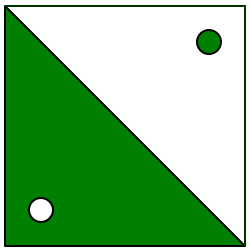
Abacus Biocomputing Systems



Lawrence Stark
Michael Majdanski
Katherine Duncan
Hardik Patel
Sean Harney
Tom Motyka

Preface

The contents of this document and in fact the very essence of the project itself are representative of an entirely new and unique approach to solving one of modern medicine's biggest challenges: Accurate and Effective Patient Care.

Abacus Biocomputing Systems is currently in the process of expanding from a startup company focused on an idea about how web-based delivery of healthcare solutions can improve patient care to actually implementing the solution for customer usage. The driving force behind all of the work done so far is a conglomeration of proprietary algorithms that ABS has developed. These algorithms, collectively referred to as a 'Predictive Patient Compliance Tool' are unlike anything found on the market today.

While reading the rest of this document, it is important to keep the uniqueness of this system fresh in one's mind. Perhaps most notable when reading this document is the absence of an analysis of the current system in place. As already mentioned, through the aid of the proprietary algorithms developed by ABS, this system is unlike any other that has been brought to market or even one that is currently in any one of the various stages of development.

Surely the lack of a current system to compare the strengths and weaknesses of ABS's new system presented a challenge for the *User Management Module Team*, however it also provided a great deal of flexibility. Where some other aspects of this project, like the *Security Management Module*, were restricted to tried and true methods for user validation and authentication, the *User Management Module,* had various freedoms to explore new ways to accomplish familiar (and unfamiliar) tasks.

The freedom associated with developing an entirely new system allowed each member of the *User Management Module* to expand their thinking outside of the traditional boundaries of software development and system analysis. Among other aspects, it was this freedom that allowed the *User Management Module Team* to meet daunting challenges head-on in developing the system and its analysis

As the project manager for the *User Management Module*, I can speak for the team in saying that this was truly a unique project that each and every one of us enjoyed working on and benefited from tremendously. We hope that you enjoy learning about our system as much as we enjoyed creating it.

Sincerely,

Lawrence W. Stark

User Management Module

Abacus Biocomputing Systems

Table of Contents

REQUIREMENTS ENGINEERING

LOGIC MODELING

APPENDICIES

Official Work Break Down by Team Member:

Lawrence W. Stark	–	Project Manager and Assistant Programmer
Michael Majdanski	–	Documentation
Katherine Duncan	–	Systems Analyst – GUI Analyst
Hardik Patel	–	Lead Programmer
Sean Harney	–	Architectural Design
Tom Motyka	–	Data Designer

Actual Work Break Down by Team Member:

Lawrence W. Stark:

1. Project Manger
2. Assistant Programmer
3. Software Economics

Michael Majdanski:

1. Requirements Gathering
2. Requirements Definitions
3. Data Flow Diagrams

Katherine Duncan:

1. Background
2. Problem Statement
3. Analysis of Previous Work
4. Analysis of Previous Functional Systems
5. Methodology Analysis
6. Glossary terms.

Hardik Patel:

1. Lead programmer
2. Database Designer
3. Database Implementer

Sean Harney:

1. Planning
2. Scheduling
3. Pert and Gant Charts
4. Milestone Evaluation
5. Cost/Benefit Analysis

Tom Motyka:

1. Architectural Models
2. Data Dictionary
3. Additional Data Flow Diagrams
4. Decision Trees
5. Database Structure

Lawrence W. Stark

10 Tower Road
Newton, NJ 07860

Cell Phone: (607) 592 – 4422
Home Phone: (973) 383 – 0897
E-Mail: lws2@njit.edu

Objective

Seeking fulltime employment in a global, technology-based company where I will have the opportunity to use my extensive knowledge of computer software, hardware and algorithm development while learning new skills, procedures and technologies.

Experience

Netilla Networks Inc.

Application Development: Independently developing 'Wizard-Based', client-server application to automate the daily process of configuring and shipping servers to customers, making entries into the database error free.
Assistant Database Administrator: Daily maintenance, collection, and distribution of all company data. Initiated the upgrade from an Access database to a MS SQL Server 2000 Database.
Technical Support Engineer: Assisting with customer support for licensing, configuration and general difficulties when operating and configuring their servers.
Beta Test Engineer: Assist with testing new server hardware and also with each updated release to the Netilla's proprietary software.
System Administrator: Planned, configured and administer windows network at home.
Web Development: Freelance web design for small and startup businesses using the latest technologies from Macromedia and Sun's Java.

Skills and Knowledge

Software:
Programming Languages: Java, C++, Visual Basic, Perl, PHP, HTML, XML, ARM and VAX assembly languages.
Software Suites: Macromedia Studio (Flash, Coldfusion, Dreamweaver, etc.)
Photo Editing: (Adobe Photo Shop, Illustrator, Maya, Fireworks)
Microsoft Office: (Word, Excel, Power Point, Access, Outlook)
Operating Systems:
Servers: Windows NT, 2000 Server/Advanced Server, 2003 Server, Mandrake Linux, Unix
End User: Windows 3.1, 95-2000, XP, XP Pro, Red Hat and Debian Linux,
Hardware: Able to troubleshoot hardware as well as locate and resolve compatibility issues. Adept at building entire systems from raw components.

Education

New Jersey Institute of Technology (NJIT), Newark, New Jersey
School of Computer and Information Sciences – 2002 – present
BSCS with a minor in Mathematics, anticipated graduation 12/2004
Currently taking graduate computer science courses.
Grade Point Average: 3.95
Cornell University, Ithaca, New York
School of Engineering – 2000 – 2002
Kittatinny Regional High School, Hampton, New Jersey (1996 – 2000)

Awards

NJIT Computer Science academic achievement scholarship.
Cornell Tradition Fellowship: top five percent of "most well-rounded" freshmen – 2000
Starting Right Guard: Cornell Varsity Football Team – 2000 and 2001
Recipient of two varsity letters – 2000 and 2001 and Cornell VS Princeton Game Ball – 2000
Edward J. Bloustein Distinguished Scholar – 2000
Sussex County State Bank Scholar Athlete of the Year – 2000
National Honors Society – 1999 and 2000 and Seventh in Graduating Class – 2000
Selected for all-league, all-county, all-New Jersey football teams – Offensive Line
High School varsity letters in track and football – MVP in football.

References

Available Upon Request

Katherine Duncan

- **Specialization (CS, IS or IT):** IT Communications
- **Project Idea (from webct):** Abacus Biocomputing Systems
- **Project Team you wish to join (get name from webct):**
- **Team Project manager Name :** Lawrence Stark
- **General Job Experience (if any):**
- **Academic Awards / Achievements:**

- **Position you are applying for (check ONLY one)**

(Please Read Syllabus For Detailed Responsibilities and Required Qualifications – Note :For a project manager position , use project manager application form NOT this one):

☒ **P01 System Analyst**
(Knowledge of requirements analysis techniques and modeling (including use cases) is important)
☐ **P0301 Database Designer**
(Knowledge of ERM, SQL, and normalization is important)
☐ **P0302 Network Designer**
(Knowledge of topologies, protocols and web networking is important)
☐ **P0303 Architectural Designer**
(Knowledge of software engineering, architectural models, OO models is important)
☐ **P04 Front-end designer**
(Knowledge of user interface design, GUI components, and cognitive psychology is important)
☐ **P05 Programmer**
(Knowledge of at least one programming language is a must)
☐ **Other, please specify below (*subject to availability*):**
[ ]

- **Indicate in what programming languages/environments/tools/DBMS packages are you more skilful**

(Select all that apply):

☐C++ ☐Java ☐Visual Basic ☐ Delphi ☐ Python ☐ Cobol ☐Pascal ☐C ☐HTML ☐Java Script

☒Dream weaver ☐Cold Fusion ☐XML ☐ActiveX ☐Oracle ☒Access ☐Eiffel ☐Fortran ☐ Prolog

☐Java Beans

☐Other (Please specify):

- **Do you master any CASE tool(s) (Please specify ALL THAT APPLY below)?**

☐MS project management ☒MS Visio ☐Smart Draw ☐Power Designer ☒Ms Front Page

☐Designer 2000 ☐Other (Please specify):

- **Position-Related mandatory courses achievements (Only A , B+ or B)**

Course No	Course Name	Grade achieved
CIS 270	**Multimedia Info Systems**	**B**
IT 201	**Information Design Techniques**	**A**
CIS 431	**Intro to Database Systems**	**B**

- **Position-Related elective courses and/or practical experience (in school):**

1-IT 490

- **Please explain why do you think your background/knowledge/skills will suit the position you are applying for and how can you contribute effectively to the overall success of the team you wish to join?**

  My concentration in IT is communications. Communications is a broad field, but I have learned how to put information and data together in a well organized form. The system analyst also needs to be able to correspond well with the entire team in order to gather information from each part of the project in order to collaborate it into structured document.

- **What are your other software developments skills in which the team can benefit from in addition to your major position (i.e.: analysis, design, implementation, testing, prototyping, etc.)?**

  Although I have no formal experience in software development, I believe I would be able to contribute to the software's testing and suggesting improvements.

Hardik Patel

- **Specialization (CS, IS or IT): CS**
- **Project Team (from webct):** Abacus Biocomputing Systems
- **Team Project manager Name :** Lawrence W. Stark
- **General Job Experience (if any):** Web page design, Graphics Design
- **Academic Awards / Achievements:**
- **Research Work (theoretical and/or empirical):**

- **Position you are applying for (check ONLY one)**

(Please Read Syllabus For Detailed Responsibilities and Required Qualifications – Note :For a project manager position , use project manager application form NOT this one):

☐ **P01 System Analyst**
(Knowledge of requirements analysis techniques and modeling (including use cases) is important)
☐ **P0301 Database Designer**
(Knowledge of ERM, SQL, and normalization is important)
☐ **P0302 Network Designer**
(Knowledge of topologies, protocols and web networking is important)
☐ **P0303 Architectural Designer**
(Knowledge of software engineering, architectural models, OO models is important)
☐ **P04 Front-end designer**
(Knowledge of user interface design, GUI components, and cognitive psychology is important)
☒ **P05 Programmer**
(Knowledge of at least one programming language is a must)
☐ **Other, please specify below (*subject to availability*):**
[ ]

- **Indicate in what programming languages/environments/tools/DBMS packages are you more skilful**

(Select all that apply):

☒C++ ☒Java ☐Visual Basic ☐ Delphi ☐ Python ☐ Cobol ☐Pascal ☐C ☒HTML ☐Java Script

☒Dream weaver ☐Cold Fusion ☒XML ☐ActiveX ☐Oracle ☒Access ☐Eiffel ☐Fortran ☐ Prolog

☐Java Beans

☒Other (Please specify): JSP, SQL

- **Do you master any CASE tool(s) (Please specify ALL THAT APPLY below)?**

☐MS project management ☐MS Visio ☐Smart Draw ☐Power Designer ☐Ms Front Page

☐Designer 2000 ☐Other (Please specify):

- **Position-Related mandatory courses achievements (Only A , B+ or B)**

Course No	Course Name	Grade achieved
CIS 375	**Application Development WWW**	**B**
CIS 431	**Intro Database Systems**	**B**

- **Position-Related elective courses and/or practical experience (in school):**

1- CIS 375 – Application Development WWW
2- CIS 431 – Intro Database Systems

- **Position-Related work experience (in industry)**

1- Web design, Graphic Design – Volunteer work experience.

- **Please explain why do you think your background/knowledge /skills will suit the position you are applying for and how can you contribute effectively to the overall success of the team you wish to join ?**

  I have experience in various languages. I can work in a team-based environment. I can also use flash to create WebPages. I also have knowledge of database. So far I have created two websites. One was about On-Line Parking systems, where person can log in and edit their accounts. Second website I have created is about Flight Reservation. Person can search for flights and then make reservation.

Michael Majdanski

- **Specialization (CS, IS or IT): CS**
- **Project (from webct):** Abacus Biocomputing Systems
- **Team Project manager Name :** Lawrence Stark
- **General Job Experience (if any):**
- **Academic Awards / Achievements:**
- **Research Work (theoretical and/or empirical):**

- **Position you are applying for (check ONLY one)**

(Please Read Syllabus For Detailed Responsibilities and Required Qualifications – Note :For a project manager position , use project manager application form NOT this one):

☐ **P01 System Analyst**
(Knowledge of requirements analysis techniques and modeling (including use cases) is important)
☐ **P0301 Database Designer**
(Knowledge of ERM, SQL, and normalization is important)
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(Knowledge of topologies, protocols and web networking is important)
☐ **P0303 Architectural Designer**
(Knowledge of software engineering, architectural models, OO models is important)
☐ **P04 Front-end designer**
(Knowledge of user interface design, GUI components, and cognitive psychology is important)
☐ **P05 Programmer**
(Knowledge of at least one programming language is a must)
☒ **Other, please specify below (*subject to availability*):**
[Project Documentation Writer]

- **Indicate in what programming languages/environments/tools/DBMS packages are you more skilful**

(Select all that apply):

☒C++ ☐Java ☒Visual Basic ☐ Delphi ☐ Python ☐ Cobol ☐Pascal ☒C ☐HTML ☐Java Script

☐Dream weaver ☐Cold Fusion ☐XML ☐ActiveX ☐Oracle ☐Access ☐Eiffel ☐Fortran ☐ Prolog

☐Java Beans

☒Other (Please specify): SQL

- **Do you master any CASE tool(s) (Please specify ALL THAT APPLY below)?**

☐MS project management ☐MS Visio ☐Smart Draw ☐Power Designer ☐Ms Front Page

☐Designer 2000 ☐Other (Please specify):

- **Position-Related mandatory courses achievements (Only A , B+ or B)**

Course No	Course Name	Grade achieved
CIS 490	**Design in Software Engineering**	**B**
CIS 390	**Analysis & System Design**	**A**
ENG 352	**Technical Writing**	**A**

- **Position-Related elective courses and/or practical experience (in school):**

1- CIS 434 – Advanced Database Systems (Documentation Writer for Database Project)

2- CIS 350 – Computers & Society

- **Please explain why do you think your background/knowledge/skills will suit the position you are applying for and how can you contribute effectively to the overall success of the team you wish to join ?**

Technical writing played a great role in many of CIS elective courses I have taken, and I was usually the one to take the job of writing the documentation, DFDs, etc. I have a strong background in writing and a good knowledge of what is required in the documentation of any software project. I feel that I can contribute greatly to the team by performing to the best of my ability.

- **What are your other software development skills in which the team can benefit from in addition to your major position (i.e.: analysis, design, implementation, testing, prototyping, etc.)?**

In addition to my major position, I can also utilize what I have learned towards system analysis, design, and testing of software projects, as I was a co-leader of our team in my CIS490 course.

Sean Harney

Specialization (CS, IS or IT): IS
Project Team (from webct): Abacus BioComputing Systems
Team Project manager Name: Larry Stark
General Job Experience (if any): I was manager of two stores
Academic Awards / Achievements: Dean's list
Research Work (theoretical and/or empirical): 390

Position you are applying for (check ONLY one)
(Please Read Syllabus For Detailed Responsibilities and Required Qualifications - Note :For a project manager position , use project manager application form NOT this one):

P01 System Analyst #
(Knowledge of requirements analysis techniques and modeling (including use cases) is important)

Indicate in what programming languages/environments/tools/DBMS packages are you more skilful
(Select all that apply): C++ # Java # Cobol # Pascal # HTML # Java #

Do you master any CASE tool(s) (Please specify ALL THAT APPLY below)?
MS Visio Ms Front Page Designer 2000

Other (Please specify):

Position-Related elective courses and/or practical experience (in school):
1-cis 392 TEXT PROC, RETRIEVAL & MINING B

Please explain why do you think your background/knowledge /skills will suit the position you are applying for and how can you contribute effectively to the overall success of the team you wish to join ?

I am proficient at gathering data and information for research assignments and papers. I try to stay very organized and set deadlines for myself. I take direction well and am always willing to listen to others ideas and willing to change directions if the group feels that we need to focus in another direction. I am also not afraid to ask questions if i don't understand or need clarification so that my work is not off topic

What are your other software development skills in which the team can benefit from in addition to your major position (i.e.: analysis, design, implementation, testing, prototyping, etc.)?

I am always willing to offer my input on something and I find that i can be pretty good at trouble shooting a project. what with all the programming courses that I have taken.

