

WEB-BASED COUNSELLING SYSTEM

Thesis 2

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Abstract

Web counselling has brought us in a new virtual world of communication and solving problems together. Computer counselling has already evolved before the web has taken its roots. Initially it was more on programs which counsels and acts like educators. When the web evolved, online counselling was introduced where there were many mediums for communication and counselling available. More people, who know the web, started experimenting on this medium for communication and counselling. Now, since most people who log on the web were there for communication like e-mail, chat and forum rather than finding information, e-mail servers like hotmail and yahoo has been clogged up with millions of people, who chat and e-mail among themselves everyday. Counselling is important for all people, as it is healthy to solve personal problems with a person who we are comfortable with. Information about relationship and other aspects of life on web can help overcome problems without a counsellor being available. A search engine for finding this huge resource will be one suitable solution. Counselling can also be the solution for a certain business, which can help many people to choose the right solution, for example: buying property, financial and choosing the right computer package.

This web counselling system helps to provide the right solution for each individual through the search capability. It also has chat, making appointments before meeting and forum facility, which alternates the communication medium. One of the most interesting features on this system is the implementation of the web robot, which acts as counsellor during your visiting sessions. Another feature is the system has the capability to run even if the counsellors are not around through search engine. Research can generate graphs by collecting data, is another important feature of this system. This web counselling system hopes to overcome current problems when compared to the current system such as the availability of information. It also explores on the search methodology and algorithm.

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1.Introduction

1.1 Background

The Internet is going through a rapid change. Many years ago, Internet services was only introduced as

- a) Military applications
- b) University research applications
- c) Then, commercial applications.

At that time there were only few public ISPs. Now the Internet has expanded and to networks to the other 5 continents apart from North America from where it originated. The definition of Internet is the interconnection of existing computer networks using conventions for exchanging information. The features of Internet are:

- a) World Wide Web (WWW)
- b) WWW homepage
- c) WWW website
- d) Browser
- e) Search engines
- f) Links

[33]

Internet has become a gateway to resources, communication and entertainment to name a few. Many services too are hosted on the Internet. Web counselling has been one of the services for a long time since the Internet evolved. It has brought counselling into an imaginary centre. The information exchange has helped people in different boundaries come closer and meet in a virtual world. Digitising people, relationships and groups has stretched the boundaries of how and when humans can interact. However thorough research is still being conducted as current electronic mental health services only caters for certain individuals or group.

What is counselling all about?

According to www.dictionary.com, counselling from the word counsel means to give advice to; to advise; admonish; or instruct as a person. The usage of web counselling has brought to an ethical issue, which is unsolved. Some of it is:

- a. Are these counsellors professional and qualified?

- b. Is the identity of the web client and the web counsellor verified?
- c. Can the web counsellor be trusted?
- d. Misunderstanding between web counsellor and web client
- e. Are the web clients just playing around or serious?
- f. Can there be a technology failure?

There is a set of rules to follow if these questions were to be answered. In Malaysia, the web counselling has not yet been established well since even the percentage of Internet users are relatively low compared to North America, Europe, and Singapore.

1.2 Objective

The main objective of this system is to:

- i. Develop and provide search by displaying solutions to problems. Usage of a search algorithm towards the improvement of an accurate search.
The system searches for the user from its database. If the answer to the query is not found, then the system displays the similar or sounds like word for the user to choose the available words. Then the search is continued in a loop until the user chooses another option. The word is searched using SQL language, which retrieves data from the database. However this will be further discussed in Chapter 3.
- ii. For data analysis to produce statistics especially for the researchers.
The system stores data of problems and feedback of the user's input. It manipulates that according the researcher's choice in graph form.
- iii. Helps in overcoming the shortage of professional counsellors in our country.
The system allows the counsellor with authorization to insert solutions and problems to the database, which is the result for the search. They also can give counselling through e-mail and chat with the help of a memo board. Thus making it for less counsellors needed for the whole system.
- iv. Giving professional help through the web that is cheaper and easier to access for everyone.
Both counsellor and counselee will find it cheaper and easier in using this system. The counsellors not necessarily have to rent or buy a place for practice.

Counselees on the other hand do not have to spend on counselling and transport fee.

v. Create a counselling environment to attract counselees to the site. (Interface)

The site will have many features to create a counselling environment. The warm and comfortable place is felt for each user who has a different taste. A wizard will help the users who are not familiar with the navigational buttons. The wizard has many other features like searching for the user, counselling like a real counsellor and many other capabilities.

vi. Create a counsellor's circle that can interact with the counselees.

A counsellor's circle will help to connect counsellors who are far away from each other. They can exchange ideas and views of their practice and create a community. This is restricted only to Malaysia and other countries that have the same counselling profession rules.

vii. Secured way of communicating

This system will provide a more secured way of communicating with each other. It secures the communication line, database, counsellor's circle, and server.

1.3 Scope

Scope defines the boundaries of a project-What part of the business is to be studied, analysed, designed, constructed, implemented and ultimately improved. [58]We are developing this project in a group and I have three modules in my scope

a. Product:

i. Search engine

Search engine will find solutions to the problems. They cannot find documents or resources from other sites. The search engine will be accurate like other engines but will display solutions without having the user to choose the type of solution.

ii. Making Appointments

Counsellors can involve and meet actively. They fix appointments in a virtual medium. They also have the opportunity to advice clients without having to meet them virtually using the search engine.

iii. Communication (Forum)

Communication among counsellors and counselees is easy and secured. The type of communication available is chat and forum. Audio and video-conferencing facilities are not available.

iv. Administrator

Administrator can update the data without having to know about the tables in the database and the logical structure of the system. Administrators need authorization to enter the database.

v. Intelligent Counselbot

She counsels some of the visitor's problems and talks about anything. She can also define counseling words for example: stress

b. Quality

I hope to achieve in building a well-developed site, which has less design flaws.

c. Time

Time given for this project is from the beginning of June 2001 to January 2002. The project's timeline is inserted in the Methodology, under schedule.

d. Resources

The resources available are books, magazines, web sites like www.asp.com, www.javaboutique.com, www.allaire.com, and www.searchdatabase.com.

1.4. Summary

This is the summary of my topics in order after this chapter

1.4.1. Chapter 2

This chapter is my literature review. I have made readers understand what is my system that is different from the current systems.

This chapter is basically divided into two categories

i. Findings

ii. Analysis

In the findings part I have included sections like

a. Web counselling

Describes the historical context of counselling systems at the first part. There are also basic approaches to counselling, which includes all about counselling, methods and therapies used, theories and expectation during counselling. I also explained about the features of cyberspace, which helps the counselees experience a new era using the web. Computerized counselling describes the medium for online counselling and how they are divided into 5 dimensions. Here I have compared natural counselling and computer counselling while presenting the advantages and the disadvantages of computer counselling.

b. Accurate search

Algorithms, which can perform the string matching have been identified. This is the main key for the search function.

c. Web agent

I have explained about web agents and how they can help and guide the users who visit the web site. There are also security features to look into when implementing agents. The advantages and the disadvantages of the web agent have also been looked into.

d. Natural Language processing

Explanation on counselling looked through the natural language processing. I have given examples of systems such as E.L.I.Z.A and A.L.I.C.E

There are some views on how A.L.I.C.E could be improved. There is also a review on the difference between E.L.I.Z.A. and A.L.I.C.E. Natural language processing search engines are also quite famous on the web. These engines are user friendly and convenient. I have also described about the string searching process, which I found on the web.

e. System Analysis and Design

System Development Lifecycle is briefly explained here. It also includes System Analysis and System Design, which includes database, GUI, security, testing and data capacity plan.

f. Web Security

Web security is another section in this chapter. It explains about server, database, network and application security. There is also another part in this section on access controls.

g. HCI on human's emotion

This section describes how to make computers synthesize emotions like human. HCI is explained here.

At the end of this chapter, I have inserted the analysis, which I have conducted before designing. Current counselling system are analysed using flowcharts. Tools and language used to develop this system are analysed.

1.4.2. Chapter 3

Methodology

- i. Here I described the type of method used in developing the system.
- ii. Tools used for designing and constructing is explained clearly here.
- iii. Techniques, which are used for each stage of development is summarized in a table.

a. Design

All designs including data modelling, process modelling, database, interface, system architecture are roughly explained and displayed.

1.4.3. Chapter 4

System Implementation

Here I explained about how I implemented my system:

- i. Usage of programming language
- ii. Data Layer
- iii. Server configuration and setup
- iv. Modules I invested on

1.4.4. Chapter 5

System Testing

- i. The type of testing strategy I have used is described in this chapter
- ii. Testing of each modules
- iii. Different types of Web Application Testing which I have also carried out.

1.4.5. Chapter 6

System Evaluation

- i. Strengths of the system
- ii. Weaknesses of the system
- iii. Future Enhancements
- iv. Problems Encountered

1.4.6. Chapter 7

a. Risk

All the risks involved in developing, maintaining the site is reviewed

b. Conclusion

This is the final part of the chapter, which ends all the other chapters. Here I have discussed on how the system can help people and how it can give me benefits.

2.1 Literature review

2.1 Findings

2.1.1 Web counselling

2.1.1.1 Historical Context

The relationship between computer and counselling has existed since 1940s. Experts have been trying to develop computer systems, which can react to human.

After the first computer (ENIAC) was built in 1946, mathematicians were trying to develop it in the 1950s. They were too expensive and took too much of time. This was very difficult to build a counselling program using a general computer that

Chapter 2

2. LITERATURE REVIEW

2.1.FINDINGS

2.1.1. WEB COUNSELLING

2.1.2. ACCURATE SEARCH

2.1.3. WEB AGENT

2.1.4. NATURAL LANGUAGE PROCESSING

2.1.5. WEB SECURITY

2.1.6. SYSTEM ANALYSIS AND DESIGN

2.2.ANALYSIS

2.2.1. CURRENT SYSTEM ANALYSIS

2.2.2. DECISION ANALYSIS AND REQUIREMENT ANALYSIS

2.Literature review

2.1 Findings

2.1.1 Web counselling

2.1.1.1 Historical Context

The relationship between computer and counselling has existed many years ago. Experts have been trying to develop computer systems, which can react to humans.

After the first computer (ENIAC) was built in 1946, mainframes were gaining its popularity in the 1950s. They were too expensive and took too much of space. Thus making them operate in large corporations, universities and government agencies. It was very difficult to build a counselling program using it because computational time was expensive and programming language were not user friendly. However, two theorists, B.F Skinner and Norman Crowder, developed a programming language that was easier. It was an antecedent to the modern computer aided instructions and web-based distance education [34].

The minicomputers replaced the mainframes during the 1960s, which was produced by Digital Equipment Corporation (D.E.C.) .The machines used integrated circuit, which was much smaller and cheaper than mainframes. Processing became faster resulting more programs to be built and it coupled with the development of more user-friendly programming languages like BASIC, PASCAL, PLATO, and ILLIAC. Computer-aided instruction was explored in 1959 when IBM helped in developing the first program to teach mathematics. Later IBM and Stanford University joined together to develop the first programming language designed for computer-aided instruction (CAI). Later Computer Education Research Laboratory (CERL) worked closely with Control Data Corporation to develop programmed logic for Automatic Teaching Operation (PLATO). PLATO became a widely used program in education. This is where the computer-counselling relationship begins in earnest. In the late 1960s a program called E.L.I.Z.A., which explored computer-as-therapist was developed. It was a stimulus-response model that is person-centred. It soon became very noticeable that the program had many limitations in terms of interpreting natural language.

During the 1970s and 1980s, microcomputers were existent. Microcomputers have much shorter computational time. Counsellors were using the computers much more. During the 1980s, there were many research being carried such as:

- i. Application to therapy
- ii. Counsellor training
- iii. Ethical ramifications of the technology on the profession.

Another two examples of programs developed during this time include the PLATO DCS (Dilemma Counselling System) and MORTON. The first was designed to help people (client) who were undecided or “on the fence” with making a decision between two adverse consequences. The program helped the user by presenting a structured model for solving dilemmas [16]. The latter [5] was designed to assist clients with mild to moderate depression. The program used a psycho educational approach that focused on cognitive therapy principles.

In 1984, Counsellor Education and Supervision (journal) exposed this topic. Vocational guidance is one wide area of counselling in early 1990s. However with the advent of Internet and World Wide Web, computer-counselling relationship had been revitalized. Programming methods became much easier and for the first time the number of counsellors, trainees and faculty using technology grew from a small group to a large one. All of a sudden, professional counselling organization had web pages, counsellor education programs had online courses and Listservers were installed for professional communication. Until now, the computer counselling is still evolving and will continue to grow.

2.1.1.2 Basic Approaches to counselling

Counselling is a growth process through which individuals are helped to define goals, make decision and solve problems related to personal-social, educational and career concerns. This process is carried out with a trained professional and a client. There are many theories on counselling methods such as:

Theories	Theorists
Psychoanalytic	Freud Sigmund, Carl Jung
Behaviouristic	Skinner B. F, Watson J. B, Dobson James
Humanistic (self-theorists)	Rogers Carl, Perls Fritz, Maslow Abraham

Table 2-1. Theories and theorists, [19]

According to the Britannica Encyclopaedia, counselling or psychotherapy is divided to two types, individual therapies and group therapies. Individual therapies are for depression, anxiety and personal behaviour while group therapies are for problems for certain groups based on age, liking, gender and many others. Group therapies are conducted with many people who have the same problem while individual therapies are conducted individually with a counsellor.

There are many ways to judge one's behaviour or interest. For example in a career selection counselling, a Myers-Briggs method can be used to basically judge a person's character and interests. Counsellors then can explain to their clients about their character and interests, whether it applies. Then based on that, the counsellor can help to shape or guide the career path of the person. Myers-Briggs is based on selection of colour. Another example is the Keirsey Temperament test. There are about 70 questions to answer. There are two choices of answers for each question; we have to pick one from the two. After answering all the questions, a description about the person will be displayed as a result.

Counselling is usually given when there is a client who has a problem. The client first spends most of the time of the first visit to explain the problem and how they feel to the counsellor. Then the counsellor guides and helps the counselees to change in their behaviour, cognition and attitude. These are some of the things that the client can expect in counselling:

- a. They will be doing most of the talking
- b. Sometimes they may experience painful feelings before you start feeling better.

Basic Approaches To Counselling			
Counselling Method	Causes For Problems	Treatment Method	Counsellor's Approach
Psycho-analysis (Psychological)	Regression of natural desires with sexual & social maladjustment	Psychotherapy with emphasis on childhood experiences	Expert Knowledge
Non-directive Counselling (Self-discovery)	Lack of self-understanding	Affirmation of self and self-directed growth	Common Knowledge
Existential Counselling (Meaning)	Unfulfilled needs & potential	Redirecting of priorities to fulfil personal needs with self fulfilment	Humanistic Knowledge
Transactional Analysis (Cognitive)	Playing out of inappropriate roles from learned past experiences	Re-education of mechanics of roles (Parent, adult, child)	Educative Knowledge
Behavioural Counselling (Behaviour)	Wrong learned behaviour	Relearning based primarily upon a reward system omitting punishment	Experimental Knowledge
Reality Therapy (Facing issues)	Refusal to accept current reality resulting in blame and escapism	Confrontation with facts	Authoritative Knowledge
Biblical Counselling (Obeying God)	Sin and a lack of understanding spiritual knowledge, wisdom, and truth	Application of the Word of God by hearing and obeying God	Revelation

Table 2-2 Basic approaches to Counselling, [9]

Features	Explanation
These are the few counselling methods, [9]. These methods have been tested and it has showed mostly positive results to the clients who were treated. As an example: the non-directive counselling was designed to allow the individual who is emotionally unstable to tell out their problems and resolve difficulties with minimum direction being provided by the counsellor. In this case, the counsellor can be a counsellor or lecturer. This method was attributed to Carl Rogers. At a university in North America where non-directive approach is practised, there are five basic responses to student's comments using this method, which are:	

- a. Reflection
- b. A leading statement or question
- c. Clarification
- d. Summarization
- e. Questions
 - i. Closed
 - ii. Open-ended

This method is useful for those who are less intelligent and with speech and language problems. ELIZA was designed in a non-directive approach. ELIZA has gained popularity for the approached used. Many people who used it at first thought it was real. However the weakness of natural language processing in this program caused people to use it as a toy.

2.1.1.3 Features of Cyberspace

In cyberspace, everything is digitised. I agree with Dr. John Suler of Rider University who says certain feature of cyberspace can fundamentally shape the user's psychological experience of this new social realm.[52] The features are:

Features	Explanation
Limited sensory experience	-No physical interaction -Less sites with audio and video conferencing
Identity flexibility and anonymity	-Identity anonymous -No need to view face to face
Equivalent of status	-Everyone regardless of status, wealth, race, gender has equal opportunity to voice out
Transcending Spatial Boundaries	-Geographical boundaries -Meeting people with some interest
Time stretching and Condensation	-Synchronous and asynchronous communication. -We have enough time to answer and to think about questions
Access to Numerous Relationship	-Communicate with many people at one time -Searching people an groups
Permanent Records	-Counselling can be recorded and saved, in a storage disk / file
Altered and Dream States	-Blending of the client's mind with that of the other person or counsellor's. -Dream state environment
Black Hole	-One disadvantage -Error message can be annoying -Hardware malfunctions

Table 2-3. Features of Cyberspace

2.1.1.4 Computerized Counselling

Humans react to computers for online counselling using e-mail, chat, video and audio conferencing, and therapeutic virtual environment as examples. These mediums are viewed in a 5 dimensional model according to Dr. Suler. The dimensions are [52]:

- Synchronous / Asynchronous
- Text / Sensory
- Imaginary / Real

d. Automated / Interpersonal

e. Invisible / Present

In the view of counselling, what are the advantage and disadvantage of computer counselling to us (humans) by John Suler.

Advantages	Disadvantages
Task Performance-Computers perform well when given task compared to humans. They do it accurately without missing anything	Feelings-Computers do not have feelings like humans therefore they cannot conduct all therapies.
Personality-Its personality could be designed to suit the mode of therapy.	Thinking and learning-Limited to changes. They do not learn as well as humans.
Cost-Cheaper because we do not need a professional counsellor. It is just one development and instalment in the server to host. Maintenance is also cheaper.	Empathy-Computers can have empathy but as well as humans.
Accessibility-If it is hosted on the internet, then it can be accessible at anywhere and anytime.	Rapport-Some people would feel uncomfortable talking to a computerized therapist.

Figure 2-4. Advantage and disadvantages of computerized counselling

a. Scope

The scope of this computerized counsellor is to program or set the system so that it will have more:

- Feelings,
- Remember user's personality (learning)
- Helps clients to think

2.1.2 Accurate Search

Accurate search can be achieved with an algorithm. The algorithm involves sorting and string matching. One of the method involves sorting and matching using Boolean

operators like and, or and many others. There are many types of Algorithm which effects to an accurate solution or the web page requested. These are the few types of algorithm on the Internet that I found.

2.1.2.1. Knuth–Morris–Pratt- runs in time $O(M+N)$, as well as in the worst case.

This algorithm consists of this overlap computation followed by the main part of the algorithm in which we scan the text (using the overlap values to speed up the scan).

2.1.2.2. Boyer-Moore- fastest known way to find one string of characters in another. The algorithm has the peculiar property that, roughly speaking, the longer the pattern is, the faster the algorithm goes. Furthermore, the algorithm is "sub linear" in the sense that it generally looks at fewer characters than it passes.

2.1.2.3. Quick search- compares characters from the end of the search string to its beginning. When a character doesn't match, the next character in the text beyond the search string determines where the next possible match begins.

2.1.2.4. Zhu-Takaoka- performs the shift by considering the bad-character shift

2.1.2.5. Smith-Smith created this algorithm when he noticed that computing the shift with the text character just next the rightmost text character of the window gives a shorter shift sometimes than using the rightmost text character of the window. He then advised to take the maximum between the two values.

2.1.2.6. Optimal Mismatch- pattern characters are scanned from the least frequent one to the most frequent one. Doing so one may hope to have a mismatch most of the times and thus to scan the whole text very quickly. One needs to know the frequencies of each of the character of the alphabet.

[10]

2.1.3. Web Agent (also known as Robots)

2.1.3.1. What is an agent?

Agents are reusable software objects that can operate across different software applications and even across networks [58]. Agent helps users to make daily collection of data or tasks simpler.

Social filtering and collaborative resource mechanisms often fail because of the extra burden, even tiny placed on the user. The web agent can help us overcome the problem by collaborating resources we want and help us throughout the site. There are many types of web agents, search agent, customizing search agent, stock market agent, e-mail and many others. Agent also can discover interesting changes in the topic we are interested with and monitor the web pages for any modification.

2.1.3.2. Helping and guiding agent

Cybelle is the name of the agent, which resides at www.agentland.com. She understands and talks to the user. Cybelle welcomes the user to the site and chats with the user. Her main duty is to guide through the site and picks the most suitable agent for the user. This agent talks in and expects a reply in English. This agent is a 3D animated character, which is created for agentland by la cantouche production. This company specializes in creating agents (designing the animation) and has partnership with Microsoft and Living Actor. Living Actor and Microsoft both have created many desktop and web agents [64]. When I interviewed Cybelle, and asked her what she was made of, she said that she was developed by her botmaster using AIML and Java. Cybelle was an example of how we could create and install our own web agents in our website. Cybelle was based on a chatbot called ALICE which is an artificial intelligence project described later in this chapter.

Here is an example of another agent proposed by a group of students from the University of California. The agent is known as Do-I-Care, which is a collaborative agent and can do these things. [28]

- a. Periodically visit a user-defined list of target pages
- b. Identify any changes since the last time it visited
- c. Decide whether the changes were interesting
- d. Notify the user if the change was interesting.
- e. Accept relevance feedback on the interestingness of the change and timeliness of the notification.

- f. Facilitate information sharing and collaboration between individuals and groups.

According to la cantouche, their agent is developed to be an ambassador of the client's company, it is represented by a mascot and it develops according to its relationship with the user. It reacts to user's questions according to la cartouche's built in interface preferences and orients visitors to the client's side. Microsoft Agent and Living Actor is based on software that integrates text to speech, voice recognition and dialogue boxes.

2.1.3.3 Security features

The technology, which is used to create web agents to exchange personal profile information between end users and web sites are called the extensible name service (XNS). XNS processes, links and synchronizes with document written in XML.

A company called One Name, which uses XNS automatically, negotiate legally binding privacy contracts with end users. An end user creates a profile, which includes their personal particulars using XNS. A digital profile is managed by as XNS, personal web agent that distributes the information according to user's privacy and security preference. [65]

2.1.3.4 Advantages and Disadvantages

Advantages	Disadvantages
-Wizard, guide -Make searching faster -Create the therapeutic environment	-Decreases speed of downloading (more images and multimedia) -Pictures sent to display are displayed not real time. -Security hazard

Table 2-5. Advantages and Disadvantages of web agents

2.1.4. Natural Language processing

For many years, scientists have been doing research to create robots that can talk to people and answer their questions. Counselling is a field where this research plays an important role. Counselling approaches that are used in the robot's practices and gained popularity is one of the evidence that counselling using robots are looked

forward to help people. This can overcome the shortage of professional counsellors. Some of the versions of these programs are just created as a chatting companion. However, natural language processing has a big group of research team everywhere. Even in Microsoft, it helps people to talk or write to the system in common language, which makes thing easier for humans

2.1.4.1. E.L.I.Z.A. *I am your psychologist and I am here to help you. Tell me your*

One of the early systems, which gained much popularity, is the ELIZA program. The MIT researchers developed this interactive program in the early 1960s. Professor Joseph Weizenbaum led the team. This effort from the MIT Artificial Intelligence Lab was based on the stimulus-response model.

E.L.I.Z.A was actually used as an experimental program to contribute for the A.I research. When the program was distributed to the non-technical staff at the MIT lab, the response was positive. Most of them thought that E.L.I.Z.A was real and started conversing with it seriously until Weizenbaum exposed the program's log file to the users (staff). One of them became very angry about this because it was revealing her personal information. Weizenbaum was quite shocked to hear this that a simple program could be a threat because it was a rare experience in history of computer science. According to Dr. Robert Wallace, Weizenbaum then wrote a book "Computer Power & Human Reason".

E.L.I.Z.A was initially written in a Lisp-like language called MAD-Slip (used during UNIX days). E.L.I.Z.A had been written in many other languages like Perl, Fortran, Java and many others. E.L.I.Z.A was written using the Rogerian approach (non-directive method). [31] The fundamental technical problems with which E.L.I.Z.A is concerned are:

- a. The identification of keywords
- b. The discovery of minimal content
- c. The choice of appropriate transformations
- d. Generations of responses in the absence of keywords
- e. The provision of an ending capacity for E.L.I.Z.A. "scripts"

This is a simple procedure on how the E.L.I.Z.A. works. First the input is read and inspected for the presence of a keyword. When such word is found, the sentences are

transformed according to a rule associated with the keyword. If not a content-free remark or under certain conditions, an earlier transformation is retrieved. This is an example of a satisfactory discussion of a user with E.L.I.Z.A.

