configure PWS)	✓		
Windows Millennium (Requires TO Configure PWS)	✓		
Windows NT4 (Requires TO Configure IIS)	✓		
Windows 2000 (Requires TO Configure IIS)	✓		
Windows XP Home Edition (32 Bit) – Beta version 2 (Requires TO Configure IIS)	✓		
Windows XP Home Edition (64 Bit) – Beta version 2 (Requires TO Configure IIS)			✓
Internet Explorer 4 To Internet Explorer 6	✓		
Netscape 4 To Netscape 6	✓		

Reference

In order to accomplish this project, the references that we had referred to are as stated below: -

Web-Sites

- www.counselling.org.sg/
- www.sunink.com/counselling/home.html
- www.2pysch.com/

Books

- New Therapy Magazines by *Dr. Michael Yapko*
- Breaking The cycle of Depression by *Ivan Tyrrell*
- In search of Solutions by *William O'Hanlon and Michele Weiner-Davis*
- Battle for the Mind by *William Sargant*
- Software Engineering by *Dr.Sellapan (University Malaya)*

Consultant

- Prof. Dr. R. Kadeer Ibraheem
- Mr. A. Sivasubramaniam
- G. Surya Moorthi
- Ms. Pathmavathy
- Prof. Gill Jack Man
- Webtrent Technology (http://www.webtrent.com.my)
- Terence Lau