Tom Motyka

- **Specialization (CS, IS or IT):** IS
- **Project Team (from webct):** Abacus BioComputing Systems
- **Team Project manager Name :** Lawrence (Larry) W. Stark
- **General Job Experience (if any):** Network Administration, Web page development, Desktop Support
- **Academic Awards / Achievements:** Deans List
- **Research Work (theoretical and/or empirical):** None

- **Position you are applying for (check ONLY one)**

(Please Read Syllabus For Detailed Responsibilities and Required Qualifications – Note :For a project manager position , use project manager application form NOT this one):

☐ **P01 System Analyst**
(Knowledge of requirements analysis techniques and modeling (including use cases) is important)
☒ **P0301 Database Designer**
(Knowledge of ERM, SQL, and normalization is important)
☐ **P0302 Network Designer**
(Knowledge of topologies, protocols and web networking is important)
☐ **P0303 Architectural Designer**
(Knowledge of software engineering, architectural models, OO models is important)
☒ **P04 Front-end designer**
(Knowledge of user interface design, GUI components, and cognitive psychology is important)
☐ **P05 Programmer**
(Knowledge of at least one programming language is a must)
☐ **Other, please specify below (*subject to availability*):**
[ ]

- **Indicate in what programming languages/environments/tools/DBMS packages are you more skilful**

(Select all that apply):

☐**C++** ☐**Java** ☐**Visual Basic** ☐ **Delphi** ☐ **Python** ☒ **Cobol** ☐**Pascal** ☐**C** ☒**HTML** ☐**Java Script**

☐**Dream weaver** ☐**Cold Fusion** ☐**XML** ☐**ActiveX** ☒**Oracle** ☐**Access** ☐**Eiffel** ☐**Fortran** ☐**Prolog**

☐**Java Beans**

☐**Other (Please specify):**

- **Do you master any CASE tool(s) (Please specify ALL THAT APPLY below)?**

☐MS project management ☐MS Visio ☐Smart Draw ☐Power Designer ☐Ms Front Page

☐Designer 2000 ☐Other (Please specify):

- **Position-Related mandatory courses achievements (Only A , B+ or B)**

Course No	Course Name	Grade achieved
CIS431	**Database Design**	**A**
CIS390	**System design and analysis**	**B+**
CIS465	**Advanced Information Systems**	**B**
CIS456	**Open Systems Networking**	**A**

- **Position-Related elective courses and/or practical experience (in school):**

1- CIS270 Multimedia Info Systems – Development of effective web page layouts through the use of HTML and java scripts.

2- CIS455 Information Systems Management – Worked in a set team through out the semester where meetings were crucial to overall success. Our team worked on analyzing different real life events, through the use of different case tools that were acquired through the semester.

3- Calc I,II,III – I'm am putting math as relative to this course due to that maths main focus are to be analytical and to be able to become an effective problem solver. I have received B's in all of my math courses. I am also a firm believer that these classes allowed me to become a better manager of time with regards to my studies and responsibilities in my endeavors.

- **Position-Related work experience (in industry)**

1- I do not have as much industry experience with regards to being a systems analyst or a systems developer. My main industry experience has been in user support and network administration. Nonetheless, I have gained a valuable tool from working in the industry and that is team work. When I worked at Mercedes Benz USA, I was responsible for coordinating and documenting my teams performance in the project that we were

assigned. My main objective however was with dealing with dead lines, motivating team members to stay on track, scheduling meetings with users that needed upgrades, preparing and presenting weekly status reports to upper management, and most importantly get the job done right.

- **Please explain why do you think your background/knowledge /skills will suit the position you are applying for and how can you contribute effectively to the overall success of the team you wish to join ?**

  I am currently interested in all of your positions that you have available. I believe that I can do any one of them.

  System Analysts – I have taken CIS390 and would have gotten an A in the course if it wasn't form team leader that forgot to hand in one of our project requirements. Prof. Chumer has a thing called "A breakers". A breakers are requirements that need to be fulfilled in order to get an A in his course. Late assignments are one of them. Nonetheless, I completely understand how to go about gathering information and analyzing that information so that all of the requirements for that system have been met. Documentation is the easy part. I believe that I have the essential communication skills that are required in gathering these requirements. Asking and more importantly listening to the clients questions and concerns will be the integral part of the solution to our problem.

  Front end designer – I would really love this position, due to that I am artistic and believe that I have a firm understanding what a user needs to see when dealing with a computer interface. Understanding cognitive processes of a user with regards to information over load is one of the concerns a developer most adhere to when developing such interfaces. I have a good understanding of Adobe Photoshop and graphic design. This is one thing that I enjoy doing outside of an academic environment.

  Database - I got an A in this course, I loved this class!. Its been a year since I have dealt with any SQL statements, normalizations, and relations, but I do have my notes, old exams, and projects saved. So I can brush up on it and get to work if this is where you want me, that's to say you even pick me.

ABSTRACT

In today's world it is important to provide people with accurate medical information. Web-based delivery of healthcare is just one way people can receive medical information. Abacus Biocomputing Systems (ABS) is developing an attractive strategy for achieving awareness, acceptance and adoption of web-based tools for delivering healthcare solutions with demonstration of improved correlation of predictive information with patient outcomes.

The team hopes to offer a better user interface, graphical user interface, and content. A better user interface will allow for easier input and gathering of information from the database. The login screen will allow for a more secure web-site than most other medical sites offered. The team hopes to provide a better graphical interface through complimenting, and inviting colors and a simplistic yet effective layout. The content will be presented in such a way that customers can find what they need to do in a quick and efficient matter. Many other medical sites over do their content level on a page, making information timely and difficult to find.

The ABS site will also feature discussion forums, mailing lists with news letters, an event scheduler, and online polls. Many of these features will set the ABS site apart from other medical web-based deliveries of medical healthcare. Healthcare is an important issue in today's world, and ABS hopes to help people stay better informed with medical issues.

LITERATURE REVIEW

Over the years the Internet has evolved to become a pertinent part of our society. Individuals can now search, or buy anything off the Internet. There are even advertisements to get your degree online. Just about every company and business now has a website, getting their information out for everybody to have access to. The information that can now be found is amazing.

People are now able to search and find medical information and advisement online as well. This information can avoid a costly doctor's visit; or maybe convince that person who is evading a visit to the doctor to go. Sites like these can also guide individuals in finding the right doctor for their needs. With this trend, there are several new medical websites entering the medical market. While researching for the Abacus Biocomputing Systems web development, the team took a look at other medical sites that we will use as a tool of comparison to best enhance our websites features.

WebMd.com was the best healthcare navigation system we found. WebMd provides access to several different services including: *WebMd Health*, a consumer focused healthcare information site, *Medscape*, which provides medical information and educational tools, like journals for healthcare professional, *WebMd Envoy*, a transaction tool for providers and payers which also aids in electronic prescribing, and finally *WebMd Practice Services*, which offer practice management systems.

WebMd also allows its users to check symptoms, find physicians, and has a weight loss program. It also has information for newly diagnosed people, and expectant mothers. All these great features make it popular for other companies like AOL and

MSN to use its services. Features like these are things that Abacus Biocomputing Systems may look to use in the site.

WebMd's site is a very bright and eye popping. But the user is immediately bombarded with loads of information upon entering the site. The homepage is over packed with information and could leave a user frustrated while looking for what they need to find. This is something the team is trying to avoid at ABS.
(www.webmd.com)

Betterhealth.com is a small healthcare site ran out of the Saint Raphael Healthcare system in the New Haven, Connecticut area. It mainly strives to improve the health of the poor and elderly. Their site offers you many of the features WebMd offers, including information about medical and surgical services, helping find a doctor, and support groups.

Betterhealth.com offers a good, classic navigation system, most likely made with cascading style sheets. On the flip side this medical site greats you with drab colors. A medical site should reflect healing and happiness, which is not seen in shades of browns and grays.
(www.betterhealth.com)

HealthWeb.org is a site that provides a slightly different angle on the medical informational site. This site is more of a medical guiding site. The sites objective is to provide you links to other sites that are relevant to the topic you searched for. The site allows you to search the topic you are looking for information on, give feedback, and suggest other websites to be added to the list.

HealthWeb has layout features that ABS will look to use in the site. HealthWeb offers a very simple layout, with basic information laid out on the homepage to help visitors find what they are looking for. The website is simple in its layout but makes a "pop" with its catchy buttons. The one downside to a site like HeathWeb is that it is basically just a link page. A user still has more searching to do once at the site. (www.healthweb.org)

Looking at other work is important in our process of making an ABS site. By taking the positives and negatives from other markets the team can build a better site.

PROBLEM STATEMENT

Abacus Biocomputing System (ABS) is a startup company focusing on web-based delivery of healthcare solutions revolving around proprietary computational algorithms. ABS is developing "Predictive Patient Compliance Tools" for enhancing the accuracy and efficiency of existing questionnaire-based tools that require time-and resource-intensive patient reviews. This will be a first test of the clinical utility of the company's computational methods. The goal of the predictive patient compliance tools is to improve the effectiveness of assistance devices and equipment used to treat ambulatory patients. This application will address a significant problem in the healthcare delivery.

The User Management Module of the Abacus Biocomputing System requires the design and implementation of user verification login screen that coincides with a database system with all the user accounts. Along with those objectives a clear, user-friendly page must be created that is favorable to all users. A logging system must also be made to follow site activities.

The user interface must be clear, contextual, and concise. To do so, the team will use cascading style sheets (CSS), the current industry standard that is replacing tables and frames, which will keep the pages consistent and easy to upkeep and maintain. CSS are a preferable method to use since they are good for maintenance. With CSS the UMM group will only have to write the user interface code once, and then use that code for each page. This method also creates uniformity among all browsers (Internet Explorer, Netscape, ect.) and complies with the current ANSI standards.

The team must also create a user verification login screen that will allow the right people to access their appropriate and permissible information. This will be done in

coincidence with the database system. In order to meet the specifications the UMM group will verify the users with tables that manage the user's rights. Administrative and standard account users will be able to Create, Read, Update, or Delete (CRUD) their accounts.

When first coming to the site, everyone will be considered a visitor until logging in. The team will allow site viewers to scan the sight and look at any information that is permissible to visitors. Visitors may view non-secured pages and content, and have read-only access. Once they attempt to link to something that is not allowed for a visitor to view they will be prompted to the login page and be asked to enter their username and password, or will be allowed to attempt to register to become a member. A visitor that chooses to register will be taken to a registration page where they will create a unique user name and password. Usernames can only be numbers, letters, and dashes. Special characters will not be allowed. Passwords must be greater than 5 characters. A person wanting to become a member will also be asked to enter their name, age, sex, address, and their general health history (last flu shot, diabetic, cancer, heart disease, ect.).

METHODOLOGIES

In order to complete a successful project, the team must examine different ways to accomplish the design and integrity of the system. Methodologies are the guides, procedures, and rules that the team will use to help blueprint our project. It is important that the right methodology is followed; therefore we must examine many different methods in order to see that we are following the right one for our project. For this project the methods examined were Rapid Application Development (RAD), Prototyping, and the Spiral Method.

RAPID APPLICATION DEVELOPMENT

RAD is a method that allows products to be developed faster, sometimes as fast as sixty to ninety days, and of higher quality. With this method there is a focus on the design of the user interface (UI), and determining the screen layout. RAD is a less formal method, but requires following a stricter schedule. A team must gather requirements using methods like focus groups. Prototyping and early testing is a very important part of the RAD process.

RAD is a very good method when the application stands alone. Other advantages also include greater flexibility, and the ability to get early visibility through prototyping.

PROTOTYPING

Prototyping is often used in conjunction with RAD. With prototyping a model is built and then tested. After being tested the system is rebuilt until a

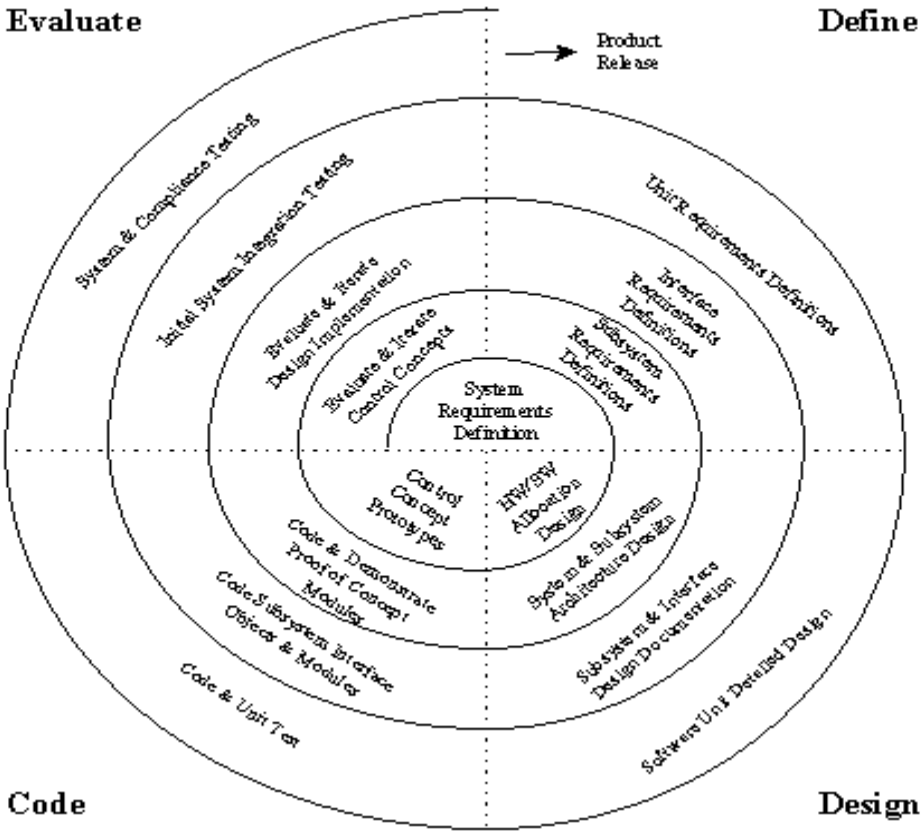
developed final product is complete. Prototyping is a trial and error process. Here is a nine-step process that goes through the prototyping method:

1. The new system requirements are defined in as much detail as possible. This usually involves interviewing a number of users representing all the departments or aspects of the existing system.
2. A preliminary design is created for the new system.
3. A first prototype of the new system is constructed from the preliminary design. This is usually a scaled-down system, and represents an approximation of the characteristics of the final product.
4. The users thoroughly evaluate the first prototype, noting its strengths and weaknesses, what needs to be added, and what should to be removed. The developer collects and analyzes the remarks from the users.
5. The first prototype is modified, based on the comments supplied by the users, and a second prototype of the new system is constructed.
6. The second prototype is evaluated in the same manner, as was the first prototype.
7. The preceding steps are iterated as many times as necessary, until the users are satisfied that the prototype represents the final product desired.
8. The final system is constructed, based on the final prototype.
9. The final system is thoroughly evaluated and tested. Routine maintenance is carried out on a continuing basis to prevent large-scale failures and to minimize downtime.

(http://searchvb.techtarget.com/gDefinition/0,294236,sid8_gci755441,00.html)

SPRIRAL

The spiral method utilizes increased emphasis on parallelism and concurrency in design. Spiral method helps manage risks, through processes like feedback. Tasks and deliverables are indentified for each step in the spiral (See the picture below)



(http://www.hyperthot.com/pm_sdm.htm)

	TIME (30)	RISK (20)	COST (30)	QUALITY (10)	INTEGRATION (10)	TOTAL (100)
RAD	23	11	25	8	7	74
PROTOTYPING	18	9	22	8	7	64
SPIRAL	17	17	19	9	7	69

METHODOLOGY SELECTION

After considering these three methodologies, the team has decided to use a combination of Rapid Application Development (RAD) and Prototyping for the Abacus User Management Module. The combination of our budget and time constraints brought us to this conclusion.

Being that we only had about 70 days to complete this project time was a big issue. RAD and Prototyping will allow for the team to accomplish a lot in a short period of time. Cost is also a big issue. Since Abacus is a startup company, the User Management Module wants to keep the budget small and under control.

By maximizing those elements, the User Management Module will be able to create a quality, reliable product for Abacus. There is some risk involved in our strategy, but we feel the strengths of these methodologies will over come the downsides.