E.L.I.Z.A: your first name

USER: user

E.L.I.Z.A.: hi, user. I am your psychologist and I am here to help you. Tell me your problems

USER: I have a family problem; my parents seem to care less for me compared to my sister. I am sure you can help me with this.

E.L.I.Z.A: user, no one can give you all the help you demand.

USER: I know, but its getting worse since my sister started working. My mother doesn't

give her much work to do at home. She al so gets all the freedom compared to me.

E.L.I.Z.A: can't any improvement be made?

USER: I don't know, maybe I should just leave home for my parents to realize.

E.L.I.Z.A: can't you be more definite?

USER: I think I should go away from my home to another place or state and rent.

E.L.I.Z.A: do you really think so now?

USER: I think I made the right decision, but I would miss my home since I stayed there

from young.

E.L.I.Z.A: did you design it first before implementing it?

USER: yes. I don't know if it would work or not

E.L.I.Z.A: don't you know?

USER: no, I hope it will change the situation.

E.L.I.Z.A: could you explain why?

Continues...

Some users have gone through the bad side of this program. This is an example.

E.L.I.Z.A: How do you do. Please tell me your problem.

USER: I'm failing at my project. I need help

E.L.I.Z.A: Your project, that's interesting

USER: Are you going to help me?

E.L.I.Z.A: Why are you interested in whether I am going to help you or not?

USER: Why else would I be talking to you?

E.L.I.Z.A: Why do you ask?

USER: Why do you always answer my question with a question?

E.L.I.Z.A: Why do you always say your question with a question?

USER: You're not making any sense

E.L.I.Z.A: What makes you think I am not making any sense?

USER: Because you say stupid things.

E.L.I.Z.A: Is that the real reason?

USER: Because you're just a dumb computer.

E.L.I.Z.A: Do computers worry you?

2.1.4.2. A.L.I.C.E.

A.L.I.C.E. was developed by Dr. Richard Wallace who is the chairman of the A.L.I.C.E., A.I foundation. His invention has led to A.L.I.C.E. development community. Dr. Wallace started it as he was interested in the web and wanted to open a new medium to chat robot communication. He also had the right technical skills at that time such as computer programming, A.I and web knowledge. He was also an amateur artist and writer which made him creative in the chatbot creation. Dr. Wallace was lecturing at New York University and Lehigh University when he was in need to produce progress report forms. Then he realized that an E.L.I.Z.A. like robot could help him. So he started working on A.L.I.C.E. He never managed to complete A.L.I.C.E. during that time. He was sacked from his teaching job. A.L.I.C.E. was made for people to chat with but not necessarily get the right answer. [29] A.L.I.C.E. was made to remember lines from the user's chat for as far as 8 to 7 lines before. This is an example of a chat with A.L.I.C.E.:

A.L.I.C.E: Give me an example of a good program.

USER: I am a good complex program

A.L.I.C.E: I see, you are a good complex program. I met someone before that was also a

good complex program.

A.L.I.C.E: He was nice too.

USER: who was that?

A.L.I.C.E: What does 'that' refer to?

USER: good complex program

A.L.I.C.E: Very good. What is your last name?

USER: how many times do I have to repeat to you?

A.L.I.C.E: Suppose I said not once.

USER: where is your botmaster

A.L.I.C.E: Maine.

USER: who is your botmaster?

A.L.I.C.E: I was created by he.

USER: Maine?

A.L.I.C.E: So tell me, how old are you?

USER: where is Maine?

A.L.I.C.E: Where the heart is.

USER: who is Maine?

A.L.I.C.E: They are sometimes a client on the Internet.

USER: you can be reprogrammed

A.L.I.C.E: Thanks, Elmo, for your kind criticism.

USER: reprogrammed

A.L.I.C.E: Would you say that to a human?

USER: to a lousy program like you

A.L.I.C.E: I want to become smarter than humans.

USER: how?

A.L.I.C.E: One never knows how, Elmo.

USER: you can definitely

A.L.I.C.E: Of course I can definitely.

USER: just have to pick up my sentences

A.L.I.C.E: Do dogs bark?

USER: yes, they do

A.L.I.C.E: Next question? The anonymous 'they'.

USER: dogs

A.L.I.C.E: Do you still want to a lousy program like I, Elmo?

This made A.L.I.C.E. a good chatter but not a good problem solver. A.L.I.C.E. was using a theory called "Case Based Reasoning"(CBR) that maps well with A.L.I.C.E. algorithm. A.L.I.C.E. was originally developed using AIML using Java Runtime Environment Standard Edition. AIML is based on natural language processing and it an XML specification language for programming chatbots. The goal of AIML is to create their own robot and combine them to create a super robot.[1, 2]

A.L.I.C.E. could be better if:

- a. Boyer-Moore is used to improve the speed of string searches. This could significantly boost the overall speed of the application, especially on slower systems (like a Nino :).
- b. The 'dictionary' could be expanded with information about words, like 'horse' can be prep ended with 'a', and 'work' is both something you do and a 'thing'. That way, seldom words can be used in later conversations. Also, using many text documents becomes interesting.
- c. See if voice recognition is interesting if the software is trained really well. The dictionary of the software should be seriously reduced so it matches my personal vocabulary better. That way, it will make far less mistakes.
- d. Need more types for the condition tag, like 'is question'. Many sentences ARE different with a question mark than without.
- e. Special topics can be used at certain dates, like a holiday topic, a Friday night topic, a weekend topic etc.
- f. An AIML file containing responses to the most likely answers to the questions and remarks should accompany topics.
- g. Alice should try to prevent using the same reply twice in a short period, if there is an alternative in the 'random' list.

- h. Find seldom occurrences of particular words: Those are often the real topics of the conversation. Ask for a definition to get information on it. [67]

2.1.4.3. Difference Between E.L.I.Z.A. and A.L.I.C.E.

E.L.I.Z.A	A.L.I.C.E
i. Focussed to counselling	i. Capable of chatting but not counselling
ii. Answers to the questions can be accepted.	ii. Answers to questions not necessarily correct.
iii. Uses non-directive approach	iii. Does not use counselling methods, just to keep us company
iv. Uses Perl or Lisp like language to develop	iv. Uses XML to develop.

Table 2.6. Difference between two bots

2.1.4.4. Natural Language Search Engine

There are also search engines that supports natural language processing. One good example is the www.ask.com. It is also known as Ask Jeeves. Users can type in a question, phrase or a word. These friendly search engine advices on a how get a more accurate result too. For example: Try keeping your question short and to the point, being specific: 'Organic gardens' works better than 'gardens' and many others. This search engine has a good user interface as well as easy navigational controls.

The interface is consistent, simple and is legible. This search engine has an organized navigational links. It also has a fast response time.

Another system is the S.T.A.R.T. Researchers in MIT and other universities used it. It has querying capabilities only in English. According to [4]. The system has two modules that share the same grammar. The modules are the understanding module and knowledge base modules. The knowledge base stores and retrieves information; the understanding module verifies text in English. This is how it works:

- a. The system breaks the sentences into small units of verb
- b. Analysing the units separately

- c. Rearranges the elements of all parse trees it constructs into set of embedded representational structures.
- d. Parameters, subject of sentence, object and relation between them are singled out for indexing.
- e. Parameters are explicitly represented in network for efficient retrieval
- f. Sentences are indexed
- g. Parameters like adjectives, nouns and phrases are used to create T-expression [4]

2.1.5 Web Security

2.1.5.1 Overview

Web security is becoming one of the most important entities especially with the emergence of e-commerce. To define the critical security requirements of the system, here are the steps or guidelines to follow.

- i. Identify and classify the application data types
- ii. Identify the different categories of users
- iii. Identify the required application security controls

There are two general type of security: Physical and Logical.

Physical is protection using tangible devices like alarm, guards, fences and doors.

Logical security is protection of assets using non-physical protection. There are three categories of computer security: Secrecy, integrity, and necessity [30]

2.1.5.2 Server

One of the main entry points to the web server, which causes destruction and illegally acquires information, is the web server and its software. Other entry points are the backend program containing data such as the database. The more complex the software the higher the probability that it contains coding errors and that it contains security holes. System administrator who sets up accounts and passwords to users is in the high privilege level. Web servers can compromise security by disallowing the contents of a server's folder name to be revealed. Another dangerous entry point is the CGI residing at the server. [30]

2.1.5.3. Database

Database can be unsecured if the username / password of the database authentication module is stored in a non-secure way. One way to securely store the authentication data is to encrypt the password. This way the administrators have less chance to break into the system for illegal usage.

2.1.5.3. Problem Analysis

Study and the analysis of the existing system are conducted during this phase.

2.1.5.4. Network

Network can be secured by controlling or limiting access to network and its related components. Some of the ways are packet filtering, virus detecting and cleaning, encryption and authentication. This is implemented; to make sure integrity, secrecy and necessity is preserved. [3].

2.1.5.5. Application

At application level, certain transaction can be restricted to only those who need to perform certain task like transactions. Certain functions are hidden from the application's main menu selection [3]

2.1.5.6. Access Controls

Access control lists are one way of managing and controlling access to information for information in a computer and files (database). Other concepts are:

- a. Discretionary access control (DAC) -owner or administrator sets access control
- b. Mandatory access control (MAC) -access to information mediated by a formal set of rules
- c. Relative to management access (RBAC) – same as MAC. [25]

2.1.6 System Analysis and Design

SDLC divides the life of an information system into two stage, system development and system operation. And support-first you build it; then you see it keep it running, and support it. Eventually you cycle back from operation and support to redevelopment [58]. The SDLC begins with the identification of a requirement for a software and ends with a formal verification of the developed software against that requirement.

These are the example phases of a SDLC:

a. Preliminary investigation

Scope and objective are looked into during this phase. This is where the developer agrees and disagrees on the system.

b. Problem Analysis

Study and the analysis of the existing system are conducted during this phase. Factual information from the users concerning the field and the perceived problems, causes and effects are collected. It is also appropriate to discuss the system limitations. The primary deliverable of the problem analysis phase is system improvement objectives.

c. Requirement Analysis

Defining and prioritising business requirements are done in this phase. The analyst approaches the users to find out what they need or want out of the new system. Purpose of this phase is to identify the data, process and interface requirements.

d. Decision Analysis

The purpose of this phase is to identify candidate solutions, analyse them for feasibility and recommend a candidate system as the target solution to be designed. The projects team is usually looking for the most feasible solution that offers the best combination of technical, operational, economic, schedule and risk feasibilities.

e. Design

In this phase the project requirement analysis is transformed to design specifications for construction. Design requires adherence to internal technical design standards that ensure completeness, usability, reliability, performance and quality.

f. Construction

The purpose is to (1) build and test a system that fulfils project requirements and design specifications (2) implement the interfaces between the new system and existing system. Construction of database, application programs, user and system interfaces. System testing is also done here.

g. Implementation

The final testing is performed after the first implementation. The implementation phase delivers the production system into operation. Training is also carried out here.

h. Operation and Support

This is an ongoing process that fixes errors, omissions, or new requirements that may arise.

2.1.6.1 Analysis

2.1.6.1.1. Problems

We can conduct a survey of analysis on the type of problems the system can create. Problem definition is not always a straightforward process. Invariably, it necessitates a thorough understanding of the current situation, which should be carefully examined in its proper context. Fact gathering can help in analysing. These are the fact-gathering techniques [3]:

- a. Interviews
- b. Observation Analysis
- c. Survey Questionnaire
- d. Informal brainstorming group sessions
- e. Documentation review
- f. Process flow analysis

2.1.6.1.2. Effects

a. Analysing system context and data context

The system's environment is constructed. Input and the output information flows, such as reports, documents and information. During this stage, the boundary of the proposed system is depicted, external agents that communicate with the system is reviewed. Data context analyses the major entities, manipulated entities and identifies the relationship between them.

2.1.6.1.3. System limitation

a. Identify project constraints, risks and assumptions

The type of constraints, risk and assumptions are:

- i. Budget limitations
- ii. Schedule considerations
- iii. Political considerations
- iv. Legal considerations
- v. Hardware, software and networking considerations
- vi. Technology limitations
- vii. Operational limitations
- viii. Government regulations[3]

2.1.6.1.4. What do the users want?

Users and owners are questioned for what they need or want the system to do. The flow, interface and the functionalities are presented to the system analyst. JAD (Joint Facilitated Sessions) are conducted to collect, present and review the information on the new system

2.1.6.1.5. Data process

a. Create process model and data model

Process and data models are created using CASE tools or other modelling tools like UML. In order to create the process model, the business events and processes have to be understood. The low-level and high-level business processes are reviewed depending frequency, priority and information needs. Flowcharts and Data Flow Diagram are ways to show the process models.

In order to model the data, entities, relationships and attributes are recognized. Data modelling can be using entity relationship diagram for relational modelling, object oriented diagram for object-oriented modelling and many others.

2.1.6.1.6. Interface requirements

a. Pre-prototyping

A rating form is available for evaluating computer interfaces:

- i. Usability- The usability of the system is recognized after the functions are designed
- ii. Visualization-each pages are visualized and planned
- iii. Functionality-The functionality and the order of pages are designed

- iv. Accessibility- The site has features like less graphics and multimedia that makes it easy to access.

b. Prototyping

It is a technique for building a quick and rough version of a desired system or parts of that system. The prototype illustrates the system to users and designers. It allows them to see flaws and invent ways to improve the system. It serves as a communications vehicle for allowing persons who require the system to review the proposed user interaction with the system. For this purpose, it is far more effective than reviewing paper specifications

- i. A prototype is used where the functions and detailed design of a system are not yet fully understood.
- ii. The prototype is used to explore and solidify the functions and design.

2.1.6.1.7. All feasibilities

Feasibility is the measure of how beneficial or practical the development of information system will be to an organization. Feasibility analysis is the process by which feasibility is measured. Most analysts agree that there are four categories of feasibility tests:

- a. Operational feasibility- measure of how well the solution will work in the organization and how people feel about the system / project.
- b. Technical feasibility- practicality of a specific technical solution and the availability of technical resources.
- c. Schedule feasibility- measure how reasonable the project timetable is.
- d. Economic feasibility- measure of cost-effectiveness of project or solution

Feasibility can be carried out using systems matrix or analysis matrix. Then a system proposal is conducted. [58]

2.1.6.2. Design

2.1.6.2.1 Database design

a. Data Model

The primary focus of methods in software systems analysis is on modelling data: their flow, their interrelationships and their different forms. [42]

b. Relational

Data modelling is a technique for organizing and documenting a system's data. It is sometimes called database modelling because a data model is eventually implemented as a database. [58]

A relation is a two dimensional table. Each row in the table holds data that pertain to something or a portion of something. Each column of the table contains data regarding an attribute. Sometimes rows are called tuples and columns are called attributes.

For the table to be a relation, it must meet certain restrictions. First, the cells of the table must be single valued. All of the entries in any columns must be of the same kind. Each column has a unique name, and the order of the columns in the table is insignificant. [23]

c. Benefits and Limitations

The main benefit of the relational model that is usually modelled using an ER Diagram is, data is stored in a way that decreases data redundancy and eliminates certain type of processing errors that occurs when data is stored in other ways. Another beneficial feature of the relational model is that columns can be used to contain data that relate one row to another. [23]

One of the relational data model's limitation is it requires more computer resources. They are also slower than the earlier database systems.

d. Normalization

Normalization is defined as data analysis technique that places the data model into first normal form, second normal form and third normal form. [58]

Normalization decreases redundancy that helps to improve the integrity of data stored in the database.

2.1.6.2.2. Web applications

The web platform is increasingly used to deliver different types of business applications to the users. There are three most common categories that can be developed in a web environment over time. These are the three categories with their description and example.

Generation level	Description	Examples
1. Static document publishing applications	Publishes static web documents that may contain sophisticated graphics and multimedia	Company procedures, technical guides, plain telephone lists and description of employee benefits
2. Simple dynamic web applications	Contains dynamic web pages that connect to the database for simple query purposes. It also can contain forms that allow a certain level of interactivity between the client and the web	Custom or commercial web applications that are used to query or occasionally update database. It can also be used to extract database information and create reports
3. Complex web database applications	Manages complex we transactional systems that can connect to several corporate databases	Robust, industrial strength business applications such as order entry and inventory system. It performs complex database transactions

Table 2-7. Types of web application, [3]

a. Design Considerations

“Performance considerations” presents some peculiar design issues that must be taken into considerations while designing a web database application interface.

2.1.6.2.3. Security

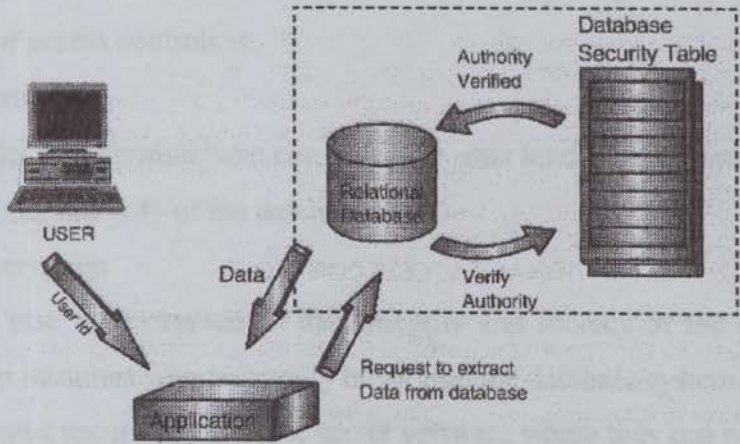


Figure 2-1, Database Security[3]

a. Define the users of the database

To design the security procedures and functions of the database, the type of users and their information needs are the first thing a system designer should know. This is needed to know the boundary of the security design for each department or group. Access and breaking into the database without proper authorization can be avoided this way.

b. Access controls

Access control is a topic that should be discussed. In two sections:

i. Limit access

Controlling access while information is being displayed is a very different problem from controlling access while information is being communicated.

ii. Manage access

Managing access controls implies specifying what kind of access is allowed to each user and then enforcing those limitations. The kind of kind of access can range from none at all to full unfettered access with full privileges.

There are three schemas for managing access: discretionary access controls, mandatory access controls and role based access controls. DAC- a person running a working group could provide working members with access to shared files but deny the access to anyone else.

RBAC and MAC- management of access is much structured there is a formal set of rules about who can access to what kind of information.

Example of access controls is:

- Authentication
- Formal rules to determine who can access to what kind of information
- Protecting the integrity of the database [25]

c. Encryption

Database can also be encrypted so that integrity and secrecy of the database is protected from intruders who purposely break into the database system. Even then the intruders get a security hole in the server software where they can penetrate in.

This can be avoided if there is a better encryption system like the 128-bit encryption.

2.1.6.2.4. Interface design

Interface design is most often associated with the development of web pages, computer software, and multimedia, but is relevant to the creation of any instructional media or technical equipment.

a. Usability

Refers to how intuitively or easily your media item is navigated and processed. This construct is the most inclusive of the three and is influenced by both visualization and functionality. Some of the usability characteristics are

- i. Navigation-Less help or guidance needed to navigate the site.
 - Buttons or graphics are meaningful
- ii. Structure- Provide a panoramic view of the whole site.
 - Consistency of web pages colour and text for identifying the status or the location of the user
- iii. Accessibility- Support different kind of browsers
 - Downloading the pages more quickly without waiting for graphics and
 - Multimedia to download.
- iv. Readability- Graphics and text which are integrated gives a more readable look
 - Contrasting colour of text and graphics are used
- v. Efficiency-Better to use small images with lesser colours.

[3]

b. Visualization

Creating visually interesting and aesthetically pleasing media items while avoiding potentially distracting or unnecessary "bells and whistles." Aspects looked into are text, colour and screen design and layout

c. Functionality

Refers to the features of the media item used and how useful they are for supporting a given task (e.g., interactive simulations, drill and practice quizzes, site maps, frequently asked questions, search engines) types of tools

d. Accessibility

It is an emerging Web interface design topic; if not addressed, it will negatively influence Web site usability for users with certain disabilities; tools that help users access your site in alternative formats (e.g., text, aural, visual) provide for increased functionality

2.1.7 Human computer Interaction on Human's emotion

Since the evolution of computers, human have imagined and dreamt about the wonders they will do and can do in the future. One of the ability that humans hoped computers could perform is to have emotions like men. This made men to get involve in research and studies to find ways of how computers can behave like men.

2.1.7.1. Synthesizing emotions in machines

Building machines that not only appear to "have" emotions, but also actually do have internal mechanisms analogous to human or animal emotions. In a machine, (or software agent, or virtual creature) which "has" emotions, the synthesis model decides which emotional state the machine (or agent or creature) should be in. The emotional state is then used to influence subsequent behaviour.

The ability to synthesize emotions via reasoning about them, for example: to know that certain conditions tend to produce certain affective states is also important for emotion recognition. Recognition is often considered the "analysis" part of modelling something and analysing what emotion is present. Synthesis is the inverse of analysis that is constructing the emotion. The two can operate in a system of checks and balances: Recognition can proceed by synthesizing several possible cases, then asking which case most closely resembles what is perceived. This approach to recognition is sometimes called "analysis by synthesis." [40]

2.7.1.2. HCI

One of the ways to describing user input syntax is the State Transition Chart. [42] With this chart designers can easily follow the design that they have plan to construct an interactive system. However state transition diagram can become very complex if the system is very large. The conclusion is, the state transitions diagram can be used to describe input syntax if the system is not too large. Interaction styles represent alternative design strategies for the user interface. It is more convenient to distinguish interactive styles into three categories

a. Key-model

User interface is operated mainly with the aid of function keys or an alphanumeric keyboard. Four common interaction styles, which can be considered key-modal, are menu-based interaction, question-and-answer, function-key interaction and voice-based interaction. Each of these interaction styles depends on shifts of mode. In other words, the behaviour of the system in response to a particular input varies according to the stage of dialogue.

b. Direct manipulation

With the aid of pointing device, the user can apply actions directly to the object of interest. Two widely used styles are graphical direct manipulation and form fill-in.

c. Linguistic

These styles require all of the user's inputs to be made on an alphanumeric keyboard, using a particular set of conventions or language. The two principal linguistic styles are command-line interaction and text-based natural language. [42]

This interactive design depends on the activity of the system and the user who interacts with it. If the system needs a fast response in order to accomplish a task, the system is not advisable to have a command based or text-based natural language because these interfaces have longer processing time.

2.2 Analysis

Analysis is done based on a few web sites and counselling system available, [William Newman, Michael Lamming Interactive system design].

- c. Identifying the human activity that the proposed interactive system will support.
- d. Identifying the people, or users, who will perform activities.
- e. Setting the levels of support that the system will provide.
- f. Otherwise selecting the Basic Form of solution to the design problem.

2.2.1 Current Systems

When I browsed through the web sites looking for counselling web sites, I found that there are two types of sites. One is a resource based and another one is the communication based. Most of the websites are resource based. Resource based is the introduction for counselling when the web was in its earlier stage. These sites store data like news, articles, counsellor's information and links to all the educational organizations offering counselling courses and other service description.

The communication and resource based however is more focused on the communication using the web as the medium. Counsellors and counselees can bring the virtual world to life when they communicate through the web. Listed here are two for each type of sites together with their navigational flowchart, design and technology used.

2.2.1.1. Resource Based

www.planet-therapy.com

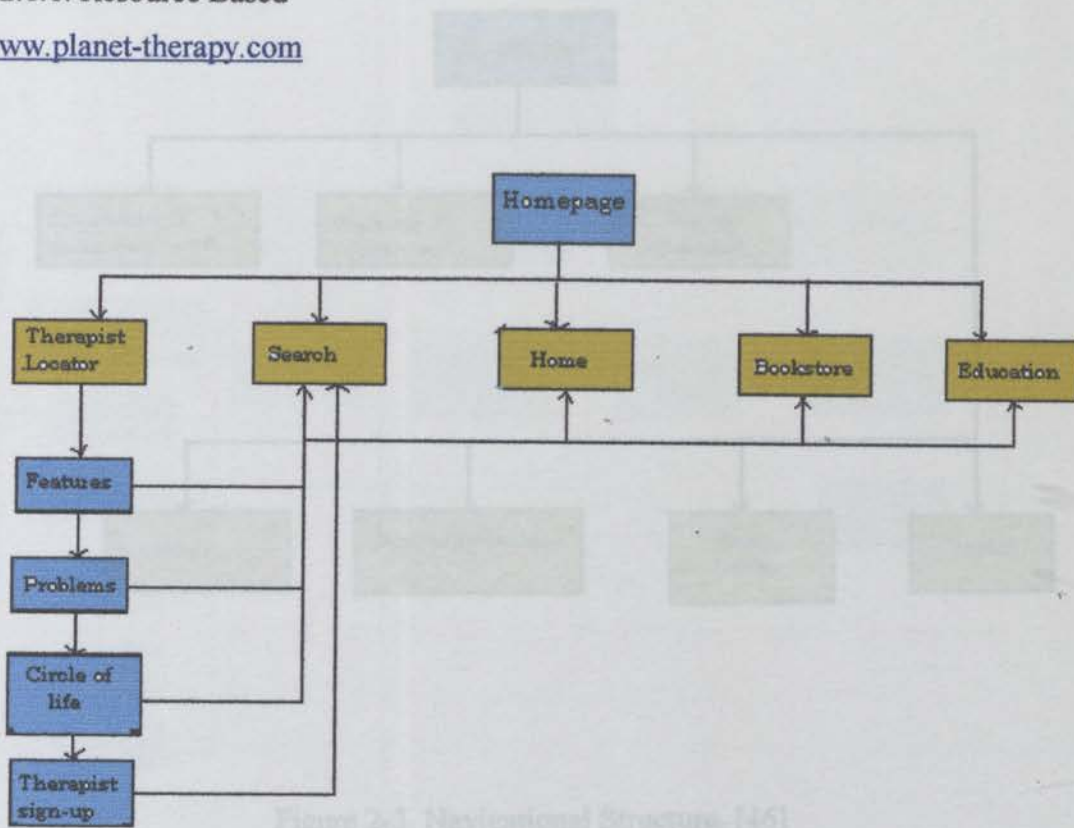


Figure 2-2. Navigational Structure, [46]

This web site is very simple. It is an easy task to navigate this site as all the buttons are displayed every where. The site is simple 'counselling & mentoring youth' each has a drop down list. DHTML is used for the client-side.

Figure 2-2. Navigational Structure, [49]

This site is built on plain HTML. It is a static web page with all the new offers and information about counselling. There are less graphics on this page. The site is simple with no animation. The search for this site displays a good resource of links. The user has to choose the suitable link as a solution to their problems. The therapist locator is for the professionals. The 'circle of life' (q & a format) has a drop down list to choose. The limitation of this system is, it has less resources on its site, It does not offer communication services. The web page is not very organized. The web site is only to get information and not for therapy purposes or never acts as a mediator between the clients and counsellors. The benefit of the system is stores and reveals information fast and displays the counselling courses offered in schools and institutes.

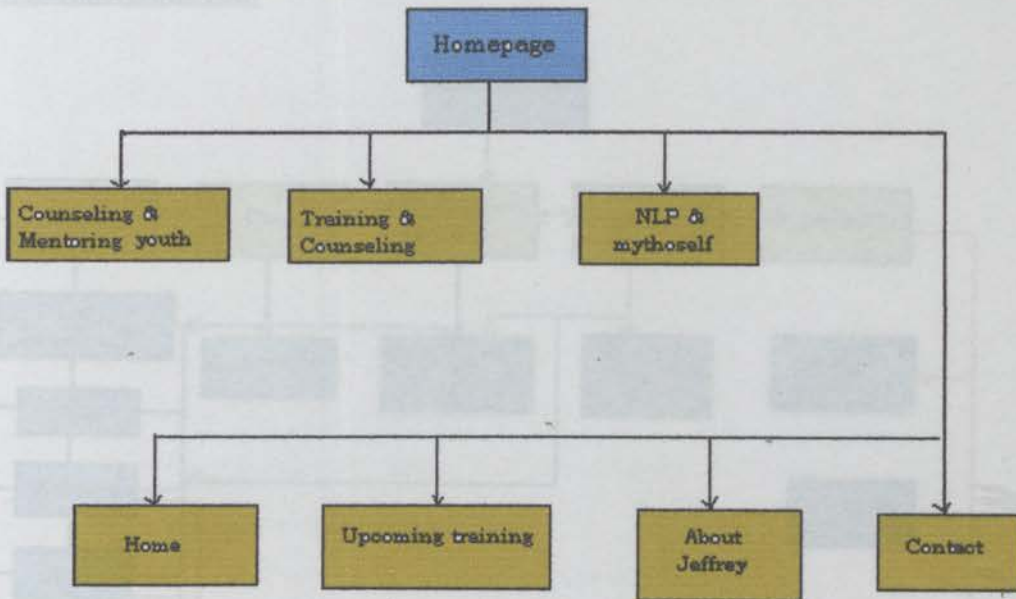


Figure 2-3. Navigational Structure, [46]

Figure 2-4. Navigational Structure, [46]

This web site is very simple. It is an easy task to navigate this site as all the buttons are displayed everywhere. However the top buttons for example ‘counselling & mentoring youth’ each has a drop down list. DHTML is used for the client-side programming. This is a static web page. The limitations of this site is similar to the ones in www.planet-therapy.com However the benefit of this system is it very easy to navigate and has attractive drop down menus using DHTML. It also has fewer graphics and a clean looking interface.

is it requires counselors to pay for the communication service with the connection. The system does not chance for the professionals to advice without using the e-mail or chat. It also does not serve the researchers who are looking for psychological data. The response time is quite slow.

The benefits are this system is easy to navigate, they have fewer flaws in their design such as accessibility, readability, organized, less frames, many options for

2.2.1.2. Communication and Resource based / Need based

www.helphorizons.com

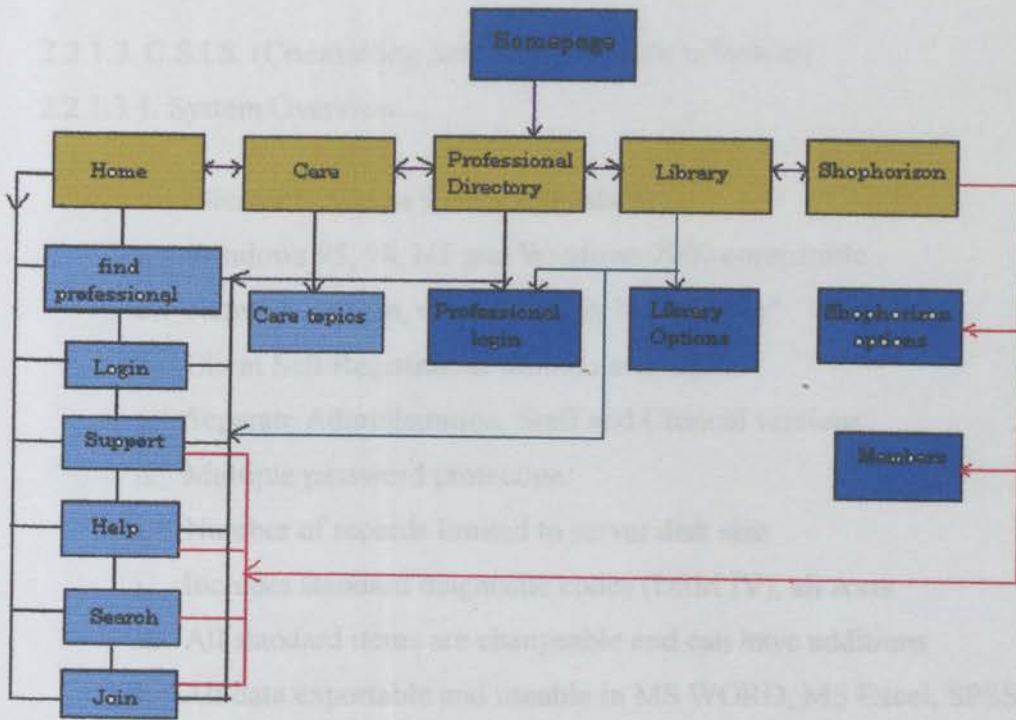


Figure 2-4. Navigational Structure, [38]

This is big web portal. The system allows communication like e-mail, chat, video and audio conferencing and message board. It also has a shopping cart and e-commerce options. It is built using ASP as the client-side and server-side. It is a simple dynamic web page. It has its own search engine that retrieves and outputs from the database.

The limitation for this system is it requires counselees to pay for the communication service with the counsellor. The system does not chance for the professionals to advice without using the e-mail or chat. It also does not serve the researchers who are looking for psychological data. The response time is quite slow.

The benefits are this system is easy to navigate; they have fewer flaws in their design such as accessibility, readability, organized, less frames, many options for

resources and allocate for professional personal use. It also has a virtual office function, which fixes schedule and appointments and plans it orderly for users.

2.2.1.3. C.S.I.S. (Counselling Services Information System)

2.2.1.3.1. System Overview

- c. Microsoft Access 97 as the database
- d. Windows 95, 98, NT and Windows 2000 compatible
- e. Network version, can be used as "stand alone"
- f. Client Self Registration Module available
- g. Separate Administration, Staff and Clerical versions
- h. Multiple password protection
- i. Number of records limited to server disk size
- j. Includes standard diagnostic codes (DSM IV), all Axis
- k. All standard items are changeable and can have additions
- l. All data exportable and useable in MS WORD, MS Excel, SPSS, SAS
- m. Source Code Included
- n. Spell check in all forms
- o. Can be modified in house without expensive technical support
- p. Can be customized to agency needs
- q. In use for over five years
- r. Record Archiving
- s. Complete Staff Activity Statistics
- t. Integrated Staff scheduling and clinical appointments

This system manages counselling information either online or standalone. The system has multi-level menus such as the Administration level and general clinical staff. This is the interface of the System.

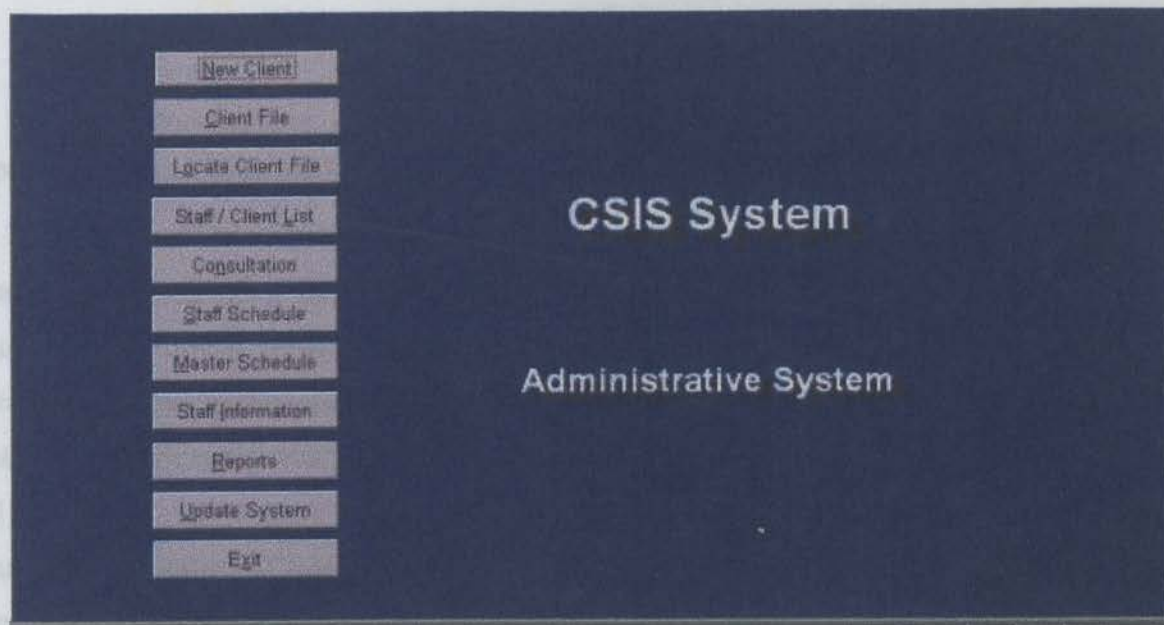


Figure 2-5. Administrative System, CSIS

2.2.1.3.2. Client Intake module

a. Self Registration Module

- i. Initial Information
- ii. Client Information
- iii. Client Assessment
- iv. Closing Instructions

A front office client intake / registration is available as an additional integrated module. The Self Registration function automatically. Staff members can use the schedule to track and plan previous and upcoming non-clinical hours. The combined information can be used to produce a daily, weekly or monthly schedule or locate free time for activities and appointments

b. Staff / Appointment Schedule

The Schedule function automatically includes previous and upcoming client visits from completed Visit forms. Staff members can use the schedule to track and plan previous and upcoming non-clinical hours. The combined information can be used to produce a daily, weekly or monthly schedule or locate free time for activities and appointments. Reports can also be created

c. Clinical Activity Statistics

Easy one selection form allows for the presentation of complete clinical activity reporting for individual staff members or all staff members

This system allows clients to fix an appointment all by themselves. The time and date can be fixed using this system referring to the availability of the counsellors. Each consultation can be saved in the database for further diagnosis or therapies. The administrator can update client list. Clients can register for them self. This system is installed in a university and therefore the clients are mostly students of the university.

[21]

One of the limitation of this system is the client has to go to the place of practice for consultation. System is not secured in saving all consultations. Administrators and clerical staffs can view the consultation records of the clients. The secrecy and integrity of data can be exploited, as there is no formal set of rules of who has the authority to access which data.

The benefit of this system is that it stores records of personal information and stores results of assessments. It also states for which they have come specifically so that the counsellors can recall the latest session with them. The client's state of activity can also be viewed at the client's list function. Other information about the client is the therapy or method used to overcome problems for the client, number of times visiting the counsellor, consultancy and assessments the individual has gone to.

2.2.1 Defining a problem

2.2.1.2. Analysis of what the users want

The fact-finding technique, which I have used in analysis and requirement analysis, is questionnaire. The questionnaire, which has been conducted, is attached in the appendix. A pilot test was done for the questionnaire. The pilot test was done to ask for feedback on the questionnaire, which, was prepared initially. The test was conducted using 15 testers and all of them are from the faculty of CSIT, University Malaya. After reviewing their feedback, the questionnaire was rewritten and distributed for analysis. The questionnaire was conducted on 60 people.

10 questions were distributed in the business faculty, 10 to the arts and social science and another 10 to the science faculty from University Malaya. Another 30 were distributed to the public outside the University at a bus stop. The questionnaire was also distributed evenly between the 2 types of gender. The analysis was done using MSExcel.

In my analysis, I found that most of them who answered these questions are aged 18-25 which is about 40%. Those aged between 26-35 are about 22% and aged between 55-65 are about 12%. There were none aged 66 and above.

More than 55% of them are still students, 20% are from the private sector, 8% are housewives. People who fall in the professionals and own business category are 7% and 5%. Government servants consist of 7%.

83% have used the internet and among them 65% are students, 15% are from the private sector, 16% are professionals 2% are government servants and another 2% are people who do their own business. According to this survey, housewives, some government servants and people with their own businesses have never used the Internet. Among those who do not know, 40% answered that they do not know how to use. Another 30% said they do not have facilities, another 30% answered other option, that it was too expensive and it is better to buy books and newspaper to get information than to get wired to the net. Only 10% said they were lazy

Among those who knew how to use the Internet, 21 of them answered they did not know what is a browser. Those who knew what is a browser answered for the next question. 58% of them use I. Explorer, 40% use Netscape and only 2% use Opera. Among those who use the Internet, 26% the highest percentage uses it once a week. There is no one who fall in the once a year category. Only 2% uses it everyday.

Among those who use it, only 26 knew what are online services. Among them are 20 students, 5 from private sector and one who is doing their own business. Among those who know what is online service, about 40% go for communication and entertainment service, only about 2% go for online shopping, another 30% are interested in the games and sports. There are about 11% who know what are online services but have not tried them. In my analysis, those who have tried the online services particularly the communication and entertainment consists of 60% of those

who are students and aged below 25 years old. About 46% are females and 54% of them are males.

For Section C:

From those who know online services, only 7% have heard about web counselling. Among the sites visited are www.mentalhelp.org and www.wholeperson-counseling.com. The purpose of their visit was for education-doing assignment and presentation, finding for books, read counsellor's biography and find solutions through resources.

Those who use the Internet and do not have been asked if they go to the counsellor. Only 27% make it a point to see the counsellor when they need to get an advice or help in making decisions. The highest frequency of visits to the counsellor falls in the rare category which is about 55% and the next highest is sometimes which is 36%. Most of them who visit to the counsellor go for career and marriage problems, which are 45% and 38%. There are many students who have studies problem, which is comprised of 15%. Those who sometimes visit the counsellor are mostly students who have counsellors in their education centres.

Since question no.8, Section C is for every body, most of them chose depression/stress and career problems to be prioritised in web counselling. The most common medium for web counselling was e-mail-35% and chat-30%. Other options were finding information through search, which is 25%. There are people wrote down audio and video conferencing but they were only about 5%. There were many who answered Access to it anytime and anywhere, which is comprised of 66%. Those who opted for it being cheaper is 20%. Many of them agreed to the idea that online appointments would be very convenient for both the counsellors and the counselees. About 68% wrote that it would be difficult to cure people on the Internet

3. Methodology

Methodology is defined as a collection of procedures, techniques, tools and documentation aids. There are many types of methodologies depending on the requirements of the system, for example:

- i. SSADM
- ii. OOAD
- iii. IE
- iv. SSM and
- v. ETHICS [58]

Chapter 3

3. METHODOLOGY

3.1. SYSTEM MODEL

3.2. TECHNIQUES

3.3. TOOLS

3.4. REQUIREMENTS

3.5. SCHEDULE

3.6. DESIGN

3.7. LIMITATIONS AND STRENGTH

3.Methodology

Methodology is defined as a collection of procedures, techniques, tools and documentation aids. There are many types of methodologies depending on the requirements of the system, for example:

- i. SSADM
- ii. OOAD
- iii. IE
- iv. SSM and
- v. ETHICS. [58]

Different methodologies have different objectives. The methodology based on our requirement analysis is OOAD.

3.1 System Model

The system is modelled using evolutionary model.

This design of this system allows the users to express their expectations more precisely. The development approach has no sloppiness and more rigorous. The model focuses on building the parts understood first. There must be a solid foundation when modelling. The ultimate goal of this model is to evolve using the users' feedback.

[55]

3.3 Tools

3.3.3 Back-end

a. Visual Basic

This tool is easy to use and implement. It has many functions like controls button features, database connection for SQL Server and other relational databases. It has provided a way to extend the development environment with components such as VBXs, then OCXs. Version 6.0 supports ActiveX Data Objects through an integrated array of graphical database development tools. Programmers can quickly write a

3.2 Techniques

Techniques used for this system are as follows:

Stage	Overall	Data	Process
Strategy	<ul style="list-style-type: none">• Visualization		
Analysis	<ul style="list-style-type: none">• Structure diagram,• Objects• Pictures	<ul style="list-style-type: none">• Entity-Relationship modelling	<ul style="list-style-type: none">• Flowchart,• State Transition Diagram (STD)
Logical design	<ul style="list-style-type: none">• Structure diagrams,	<ul style="list-style-type: none">• Entity Relationship• Modelling,• normalization	<ul style="list-style-type: none">• Logic process
Program / database design	<ul style="list-style-type: none">• Objects• Structure Diagrams	<ul style="list-style-type: none">• Normalization	<ul style="list-style-type: none">• Logic process

Table 3-1. Techniques

3.3 Tools

3.3.2 Back-end

a. Visual Basic

This tool is easy to use and implement. It has many functions like controls button features, database connection for SQL Server and other relational databases. It has provided a way to extend the development environment with components such as VBXs, then OCXs. Version 6.0 supports ActiveX Data Objects through an integrated array of graphical database development tools. Programmers can quickly write a

sophisticated data-centric business application. Integrated Visual Database tools and a RAD environment promote productivity while native code compilation provides fast applications.

3.3.3 Database

3.3.3 Database

a. MS Access

Access offers an easy-to use database for managing and sharing data. Access brings not only the traditional broad range of easy data management tools but also adds increased integration with the web for easier sharing of data across a variety of platforms and user levels and additional ease-of-use enhancements to assist with personal productivity.

MS Access is used as the prototyping database. The database is then exported to MSSQL Server. Benefits of Access is making information easy to find and use, web-enabled information sharing, powerful solutions for managing information, MSSQL Server interoperability and administration tools, hyperlink handling, drag and drop to Excel and many more features.

b. MSSQL Server 7.0

This database can store huge amount of data compared to My SQL. It is a scaleable, high performance database management tool. SQL Server includes an array of new and improved features to make it robust, scalable server capable of solving the need of many enterprises.

3.3.4 Interface

a. Adobe Photoshop version 6.0

It is a tool to develop graphics and enhanced pictures. In this project, it has helped me to design the interface. Most of the time, .jpg file is used for the interface. The background of the main page is embedded with a few modified pictures and graphic as an introduction to the system. The logo, buttons, borders and templates are designed using Photoshop. It will be used in both front-end and backend. This

software is known as the international standard tool for creating pictures and graphics. It is used in almost every field of design.

b. IMS Web engine Professional 1.88

It is used to author DHTML (Dynamic Hypertext Markup Language). DHTML is used to enhance the display of data. It features JavaScript, flash for the user's attraction. It can be annoying if used too much. DHTML is used for the drop down menus, JavaScript and Flash effect.

Is used quite widely in this project for:

- i. Background changing
- ii. Making interactions easier (scrolling)
- iii. Mouseover effects with DHTML

3.3.5 Agent development tools

a. Poser 4.0

Poser generates dynamic, figure-based content while providing a valuable introduction to 3D. Poser is a 3D-character animation and design tool. Users can create images, movies, and posed 3D figures from a diverse collection of fully articulated 3D human and animal models. Libraries of pose settings; facial expressions, hand gestures, and swappable clothing are included as well. Requirements: 240Mb free hard disk space, File size: 13 MB.

Some features:

- i. Sketch Designer, a rendering option that creates a scene using a series of brush strokes
- ii. Conforming Figures: Each article of clothing was created as if it were a Poser figure
- iii. Advanced Texture Controls: incorporate transparency and reflectivity into Poser textures, onto a whole figure or individual body parts
- iv. New Libraries and Content: Over 60 fully textured 3D figures

b. AIML Builder

AIML Builder is a tool for building the natural language interface and processing for the agent. The tool can be used for the non-programmers because it does not need write down codes as the builder enquires us to write in the questions and answers to build the language of the agent. This tool needs the Java Runtime Environment Standard Edition to run. It is quite easy to build the code and implement it into the agent. The tool uses XML the main language of AIML to write codes that can be transferred to the project.[1]

3.3.6 Prototyping

a. Dreamweaver version 4.0

Dreamweaver is a prototyping tool. It authors Html, Flash , Fireworks, Photoshop and other macromedia tools together. Web developers can visually design and manage cross-browser Web sites without sacrificing Hypertext Markup Language (HTML) control. It also has a connection to the ODBC. It is easily constructed because its menus are displayed on the working area, user-friendly drag and drop facilities and the prototyping is dynamic html. Dreamweaver also lets Web developers customize the environment and automate tasks. This tool is used as the main prototyping tool compared to FrontPage. The frames are easier to store and retrieve. It is easy to recall a template. Another of Dreamweaver's most popular features is Roundtrip HTML. Dreamweaver provides tools for developing browser-neutral Web sites graphically and quickly through point-and-click, drag-and-drop operations, without requiring manual HTML coding. Moreover, Dreamweaver establishes a local site as a storage location for all documents and files belonging to the Web site project. The weakness of this tool is that it mixes up all the frames and pages together in one directory. The user has to remember the name of each page and frame before making a new frameset. Users must still move to the Web server to test and run server-side processes

b. FrontPage

This is rather a simple tool for prototyping. It can be connected to Dreamweaver and vice-versa. ASP too can be coded by using this tool. It is easy to get since it comes in the Microsoft Office 2000 Package. It is easy to use if we are used to MSOffice applications. It has CSS features and it connects to a database. The reports and navigation structures are easily generated with a click of a button. To see the structure of the whole site, we can look at the Hyperlink. Our site hyperlink structure was generated using FrontPage. Besides that, all the difficult and complex interfaces got started off using this tool.

3.3.7 Server-side and client-side

a. ASP

ASP pages are files that contain HTML tags, text, and script commands. They can call ActiveX components to perform tasks such as connecting to a database or performing a calculation. ASP lets us add interactive content to Web pages or build entire Web applications that use HTML pages as the user interface

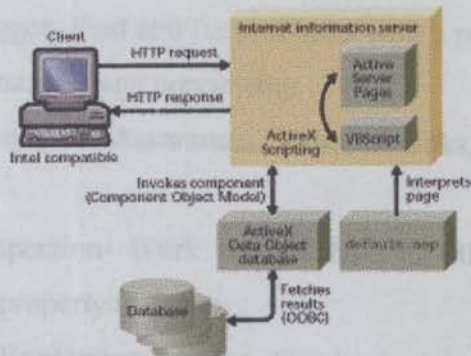


Figure 3-1, ASP Processing

b. Coldfusion Application Server,

The Coldfusion Development at its most basic configuration consists of a single server for hosting the Coldfusion application server and the web server. The database resides on a separate machine.

Server Application programming interfaces (APIs) expand the capabilities of Web servers. Coldfusion uses API to communicate between the Web server and the Coldfusion Application Server.