PROJECT / RESOURCE MANAGEMENT

WORK BREAKDOWN STRUCTURE (WBS)

Task#	Name	# of days	Start Date	End Date	Predecessors	Resources
1	**Project conception**	**1 days**	**10/6/04**	**10/6/04**		
2	Interview Sponsors	1 days	10/8/04	10/8/04		All Members
3	List Project Needs	1 days	10/8/04	10/8/04		All Members
4	Define Project Goals	1 days	10/8/04	10/8/04		All Members
5	Planning	8 days	10/8/04	10/16/04		All Members
6	Project Abstract	5 days	10/9/04	10/14/04		Katherine Duncan
7	Problem Statement	2 days	10/9/04	10/11/04		Katherine Duncan
8	Methodologies	4 days	10/9/04	10/13/04		Larry Stark
9	Glossary	1 day	10/10/04	10/10/04		Katherine Duncan
10	**Development Process**	41 day	10/10/04	11/11/04	5	Hardik Patel, Larry Stark
11	Project Management	5 day	10/10/04	10/15/04		Larry Stark
12	Central user Database	7 day	10/11/04	10/18/04	10	Hardik Patel, Larry Stark, Michael Majdanski
13	1st Prototype Release		10/12/04			
14	Root user account management	3 day	10/19/04	10/21/04	12	All Members
15	Resource Management	3 days	10/19/04	10/21/04		Larry Stark
16	Work Breakdown Structure	2 days	10/19/04	10/20/04	4,3,11,5	Sean Harney
17	Project Milestones	1 days	10/19/04	10/19/04		Katherine Duncan
18	Feasibility Study	4 days	10/19/04	10/23/04		Sean Harney
19	Economic Feasibility	4 days	10/19/04	10/23/04		Sean Harney
20	Technical Feasibility	4 days	10/19/04	10/23/04		Hardik Patel, Larry Stark
21	Cost Estimation	4 days	10/19/04	10/23/04		Sean Harney
22	Function Points	4 days	10/19/04	10/23/04		Sean Harney
23	Cost Estimation Model	4 days	10/19/04	10/23/04		Sean Harney
24	(COCOMO)	5 days	10/19/04	10/24/04		Sean Harney
25	System Analysis	3 days	10/20/04	10/23/04		Hardik Patel, Larry Stark, Tom Motyka
26	Stakeholders Identification	1 days	10/20/04	10/20/04		Tom Motyka
27	Get Feedback from Sponsors	1 days	10/28/04	10/28/04		All Members
28	Administrative user account management	4 days	10/29/04	11/1/04	14	Hardik Patel, Larry Stark
29	Standard user account management	5 days	10/29/04	11/2/04	28	Hardik Patel, Larry Stark
30	Visitor account management	2 days	10/29/04	10/30/04	28	Hardik Patel, Larry Stark
31	Brainstorming	1 days	10/30/04	10/30/04		All Members
32	Documenting Requirements	1 days	10/30/04	10/30/04		Katherine Duncan
33	Functional Requirements	1 day	10/30/04	10/30/04		Tom Motyka, , Michael Majdanski

34	Modeling Requirements	2 days	10/30/04	10/31/04		Tom Motyka, , Michael Majdanski
35	Use Case Diagram	2 days	10/30/04	11/1/04		Tom Motyka, , Michael Majdanski

36	Process Specifications	2 days	11/1/04	11/2/04	30	Tom Motyka, , Michael Majdanski
37	DFD's	2 days	11/1/04	11/2/04		Tom Motyka, , Michael Majdanski
38	DD	2 days	11/1/04	11/2/04		Tom Motyka, , Michael Majdanski
39	2nd Prototype Release		11/2/04			
40	User Authentication information management	5 days	11/3/04	11/7/04	29,30	Hardik Patel, Larry Stark
41	System Structuring	1 days	10/3/04	10/3/04	40	Hardik Patel, Larry Stark
42	User activity analyzer	5 days	11/7/04	11/11/04	40	Hardik Patel, Larry Stark
43	Allow user to create and reply to topics	5 days	11/11/04	11/15/04	42	Hardik Patel, Larry Stark
44	Visitors are not allowed to create or reply to topics	2 days	11/11/04	11/12/04	43	Hardik Patel, Larry Stark
45	Modular Decomposition	4 days	11/11/04	11/14/04		Tom Motyka, , Michael Majdanski
46	Users can store topics they are interested in as favorites	3 days	11/12/04	11/14/04		Hardik Patel, Larry Stark
47	ER Diagram	3 days	11/12/04	11/15/04		Tom Motyka, , Michael Majdanski
48	ER Model	3 days	11/12/04	11/14/04		Tom Motyka, , Michael Majdanski
49	Users can display all topics or just favorites	5 days	11/12/04	11/16/04	43	Hardik Patel, Larry Stark
50	Insure forums easy of use	5 days	11/16/04	11/20/04	48	All Members
51	testing	5 days	11/16/04	11/20/04	50	All Members
52	Update documentation	3 days	11/17/04	11/19/04	51	Hardik Patel, Larry Stark, Michael Majdanski
53	integration test requirements	5 days	11/20/04	11/24/04	52	Hardik Patel, Larry Stark
54	Design User Manuals	4 days	11/20/04	11/23/04	51	All Members
55	Design Developer Manual	4 days	11/20/04	11/24/04	51	All Members
56	Final Project due		12/7/04			

Project Milestone- Estimated Completion Time

Phase#	Phase Implemented	Start Date	End Date	DESCRIPTION	Resources
1	Primary Requirements Gathering	10/6/04	10/11/04	Meet with stakeholders to gather information for the website that is to be developed	All Members
2	High-Level System Architecture	10/20/04	11/24/04	Rapid, high-level design of system is created with the stakeholders information	Tom Motyka, Michael Majdanski
3	Prototyping	10/9/04	11/22/04	Developers construct Initial version of the website	All Members
4	Formal Requirements	10/6/04	10/15/04	Team revisits requirements and adds detail to requirements specification	All Members
5	Detailed Design	10/8/04	11/22/04	Comprehensive, well-detailed design for the software is created	Hardik Patel, Larry Stark
6	Implementation	10/11/04	11/24/04	Full-scale development of the software system is carried out	Hardik Patel, Larry Stark
7	Documentation	10/3/04	11/24/04	Documentation for the project is created by the team, including: reference manual, developer and online help system.	All Members
8	Project Review	11/16/04	11/24/04	Final overall review of software product along with completion of system testing	Hardik Patel, Larry Stark
9	Project	11/30/04	11/30/04	Intensive demonstration of project and its capabilities	All Members
10	Final Release and Presentation	12/7/04	12/7/04	Completion of entire documentation process, web-site along with the release of the web-site project and any necessary documentation for the sponsor and class.	All Members

COST BENEFIT ANALYSIS (ECONOMIC FEASIBILITY)

We set out to calculate the level of *feasibility* for our project by utilizing Cost benefit analysis equations. These equations allowed us to weight out the practicality of our web-sight design as well as its financial feasibility. Our web based s*ystem costs* can be grouped as the cost associated with the actual development of the system and the cost of its operation. The system development costs are called one time costs, because once you develop the system it exists and there is no point in reinventing the wheel as they say. Examples of these costs can be found in our One-Time Cost worksheet and can include anything from computer hardware and software to personnel that work on the site. In contrast operating costs occur over and over again throughout the lifetime of the systems for as long as it is operating. Operating cost can be found on our Recurring Cost worksheet in the form of staff salaries and maintenance. Benefits are typically defined as either increases in profit or a reduction in cost. Benefits that our group has to consider are those of both a Tangible and Intangible nature. Tangible benefits that might be associated with this project might be a reduction in cost do to hardware, while an intangible benefit to the group might be a programmer finding a way to improve the coding and make it easier to read.

One-Time Cost Worksheet:

Year	**0**
New hardware	$12,000
New (purchased) Software:	
Package application software	$9,500
Web designer software	$10,500
Communication equipment installation	$3,500

Website Development Team	
a. Development Project Manager	$55,000
b. Architect Developer	$50,000
c. Creative Designer	$40,000
Total	$ 180,500

Tangible Benefits Worksheet:

Project Initiation Fee	
Department	$65,000
Top-level administration	$50,000
Cost reduction or avoidance (1)	$2,000
Technology based system (2)	$5,000
(error reduction)	
Federal Funding	$20,000
State Funding	$30,000
Improvement in management	$2,500
Other (3)	$40,000
Total	$214,500

Notes: (1) cost reduction or avoidance is calculated by the cost of reprinting appointment manual sheets and or binders.
(2) technology based systems will replace the overhead of creating hard copies of appointment sheets by advanced technology systems.
(3) an alternating front desk secretary position eliminated.

Recurring Cost Worksheet:

	Year 1 through 4
Website Maintenance	
a. Technical Project Manager	$45,000
b. Student Work-study	$4,500
Web server Upgrades, Maintenance, Incremental data storage	$6,000
Supplies	$2,000
Managing development	$7,500
Total	$65,000

Technical feasibility risks are associated with any project. The factors can include the groups experience in the subject they are developing, project structure, and project size. All of these apply to our group and the project at hand. Our project seemed to swap back and forth in its complexity. When we began our project was very vague and complex, next our project became simple after specking with the sponsors, but it changed again when we found out that we had to work closely with the security group that was working on a different part of the same project. We are developing a web based system for Abacus Bio, which has to interact with other sections of their system that are being developed by other NJIT students and represent their new company. Our sponsors have clearly outlined the features that they would like in the system and the tools that we should us but have left the design up to us. Our group has six members in it each of which has there own personal skills and expertise that they are bringing to the project, from programmers to web analysis, we have some of every thing. Our team has a well rounded knowledge of all of the tools needed to complete this project and hopefully this will aid us in its completion. As we move through the project helping each other in our different areas of weakness we learn more and can turn that new knowledge towards the project. From our technical feasibility study we have concluded that our project has a medium-low risk value attached to it.

Economic Feasibility Analysis

Service Tracking System

	Year 0	Year 1	Year 2	Year 3	Year 4	Totals	
Net economic benefit	$0	$214,500	$214,500	$214,500	$214,500		
Discount Rate (12%)	1	0.893	0.797	0.712	0.636		
PV of benefits	$0	$191,548	$170,956	$152,724	$136,422		
NPV of all benefits	$0	$191,548	$362,504	$515,228	$615,650		$615,650
One Time Costs							($ 180,500)
Recurring Costs	$0	($65,000)	($65,000)	($65,000)	($65,000)		
Discount Rate (12%)	1	0.893	0.797	0.712	0.636		
PV of Recurring Costs	$0	($58,045)	($51,805)	($46,280)	($41,340)		
NPV of all Costs	($180,500)	($238,545)	($290,350)	($336,630)	($377,970)		($377,970)
Overall NPV							$237,680
Overall ROI - (Overall NPV / NPV of all Costs)							0.63
Break-even Analysis							
Yearly NPV Cash Flow	($180,500)	$133,503	$119,151	$106,444	$95,082		
Overall NPV Cash Flow	($180,500)	($-46,997)	$72,154	$178,598	$237,680		
Actual break even occurred at year:							**1.394**

NOTE: All dollar values are rounded to the nearest dollar

FUNCTION POINTS ANALYSIS

Software projects present a very high level of difficulty when it comes to planning there time constraints using a software management function. Function Points are one of the ways to measure a programs size and functionality from a user's point of view; it utilizes the number and complexity of inputs, outputs, files, and interfaces to facilitate its calculations. Function Points are used to predict the approximate number of source code statements that will need to be written in order to have a functioning piece of software. The levels that a particular program has are noted by the average number of coded statements that are required in order to implement a single Function Point. That is just one of the factors that can affect the complexity of a software project. There are fourteen other such factors that could also affect a software projects complexity i.e.(communication, reusability, data, end-user efficiency, etc.). When it finally comes down to determining the ultimate size of the project it is the Function Points Analysis that actually computes the Total Adjusted Function Points (TAFP), and it is this that can be used to make the Cost Construction Model or (COCOMO) model which estimates the effort spent on the creation of a software project.

Value Adjustment Factor

Factors	*Value**
Data Communications	4
Distributed Functions	2
Performance	3
Heavily Used Configuration	3
Transaction Rate	4
Online Data Entry	4
End User Efficiency	4
Online Update	4
Complex Processing	2
Reusability	3
Installation Ease	2
Operational Ease	2
Multiple Sites	1
Facilitate Change	4
Project Complexity (PC)	42

** 0 = No Effect on Process Complexity*
5 = Great Effect on Process Complexity Adjusted (PCA) Project Complexity
*(PCA) = 0.65 + (0.01 * PC) 0.65 + (0.01 * 42) => 1.07*
*Total Adjusted Function Points (TAFP) = PCA * TUFP*
1.07 * 143 => 153.01

Intermediate COCOMO

Fifteen additional cost factors, in four categories

1. **Product Attributes**
2. **Computer Attributes**
3. **Personnel Attributes**
4. **Project Attributes**

Product Attributes:

- **RELY required reliability**
- **DATA database size**
- **CPLX product complexity**

Computer Attributes

- **TIME execution time constraints**
- **STOR main storage constraint**
- **VIRT virtual machine volatility**
- **TURN computer turnaround time**

Personnel Attributes

- **ACAP analyst capability**
- **AEXP analyst experience**
- **PCAP programmer capability**
- **VEXP virtual machine experience**
- **LEXP programming language experience**

Project Attributes

- **MODP use of modern programming practices**
- **TOOL use of software tools**
- **SCED required development schedule**

INTERMEDIATE COCOMO (COCOMO II)

COST DRIVERS

Product Attribute		
RELY	Required Software Reliability	1.40
DATA	Database Size	1.08
CPLX	Product Complexity	1.15
Computer Attributes		
TIME	Execution Time Constraint	1.00
STOR	Main Storage Constraint	1.00
VIRT	Virtual Machine Votality	1.00
TURN	Computer Turnaround Time	1.00
Personnel Attributes		
ACAP	Analyst Capability	1.19
AEXP	Applications Experience	0.91
PCAP	Programmer Capability	0.70
VEXP	Virtual Machine Expereince	1.00
LEXP	Programming Language Experience	0.95
Project Attributes		
MODP	Use of Modern Programming Practices	0.91
TOOL	Use of Software Tools	1.00
SCED	Required Development Schedule	1.00
	EAF:	1.14

KDSI = 64,000 lines of code
In embedded mode

MM = 3.2(KDSI)^1.05 -->		
3.2(64)^1.05 =	267	
Adjust Effort = 267 * 1.14 =	304	Person Months
Schedule = 2.5(304)^0.32 =	8	Months

Distribution of Effort

Plans & Requirements	8%		24	Person Months
Product Design	18%		55	Person Months
Programming	53%		161	Person Months
Detailed Design	26%	79		Person Months
Code & Unit Testing	27%	82		Person Months
Integration and Testing	29%		88	Person Months

Total: 328

minus 24(from P&R) = 304

Distribution of Schedule

Plans & Requirements	34%	2.72	Months
Product Design	35%	2.80	Months
Programming	38%	3.04	Months
Integration and Testing	27%	2.16	Months

Total: 10.72

minus 2.72(from P&R) = 8

Distribution of Staffing by Phase

Plans & Requirements	8.8	~9	FSP
Product Design	19.6	~20	FSP
Programming	52.96	~53	FSP
Integration and Testing	40.74	~40	FSP

*Note: This is the recommended staff per phase and not the actual staff per phase.

Distribution by Activity

Plans & Requirements

Requirements Analysis	45%	3.96
Product Design	14%	1.232
Programming	7%	0.616
Test Planning	5%	0.44
Verification and Validiation	8%	0.704
Projet Office	11%	0.968
CM/QA	4%	0.352
Manuals	6%	0.528

Total: 8.80 FSP

Product Design

Requirements Analysis	10%	1.96
Product Design	42%	8.232
Programming	12%	2.352
Test Planning	7%	1.372
Verification and Validiation	8%	1.568
Projet Office	10%	1.96
CM/QA	3%	0.588
Manuals	8%	1.568

Total: 19.60 FSP

Programming

Requirements Analysis	3%	1.5888
Product Design	6%	3.1776
Programming	55%	29.13
Test Planning	6%	3.1776
Verification and Validiation	10%	5.296
Projet Office	7%	3.7072
CM/QA	7%	3.7072
Manuals	6%	3.1776

Total: 52.96 FSP

Integration and Testing

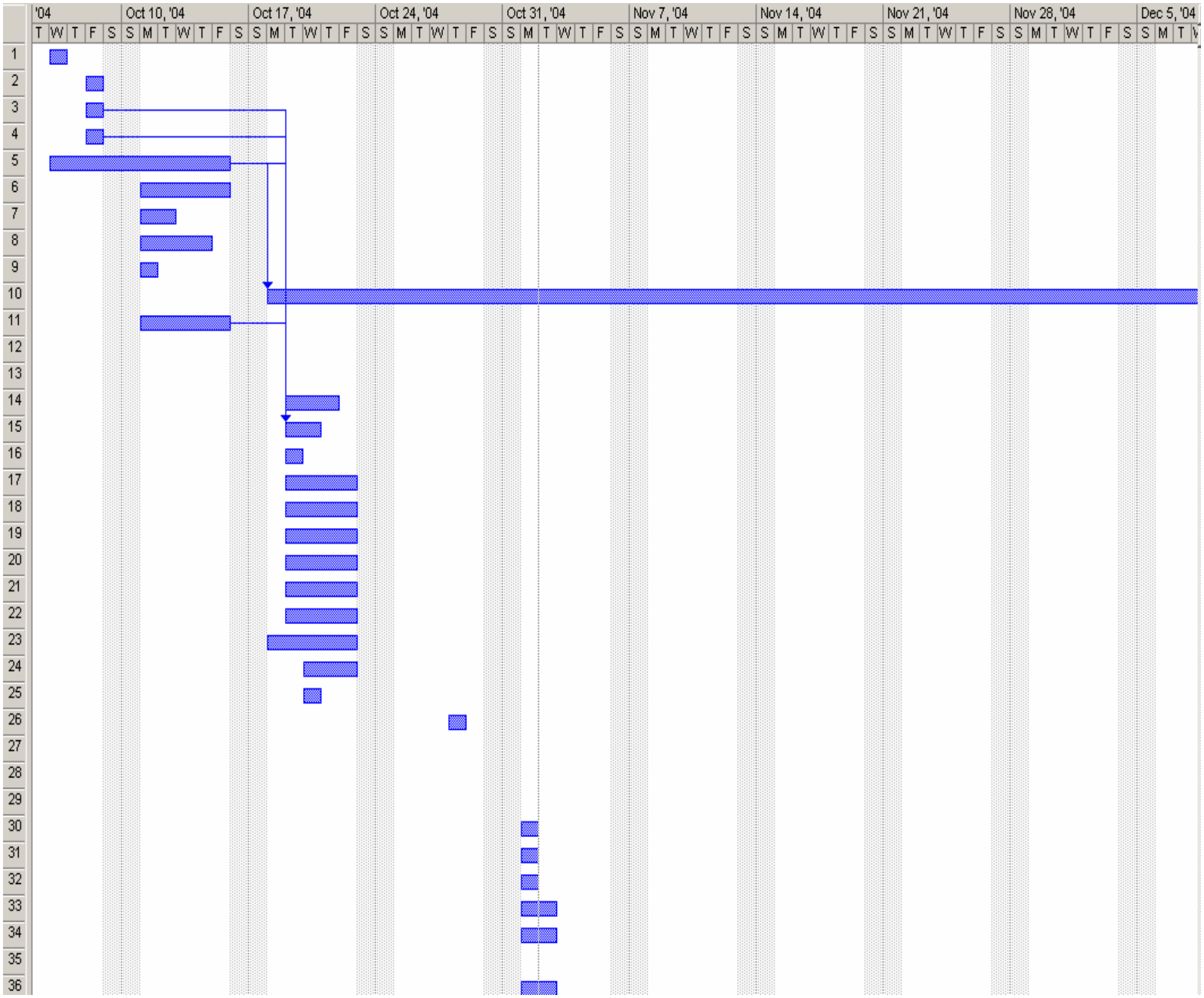
Requirements Analysis	2%	0.8148
Product Design	4%	1.6296
Programming	42%	17.1108
Test Planning	4%	1.6296
Verification and Validiation	24%	9.7776
Projet Office	8%	3.2592
CM/QA	9%	3.6666
Manuals	7%	2.8518