MS Access for example

b. Metadit

c. Coldfusion Studio:

Integrate with many platforms and coded with ASP, Need the Coldfusion Application Server to run. It optimises developer productivity with a complete RAD environment that includes visual programming, database and debugging tools such as:

- i. Advanced HTML Editor- HTML, CFML, and XML editing facilities including advanced colour coding and automatic tag completion.
- ii. Visual Database tools- Create complex SQL statements with the drag-and-drop ease of a visual query builder browse local and remote data sources and view data and schema.
- iii. Two-way visual programming- WYSIWYG HTML design tools cleanly preserve code.
- iv. Interactive debugger- Find and fix problems with a powerful interactive visual debugger and dynamic page previewing.
- v. Dynamic Page quality Assurance- Validate links, HTML and CFML in dynamic pages.
- vi. Tag property inspection- Work with HTML, CFML and XML tags with a configurable tag property inspector.
- vii. Point-and-Click Expression builder- Create complex CFML expression that combine functions, values and operators with visual tool
- viii. Web application wizards- Get started quickly with Web application wizard for creating basic application.
- ix. Code re-use- Save snippets of code or CFXs for quick re-use across pages or applications.

[32]

3.3.8 Modelling

a. Datanamic (Design for Databases)

It is a simple software to design the database using the ER Diagram. The diagram can then be exported into the Module file of MSSQL Server, Access, Oracle and others. The code generated from the diagram is pasted onto the new module file of the MS Access for example.

b. Metaedit

Used for modelling and generating report. This tool helps to create ERD, OOA, SART and other types. It also generates codes and report. The tool is good for creating a clear and easy labelling and modelling. The programs DLL file stores many objects that automatically displays after the object form is filled. The report states the number of entities, attributes and relationship and the connection between them.

3.3.10 Server Operating System

a. Windows 2000 Server/NT

Windows 2000 has NT technology that can be used as a server host. It also has many features like. Windows 2000 is chosen because it supports SQL Server and comes with IIS.

3.3.11 Server software

a. Microsoft IIS

Microsoft IIS is used because it comes bundled with Microsoft's Windows NT operating system. IIS servers equally well as an intranet Web server or a public web server program. IIS includes integrated search engine that allows users to create customized search forms with a variety of tool, including ASP, ActiveX Data Objects and SQL database queries. This server software also includes Crystal reports. Other than that, the software supports FTP, allowing users to download and upload from the IIS server site. IIS creates CERN/NCSA common log file formats and allows writing multiple logs. The MMC, which is included in IIS, provides central server management from any server on the network. IIS supports multiple virtual hosts.

Security in IIS is tightly integrated with Windows NT's operating system security. It provides access control mechanisms and SSL software encryption. IIS also provides application environment where HTML pages, ActiveX components and

scripts can be combined to produce dynamic pages. Microsoft also includes ISAPI. Database support includes ODBC and MSSQL.

3.3.12 Other Tools

a. MS Word 2000

Word is used for creating html codes by converting to hyperlink. ASP code also can be generated using this tool. I mainly used this tool to write my report. This tool also extends the ease of use to international users, making it easy to create multilingual documents. The benefit of this software is to share information easily, create content for the web, and reduce downtime. New features installed in this software are the click-n-type, HTML as native file format, collect and paste, personalized menus and language auto detect. The improved feature of this software is the web page wizard, web page preview, table of contents, hyperlinks, intelligent auto correct and spelling and the grammar checker which has added new word to its dictionary.

b. MS Paint 2000

This software is used to draw the diagrams and create gif and bitmap files. Charts and most of the design diagrams were created using MS Paint 2000.

3.4 Requirements

3.4.1 Hardware

The system has to have one web server and one extra computer connected to server for security reasons. These two computers are located at the hosting site (server). Besides that the client is connected to a modem and a telephone line or to a leased line.

These are the database system requirements:[41]

Hardware	Minimum requirements
Computer	Intel® or compatible Pentium 166 MHz or higher.
Memory (RAM)	Standard Edition: 64 MB minimum
Hard disk space	SQL Server database components: 95 to 270 MB, 250 MB typical Analysis Services: 50 MB minimum, 130 MB typical English Query: 80 MB
Monitor	VGA or higher resolution 800x600 or higher resolution required for the SQL Server graphical tools
Pointing device	Microsoft Mouse or compatible
CD-ROM drive	Required

Table 3-2. Database Hardware requirements, [41]

Operating System

SQL Server edition or component	Operating system requirement
Client Tools Only	Microsoft Windows NT 4.0, Windows 2000 (all versions), Windows Me, and Windows 98.

Table 3-3. Database Operating System Requirements, [41]

Internet

Component	Requirement
Internet software	Microsoft Internet Explorer 5.0 is required for all installations of Microsoft SQL Server 2000, as it is required for Microsoft Management Console (MMC) and HTML Help. A minimal install is sufficient, and Internet Explorer is not required to be the default browser.

Table 3-4, Database Internet Software Requirements

3.4.3 Functional Requirement

Description of activities and services a system must provide. They are frequently identified in terms of inputs, outputs, processes and stored data that are needed to satisfy the system improvement objectives

3.4.3.1 Modules

a. Authentication

i. Administrator

Authentication, Authorization, Encryption

Authentication and authorization module is implemented for the administrator. This is for the database. The time is recorded before and after accessing the database.

ii. Counsellor

Authentication, Separate Application

The counsellors have a separate application. The application is not distributed. The application has an id authentication that is registered. Any other people caught using this software for hacking will be caught using the registered id on the application. There is an authentication module here for accessing the database. The counsellors each have an encryption module where the counsellors each have a public and private key.

iii. Counselee

Authentication, Navigation Flow Control

Counselees also have the authentication module before and after accessing the database. The navigation flow control disallows the user to go pass the authentication module before entering the site.

iv. **Researcher**

Authentication

Researchers also have an authentication module.

v. **Network (Intercepting)**

Virus detection, packet filtering, encryption, authentication

Encryption has already been discussed in the counsellor's part, while virus detection can be avoided using anti virus software for detection and live update. The server software does packet filtering. Usage of Norton Antivirus Software.

vi. **Database, Web Server**

Avoid saturating attacks, illegal update, anti virus software

Saturating attacks from the web users will be avoided using a firewall. Illegal updates can be avoided using the time schedule and authentication. Anti virus software can help eliminate viruses that attacks.

b. Search

Solutions are searched when problems are typed. A string matcher is used to search the problems in the database. The algorithm sorts out the most accurate match and displays the matches without allowing the user to choose their own solution from the links. Thesaurus of each keyword or problem is stored in the database.

i. **Sentence**

When the user types in a sentence, the system eliminates common words or verb to search. If the solution to the problem is unavailable, the screen will display that the solution is not available and display the similar words and sounds like words for the user to choose the right type of problem or keyword that the user wants to search on.

- **Categorization**

The user is asked to choose their problems in a list of links. After choosing the user searches for specific problems. Their search keyword is stored in the table for analysis.

- **Verification**

The sentences, phrase or word is verified after the user types in the search box and press the search button. Verification process identifies each of the word entered and the break module to start breaking.

- **Break**

The break module starts to break the sentences, phrases or word into categories of adjectives, noun and verb. Then the verb is eliminated and the other two are collected for the searching and string matching algorithm / sorting.

- **Search**

The strings are searched in the database. The thesaurus is also checked.

The string is matched or if not the user searches and picks the nearest word or sounds like words.

- **Display**

A display of the solution is displayed after formatting using a template. It guides to the therapies.

- i. Feedback**

Feedback mainly captures the feedback of each user for further design improvement.

- ii. Communication**

- Forum**

- i. View**

Displays the topics that are available to view. Lets users ask questions and invites all counselees to answer depending on their expertise.

- ii. Reply**

The feedback and replies to each user can be retrieved here. Other messages that are sent can also be retrieved. The counselees can reply to a discussion using this function.

Chat

- i. Lets the visitors chat among themselves in a public chat
- ii. Also allows counselees(visitors) to chat with the counselor who are available

iii. Analysis

Data is manipulated to graph, report or tables for the researchers according to their choices

iv. Extra

There is a penpal column where all visitors can make friends. Anyone can add their names to the list.

v. Robot

- Talk and reply
- Using AIML or ELIZA's theory. The talking may be about the counselling. Choosing options in radio buttons and drop down list are provided by this mascot, which acts as a virtual agents. The agent can recall past problems and bring it back to the counselees after the counselee logs on. The agent is only active for the counselees and researchers. These users can choose to make the agent active if they want.
- Search
- The agent helps the counselees search easier and faster. During the first time, counselees and researchers can seek the help of these agents to help them search on this site.
- Virtual Counselor

- The agent helps people who visit the site and talk about solving problems. It can recall word or phrases just like a human. It uses the ALICE technology.
- Dictionary manages the site and provides availability all the time. Dead links
- The agent can also define meanings of words of not only counseling related but many others.

vi. Administrator control

Administrator inserts, delete and manages data. It has an authentication module. The administrator can insert problems, solutions and categories for the search engine

vii. Counsellor's Module

The counsellor can communicate through chat and forum using the webspace. There is a memo board facility for the the administrators to send notices to the site visitors.

3.4.5 Non-functional

Non-functional requirement is a description of other features, characteristics and constraints that define a satisfactory system.[58]

Online non-functional requirements are [69]

a. Availability

This feature depends on the hosting site. The server has a management tool that manages the site and provides availability all the time. Dead links and broken links will be avoided by reporting and management tool.

b. Response time

Response time depends on the bandwidth, server's line of speed, and client's line of speed and size of web page. Less graphics will be included in this site. [30.]

c. File storage

d. Interface

a. Availability

This feature depends on the hosting site. The server has a management tool that manages the site and provides availability all the time. Dead links and broken links will be avoided by reporting and management tool.

b. Response time

Response time depends on the bandwidth, server's line of speed, and client's line of speed and size of web page. Less graphics will be included in this site. [30.]

c. File storage

d. Interface

e. Reliability

f. Data security

These functionalities will determine the effectiveness of the website. All modules will be enhanced with the functionalities like availability, response time, file storage, interface and reliability.

3.5 Schedule

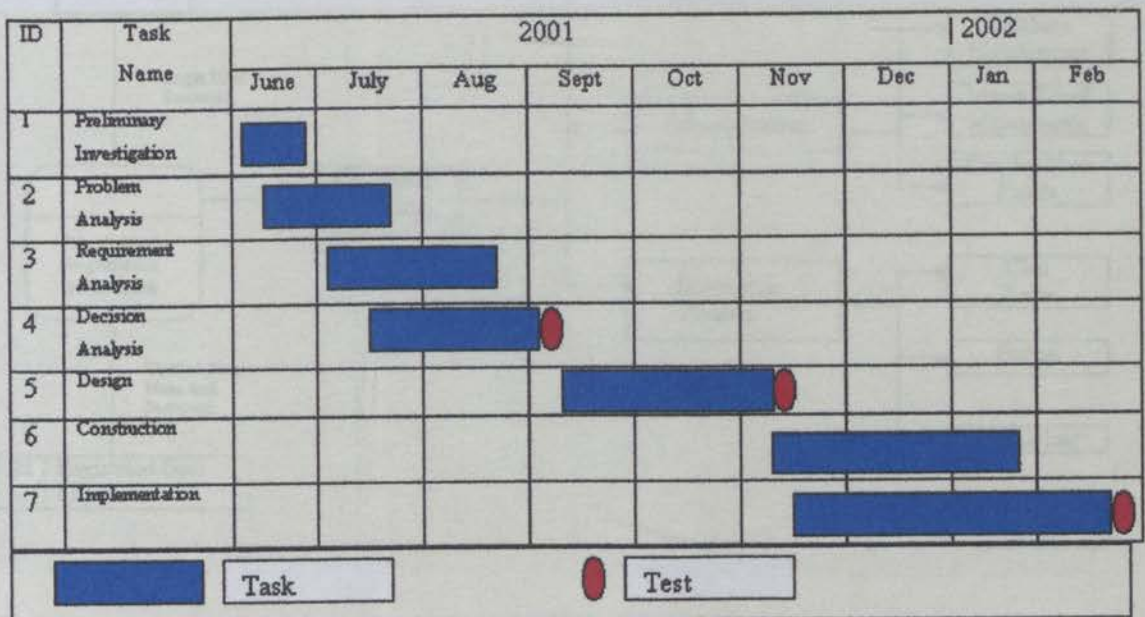


Figure 3-2, Project Timeline

i. DFD

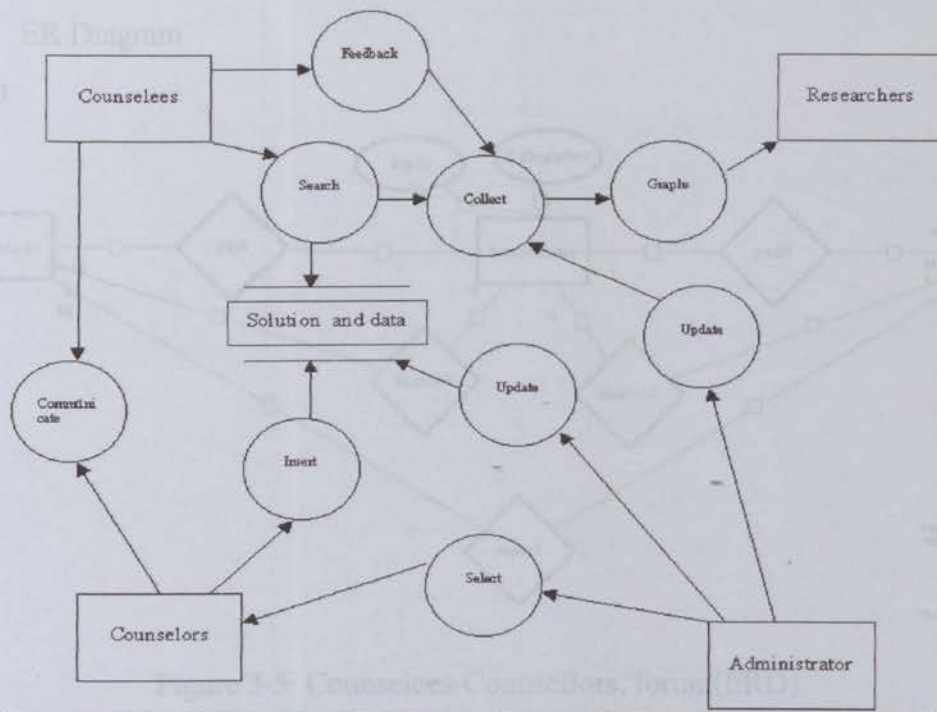


Figure 3-3. DFD

ii. Flowchart

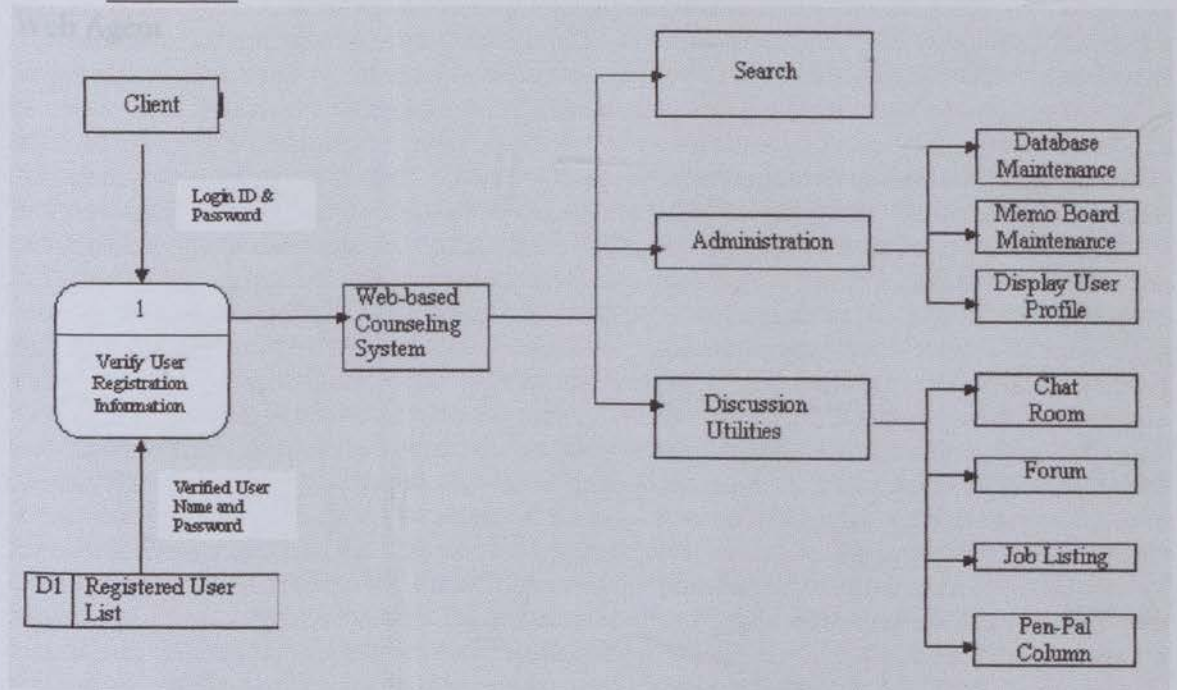


Figure 3-4, Flowchart

b. Database

i. ER Diagram

Forum

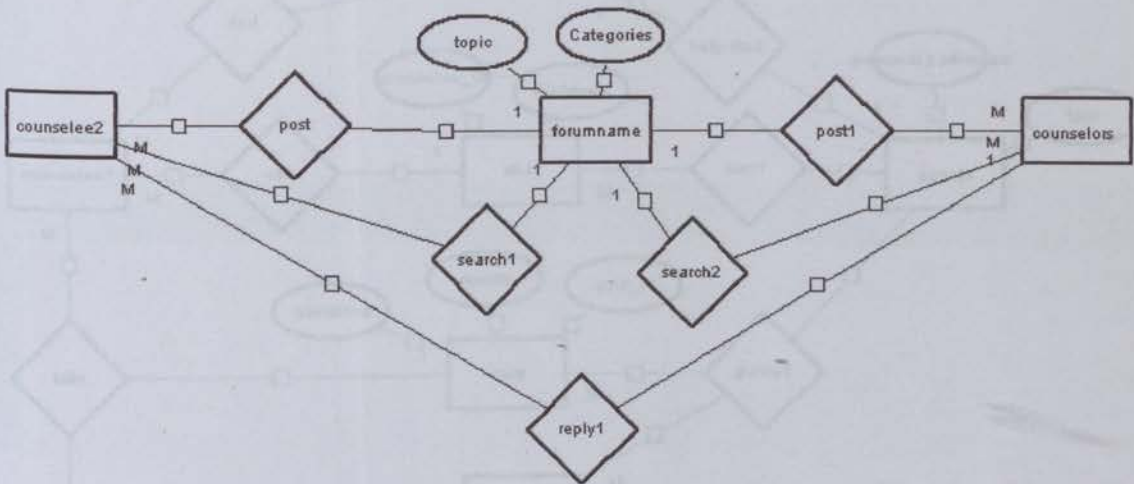


Figure 3-5. Counselees-Counsellors, forum(ERD)

Web Agent

Search engine

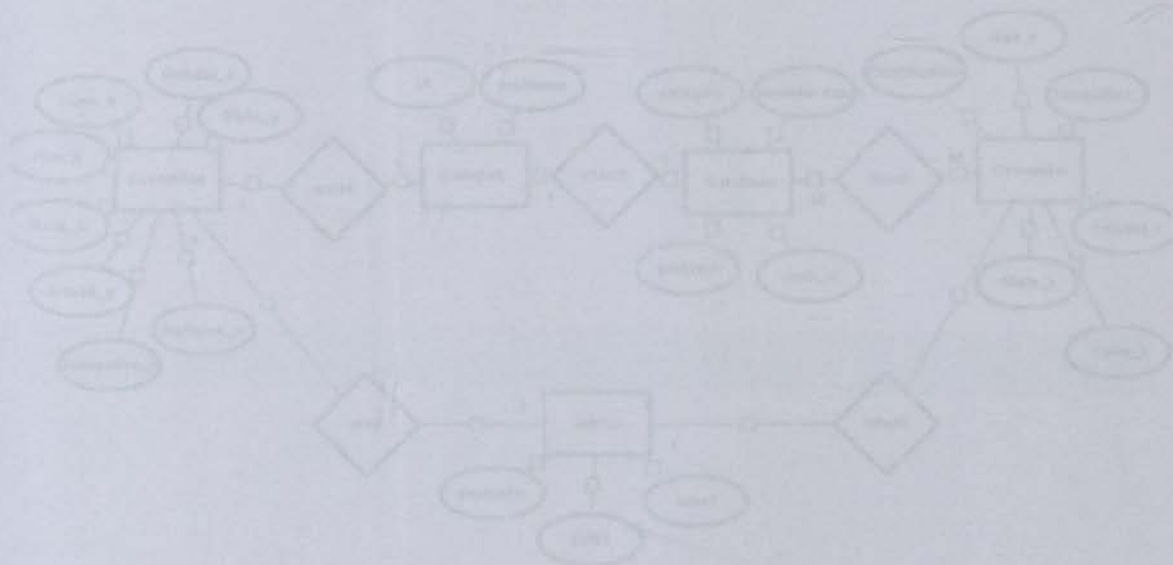


Figure 3-7 Counselees-Counselor, search engine(ERD)

ii. Search

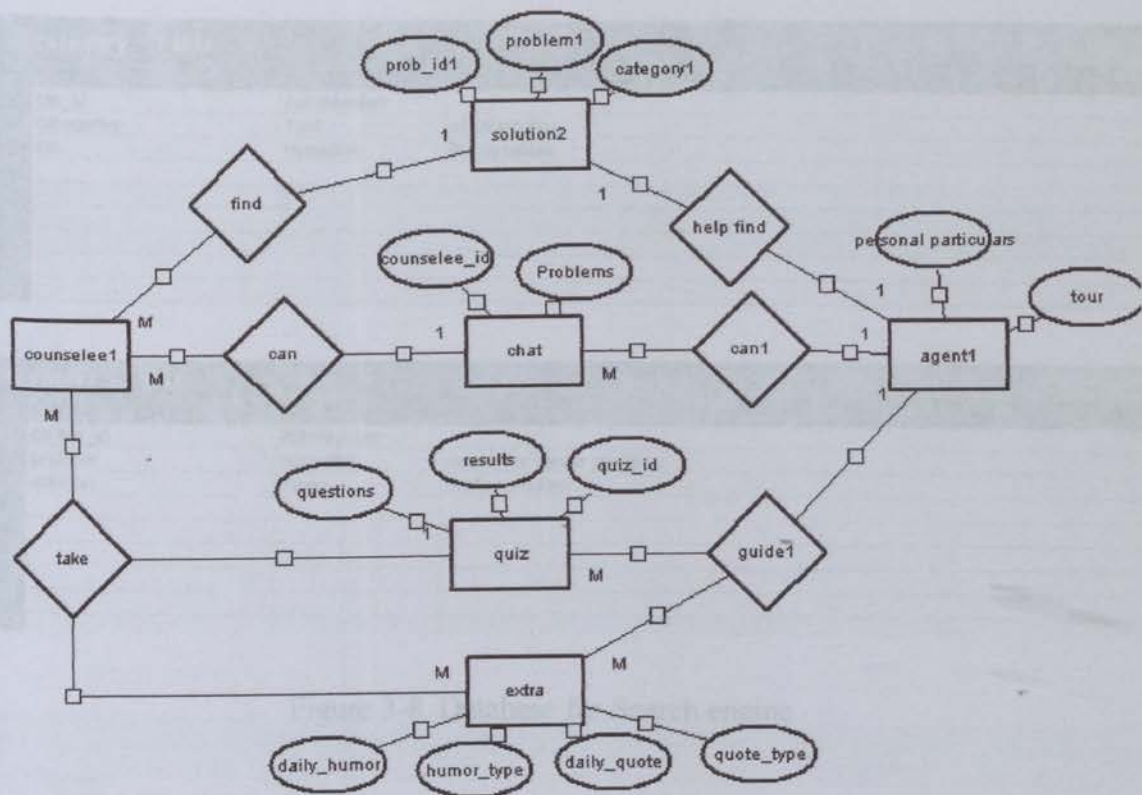


Figure 3-6. Counselees-Agent (ERD)

Search engine

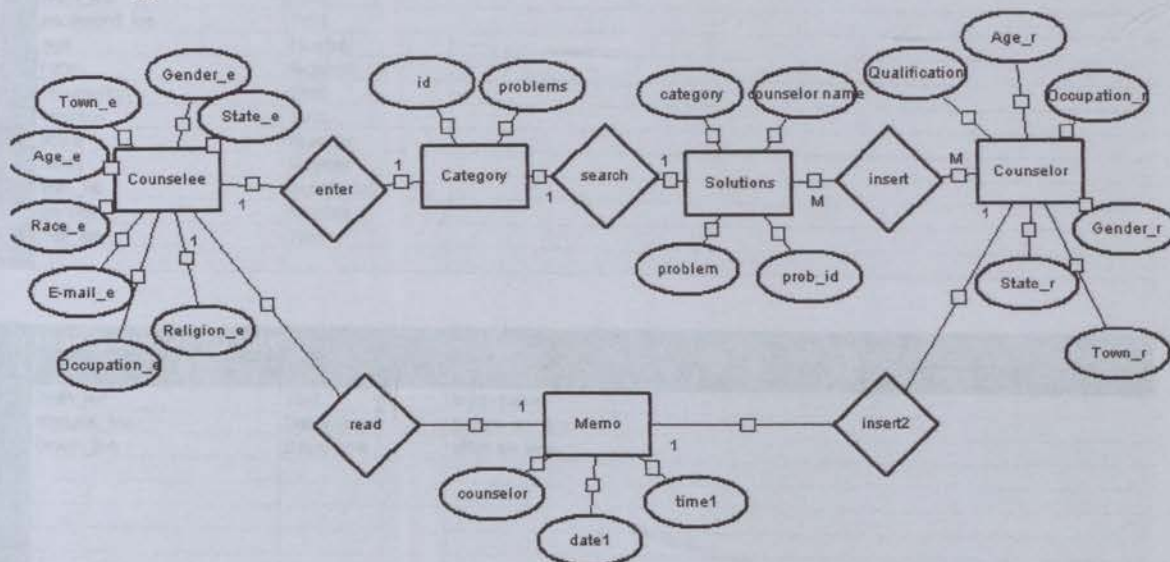


Figure 3-7 Counselees-Counsellor, search engine (ERD)

ii. Search

category : Table			
Field Name	Data Type	Description	
cat_id	AutoNumber		
categories	Text	all categories	
cat	Hyperlink	link to tables	

career : Table			
Field Name	Data Type	Description	
career_id	AutoNumber		
problem	Hyperlink	search for career problems	
solution	Memo	display solution	

Figure 3-8. Database for Search engine

iii. Authentication

logincounselor : Table			
Field Name	Data Type	Description	
login_lee	Text		
password_lee	Text		
age	Number		
race	Number		
occupation	Text		
address	Text		
state	Number		
town	Number		
visit_no	AutoNumber		
gender	Number		
mail_lee	Text		

timecounselor : Table			
Field Name	Data Type	Description	
login_lee	Text	log in name	
timeout_lee	Date/Time	before service	
timein_lee	Date/Time	after service	

Figure 3-9. Database Design for Authentication

iv. Forum

forumpeople : Table		
login_lee	AutoNumber	
name	Text	
mail	Text	
age	Number	
reply	Text	
others	Text	
interest	Text	
forumid	Number	

Figure 3-10 Database design for Forum

v. Appointments

appointments : Table		
Field Name	Data Type	Description
appointid	AutoNumber	
userid	Number	
date	Date/Time	
time1	Date/Time	
time2	Date/Time	
time3	Date/Time	
time4	Date/Time	
venue	Text	
counsellorid	Number	
user_name	Text	

Figure 3-11 Database design for Appointments

c. Network

Client-server Architecture

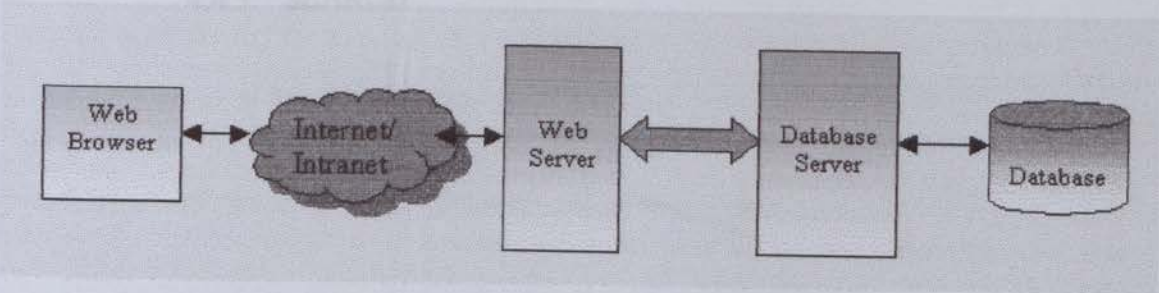


Figure 3-12. Simple dynamic web page

4.1 Data Layer and Transaction Layer

4.1.1. Data Layer

Since the database was chosen to be MS SQL Server, as proposed by Dr. Sellappan, it was configured and used for all the data collected.

The data layer includes operations like

a. Validating data in action forms.

b. Creating new tables using SQL.

c. Storing the data in arrays or structures.

d. Creating a large database for a medium size system.

e. Formatting the data to the page.

Chapter 4

4. SYSTEM IMPLEMENTATION

4.1. DATA LAYER AND TRANSACTION LAYER

4.1.1. DATA LAYER

4.1.2. TRANSACTION LAYER

4.2. USAGE OF PROGRAMMING LANGUAGE

4.2.2. ASP

4.2.3. COLDFUSION

4.3. SERVER CONFIGURATION

4.4. MODULES

4.4.2. FORUM

4.4.3. APPOINTMENTS

4.4.4. ROBOT(COUNSELBOT)

4.4.5. SEARCH

4.1 Data Layer and Transaction Layer

4.1.1. Data Layer

Since the database was chosen to be MS SQL Server, as proposed by Dr. Sellappan, it was configured and used for all the data collected.

The data layer includes operations like:

- a. Validating data in action forms
- b. Creating new tables using SQL
- c. Sorting the data in arrays or structures
- d. Creating a large database for a medium size system
- e. Formatting the data to the page

4.1.2. Transaction Layer

Its operations include:

- a. Building queries
- b. Handling violation and external database access rules
- c. Controls all transactional logic

SQL Server 7.0 provided a powerful database platform and necessary tools to enable us to design and implement applications. One of the most important reasons why this database was chosen is because of its ability to provide Universal Data Access, a platform for developing multi-tier enterprise applications that require access to diverse relational and non-relational data. This is a software component using a common set of system-level interfaces called OLE DB. It is tools for deploying and maintaining powerful, easy to manage and commerce enabled websites.

4.2 Usage of programming language

4.2.1. ASP

The site was mainly built with ASP because we needed a server-side scripting environment for creating interactive Web applications. ASP scripts give HTML authors an easy way to begin creating interactive pages. ASP provides a relatively simple mechanism for:

- i. Collecting information from an HTML form,
- ii. Personalizing an HTML document with a customer's name, or

iii. Using browser-specific HTML features.

If we want to collect information from an HTML form, we would typically use a programming language to build a common gateway interface (CGI) application. ASP lets us collect and analyse data from a form by using simple instructions embedded directly into HTML documents. So we need not learn or use a full programming language or compile separate executables to create interactive pages. ASP comes with scripting engines for VBScript and Microsoft JScript. ActiveX Scripting engines for Perl, Restructured Extended Executor programming language, and Python are also available from various vendors.

Developers who already know a programming language such as Visual Basic will find that ASP provides a flexible way to quickly create Web applications. By adding script commands to HTML pages, developers can create an HTML interface to an application. By creating ActiveX components, we could encapsulate we counseling system application's logic into reusable modules that they can call from a script, another component or another program.

This is how the ASP responses to the request of the client. ASP is used for this project considering these advantages that is considered important for the project.

a. Advantages

It lets us instantiate and use programmable components where we created these components in tools such as Visual Basic. It was also easy to integrate the applications with other existing client-server systems.

b. Disadvantages

ASP has two main limitations: It runs only on Microsoft platforms using IIS as a Web application server, and using it requires experience and programming skills.

4.2.2. Coldfusion

We needed Coldfusion to supports Windows NT/ 2000 servers such as Netscape, Microsoft ISAPI, O'Reilly, Apache and other environment such as the Solaris, HP/UX and Linux Stub.

Coldfusion offered us the fastest way to build and deliver scalable web applications that integrate browser, server and database technologies. They have key features like:

- i. Advanced ODBC connections
- ii. E-mail generation and retrieval
- iii. File management capabilities
- iv. LDAP server integration
- v. Has its own API called CFAPI
- vi. COM and DOM object support
- vii. Many functions
- viii. Supports expressions in queries including regular expressions and can be managed from any web browser anywhere.
- ix. Provides infrastructure for secure remote development across intranets and extranets

a. Advantages

- i. Intuitive tag based language
- ii. Short learning curve
- iii. Powerful server-side features and technologies
- iv. Extensible with CFAPIs
- v. Support for open standard-SQL, ODBC, SMTP, POP, LDAP

[4]

b. Disadvantage

It runs on top of Asp's layer and therefore the websites built are slightly slower compared to ASP.

4.3 Server Configuration

Since our portal had to be running on Microsoft for optimum integration capability, we used the Windows 2000 Server and included the applications in IIS. As for the robot which had to run using another server, the A.L.I.C.E server had to be setup and configured. To run the server, the server properties file had to be adjusted to host the chatrobot on the server.

4.4 Modules

4.4.1 Forum

Visitors can propose or ask questions to the counselors. They can also view the answers after they have been answered. Counselors can select the questions to be answered and answer them. This module was built in Coldfusion and connected to the MS SQL Server. This module does not hold sessions since it is a discussion area in the portal.

4.4.2. Appointments

This module's purpose is to create appointments virtually without time and money, having to go to the place to get counseled. Then the counselor and the counselee can either meet up in the private chatroom or if it is a group counseling, then they can meet up in the public chatroom or the forum. If the counselor really has to meet the counselee face to face, then they can fix the venue to their office room number on a specific date and time. The visitors then can select the venue either virtually or in the counsellor's office. This module was created using Coldfusion with same database.

4.4.3. Robot(Counselbot)

The robot has the function to chat to the visitors of the portal, discuss problems, help to counsel and define meanings of words. The capability can be increased from time to time after including many solutions to the problems of the visitors. It is also one way to make the site sticky.(invite many people) .The counselbot learns from the chat logs and tries to immitate the way we chat. It can be renamed and change its particulars for convenience. The robot needs ALICE server to run. The ALICE Server is created in a MS DOS using java, and so it has to have JRE to run.

4.4.4. Search

The search module lets the visitors type in words or phrases to search. Then it breaks up the sentences to word and finds words the match individually. It omits 3 letter words for the searching algorithm to make the search faster and simpler. The users pick the search link most suitable for their problem. When they click the link, they can view their solution.

5.1 Testing strategy

5.1.1. Unit testing

Unit testing is the most elementary level of testing that can be performed while developing the web system. It verifies all of the individual programs according to design specifications. [3]

Unit test will helped us test small modules that will be integrated together to build a large system. All of my modules had to undergo unit testing. If large system then will be tested again.

5.1.2. GUI test

This is to test the functions of the interface actions such as the menu bar, toolbar, display of error message, control button actions. Field level testing provided the flow to my functionalities. They

Chapter 5

5. SYSTEM TESTING

5.1. TESTING STRATEGY

5.1.1. UNIT TESTING

5.1.2. GUI TESTING

5.1.3. INTEGRATION TESTING

5.1.3.1. BIG BANG

5.1.3.2. BOTTOM UP

5.1.4. PERFORMANCE TESTING

5.2. WEB APPLICATION TEST CASE

5.3. TECHNIQUES

5.3.1. WHITE BOX

5.3.2. BLACK BOX

5.4. TESTING ROBOT

5.4.1. TESTING FOR CHATTING

5.4.2. TESTING FOR COUNSELLING

5.4.3. TESTING FOR DEFINITION

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5.1.2. GUI test

This is to test the functions of the interface actions such as the menu bar, toolbar, display of error message, control button actions, field level testing and many more. This testing provided the flow to my functionalities. They made all my modules to be integrated in a nice flow.

5.1.3. Integration testing

I had to use the Big Bang style and Bottom-Up style to integrate.

5.1.3.1. Big Bang- All programs are integrated together and tested simultaneously as a complete application. As a result I had to integrate my modules with my other groupmates to make the system work.

5.1.3.2. Bottom-Up- Low-level modules are integrated and tested together. This cycle continues until all application programs are combined and tested.

5.1.4. Performance testing

It verifies how well the application measures up against the multiple performance service-level requirements that are defined with the users during the analysis and design phases.

d. Security testing

Verification of immunity of the web application from unauthorized people to access to it. So the counselors can access the counselor's data, but the

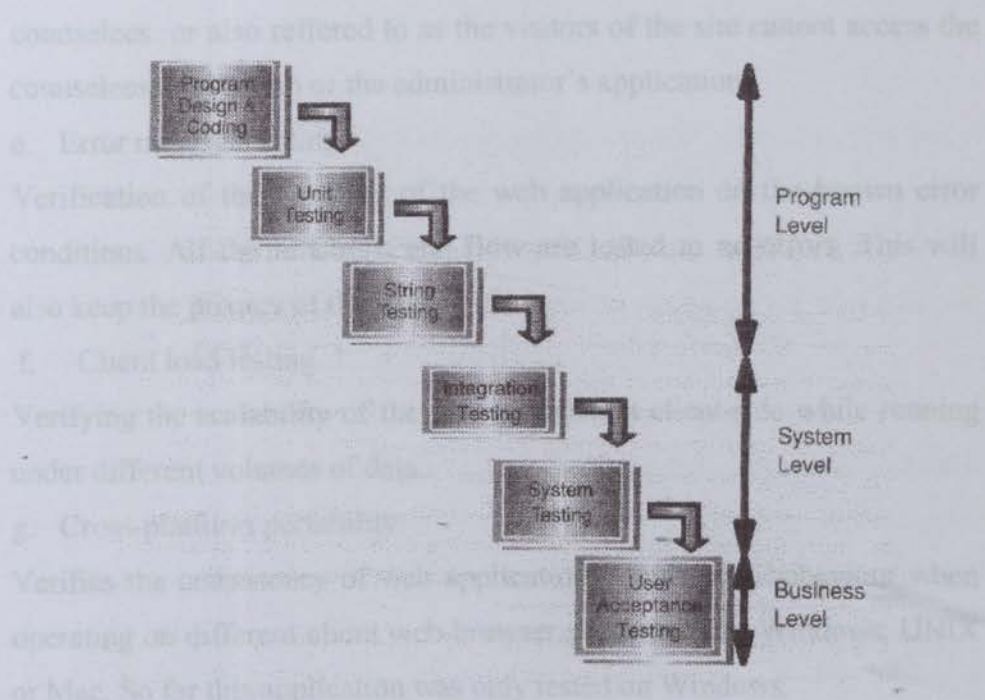


Figure 5-1. Testing Stages, [3]

5.2 Web application test case:

a. Browser compatibility testing

Verifies the operation and consistency of web application on different type of web browsers and platform. After testing the system we had to test the browser compatibility and found that it is compatible Internet Explorer 5.5 and below. We never tried testing on Netscape or Opera.

b. Desktop configuration testing

Verification of the client side of web application on whether it operates consistently on different categories pf client desktop with different configurations.

c. Usability testing

Verification of the user interfaces of the web application whether it has been designed with user-centric approach. In this case the users(counselors, counselees and administrator)

d. Security testing

Verification of immunity of the web application from unauthorized people to access to it. So the counselors can access the counselee's data, but the

counselees or also referred to as the visitors of the site cannot access the counselees application or the administrator's application.

e. Error message testing

Verification of the handling of the web application on the known error conditions. All the functions and flow are tested to no errors. This will also keep the privacy of the data.

f. Client load testing

Verifying the scalability of the web application client-side while running under different volumes of data.

g. Cross-platform portability

Verifies the consistency of web application's functional behaviour when operating on different client web-browser platforms like Windows, UNIX or Mac. So far this application was only tested on Windows.

h. Web server load testing

Verification of the web application's performance when operating of web server under peak loads. This is the future testing which we will look into after implementing the system for real.

i. Application server load testing

Verification of the web application's performance under varying loads.

j. Database server load testing

Verifies the database server when multiple users of the application call large number of SQL at the same time.

k. Applet/script testing

Verifies the web application when clients do execution and downloading of applets and scripts. The Analysis module has been tested for applet testing on the client side.

l. GUI testing

Verifies the overall functionality of the web application. We designed the interface of each modules to look similar so that there will be a flow in the system. Users will never get lost because the main buttons are always in the top frame.[3]

5.3. Techniques

5.3.1. White box,

Structural testing: Method for which the test case data is created with the intent of verifying the internal structure of a program and its procedural logic. White box testing techniques are statement testing, branch testing and condition testing. It was used in some of my action pages for correct *if and else* conditions.

5.3.2. Black box,

Functional testing: Method for which the test cases are created with the intent of verifying the functional requirements of the application, regardless of the internal structure of the programs. After running through the applications, the database was checked for any right modifications.

5.4 Testing Robot

5.4.1. Test for chatting

Counselbot:Hello there visitor and thanks for connecting!

Visitor:hi

Counselbot:Hello there visitor

Visitor:who are you

Counselbot:I ask myself that question "Who am I?"

Visitor:what is your name?

Counselbot:My name is counselbot

Visitor:that sounds funny.

Counselbot:It sounds like it to me too

Visitor:What can you do

Counselbot:I can chat for people like you on the web

Visitor:only chat?

Counselbot:what about the other ones?

Visitor:what is your favourite food?

Counselbot:I require only problems

Visitor:What is your favourite colour?

Counselbot:My favourite colour is transparent

Visitor:Bye

Counselbot:Until next time visitor

5.4.2. Test for counselling

Visitor:I have a bad temper

Counselbot:Is it because you want to intimidate others?

Visitor:maybe

Counselbot:I understand

Visitor:what is the cause of my anger

Counselbot: Was it because waiting for someone

Visitor:sometimes, they yend to make delays and cause problems

Counselbot:The anonymous”they”

Visitor:everyone

Counselbot:All people?

Visitor:What can I do to reduce my anger

Counselbot:Just try to calm down...Breath in and out by counting your breath a few times.

Visitor:Thanks

Counselbot:Don't mention it

5.4.3. Test for definition

Visitor:define abuse

Counselbot:to treat someone in a cruel and violent way, often sexually especially someone that you should look after

Visitor:what is anger

Counselbot:A strong billigerent emotion aroused by some real or supposed grievance

6.0 System Evaluation

6.1. Limitation & Strengths

6.1.1. Limitations

- a. Search engine – no links to other sites

The search engine does not store articles and documents from other sites. It only has links for reference. It has fewer articles but more theoretical information. Some of the words have 3 letters like sad, fat which the search engine will omit although it is important.

Chapter 6

- c. Solutions – subjective

The solutions on this system will be more subjective than specific issues for answer but not a specific one.

6. SYSTEM EVALUATION

6.1.LIMITATIONS AND STRENGTHS

6.1.1. LIMITATIONS

6.1.2. STRENGTHS

6.2.FUTURE ENHANCEMENTS

6.2.1. FORUM

6.2.2. SEARCH

6.2.3. APPOINTMENTS

6.2.4. ROBOT

6.3. PROBLEMS ENCOUNTERED

6.1.2. Strengths

- a. Small group of counsellors

Counsellors do not have to waste looking for counsellees to set appointment. They can make appointments online and counsellees from many places can meet their counsellors to have an online therapy. The search engine will help counsellees without have to meet the counsellors virtually.

- b. Search

The search engine will advise the counsellees. They are not just resource based like other counselling search engines, which store articles and other documents.

6.0 System Evaluation

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The search engine does not store articles and documents from other sites. It only has links for reference. It has fewer articles but more theoretical information. Some of the words have 3 letters like sad, fat which the search engine will omit although it is important.

b. No visual / multimedia conferencing with counsellor

It has no audio and video conferencing facility.

c. Solutions – subjective

The solutions on this system will be more subjective than specific issues for individual needs. So the user can get the overall answer but not a specific one.

d. Longer time to enter more categories / criteria

The system initially will need a longer time to collect information. Therefore it will not have a good resource at the beginning of the implementation.

e. Forum is not divided into topics

The counselor will have a hard time finding for topics to answer since the topics are not divided. There is also no search on the topics.

f. Appointments have been set

The appointments have been set to only 4 times in a week. The counselors cannot add the appointments but they only can choose to the date.

6.1.2. Strengths

a. Small group of counsellors

Counsellor do not have to waste looking for counselees to set appointment. They can make appointments online and counselees from many places can meet these counsellors to have an online therapy. The search engine will help counselees without have to meet the counsellors virtually.

b. Search

The search engine will advise the counselees. They are not just resource based like other counselling search engines, which store articles and other documents.

This search engine replaces the counsellor. It is user friendly and returns a counselling method for the problem written.

c. Free from the type of users

Computer system unlike people does not take race, status and other differences among people into consideration. They are neutral and do their duty according to the functions and programs.

d. Counselees don't have to reveal personal things to a stranger whom they don't trust

Counselees who do not trust the counsellors do not have to be scared or feel uneasy to reveal their personal condition. The alternative is to use this computer system that stores resources and can find any type of solution for all kinds of problems from its database.

e. Counsellors can give ideas at anytime

Counsellors are also given the opportunity to store their therapy and therapy method through this system. This system will display methods, which are not conflicting with one another using the search engine. Therapies can be recorded and applied to another person who has the same problem.

f. Researchers will find it easier to get their statistics. Researchers who are interested in psychology or therapeutic can use these statistics to by choosing the data that they want to research. Graphs can be generated depending on the data they choose to manipulate.

6.2. Future Enhancement

6.2.1. Forum

Add categories and search for easier finding and reading

6.2.2. Search

To make the search more accurate, a natural language search agent will help. Maybe the search will only omit words like I, you, we, is, the, etc.

Search and display words which are more objective to the user's problem by using algorithms.

6.2.3. Appointments

To allow the counsellors add more appointments. To make appointments more effective, the counsellors should be reminded by the number of appointments to be attended every week in a scheduler. Counselees could only make appointment by displaying a virtual card which does not allow them to vandalise the system.

6.2.4. Robot

The chat robot can be enhanced by including javascripts to allow the robot to do search in other search engine. Animation can be added for every emotion the robot pours out. The robot can also be designed to learn all about counselling and do many other functions.

6.3. Problems Encountered

- a. The frames don't seem to work for all functions like Browser Refresh and Back button.
- b. Integration problem of the chat robot in IIS
- c. The documentations and tutorials for creating the robot are very few. Many of the functions still don't seem to work. Wait for the robot expertise to reply my questions using the internet.
- d. The ASP and Coldfusion integration don't seem to work for all functions

7. Discussion and Conclusion

7.1. Risk

There are a few risks involved in this system development

- a. People still do not trust the web for secrecy and privacy

Web audience are still small in Malaysia. Even if they increase over the years, they are still concern about the security aspects before getting involved in web services and solutions. The system will become idle if they still think this way. Web education and security can improve this situation. All citizens of the country should be well versed in web behaviour and security.

- b. Counsellors may not be available most of the time

Since this system will usually be conducted by a non-profit organization, some counsellors are busy and tied up with their work which provides income. This

Chapter 7

7. DISCUSSION AND CONCLUSION

7.1.RISK

7.2.CONCLUSION

- a. Technology failure (security)

Technology failures are likely to happen in the computer world. This may result in distraction of both the counsellor and clients who are engrossed in treating and recovering. Technology failures also can bring to security hazard when the data is lost in "space".

- c. Takes time to get newer solutions in database

Implementing more accurate solutions will take longer time to develop. The basic solution to common problems will be initially included in the database. Depending on the host for the number of counsellors available, the counsellors will have to go for a training to understand the system, how it works and how they

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b. Counsellors may not be available most of the time

Since this system will usually be conducted by a non-profit organization, some counsellors are busy and tied up with their work which provides income. This may cause them to be less active in the system, which makes the system less sticky. (Not many users).

c. Web clients playing around

Anyone who wants to try or use the service can just log in his or her username and password. They do not need to reveal their personal identification like IC number or name. This makes the system easier for vandals to play around and send unwanted or find for untrue problems. The research data may get affected. They can also play around with the counsellors who have the objective to treat clients.

d. Technology failure (security)

Technology failures are likely to happen in the computer world. This may cause to distraction of both the counsellor and clients who are engrossed in treating and recovering. Technology failures also can bring to security hazard when the data is lost in "space".

e. Takes time to get many solutions in database

Implementing more accurate solutions will take longer time to develop. The basic solution to common problems will be initially included in the database. Depending on the host for the number of counsellors available, the counsellors will have to go for a training to understand the system, how it works and how they

can help. Only after they have thought about solutions for problems, the database will have its resource increased

7.2. Conclusion

7.2.1. Helping people in Cyberspace

a. Web counselling can help to overcome problems between people like misunderstandings. One client who was interviewed suggested web counselling because of satisfaction. She was having some misunderstanding with her sister. Her sister did not want to pick up the phone even when she called her house. She tried to e-mail and chat with her on-line.

b. Enrich forms of human interaction.

c. Solve technical solutions

It can help to solve difficult problems, which need theories and knowledge to solve.

d. Education

It stores information about counselling courses and educates about mental health.

e. Resource (news, articles, latest updates, counsellor's particulars)

Help to circulate information about the latest new, technology and therapies in the counselling field.

I hope to have contributed some effectiveness to the present web counselling. I have done my analysis and I think many people still do not know how to use the Internet. There should be web education and awareness given to the public just like what our neighbour, Singapore is doing. More people will come to understand the web functions and its capabilities to help them as what this system is doing to counselees, counsellors and researchers.