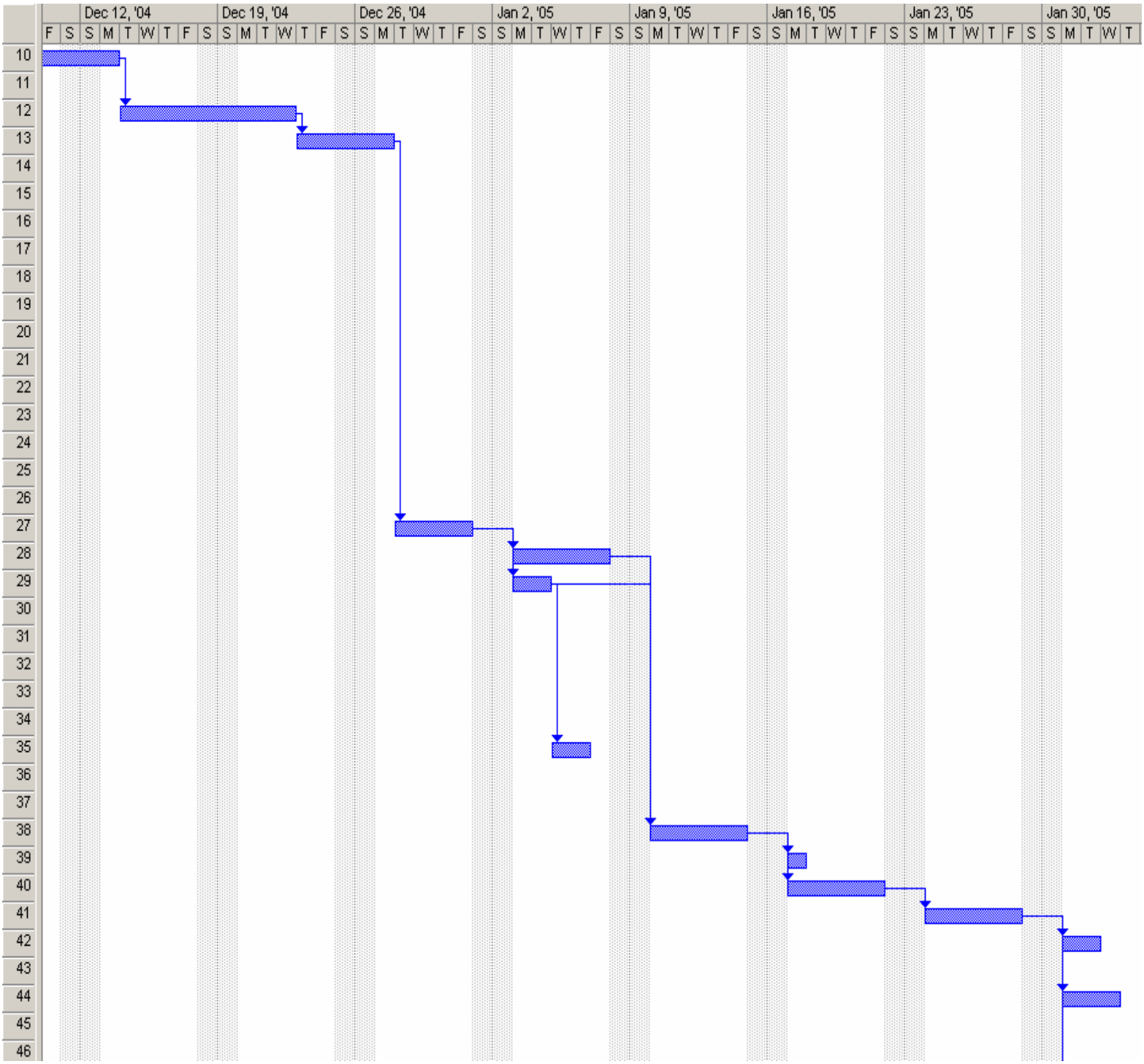
Total: 40.74 FSP

Project Scheduling

These graphs (the Gantt chart and Pert chart) illustrate how the project load is broken up and how the project steps are related and will proceed over the project timeline.

Gannt Chart

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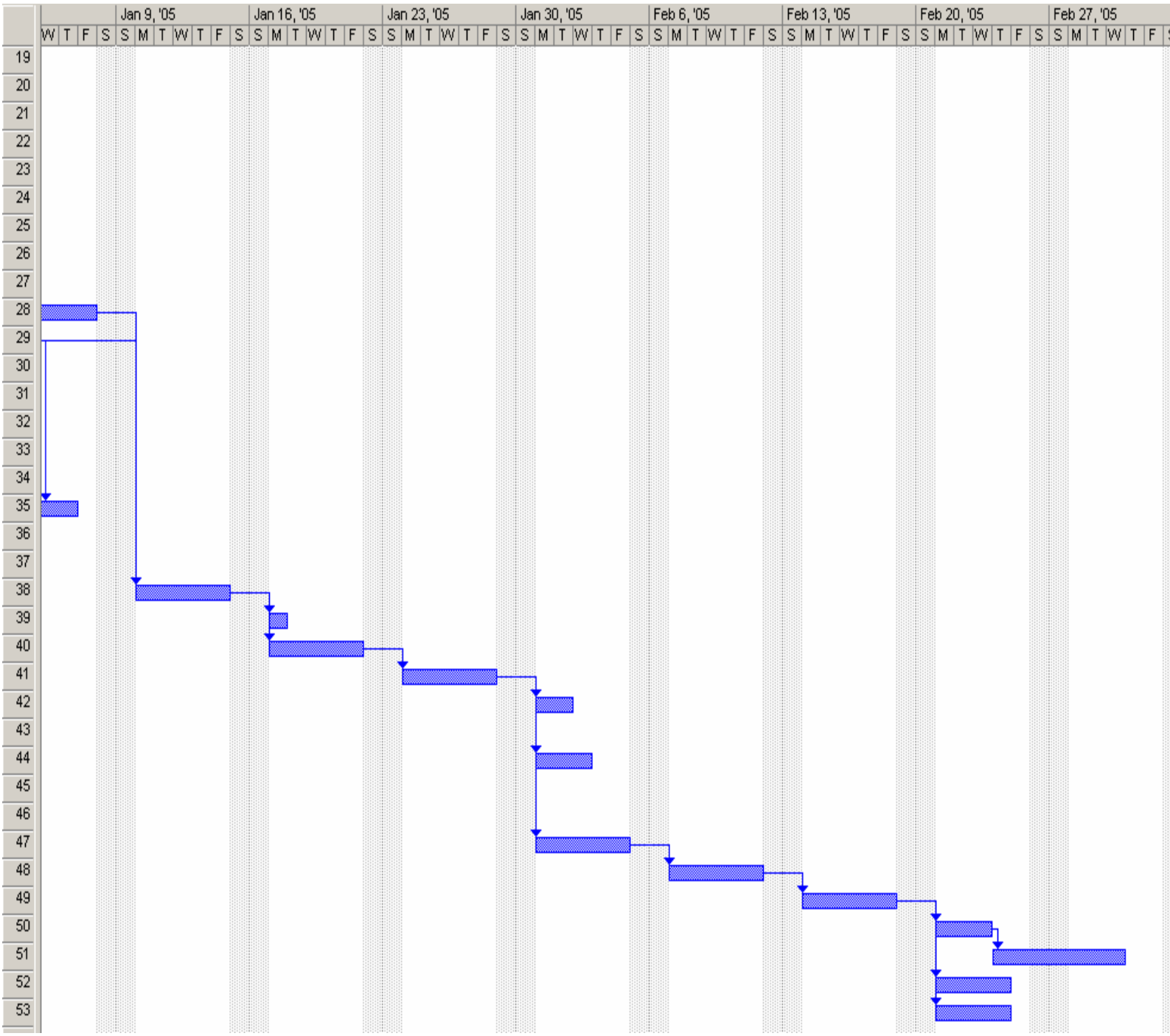
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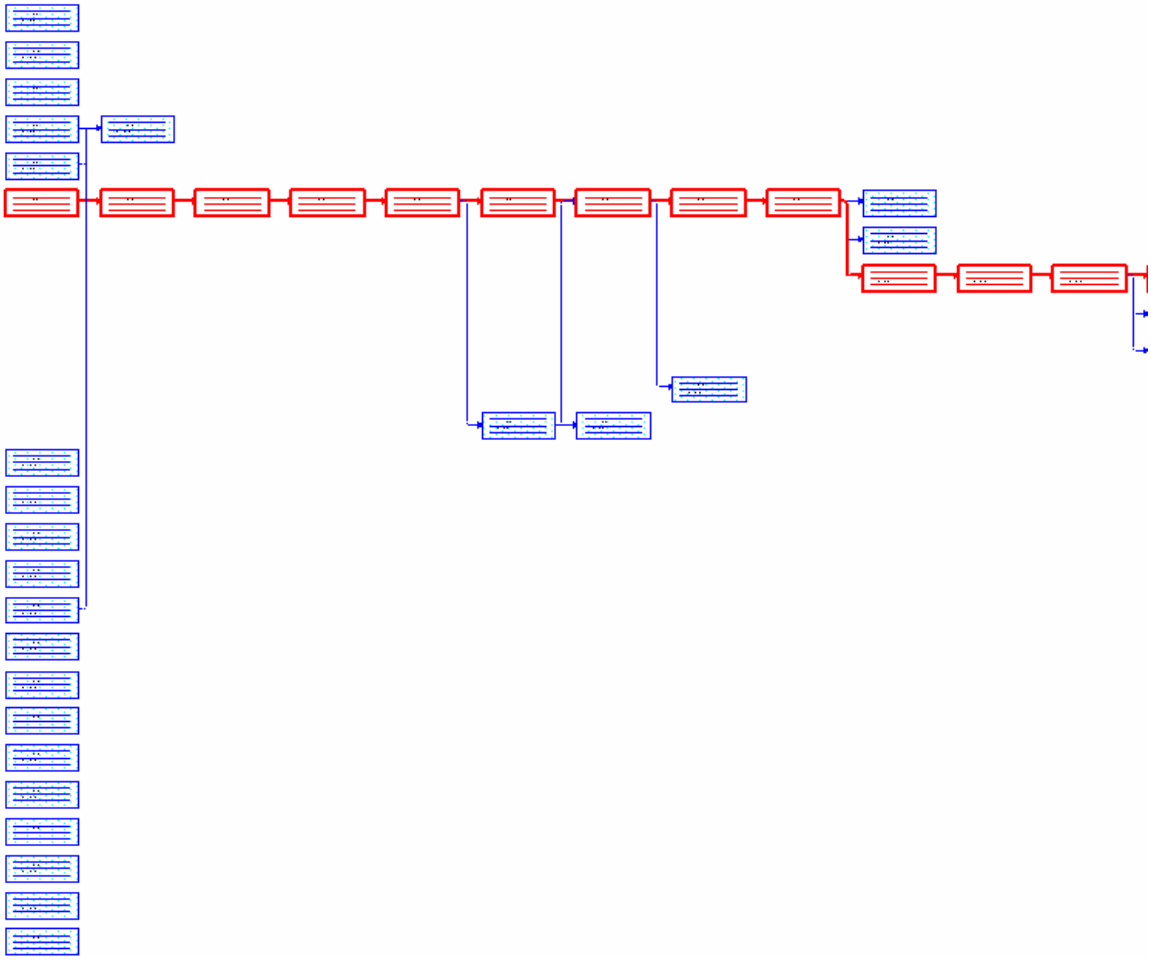
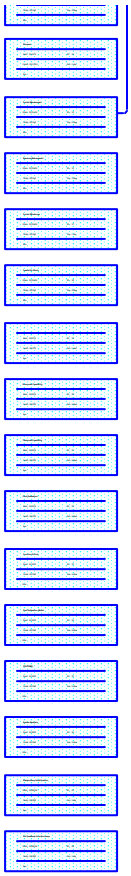
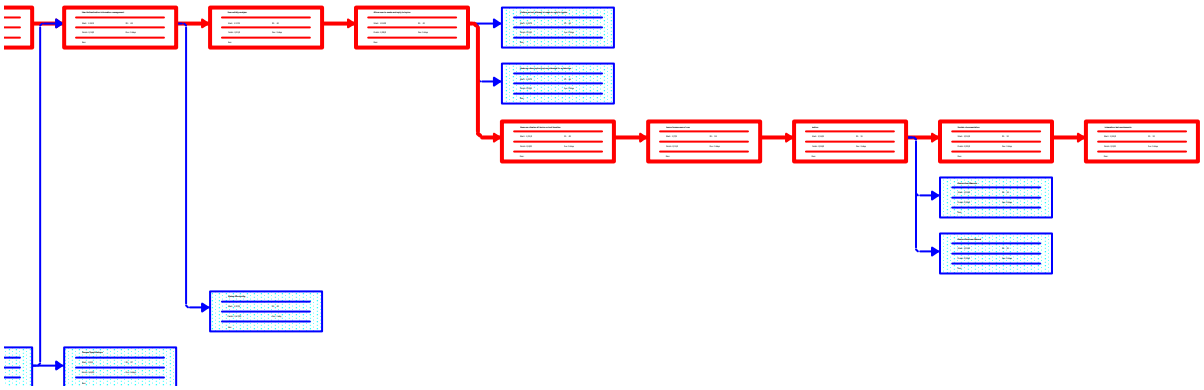
PERT CHART







Requirements Engineering

Stakeholders Identification

There are five stakeholders in the Abacus Biocomputing Systems' User Management Module:

- ***ABS***
- ***Customers***
- ***Associates***
- ***System Designers***
- ***Web Masters***

Abacus Biocomputing Systems (ABS) is a startup company focusing on web-based delivery of healthcare solutions known as "Predictive Patient Compliance Tools." They will be the ones administering and monitoring the system, so it must be developed to their specifications.

Customers will be the primary users of the system and are considered important stakeholders. Therefore, a user-friendly interface must exist in order to make it as easy as possible for even the least computer-literate person to access and use the system.

Associates consist of company business partners and employees who will use the system to serve their clients. The system must cater to them as well to allow them to utilize it with ease and effectiveness.

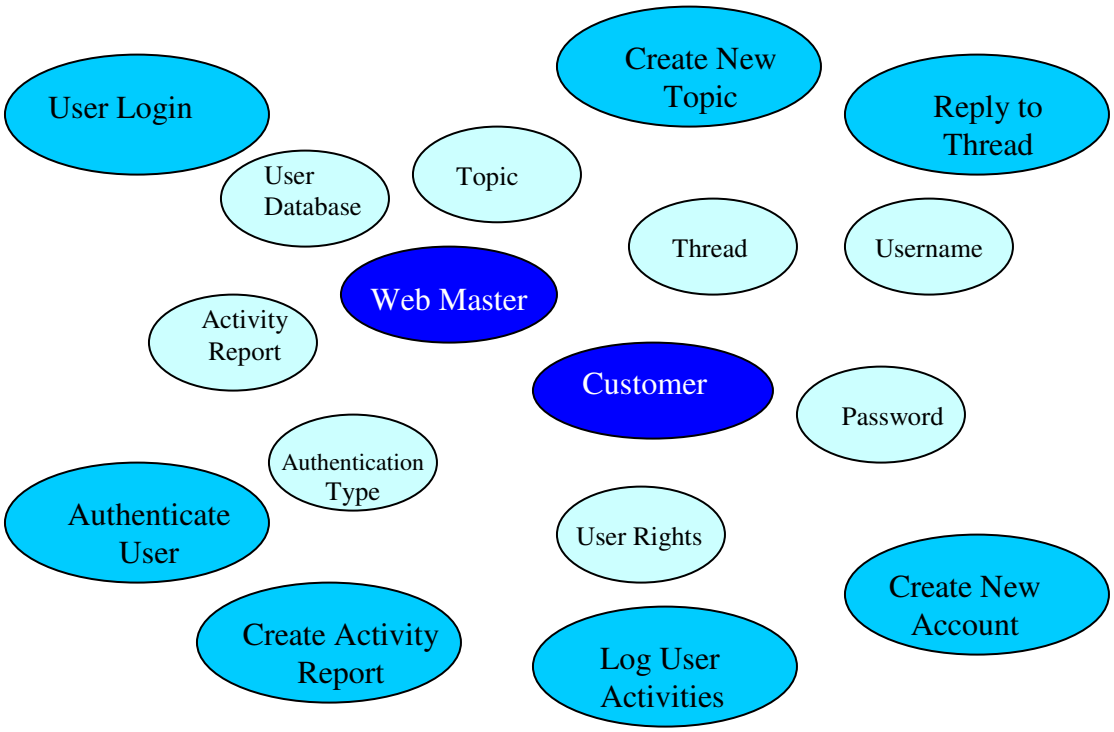
System Designers will be the ones taking the requirements from ABS and designing the system that meets these requirements. The quality of the system will depends on them, since they are the ones who will determine what it will look like and how it will operate.

Web Masters will be the site administrators who have access to all secured and non-secured sites and content with read-only access. They will be the ones maintaining the site and making sure it is always online. Should any problems arise, they will locate and fix them.

Requirements Gathering Techniques

VORD Method

Brainstorming for View Points



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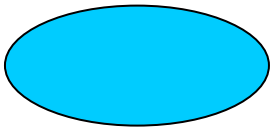
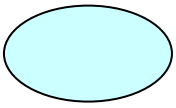
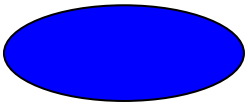


Services

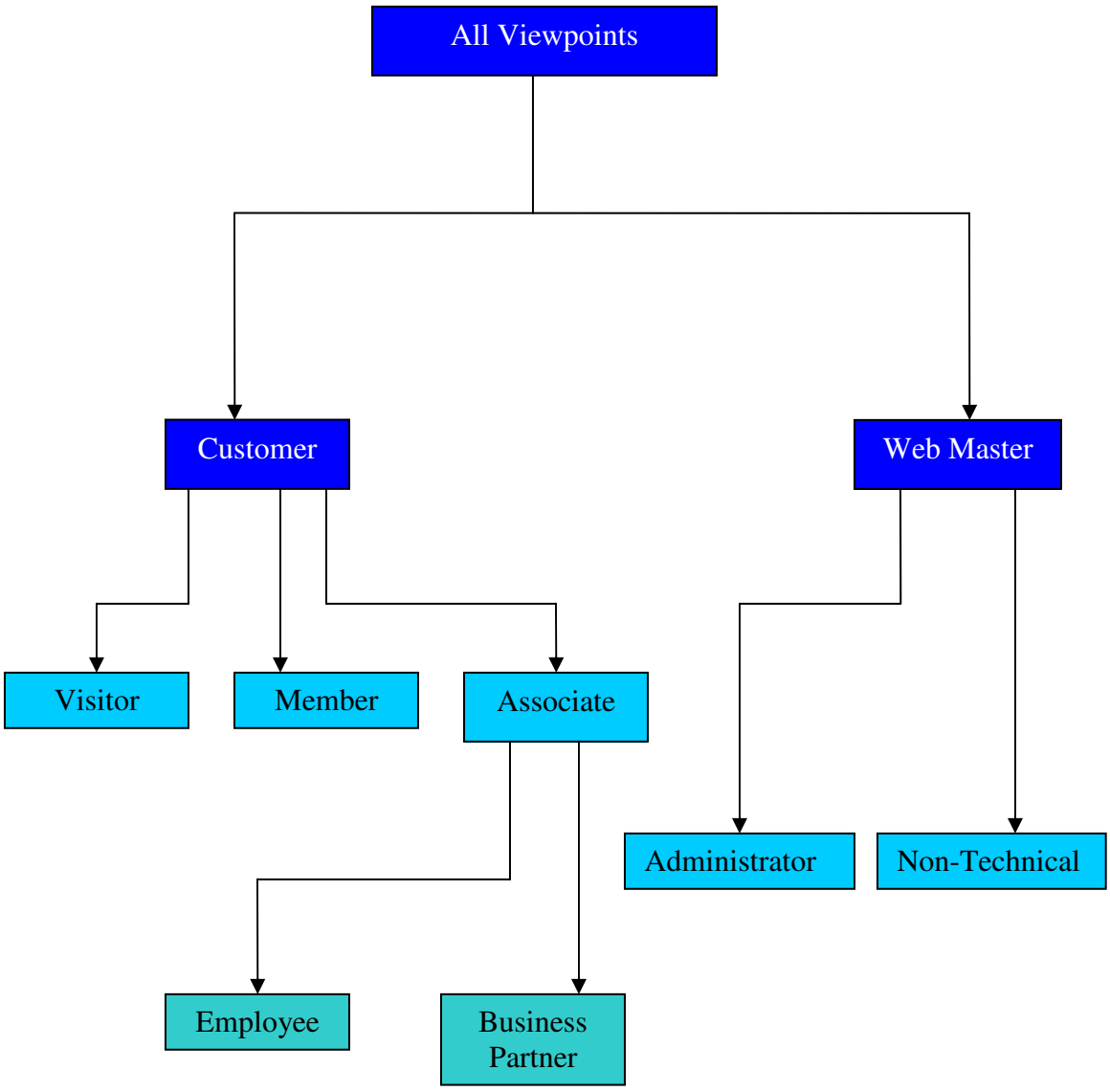


Inputs, requirements, others



Viewpoints

Hierarchy Diagram



View Points and Service Templates

***Customer* Viewpoint:**

Reference:	Customer
Attributes:	Name, Address, Phone Number, Username, Password, Email, Authentication
Events:	Login View Account Information Access Some Secured Sites
Services:	Create New Account Create New Topic Reply to Thread
Sub:VPs:	Visitor, Member

***Customer* Service Templates:**

Reference:	Create New Account
Rationale:	Allow new members to create a user account to enable full use of the site.
Specifications:	User will select the "New User Registration" form and enter the required information. Once submitted, user can log on using his/her username and password.
VPs:	Customer, Associate

Reference:	Create New Topic
Rationale:	Allow user to create a new topic forum in which discussions can take place.
Specifications:	User will select the "New Topic" Button and type in a topic title and the first message in that topic. Once the form is submitted, it will be readable to all users of the site.
VPs:	Customer, Associate

Reference:	Reply to Thread
Rationale:	Allow user to respond to existing threads in a topic.
Specifications:	User will select the “Reply” button and type in their reply to a thread message. Once the form is submitted the reply will be readable to all users of the site.
VPs:	Customer, Associate

***Web Master* Viewpoint:**

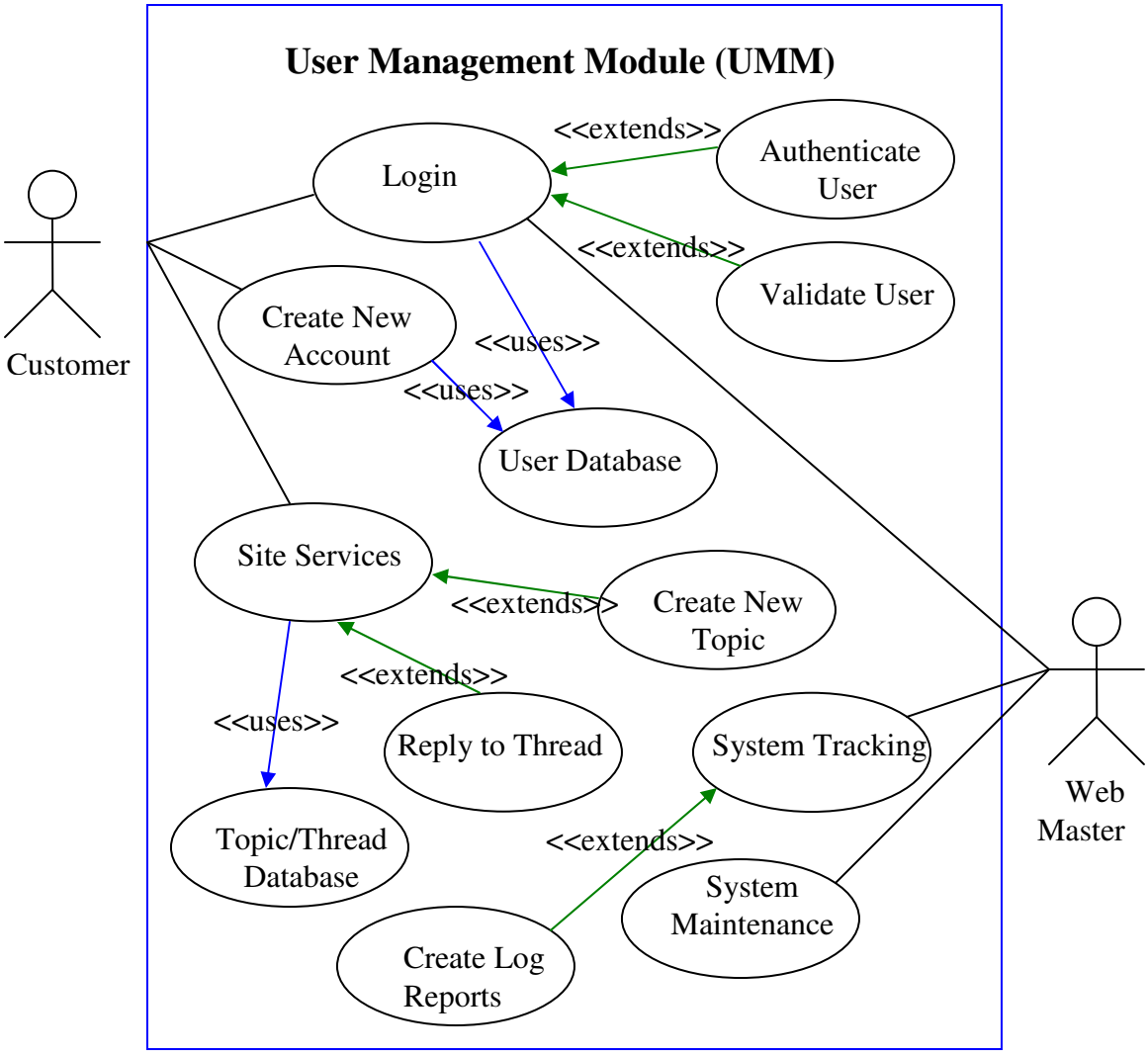
Reference:	Web Master
Attributes:	Name, Address, Username, Password, Email
Events:	Login View Activity Reports Site Maintenance Create, Read, Update, Delete Site Entities
Services:	Log Activities Create Activity Report
Sub:VPs:	Administrator, Non-Technical

***Web Master* Service Templates:**

Reference:	Log Activities
Rationale:	Maintain the system which logs the user activities, account information and status.
Specifications:	Web Master can login and use the built-in logging system to monitor users' activities and other account information.
VPs:	None

Reference:	Create Log Report
Rationale:	Allow Web Master to print out structures reports of user activity, account information, status, and other user statistics for security or business purposes.
Specifications:	Web Master can login and use the built-in logging system to print reports that will contain account statistics for single users or statistics for users as a whole.
VPs:	None

Use-Case Scenario Diagram



Analyzing Requirements Distributed by ABS

Abacus Biocomputing Systems has distributed to our team a document Outlining the Web Application Requirements. The document gives an Abstract of the User Management Module (UMM) and then describes the requirements. There are four types of users:

- Visitors
- Members
- Associates
- Web Masters

The UMM Components consist of:

1. User Management Layer

1.1 Characteristics of system and user interface.

1.2 Characteristics of database interface.

2. User Account Management

2.1 Member, visitor, and administrator account management.

2.2 Database design to store information about users.

2.3 Built-in auditing and reporting tools.

2.4 User authentication management.

3. User and site communication manager

3.1 User discussion forums.

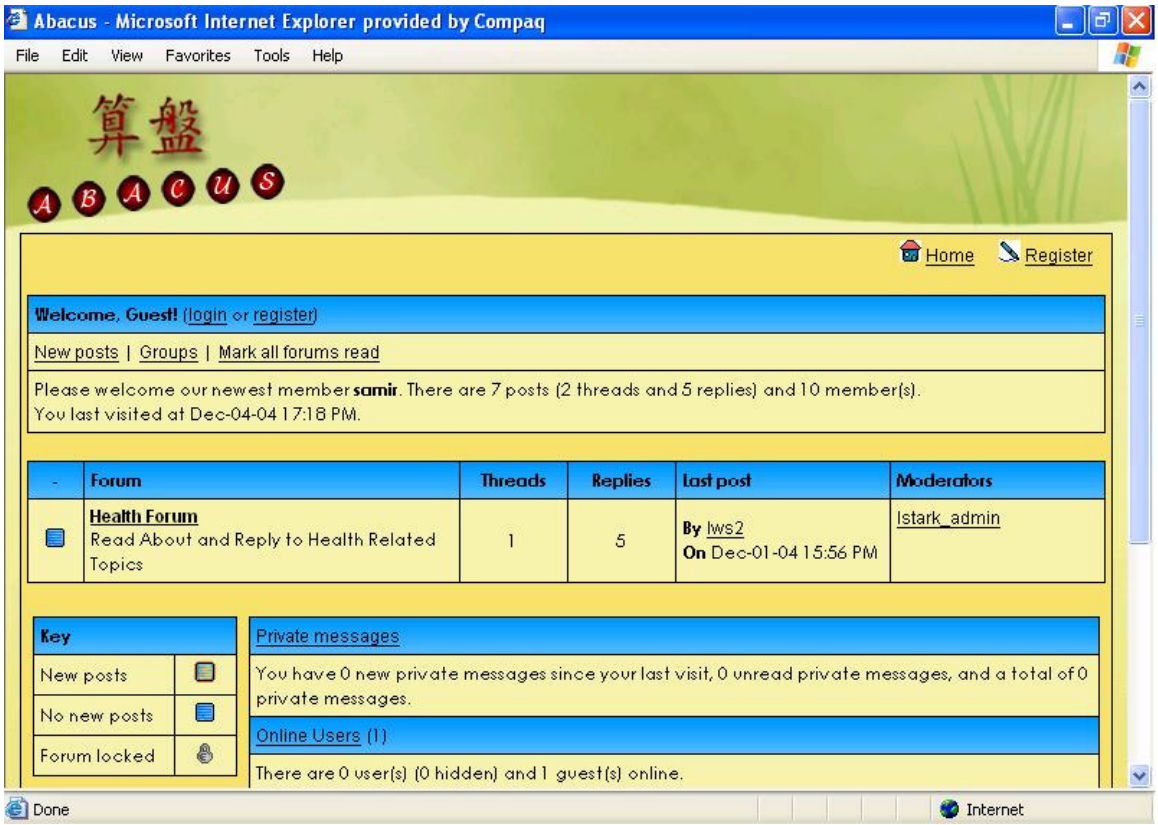
3.2 Operations for users.

3.3 Characteristics of forum and user interactions.

Prototyping

Purpose: Development of a limited but working system to be tested and changed as necessary.

The prototype the team has been working on has been uploaded to an NJIT server where it can be viewed and used by anybody who has the web address: <http://web.njit.edu/~lws2/abs/files/>. When the user reaches the site, he is presented with the main forum screen:



From here, the user can perform all of the functions specified in the functional requirements section below.

Survey/Questionnaire

Predictive Patient Compliance Tools Evaluation

***(1)* Are you (please circle): Male Female**

***(2)* Please circle an age group:**

a. Under 18

b. 18 – 25

c. 26 – 33

d. 34 – 41

e. 42 – 49

f. 50 – 57

g. 58 – 65

h. Above 65

***(3)* Occupation characteristics:**

a. None

b. Student

c. Factory or Non-Technical (High School Diploma Required)

d. Technical (College Degree)

e. Professional (Master's Degree or greater)

f. Other (Please Specify) _____

***(4)* What type of Internet connection do you use at home?**

a. 56K

b. DSL

c. Cable

d. Other (Please Specify) _____

***(5)* How would you rate your computer skills?**

a. Beginner

b. Intermediate

c. Advanced

(6) **For what purpose do you use your computer? (Circle all that apply)**

a. Business/Work

b. School

c. Video Games

d. Online hobbies (forums, clubs, etc.)

e. Other (Please Specify) _____

(7) **What types of websites do you enjoy visiting:**

a. _____

b. _____

c. _____

d. _____

e. _____

(8) **How often do you visit health-related websites?**

a. Never

b. Sometimes (once or twice a month)

c. Frequently (once or twice a week)

d. Everyday

(9) **Have you ever visited or been a member of a web forum?**

a. Yes

b. No

(10) **What are some important features of such a website? (Circle all that apply)**

a. User interface (clear graphics and ease of use)

b. Navigation (moving between topics and features)

c. Content (feedback from other members)

d. Reliability (keeping the site up and saving user preferences)

e. Additional features (private messaging, newsletters, etc.)

Thank you for your participation in this questionnaire. Your feedback is much appreciated.

Requirements Definition

Functional Requirements

- User validation information will be encrypted and maintained in a database.
- In order to login, the system will compare login information against that stored in the database.
- User rights will be maintained, meaning depending on the user type, the privileges of Create, Read, Update, and Delete will be granted to the user.
- Site visitors may simply browse the site without registering, but their activities on the site will be limited. Should the visitor try to access a member area, he/she will be prompted to login or create a new membership if they haven't already done so.
- Logging system will be used to maintain user's activities on the site and also print out reports on these activities.
- Separate modules for each task will exist, along with external error handling and validation.
- The user interface must be consistent throughout the site. The user will have the option on every page to: login, create a new thread, reply to a thread, reply privately, display favorite threads, and display all threads.

- System will perform queries to the database whenever data is requested, including user characteristics and information pertaining to threads.
- All members can create profiles in which they can choose to make available to other members: email addresses, personal information, personal websites, any other miscellaneous information, or site avatars.