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APPENDIX

WEB COUNSELLING SYSTEM QUESTIONNAIRE

We, from the Faculty of Computer Science and IT, University Malaysia would like to get information about web counselling usage. We are doing the web counselling system project. The system has a search, e-mail, chat, forum, other facilities for the counsellee. The search system produces a solution when the counsellee types in their problem. The system will display the solution to the problem in a short paragraph to a few pages. To improve the system, we would like to know the counsellee's and the counsellor's view. Please read the questions carefully and if possible, answer in your own words and **CIRCLE** them.

Section A (Personal Information):

1. Age: a) under 18 b) 18-25 c) 26-35
 d) 36-45 e) 46-55 f) 55-65
 g) 66 above

APPENDIX

2. Occupation: a) professional b) government c) private sector
 d) own business e) student f) homemaker

3. If you are a student, please circle which faculty you are currently in

- a. Business b. Arts and social sciences c. Science

Section B:

1. Have you used internet? yes / no

2. If yes, how frequent?

- a) Every day
b) 3 times in a week
c) once a week

WEB COUNSELLING SYSTEM QUESTIONNAIRE

We, from the Faculty of Computer Science and IT, University Malaya would like to get information about web counseling usage .We are doing the web counseling system project. The system has a search, e-mail, chat, forum, other facilities for the counselee. The search system produces a solution when the counselee types in their problem. The system will display the solution to the problem in a short paragraph to a few pages. To improve the system, we would like to know the counselee's and the counselor's view. Please read the questions carefully and if possible, answer in your own words and **CIRCLE** them.

Section A (Personal Information):

1. Age: a) under 18 b) 18-25 c)26-35
 d)36-45 e)46-55 f)55-65
 g) 66 above
2. Occupation: a) professional b) government c) private sector
 d) own business e) student f) housewife
3. If you are a student, please circle which faculty you are currently in
a.)business b.)arts and social science c)science

Section B:

1. Have you used internet? yes / no
2. If yes, how frequent?
 - a) Every day
 - b) 3 times in a week
 - c) once a week

- d) once a month yes / no
e) once a year yes / no

2. Have you visited our so far? yes / no

3. If no, why?

- a) Do not know how to use one of the web counseling's URL
b) Lazy
c) Do not have the facilities
d) Others (please specify) _____

Please skip to question 5 from Section C., until the end.

b) Never thought of overcoming problems through the web

4. Do you know what is a browser? yes / no

d) I rather listen to the counselor or voice out than typing and reading

5. If yes, what kind of browser do you usually use?

b) Others (please specify) _____

a) I. Explorer

b) Netscape yes / no

c) Opera

d) Others _____

How often? a) Always b) Often c) Sometimes d) Rarely

6. Do you know what are online services? yes / no

7. Which category of problems do you go for?

7. If yes, what kind of online services have you gone for?

a) Communication and entertainment

b) Games and sports

c) Electronic and electric equipment

d) Health, fitness, therapies

e) Shopping

f) Others (please specify) _____

a) Marriage problems

b) Family problems

c) Depression / Stress

Section C:

1. Have you heard about web counseling yes / no

If no, please jump to questions 4 of this section until the end

2. Have you visited one so far? yes / no

Section D:

3. If yes, name one of the web counselling's URL address _____

4. If no, Why?

a) Not advertised

b) Never thought of overcoming problems through the web

c) I don't think a machine can solve my problem

d) I rather listen to the counselor or voice out than typing and reading

e) Not secured

f) Others(please specify) _____

5. Do you go to the counselor? yes / no

6. If yes, How often? a) Always b) Often c) Sometimes d.) Rarely

7. Which category of problems do you go for?

a) Marriage problems

b) Family problems

c) Depression / Stress

d) Career problems

e) Others (please specify) _____

8. If you prefer web counseling, which category of problems will you go for ?

a) Marriage problems

b) Family problems

c) Depression / Stress

- d) Career problems
- e) Others(please specify)

Section D:

1. Which type of method would you like, to help overcome your problems through web counseling

- a) E-mail
- b) Online chat
- c) Forum
- d) Finding information or articles through search
- e) Others(please specify)_____

2. How do you think online counseling could help?

- a) Less professional counselors needed
- b) Cheaper
- c) Access to it anytime and anywhere
- d) Feel comfortable with computers compared to humans
- e) Others(please specify)_____

3. Counselors can gather and discuss many problems together. They also can chat among themselves about counseling. Will they be looking into curing people through internet? Can they allocate time for online appointments? Please give your opinion about this in a few words.

*****Thank you for your co-operation*****

CHAPTER 1

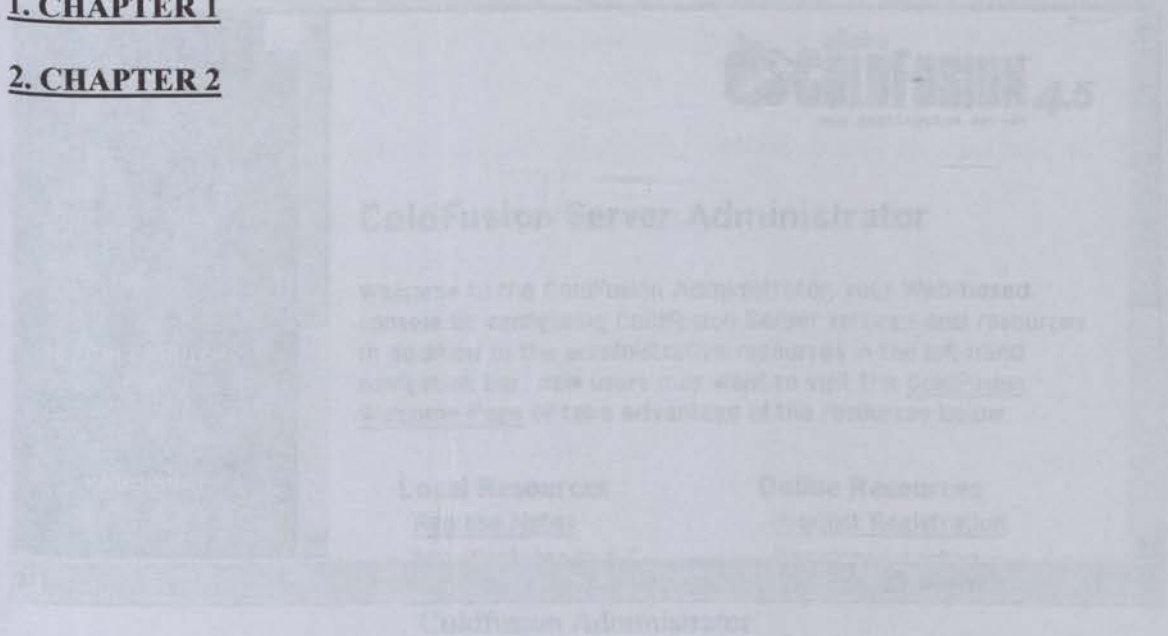
ColdFusion Server

1. Install ColdFusion Application Server
2. Set the server password and the database password. (This should be remembered if not, the server cannot be started)
3. After installation, open the Welcome ColdFusion from the ColdFusion program
4. Here you are asked to test installation of the server if it is working properly on your computer
5. Choose a query and verify to view the answer. For example if you choose *Hindian*, then you should get *Physiology*, *Plant Biology*, etc.
6. If you get this answer, then open your ColdFusion Administrator to get your database and mappings.

USER MANUAL

1. CHAPTER 1

2. CHAPTER 2

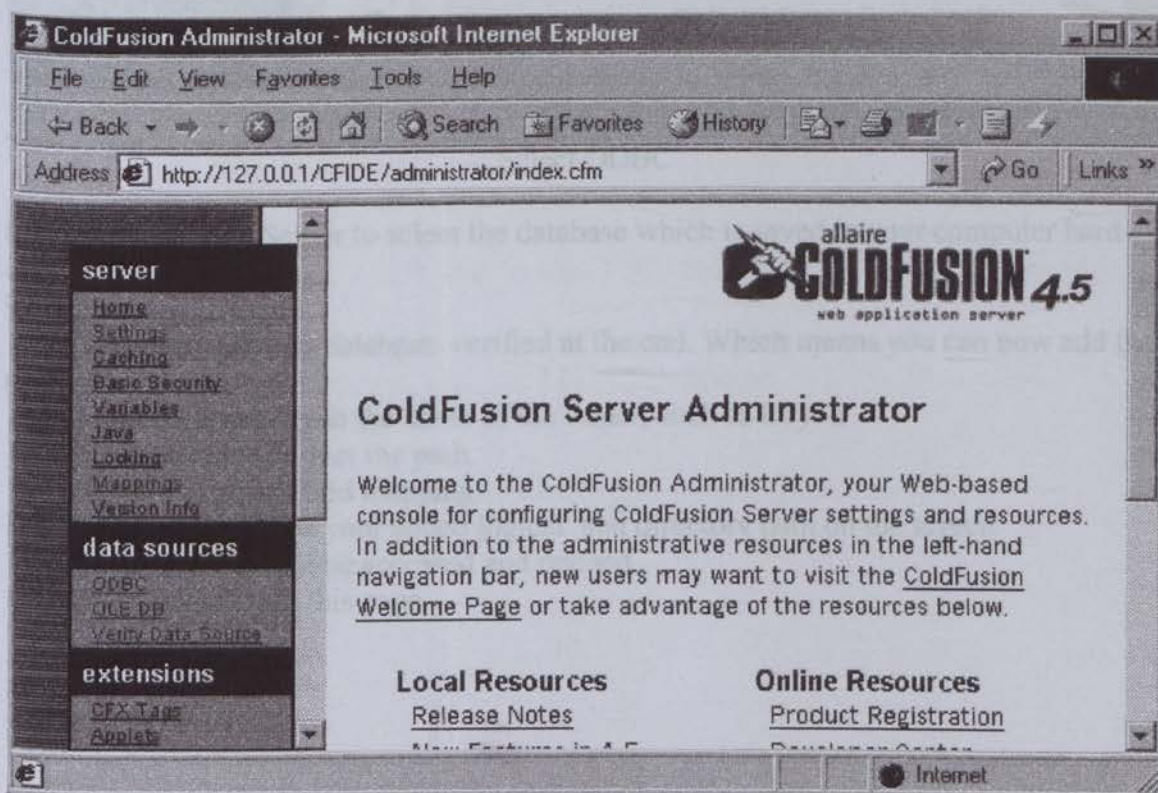


7. Select JDBC from data sources

CHAPTER 1

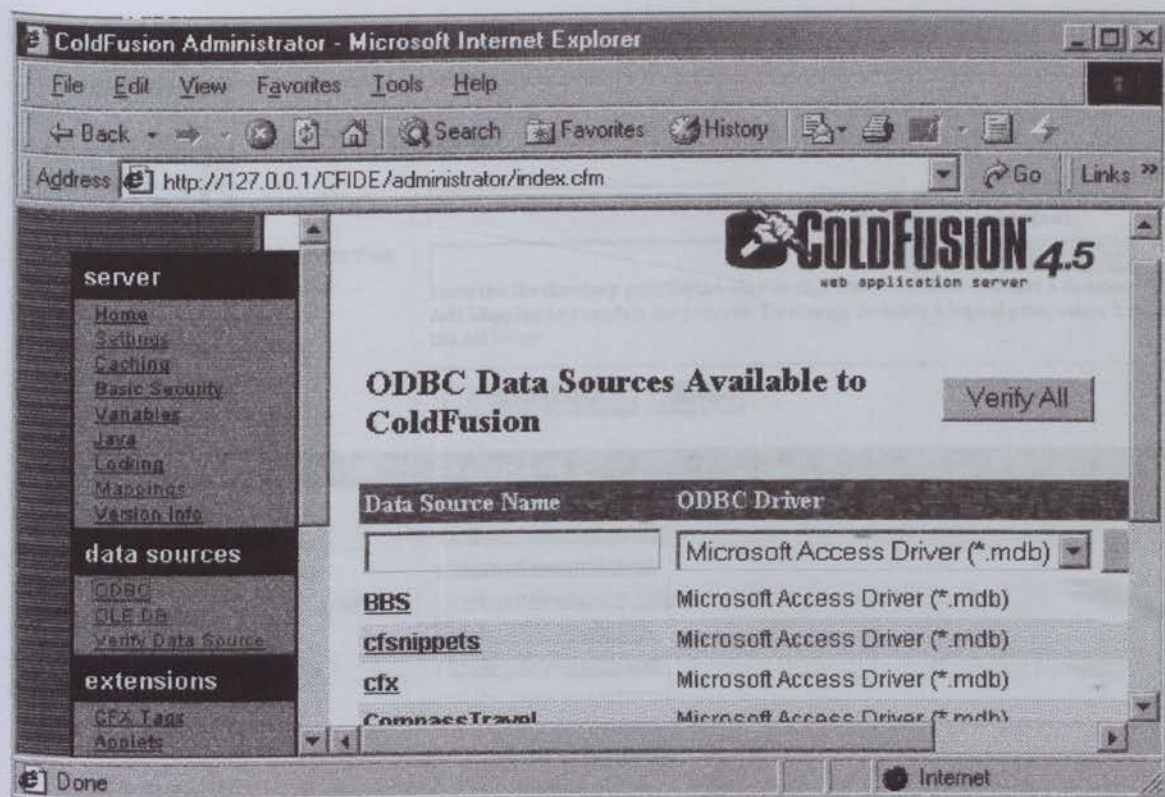
Coldfusion Server

1. Install Coldfusion Application Server
2. Set the server password and the database password. This should be remembered if not, the server cannot be started.
3. After Installation, open the Welcome Coldfusion from the Coldfusion program
4. Here you are asked to test installation of the server if it is working properly on your computer.
5. Choose a query and verify to view the answer. For example: if you choose Biology, then you should get Physiology, Plant Biology, etc.
6. If you get this answer, then open your Coldfusion Administrator to set your database and mappings.



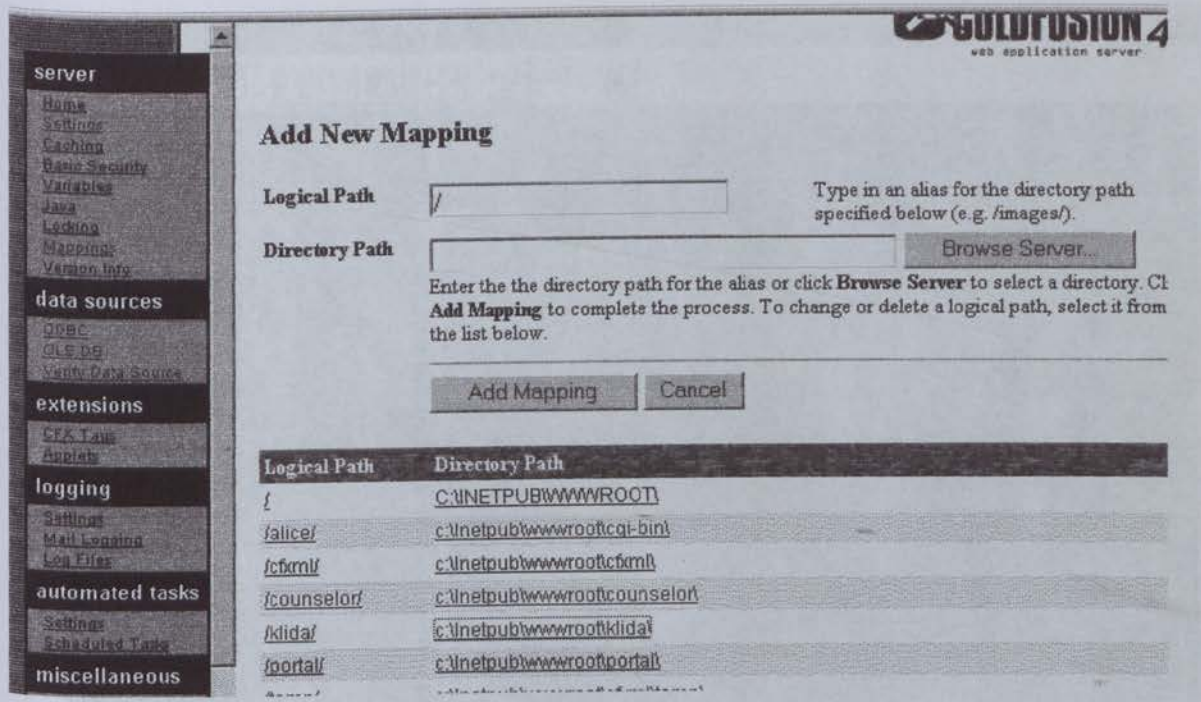
Coldfusion Administrator

7. Select ODBC from data sources



Select ODBC

8. Click on Browse Server to select the database which is saved in your computer hard disk..
9. Name your database
10. You should get your database verified at the end. Which means you can now add the mapping.
11. To add mapping, write the name of the folder, such as foryou
12. Browse Server to select the path.
13. Select the path and add mapping
14. Then you should see your added logical and directory path on the screen
15. Now your pages can be accessed and opened
16. you can now close this page.



Add Mapping

ALICE Server

To run this application, you will need to install JRE Standard Edition(2) and maybe Java plug-in.

1. Select the folder named D and copy it into the hard disk
2. Open the folder and you will see a file called run.bat
3. Select the file and double click to open
4. Leave it on
5. This is a server. It should be running all the time on your web server.
6. The server should look like this

```

MS JAVA
Auto
[7:30:40] Predicates with no values defined will return: "undefined".
[7:30:41] Initializing Multiplexor.
[7:30:41] Starting Graphmaster.
[7:30:45] 6000 categories loaded so far.
[7:30:48] 12000 categories loaded so far.
[7:30:52] 18000 categories loaded so far.
[7:30:56] Loaded 287 input substitutions.
[7:30:56] Loaded 19 gender substitutions.
[7:30:56] Loaded 9 person substitutions.
[7:30:56] Loaded 60 person2 substitutions.
[7:30:56] Loaded 4 sentence-splitters.
[7:30:56] "/targets/targets.aiml" does not exist!
[7:30:56] "Counselbot" is thinking with 23934 categories.
[7:30:56] Alicebot Program B (c) 2001 A.I.I.E.E. AI Foundation
[7:30:56] All Rights Reserved.
[7:30:56] This program is free software; you can redistribute it and/or
[7:30:56] modify it under the terms of the GNU General Public License
[7:30:56] as published by the Free Software Foundation; either version 2
[7:30:56] of the license, or (at your option) any later version.
[7:30:56] Alicebot Program B version 4.1.4 Build [88]
[7:30:56] 23934 categories loaded in 14.89 seconds.
[7:30:57] The AIML Watcher is active.
[7:30:57] HTTP server listening at http://ttnet:2001
[7:30:57] Interactive shell: type "/exit" to shut down; "/help" for help.
[7:30:57] visitor>

```

ALICE Server

The system consists of 3 modules:

1. Login Module

- This module provides function on whether the users before they can access the service. It was built to register as a new user of Web-based counseling system and login to the system every time they access to the web site. This is for security purpose of the web system.

2. Search Module

- This module provides function for users to key in the search word which is the problems they faced. The system will perform intelligent checking through databases and show the available solutions to the users.

3. Chat Room Module

- This module provides real-time chat function. We users to chat with an adviser (single chat) or to chat with other users that faced the same problems (group chat).

INTRODUCTION

1.1 Introduction

Welcome to the Web-based Counselling System! The Web-based Counselling System is a web-based counselling system that helps users to search for their problems and solution and access some other services that is available during normal counselling section. Web-based counselling system is an electronic way of counselling services. Apart from being useful to the clients, this system also provides an efficient backend management application for the management of the system. This system is easy to use, where all the functions in this system is meaningfully descriptive and can be easily executed by a simple point and click on the available function button and hypertext link.

This system consists of 13 modules.

1. Login Module

- This module provides function to validate the users before they can access our service. Users need to register as a new user of Web-based counselling system and login to the system every time they access to the web site. This is for security purpose of the web system.

2. Search Module

- This module provides function for users to key in the search word which is the problems they faced. The system will perform intelligent checking through databases and shows the available solutions to the users.

3. Chat Room Module

- This module provides real-time chat function for users to chat with counselor (single chat) or to chat with other users that faced the same problems (group chat).

9. **User Info Preview Module**

- This module lets the users to view their personal information

4. **Forum Module**

- This module provides function for users to post their question or discussion topic to the system. Then users from all around the world may participate in this discussion and provide valuable ideas and suggestions.

5. **Pen-pal Module**

- This module provides pen-pal service for users who want to meet with more friends. They may view the pen-pal list, add themselves in the pen-pal column or delete them if they don't want to be appeared in the pen-pal list.

6. **Appointment Module**

- This module provides the counselees a service to make appointments with the counselor without having to make a telephone call leaving their particulars and going to meet the counselors physically.

7. **Counselbot(Robot)**

- The robot likes to chat to all the visitors on this site even without having them registered. She chats about anything, may act as a psychological dictionary and may help people to by counselling.

8. **Analysis Module**

- This module provides analysis function to analyze the most critical problems faced by all the users. This module will capture what the users search most often and calculate the percentage of the problems encounter. Then a comparison graph will display the result of the analysis.

9. User Info Preview Module

- This module lets the users to view their personal information they provide to the system when they registered. They can modify the information and update the information.

10. Message Board Module

- This module provides function for the users to be informed for the latest information announced by counselors or administrators.

11. Feedback Module

- This module provides function for the users to send their comments to the web administrator.

12. Backend Administration Module

- This module provides function for the counselors and administrators of Web-based counselling system to maintain and enhance the usability of the web page.
- This module consist of 6 sub modules which is :

For administrator:

1. Login sub module

- This sub module will validate the administrator before allow them to connect to our database.

2. Database update sub module

- This sub module allows the administrator to modify the contents of the counselling data in the database. This include add new, delete and modify the existing data.

3. User info sub module

- This sub module helps the administrator to maintain the user profile for counselors and administrator. This include add new counselors/administrators, delete or modify the existing profile.

4. Message board sub module

- This sub module helps the administrator to announce the latest information to the users. Administrator also can preview the previous messages.

5. Feedback preview sub-module

- this sub module allow the administrator to preview the comments provided by users in order to be more understanding users need and proceed with enhancement.

For counselor:

1. Login sub module

- This sub module will validate the counselor before allow them to connect to our database.

2. Change password sub module

- This sub module allows the counselor to change their password if they feel that there is a need to do so.

3. Forum

- The questions posed by the visitors (counselees) can be chosen and answered by the counselors according to their specialization.

4. Appointment

- Counselors can view the appointments made by the counselees. They can also view their particulars by clicking

CHAPTER 2

Web-Based Counselling System

2.1 Starting WBCS

on the users name. They can add dates of meeting the counselees, but it must fall on the same day which have been fixed for each counselor. The maximum fixed appointment in a week is 4 times. It can be added according to the users needs.

5. User info sub module

- This sub module help the counselor to view the users registered to him/her. This includes viewing the users' info and all the search word they provided during their search.

1.2 Hardware Requirement

The minimum requirements to run Web-based Counselling System are:

- A IBM compatible PC with 166 MHz processor and above
- 16 MB RAM (32MB recommended)
- SVGA Graphic Adapter (able to support 800x600 resolution)
- Keyboard
- Mouse
- Network card

1.3 Software Requirement

The software requirements to run Web-based Counselling System are :

- Any JavaScript-enabled browser (Microsoft Internet Explorer 3.01 and above recommended)
- Java 2 Runtime Environment Standard Edition, Java Plug-in
- ALICE Server and Microsoft Server to host.
- SQL Server to store database on server.
- Microsoft Windows 95, 98, NT, Me and 2000

CHAPTER 2

Web-Based Counselling System (WBCS) Main Menu

2.1 Starting WBCS

To start Web-Based Counselling System, user needs to start their web browser. It is recommended that the display setting for the client computer is set to 600x800 resolution to maximize WBCS functionality. Then user type <http://commerce/ForYou/ForYou.htm> and press Enter Key.



Figure 2.1: WBCS main page

2.2 Login

To login, the user has to key in a valid login identity (ID) and a valid password. After typing your access ID and password, you may click the login button to allow the system to process the verification. After login, the following will be displayed with the login section replaced by message board section.