Non-Functional Requirements

Product Requirements

- First and foremost, the system must be user-friendly and the interface easy to read. Anybody should be able to use it with ease.
- The system must also be reliable. It will perform its required task with as little down time as possible. Should the system ever go offline, there will be a backup utility to make sure data is kept intact.
- The system will be secure. Unauthorized access in any way will be prevented to ensure protection of data and the overall system.
- The system must be compatible with the MySQL 4 database environment, PHP, and the server software Apache 3.

Organizational Requirements

- The system development process will conform to all design, coding, integration, security, and teamwork guidelines as specified by Abacus Biocomputing Systems.
- Time schedule must be followed as shown in the Project Management Section.

Requirements Specification

1. When the user reaches the site, the main forum screen will be presented. From here, the user can choose to either login to the system, or simply browse the site as a visitor.

1.1 Should the user decide to login, he will be prompted to enter a login name and password. The database containing this information will be queried, and if a match is found, the user will be granted access. If no match is found, the user will be presented with a form. The user will enter a user-name, email address, password, and have the ability to select optional functions, such as private messaging and newsletters. The database will be queried to determine that the user-name is unique; if it is not, the user must enter a different one. If it is unique, the user will become a registered member and be able to login.

1.2 Should the user decide not to login, he will only be limited to browsing the site.

2. Once the user has logged in, the system will determine the type of user by checking the user-name. There are three types: members, associates, and web masters.

2.1 Members are expected to request certain services as subscribed, and will have access to some secured sites and content with read-only access.

2.2 Associates are expected to use site provided information to serve their clients. They have access to all secured and non-secured sites and content with read-only access.

2.3 Web masters are expected to monitor site activities, participate in content management effort including updating, adding, editing, and deleting content. They have access to all secured and non-secured sites and content with read-only access. They will have read-and-write access within designated sections of the site.

3. Members will be able to browse the site, read threads, create new topics, and reply to existing topics, both publicly and privately.

4. A logging system will be running in the background to log all activities of the user, such as time spent logged in, topics created, topics replied to, and topics read. Built parallel with this system will be a reporting tool that creates clear and concise reports on account activities, account status, and general account information.

5. Unix or PC-based machines will be used for development. The software used will be MySQL4 to handle database operations and querying, and Apache 3 for

server software. Tools available for development are PHP 5, XHTML, and Javascript; and Cascade Style Sheet Configuration Language for site development.

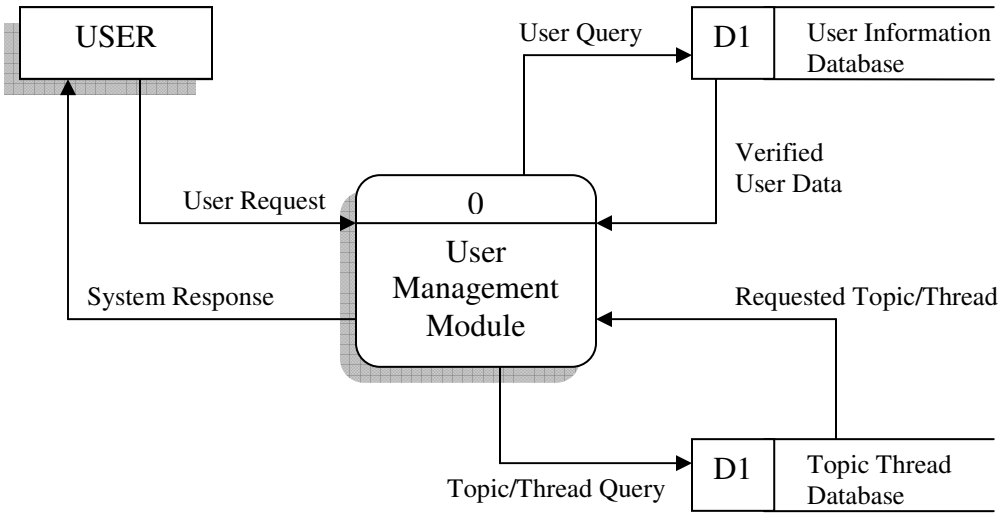
Requirements Mapping

AS-IS System Data Flow Diagrams

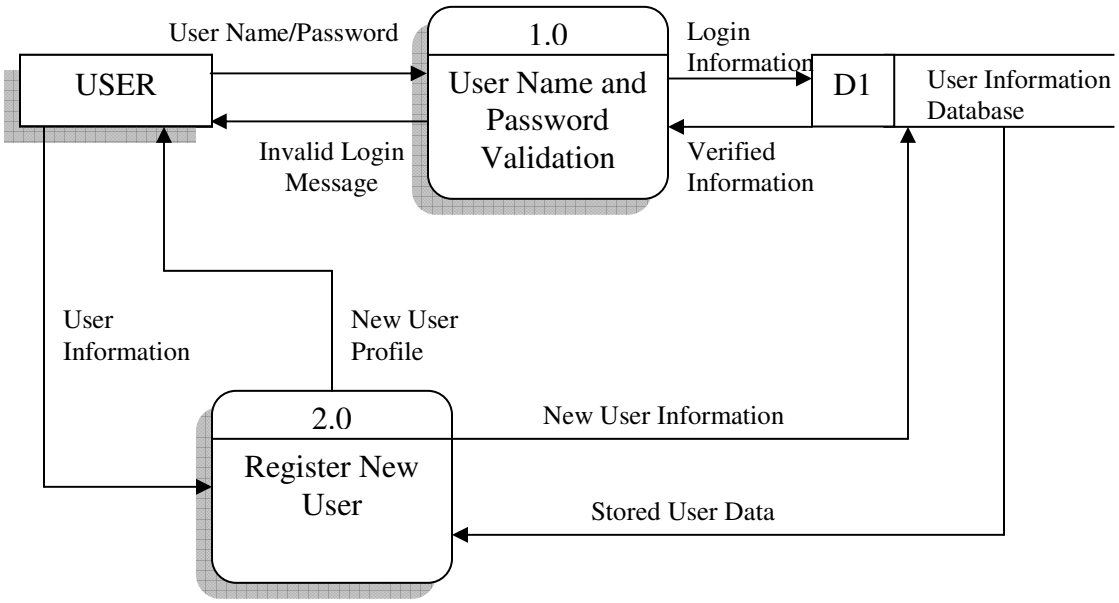
After a meeting and discussion with Professor Eljabiri on October 28, 2004 about the characteristics of an AS-IS system which could meet the requirements of Abacus Biocomputing Systems' specifications, the team has concluded that there is no such currently existing system. Therefore, the design of the TO-BE system data flow diagrams is based on the requirements received directly from Abacus Biocomputing Systems and no other sources.