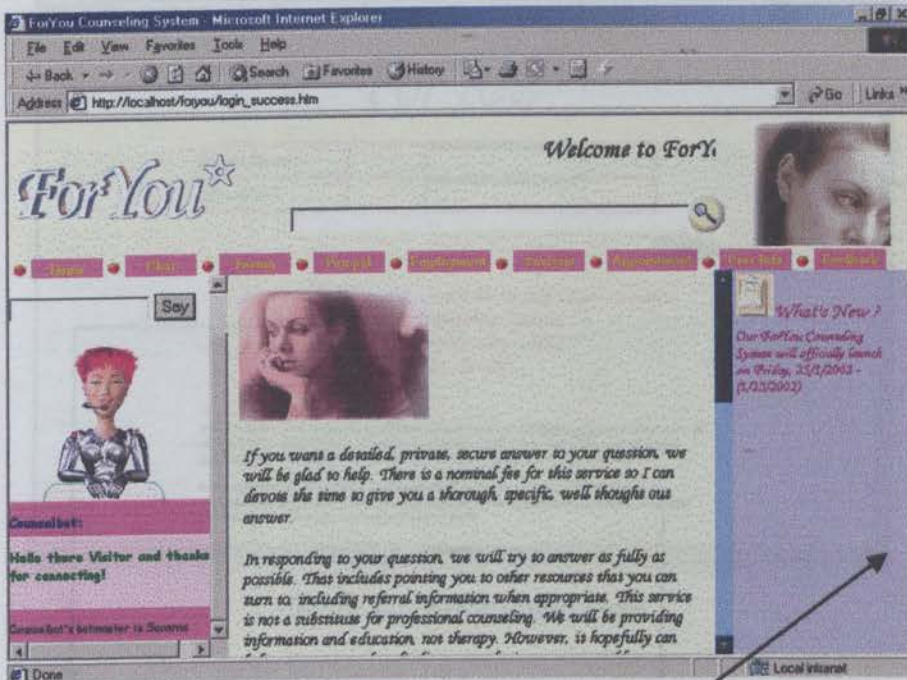


Figure 2.2 : Login Successfully page

Login Section replaced by Message Board Section

2.2.1 Error Login

If the user key in the wrong user ID or password the following page will be shown to ask for user ID and password again. Due to responsibility purposes, we attached the terms and condition together for user reference

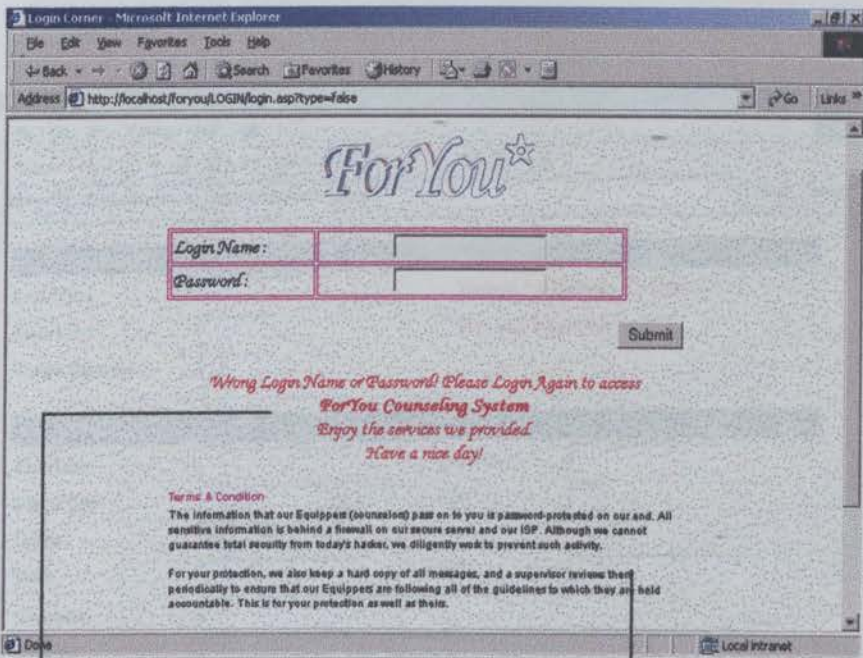


Figure 2.3: Error Login Page

Message indicates the wrong password or login ID

Terms and Condition for user agreement

2.2.2 New User

If the user is new to WBCS then the user need to register to become WBCS member before the user can enjoy all the services provided. After the user click on the “New User” button in the login column, the following page will be displayed and the user are required to complete the registration form providing all his/her personal information to WBCS.

Registration Form - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Search Favorites History

Address http://localhost/foryou_1/REGISTRATION/NEW_USER.ASP Go Links

Account Information:

Login Name : Minimum 5 & Maximum 12 characters

Password : Must be 6-8 characters

Confirm Password :

Personal Information :

First Name : Last Name :

Date of Birth : Age :

Gender :

Phone : Email :

Occupation :

Address :

State :

Postcode/Zip Code : Country :

Extra Information :

Please Select Counselor :

Done Local intranet

Figure 2.4: New User Registration Form

2.2.3 Forgot Password

If the user forgot his/her password, he/she may click on the “Forgot Password” button. The following page will be appeared to ask for user ID and email address. If the user forgot his/her user ID also, then he/she may need to contact the WBCS administrator for further action.

Figure 2.5: Forgot Password Page

Key in the login ID and email to get your password.

WBCS Administrator email address for those who forgot their user ID as well.

2.2.3.1 Secret Question and Answer

Once the system validate the User ID and email address is correct, the system will display the user secret question and answer to remind the user. If the user still can not remember the password, he/she need to contact the administrator for further actions.

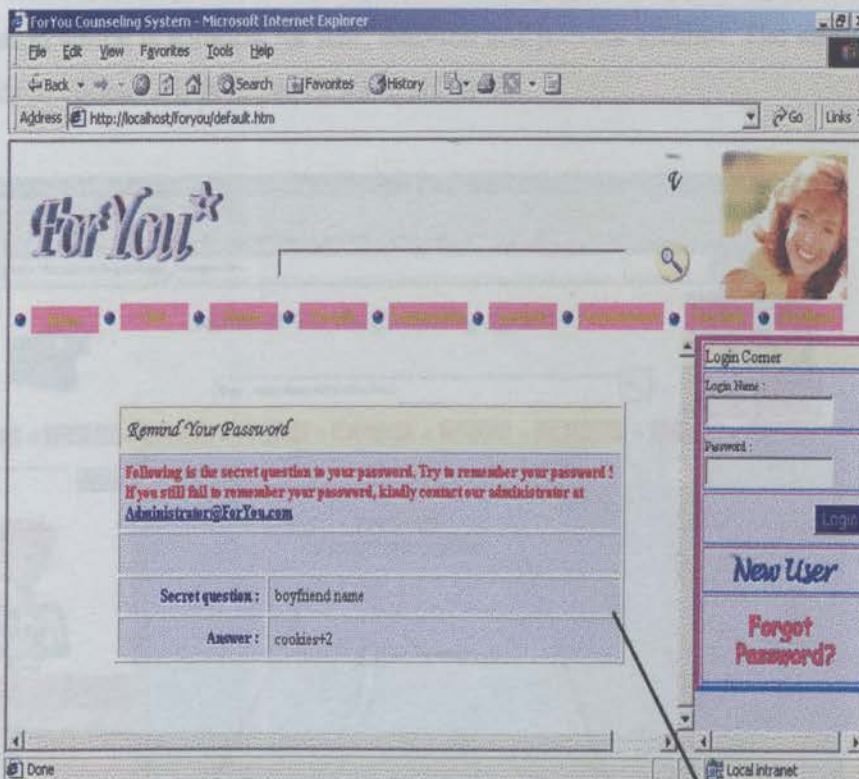


Figure2.6: Remind Password

Secret question and answer to remind user password

2.3 Search

2.3.1 Solution to Search Problems

The main purpose of the WBCS is to provide search engine for counselling perspective for the users. The user may key in a string containing their problems and the system will generate possible link to the page that containing the solution to the problems. For example, if the user key in “fear, emotion and drink alcohol problems” the system will display three types of possible solution which is solution for fear, emotion and prevent alcohol. The user needs to choose a link to preview the solution.

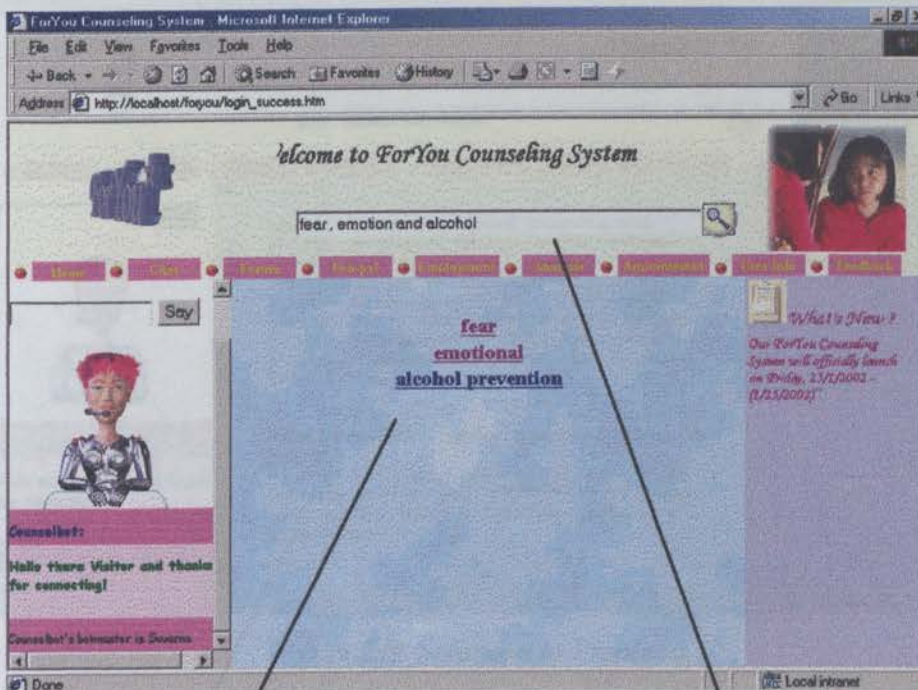


Figure 2.7: Search for Problems and Solutions

Solution Link

Search String

2.3.2 No Match for Search String

2.3.1 Solution to Search Problems

If the user searches for something that is not provided by WPCS, then the

The solution for the selected solution link will be displayed to help the user to solve their problems. The solution provided is just a guideline for the user to solve their problem. If the user does not satisfy with the answer, he/she may continue to search again using different search string.

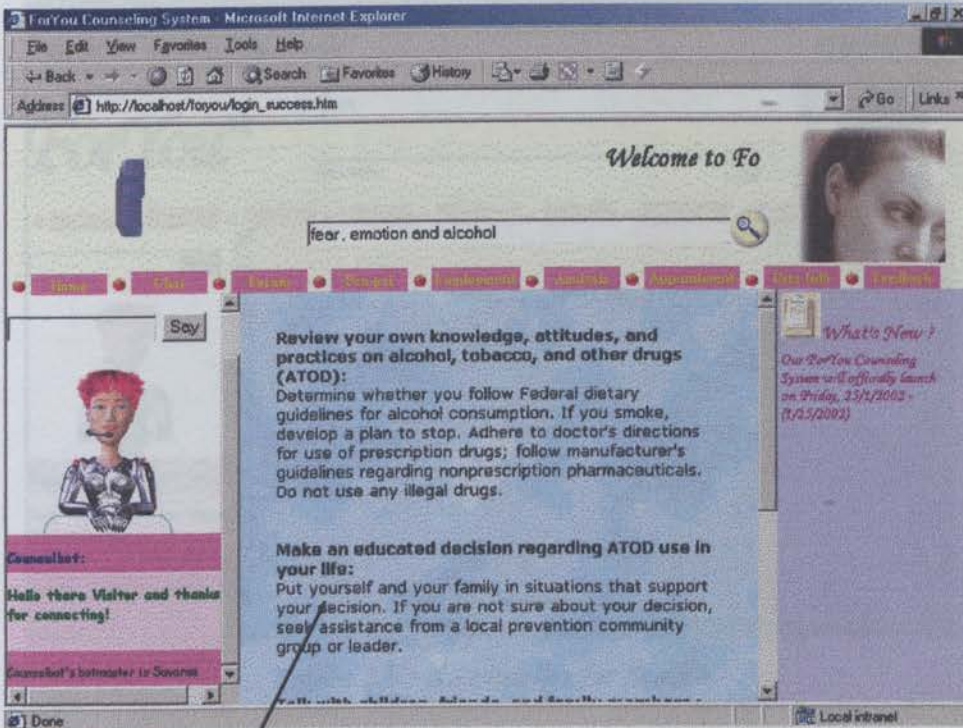


Figure 2.8: Solutions to Problems

**Solutions guideline for
user to preview**

2.3.2 No Match for Search String

If the user searches for something that is not provided by WBCS, then the system will display a page to inform the user that there is no match found for his/her search. The user may type in different search string to search again.

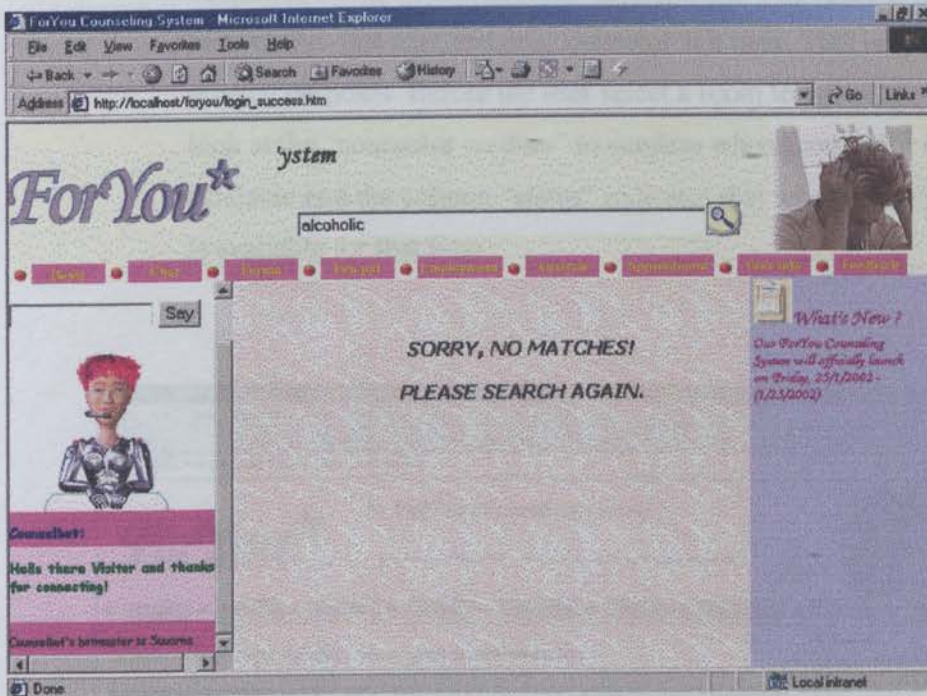


Figure 2.9 : No Matches for Search

2.4 Chat Room

WBCS provide two kinds of chat rooms for the user:

I. Private Chat Room

Three private chat room is available for the user to chat with the counselor online in the real time environment. The room is only restricted to one user and one counselor at a time. This is built on privacy purposes. Before the user select a room to go, he/she may look at the “counselor on duty” to confirm whose counselor is available and the column “status” indicates that whether the room is available for that time.

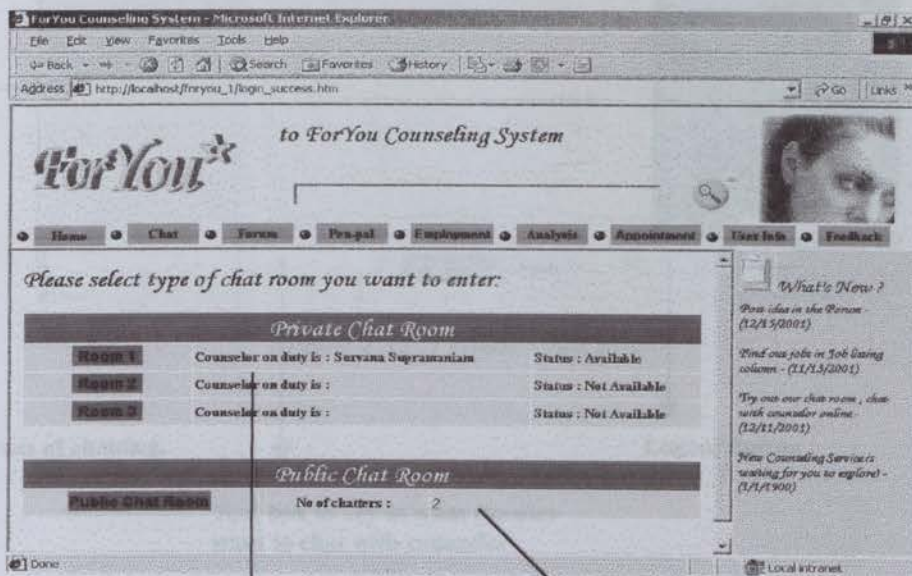


Figure 2.10 : Chat Room Type Selection

Indicates whose counselor is in the room

Indicates how many chatters are in the public room

The user ID of the user will be appeared in the “chatters” column and the counselor ID will be appeared in the “counselor” column. The contents of their chat are shown in the middle column. Twelve lines of previous chat will be shown on the screen. If the user wants to log out, he/she may click on the “logout” button or just simply close the browser. If the counselor left before the user left, then the user in the room will automatically be directed back to the main page.

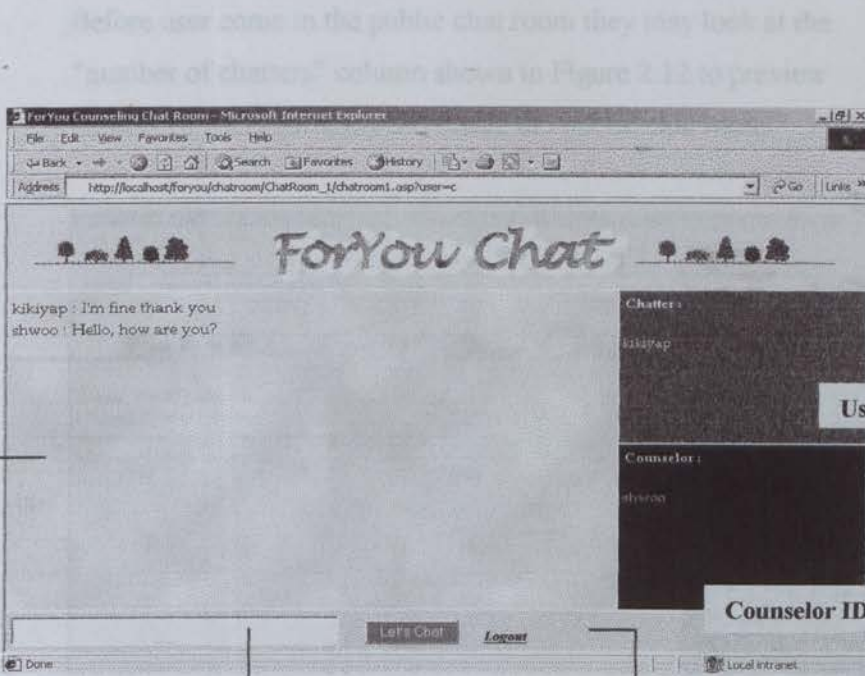


Figure 2.11: Private Chat Room

Contents of chatting.

Logout Button

Text box to key in what the user want to chat with counselor

II. Public Chat Room

Public Chat Room is open for the entire user to discuss their problems and solution together. There were no limits on how many people is allow accessing the public chat room. User may chat with other users that may come across the problem before and get the solution from them.

Before user come in the public chat room they may look at the “number of chatters” column shown in Figure 2.12 to preview number of users currently are inside the public chat room.

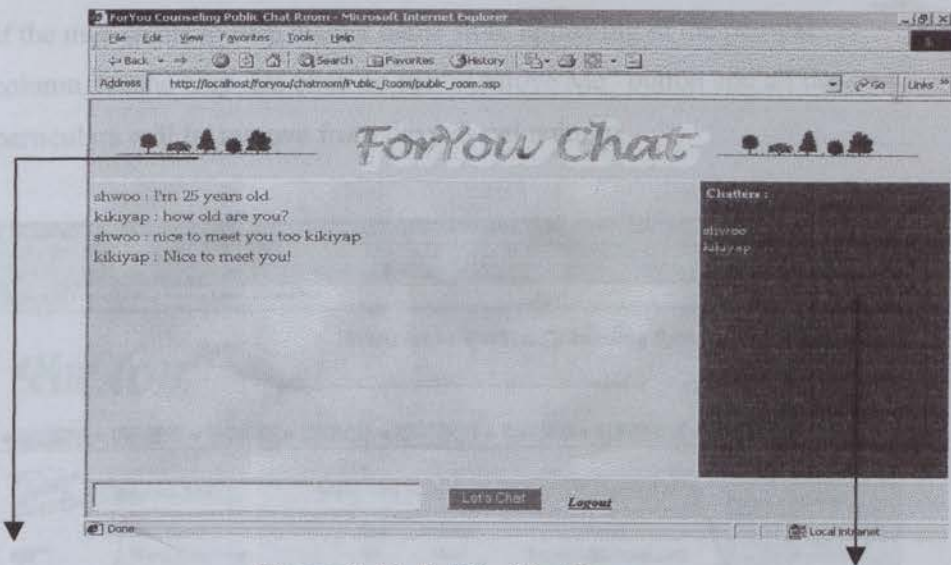


Figure 2.12: Public Chat Room

Contents of users' chat

Chatters ID

2.6 Employment

2.5 Pen-pal Column

If users are looking for members, they can click on the "Employment"

Pen-pal column is designed to help the WBCS members to meet with each others. The users can add their name in the pen-pal column by clicking the "Register Me" button. The system will automatically search for the user profile and add to the pen-pal column. This will minimize the user work to key in their name and details again.

The user may just click on the email address and send an instant email to the selected pen-pal. This can bring closer the relationship between WBCS members.

If the user wants to stop his/her name from appearing in the pen-pal column, he/she may just click on the "Remove Me" button and all the particulars will be remove from the pen-pal column.

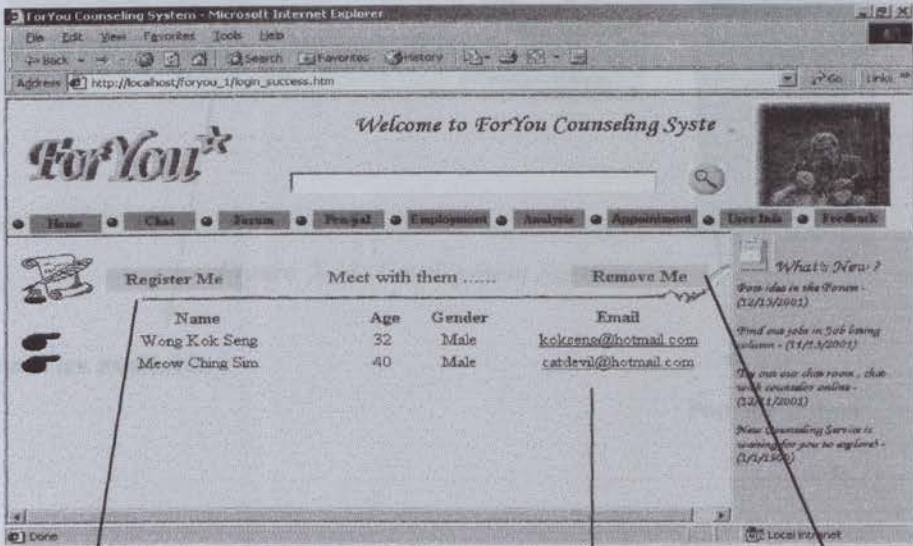


Figure 2.13 : Pen-pal Column

Register Button

Pen-pal details

Remove Button

2.6 Employment only to publish vacancies

If users are looking for vacancies, they can click on the “Employment” button to look for jobs available. The Employment section published the company’s name, total vacancies, position and company’s email to help the user to find for their favorite jobs. If the user is representing a company, he/she may post a job in this Employment section to look for employee. This can be done by a click on the “Post Job” button.

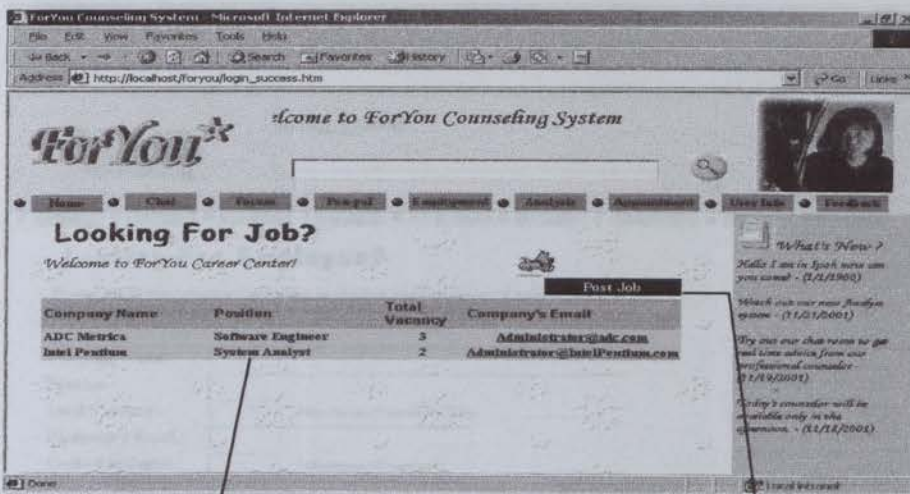


Figure 2.14: Employment Section

Vacancies available

Post Job Button

2.6.1 Register Company to publish vacancies

This page is designed mainly to help the company to publish their company vacancies. The company needs to provide all the necessary information like company's name, position, total vacancies, company email and expiring days for the WBCS. The WBCS will store all the information and publish the job on the employment section as stated above. The duration to publish the job will follow the expiring days.