TO-BE System Data Flow Diagrams

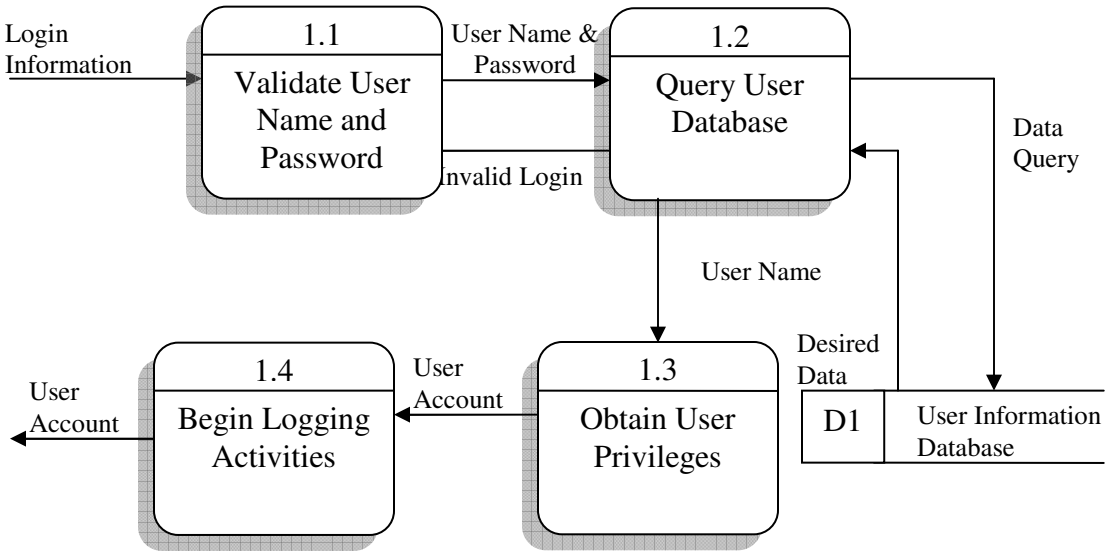
Context Diagram for System



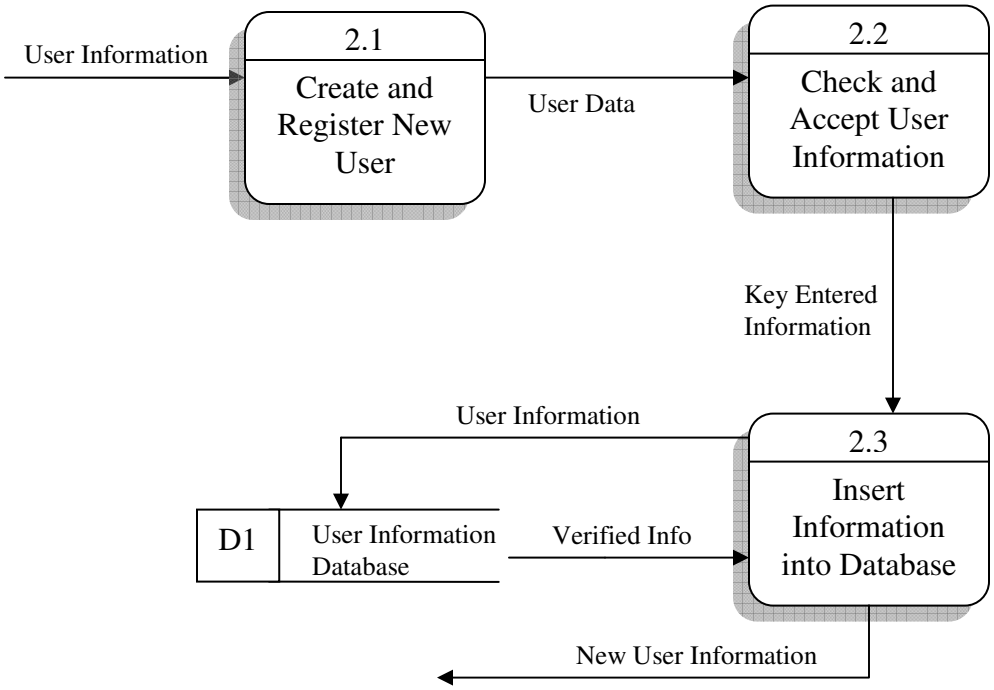
DFD For User Login Procedure



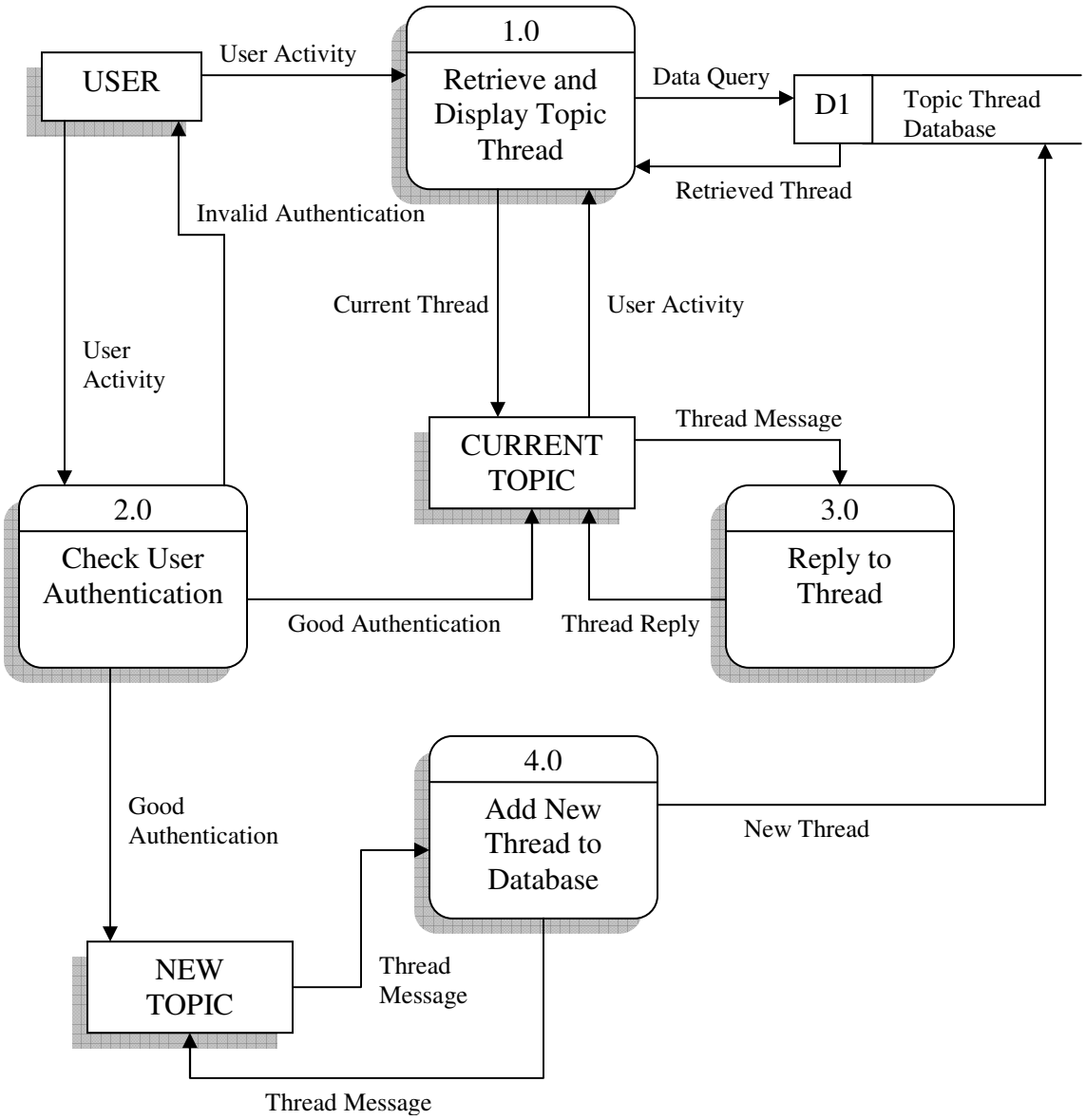
Process 1.0 Decomposition for 3.5.2.1



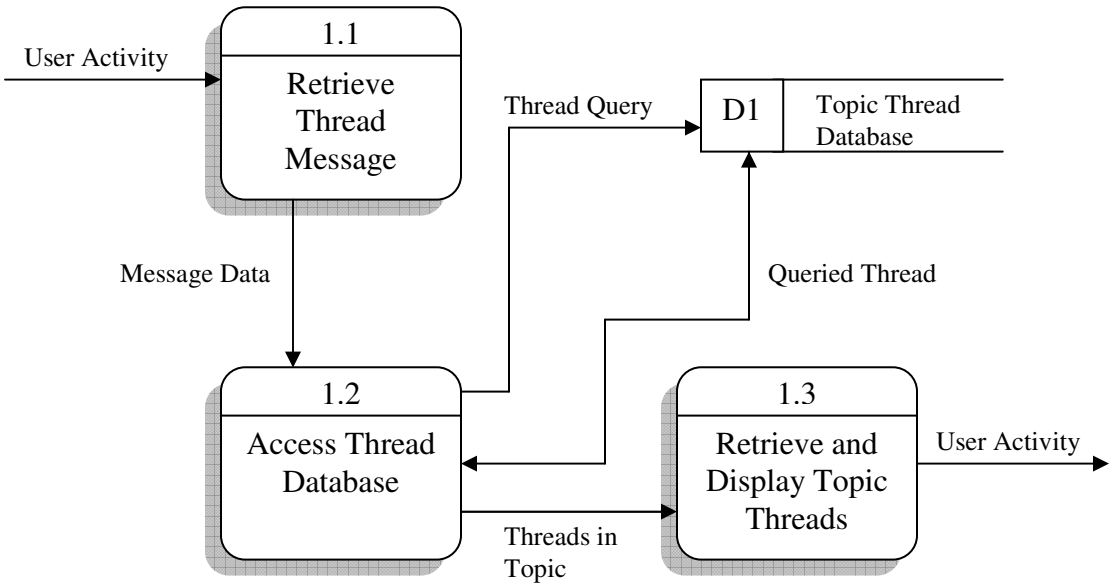
Process 2.0 Decomposition for 3.5.2.2



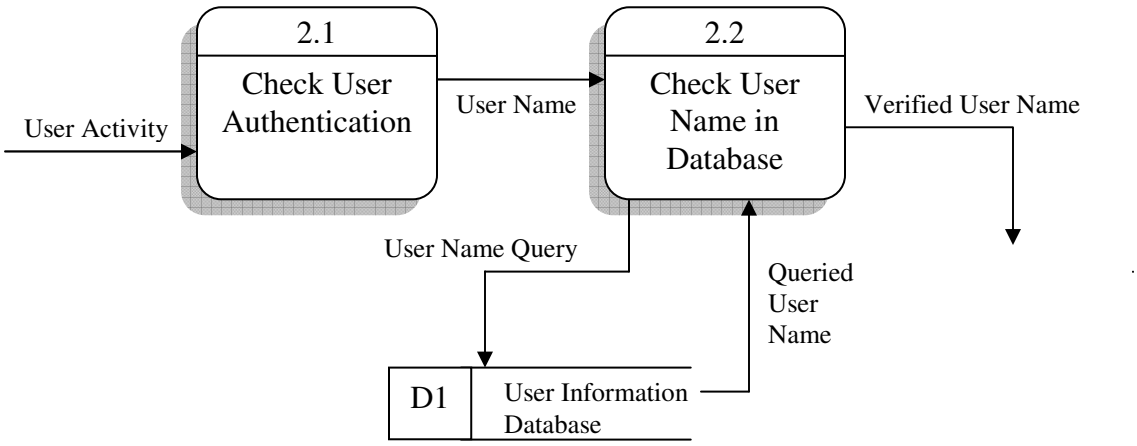
DFD For Forum Navigation Procedures



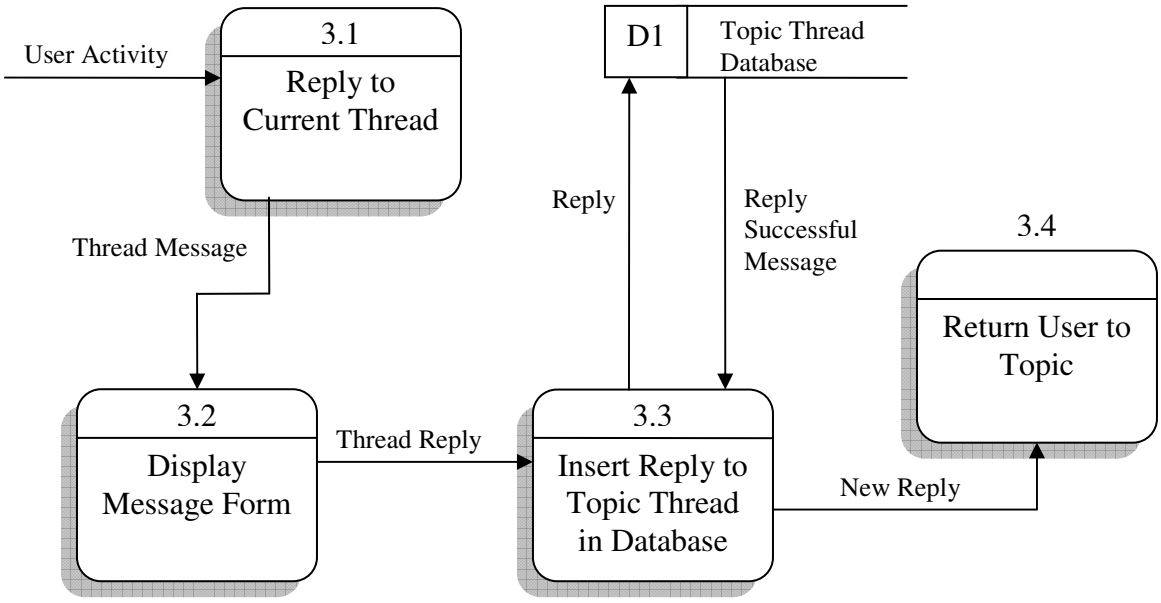
Process 1.0 Decomposition for 3.5.2.3



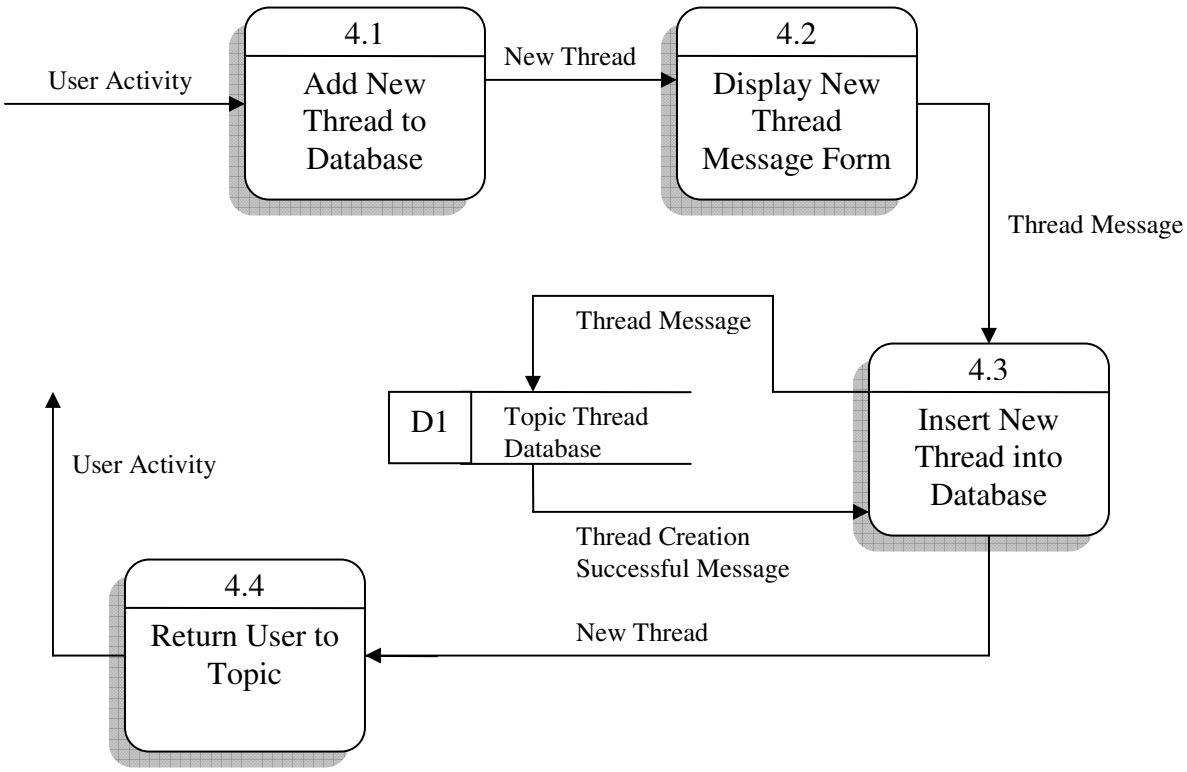
Process 2.0 Decomposition for 3.5.2.3



Process 3.0 Decomposition for 3.5.2.3

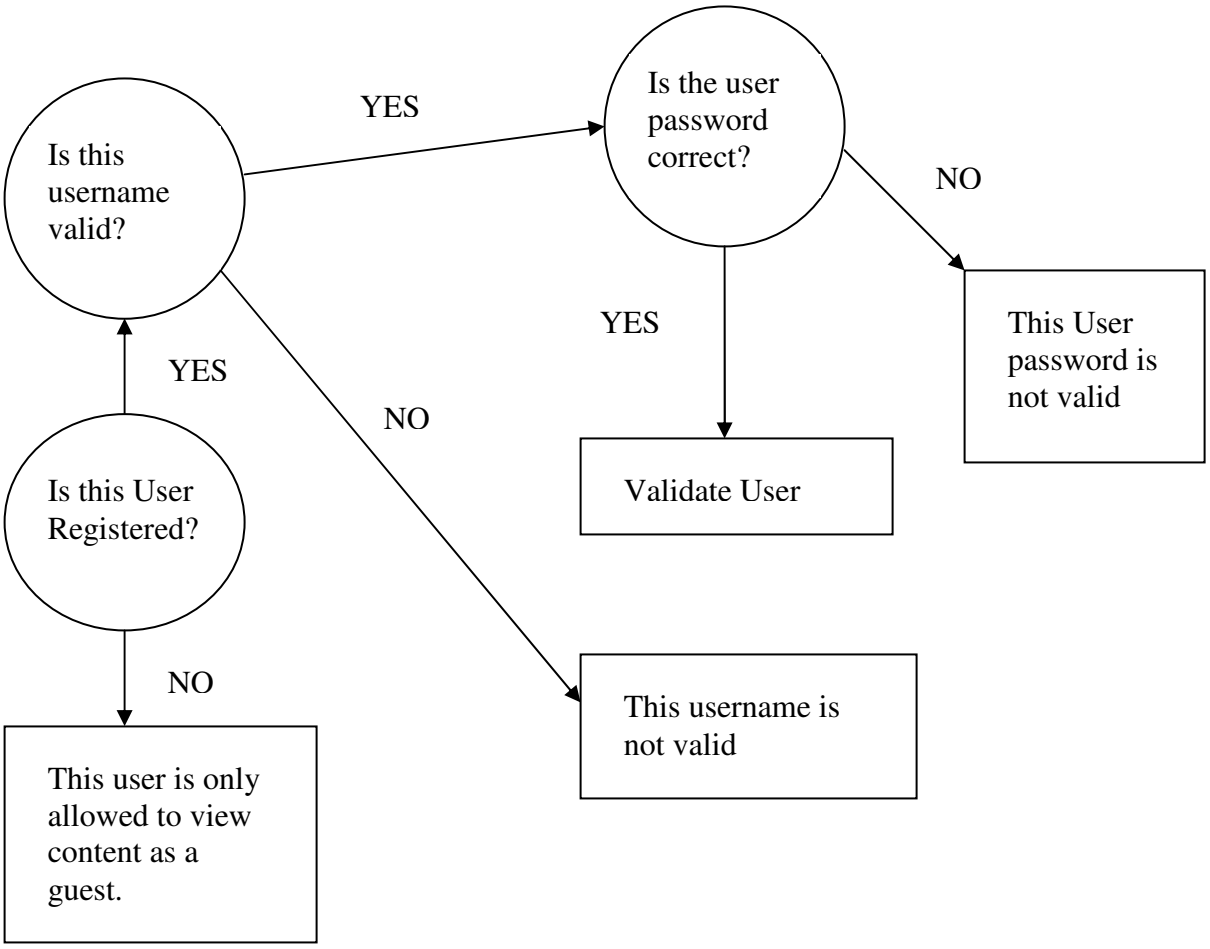


Process 4.0 Decomposition for 3.5.2.3

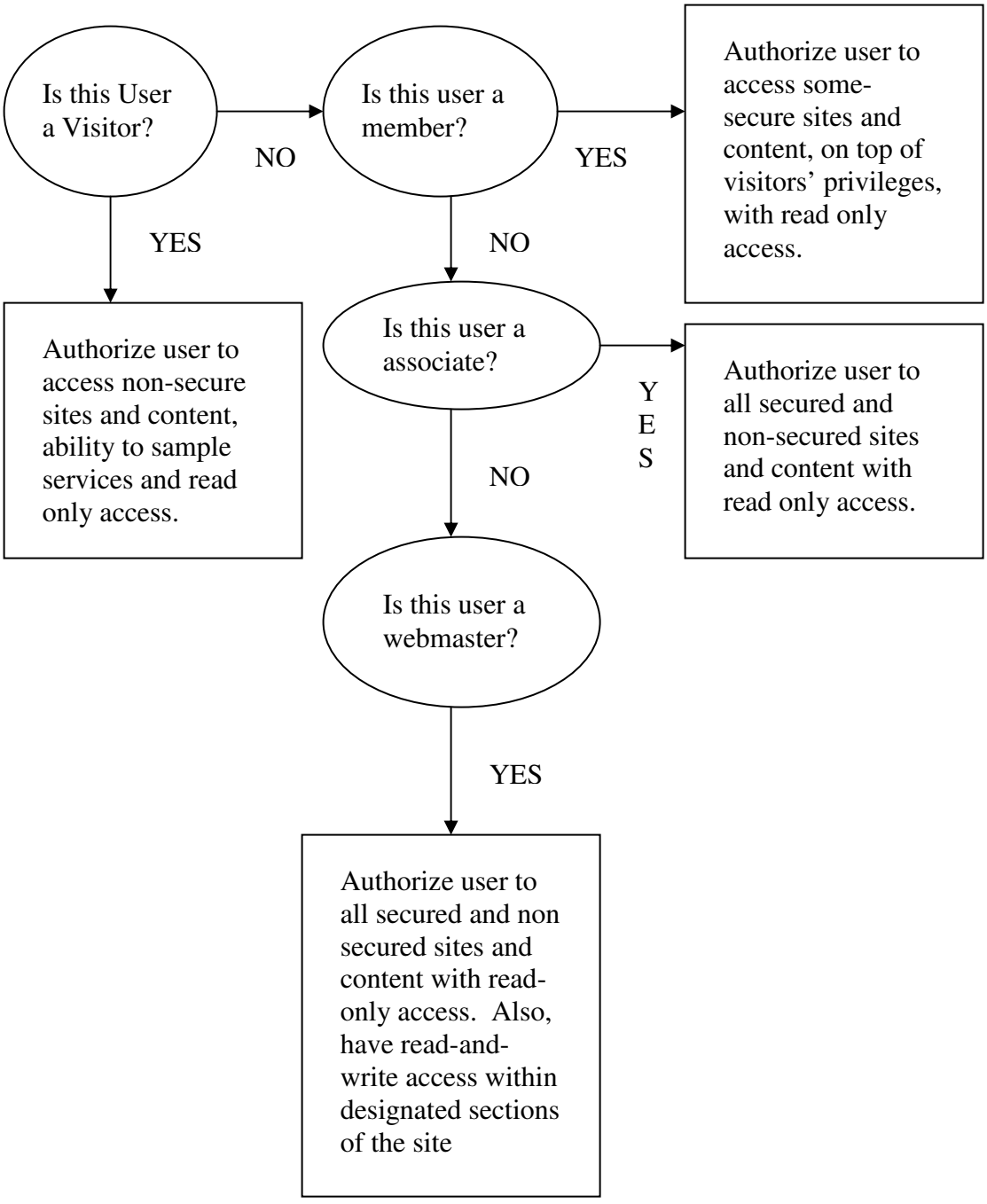


LOGIC MODELING

User Validation Decision Tree



User Authorization Decision Tree



CONDITIONS	RULES							
	1	2	3	4	5	6	7	8
Is this user registered?	Y	Y	Y	Y	N	N	N	N
Is the username valid?	Y	Y	N	N	Y	Y	N	N
Is the user Password valid?	Y	N	Y	N	Y	N	Y	N
ACTIONS								
This user is only allowed to view content as a guest.					X	X	X	X
This User password is not valid		X						
Validate User	X							
This username is not valid.			X	X				

User Validation Decision Tree

User Authorization Decision Tree

CONDITIONS	RULES															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Is this User a Visitor?	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	N
Is this user a member?	Y	Y	Y	Y	N	N	N	N	Y	Y	Y	Y	N	N	N	N
Is this user a associate?	Y	Y	N	N	Y	Y	N	N	Y	Y	N	N	Y	Y	N	N
Is this user a webmaster?	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
ACTIONS																
Authorize user with Visitor rights	X	X	X	X	X	X	X	X								-
Authorize user with associate rights													X	X		-
Authorize user with member rights									X	X	X	X				-
Authorize user with webmaster rights.															X	-

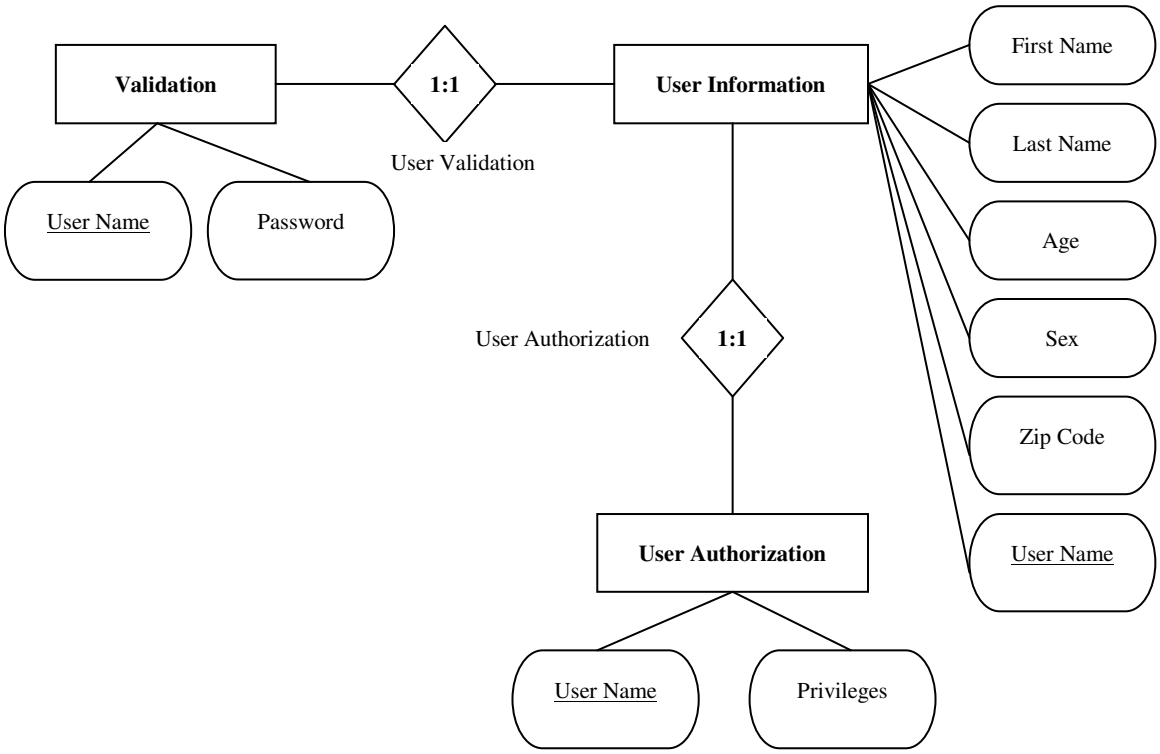
DATA DICTIONARY

Data Dictionary

Name	Description	Data Form
User	Person that is going to interact with system	**User name + Name + Zip Code + Sex + Age + Email**
Name	Individual name that is associated with user	**LName + FName**
FName	First name of User	**[{|A| |B| |C|…|Z| |a| |b| |c|…|z|}]**
LName	Last name of User	**[{|A| |B|, |C|,…|Z| |a| |b| |c|…|z|}]**
User name	Unique identifier that will act as a pseudo name, when the user is interacting with the system	**[{|A|, |B|, |C|,…|Z|, |a| |b| |c|…|z|, |1|,|2|,|3|..|9|}]**
Zip code	Used for Data mining purposes to help with establishing regions of greatest use	**[{1|2|3|4|5|}]**
Sex	Identifier used for further enhancing data mining purposes	**[“Male” | “Female”]**
Age	Identifier used for further enhancing data mining purposes	**[{digit + digit}]**
Password	Used for secure access into the system	**[{|A|, |B|, |C|,…|Z|, |a| |b| |c|…|z|, |1|,|2|,|3|..|9|}]**
Email	Identifier used for further enhancing data mining purposes, by sending marketing and questioner forms	**[{|A| |B| |C|…|Z| |a| |b| |c|…|z|}] + @ + domain name**
Privileges	Used to enable authorization of user to particular sections of the system	**[“Visitor”| “Associate” | “Member” | “Web Master”]**