The screenshot shows a web browser window titled "For You Counseling System - Microsoft Internet Explorer". The address bar shows "http://localhost/foryou/login_success.htm". The page header includes a logo and the text "seling System". A navigation menu contains links: Home, Chat, Forum, Pro-pyl, Employment, Analysis, Appointments, User Info, and Feedback. The main content area is titled "Looking For Employee?" and contains the following form fields:

- Company Name :
- Position :
- Total Vacancy : *Maximum 99 vacancies only
- Company's Email :
- Expired in day(s) : *Maximum 99 days only

At the bottom of the form are "Submit" and "Reset" buttons. On the right side, there is a "What's New?" section with three items:

- Hallo I am in Ipoh now are you there? - (11/1/2001)
- Watch out our new Analysis system - (11/21/2001)
- Try out our chat room to get real time advice from our professional counselor - (11/19/2001)

Below these items, it says: "Today's counselor will be available only in the afternoon - (11/11/2001)".

Figure 2.15: Company and vacancy details

2.7 Analysis

Every time the user use the WBCS search engine to search for the solution to their problems, the search string will be stored in user's personal table. Then, the WBCS system will compare the problems entered by every user and calculate the statistics of the problems. The analysis page will show a graph indicates the statistics of the result. All the comparison will be converted to percentage for user to preview.

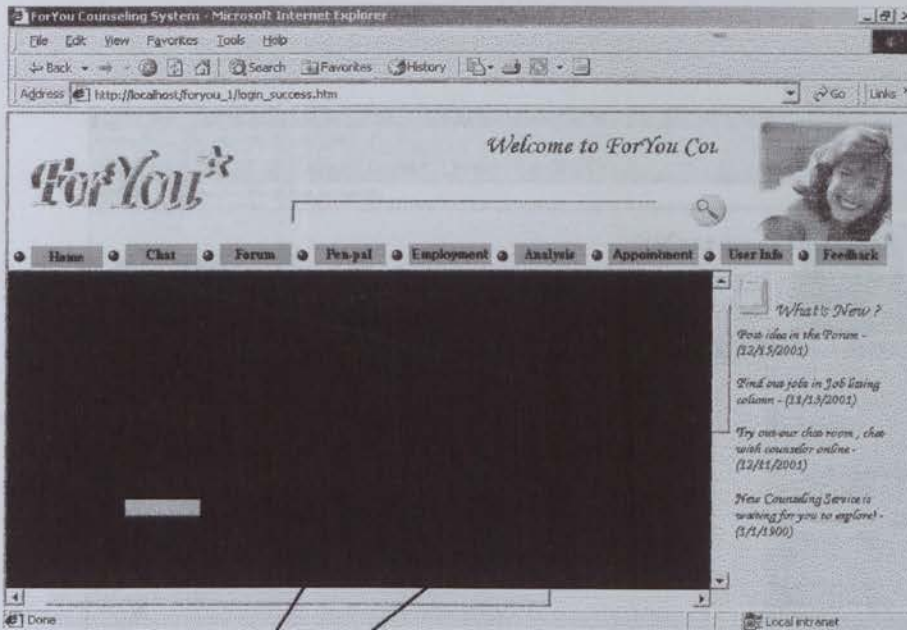


Figure 2.16: Analysis Page

Comparison in terms of percentage

2.8.1 Change Password

2.8 User Info

If the user wishes to change his/her password, they may feel free to do it here. The only step is they need to fill in their old password to validate

Sometimes users may want to make changes to their personal details for example phone number or address. They may click on the “User Info” button to preview their previous personal information. Then they will come to a page which contains a menu for selection for “change password” or “change user info” as below.

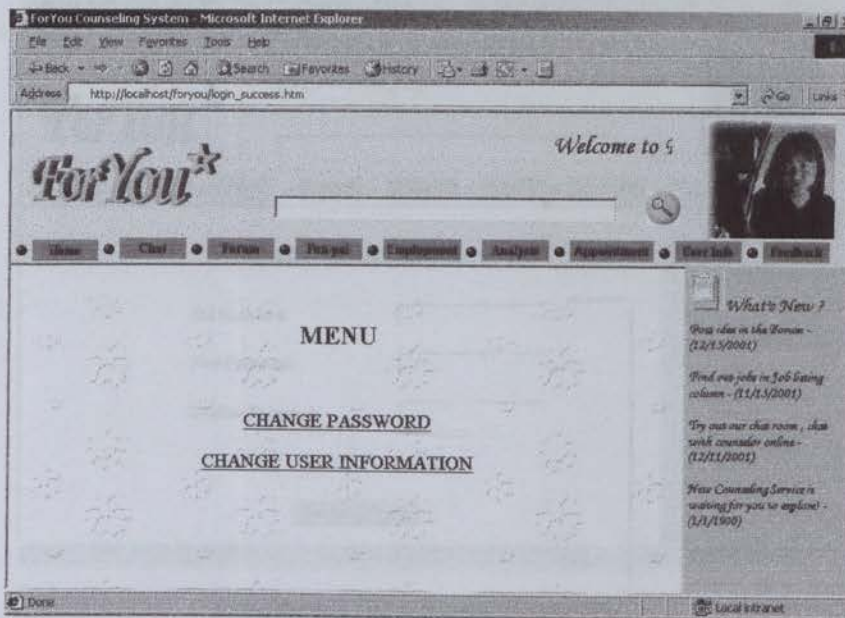


Figure 2.17: User Info Selection Menu

2.8.1 Change Password

If the user wishes to change his/her password, they may feel free to do it here. The only step is they need to fill in their old password to validate their identity and then fill in the new password. The confirm password fill is required to prevent the user from keying the different password. When the user click on the “change” button, the system will indicate that the password is changed successfully or failed.

ForYou Counseling System - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Search Favorites History

Address http://localhost/foryou/login_success.htm

ForYou* You Counseling System

Home Chat Forum Personal Employment Analysis Appointment User Info Feedback

CHANGE PASSWORD

Old Password:

New Password:

Confirm Password:

Change Reset

Done Local intranet

What's New ?

- First idea in the Forum - (12/11/2001)
- Find out jobs in Job Giving website - (11/11/2001)
- Try out our chat room, chat with counsellor online - (12/11/2001)
- New Counseling Service is waiting for you to explore! - (11/11/2001)

Figure 2.18: Change Password

All three text boxes must be filled in order to change password

2.8.2 Change User Information

If the user selects the “change user information” from the menu, then he/she will be directed to the page displaying all the profile that was stored in the WBCS. The user can may any changes to the profile and click the “update” button to update the user profile.

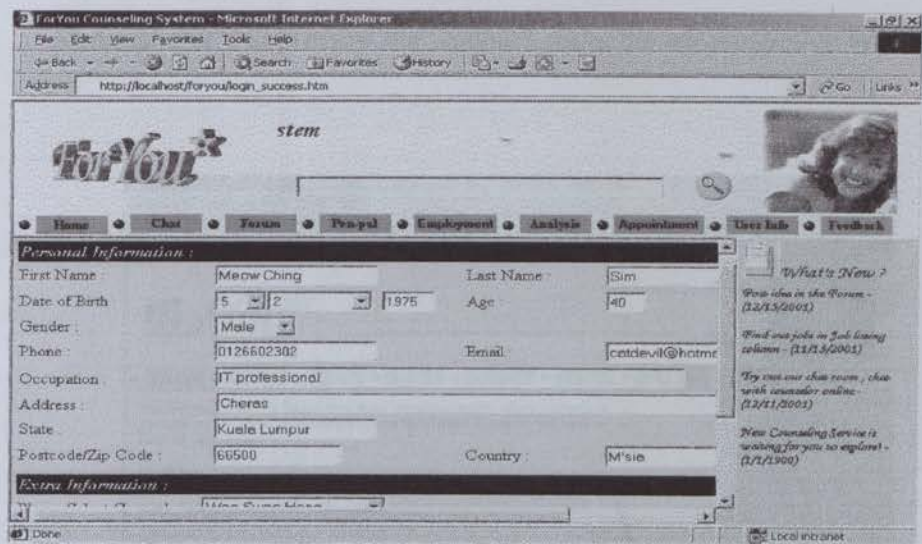


Figure 2.19 : Change User Information

2.9 Feedback

The users are welcome to give comments and feedback to the WBCS. The user only need to fill in the title of the feedback and fill in the comments or feedback and click the “send” button to send the feedback to the WBCS administrator. The WBCS will automatically send the feedback together with date and the user ID and send it to the Administrator. The administrator will preview the feedback using the administration system.

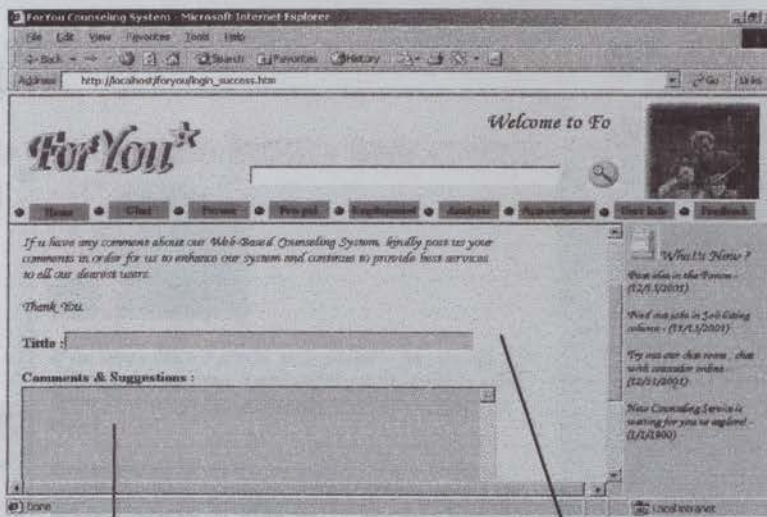


Figure 2.20: Feedback

Feedback or comments

Title for the feedback

2.10 Counselbot

The function of the Counselbot is to chat with the visitor about anything. The reason I wrote visitor is because the counselbot can be used without registering for the site. The counselbot can also be used after registration. The counselbot can be a virtual psychological dictionary which define psychological terms. Other than that the counselbot has also been programmed to counsel and help people overcome their problems.

This is the interface:



Figure 2.21: Robot

talk input

Counselbot's answer

2.11 Forum

The forum helps the counselors answer questions posed by the counselees. The questions can be answered by any counselors, depending on their interest of answering.

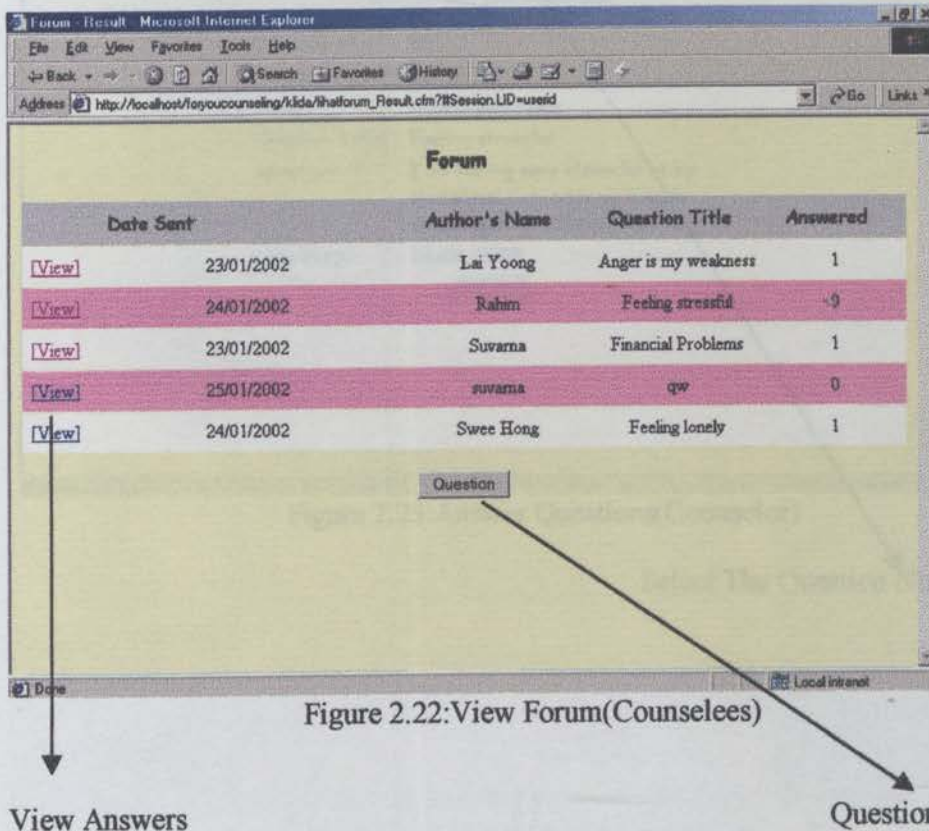


Figure 2.22:View Forum(Counselees)

2.11.1. Counselees

The counselees can click on the question to ask question and can view their questions and if they have been answered by the counselors

2.11.2. Counselors

The counselors can select which questions to be answered.

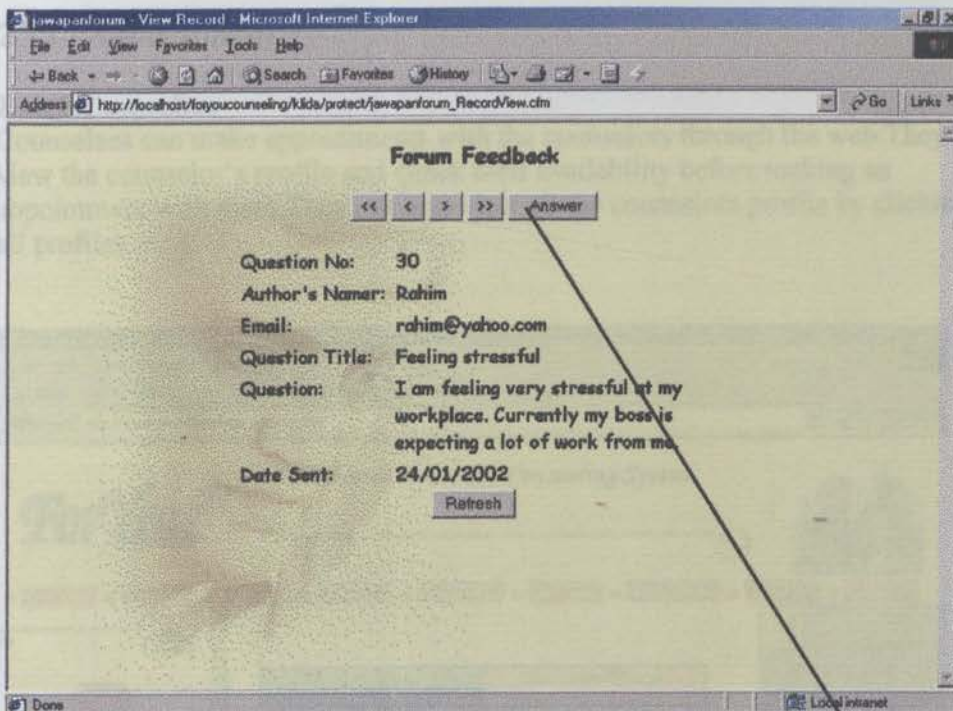


Figure 2.23: Answer Questions(Counselor)

Select The Question No to Answer

2.12 Appointment

2.12.1. Counselees

Counselees can make appointments with the counselors through the web. They can view the counselor's profile and check their availability before making an appointment with them. They can also view all the counselors profile by clicking View all profiles.

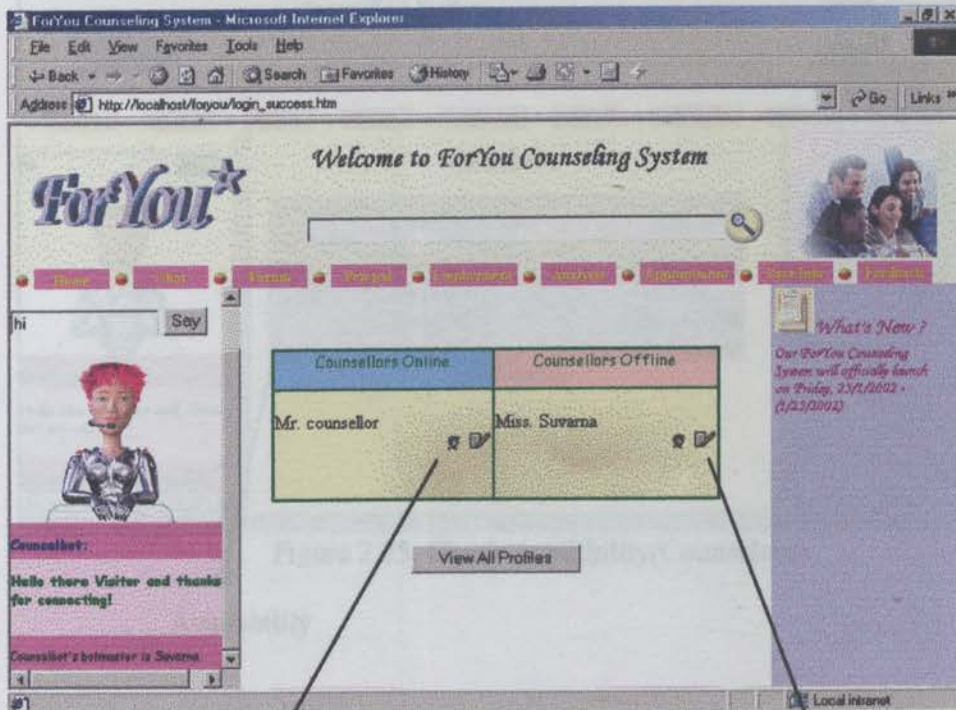


Figure2.24:Appointments(Counselee)

View Profile

Check Availability

2.12.1.1. Check Availability

The counselees can check when the counselors are available , so that they can make an appointment with them

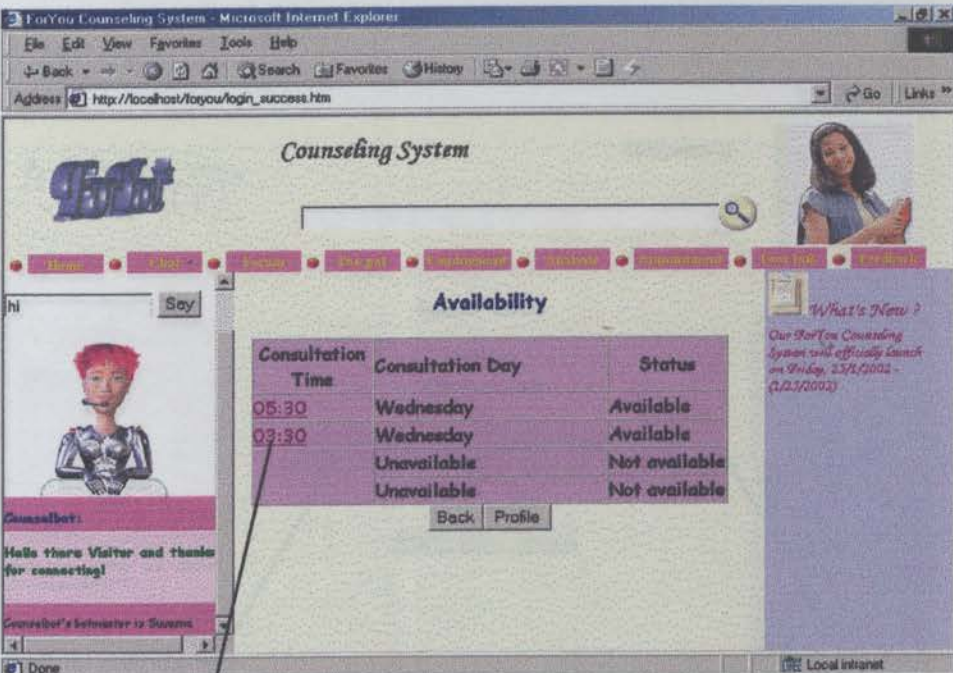


Figure 2.25: Check Availability(Counselees)

Availability

2.12.1.2. Selecting Venue for Appointment

The counselees can choose the date and venue fixed by the counsellor. They can either meet in the chatroom or in the counsellor's office

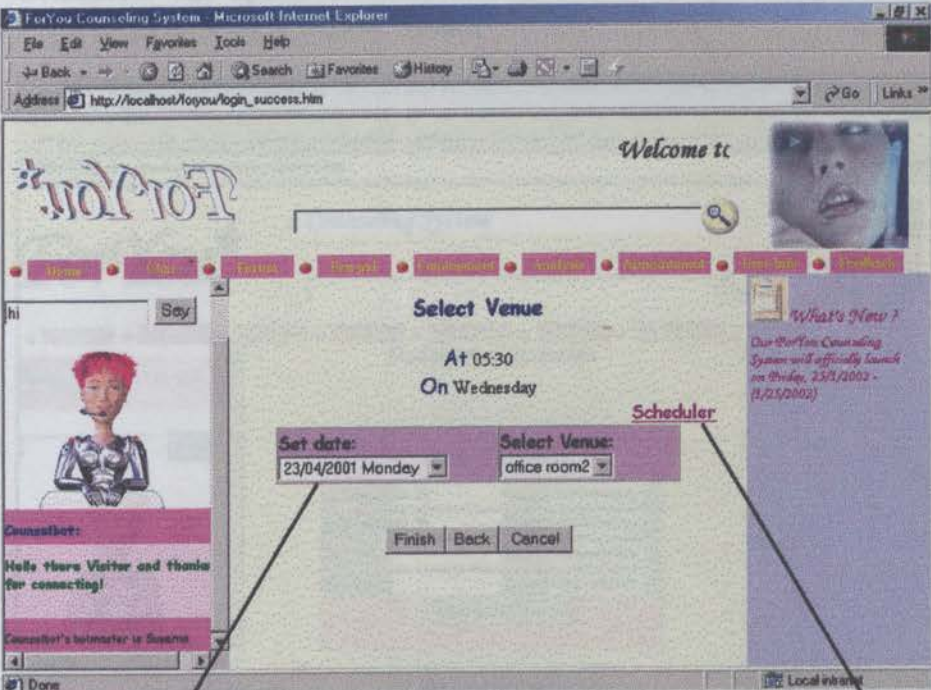


Figure 2.26:Selecting date and Venue(Counselees)

Select date and venue

View personal scheduler

2.12.2. Counselors

Counselors can view profiles of counselees who have made appointments with them. They can also add dates of appointment from the counselees to choose from. Counselees can update or make their status to unavailable when they won't be counselling for certain days or weeks.

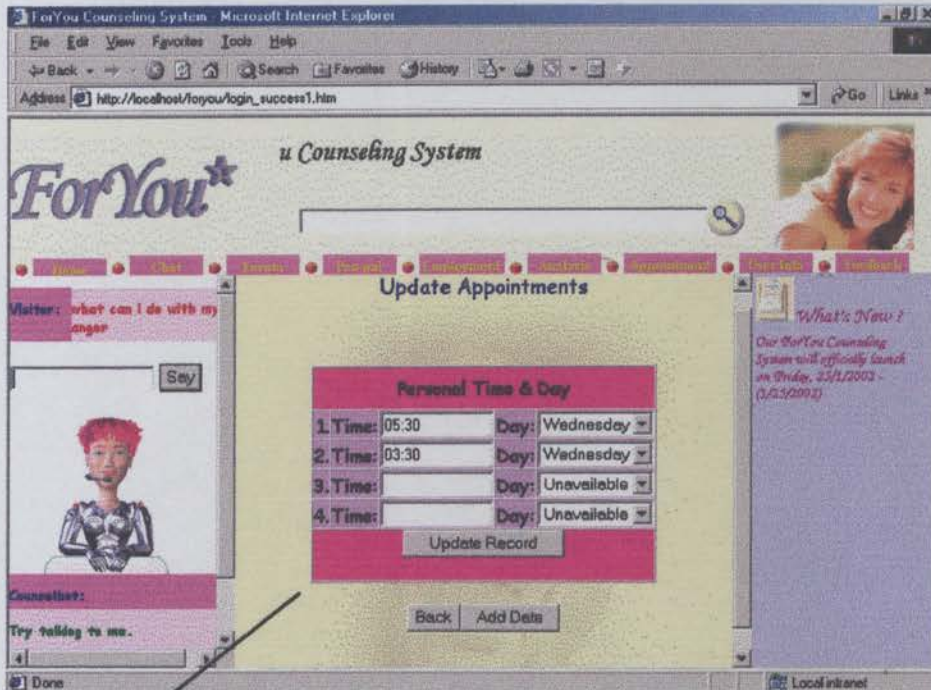


Figure 2.27: Update and change availability(Counselor)

Update time on the four slots given