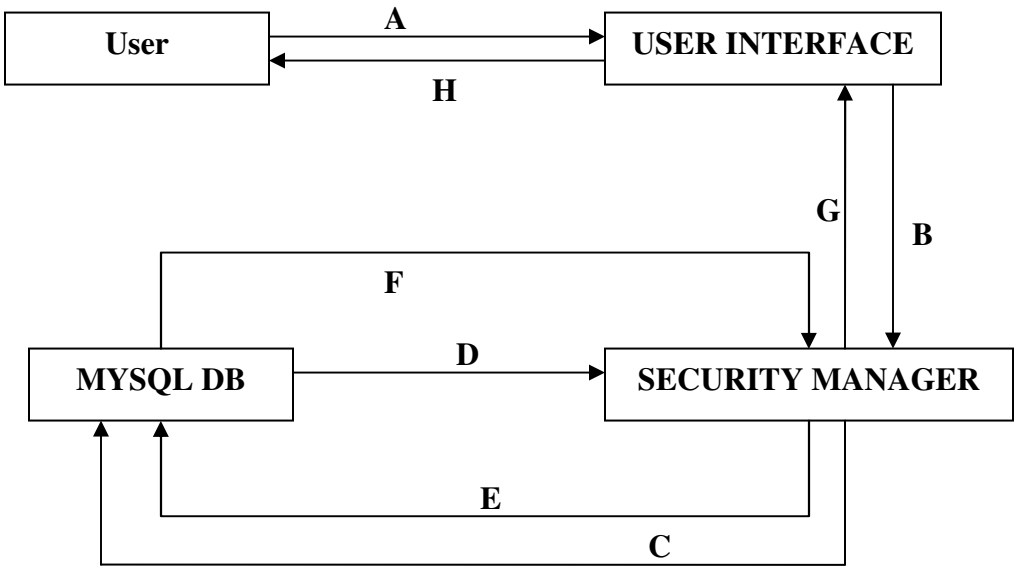
BACKEND STRATEGIES

ER Diagram



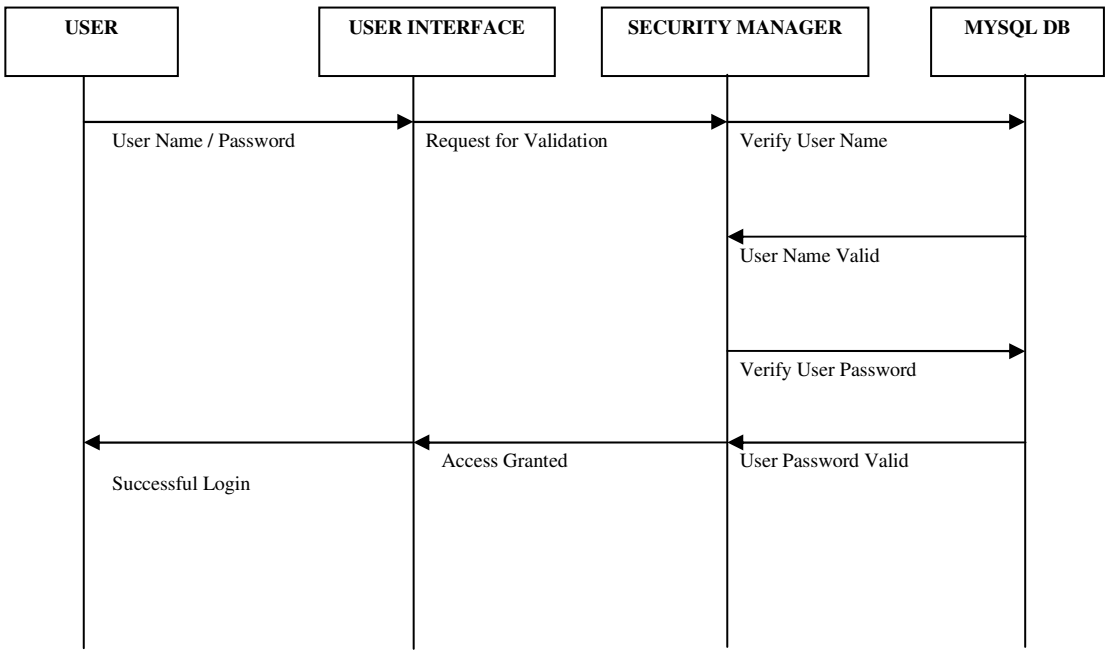
OBJECT ORIENTED STRATEGIES

Event Trace Diagram



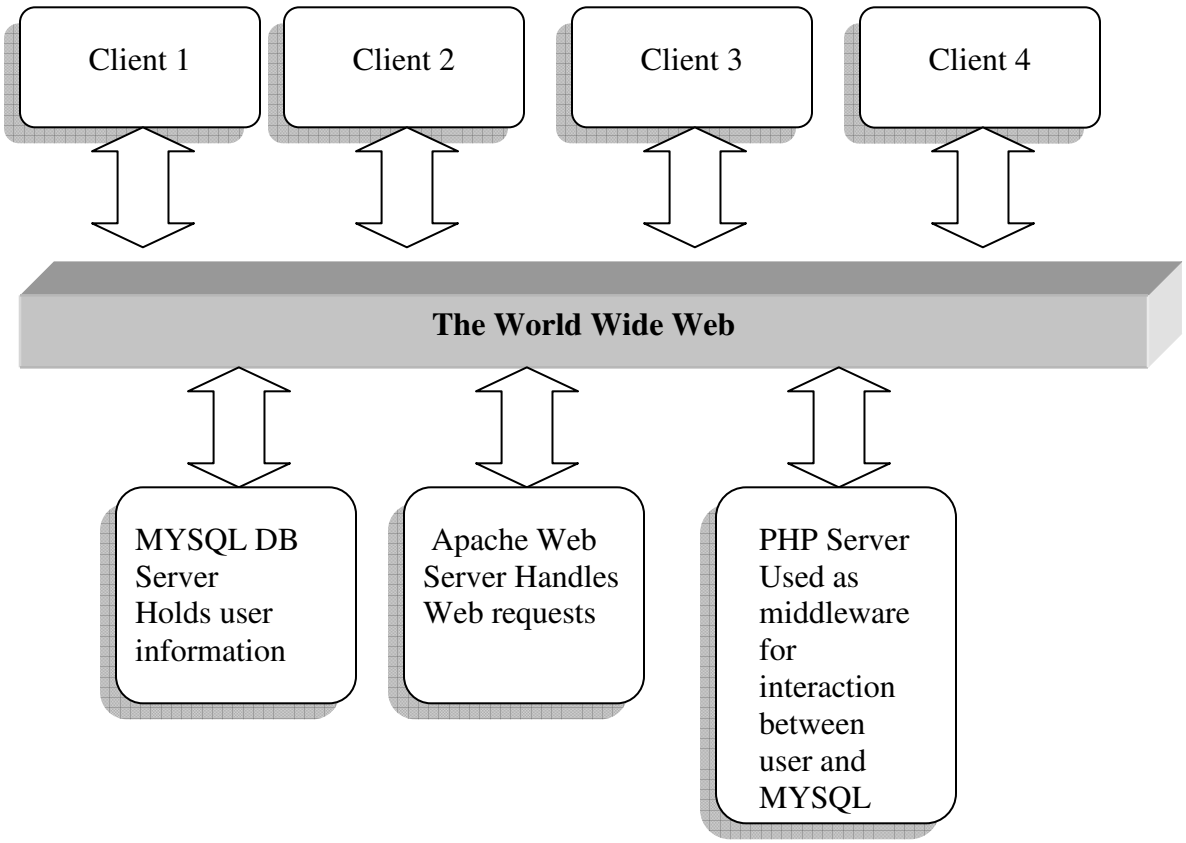
A. User Name / Password
B. Request for Validation
C. Verify User Name
D. User Name Valid
E. Verify User Password
F. User Password Valid
G. Access Granted
H. Login Successful

Sequence Diagram for Successful login

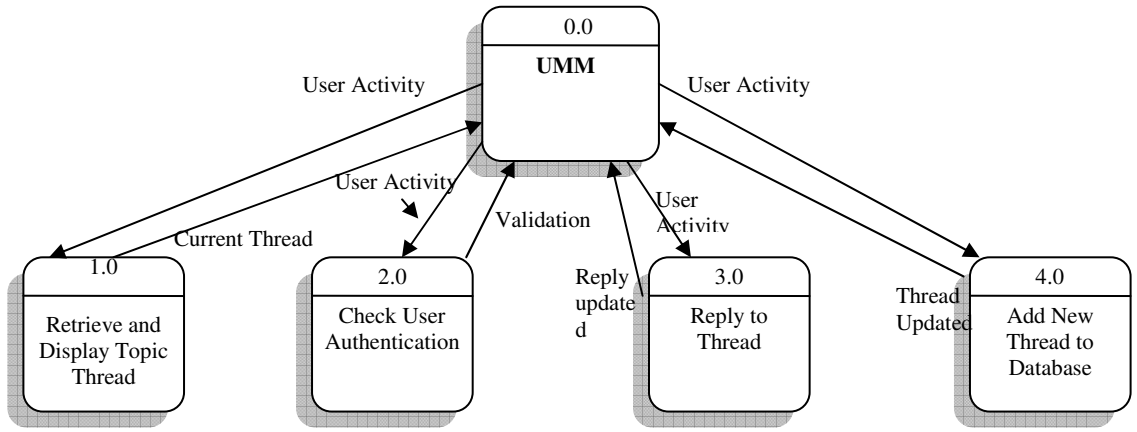


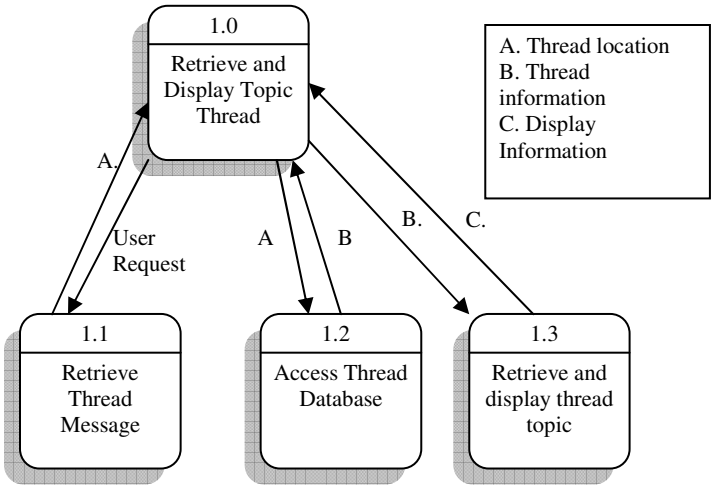
ARCHITECTUAL DESIGN STRATEGY

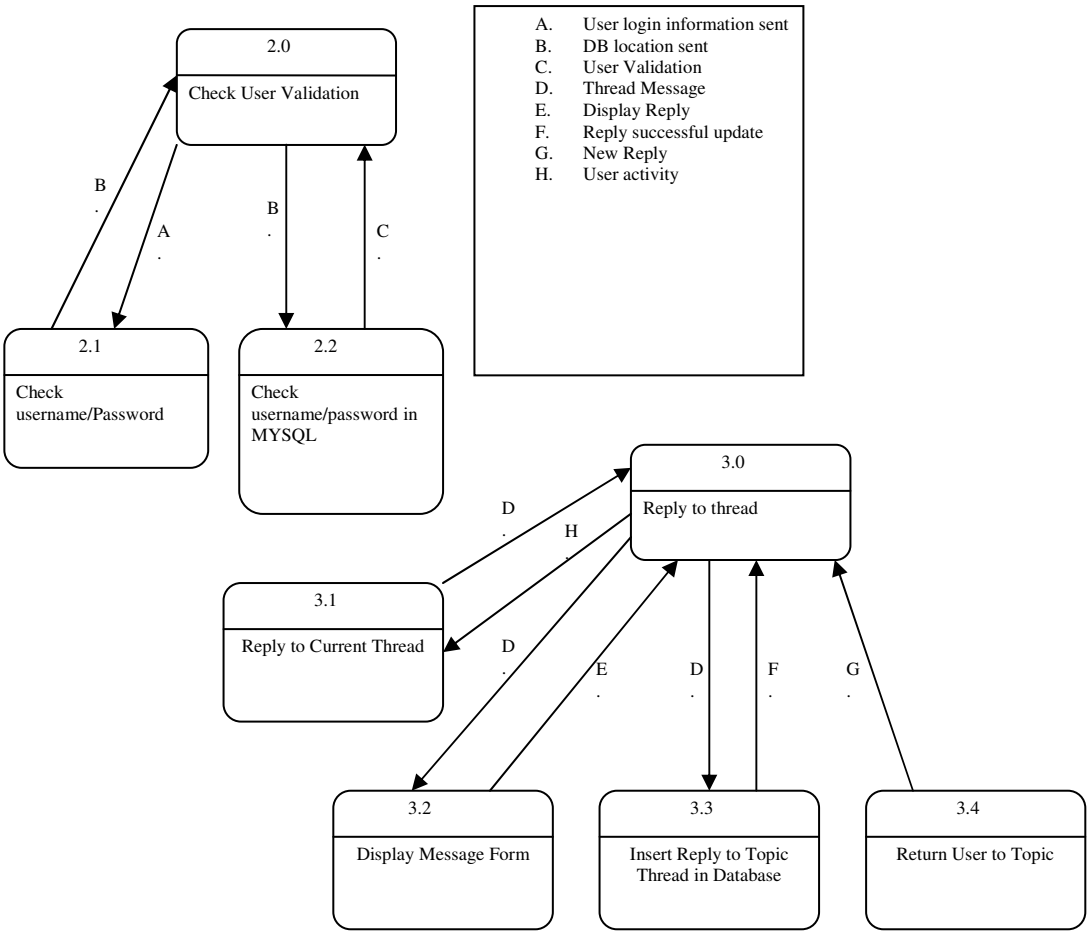
Client Server Model

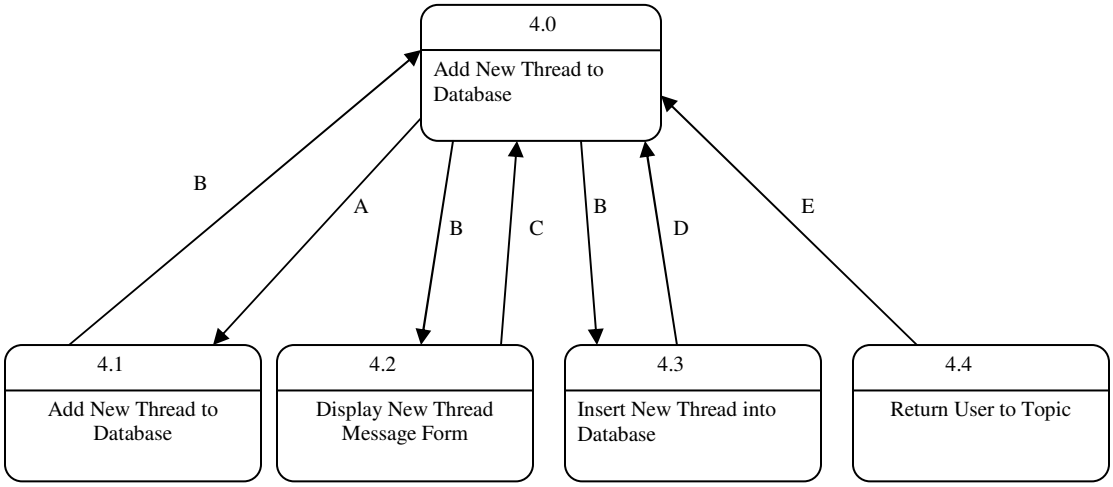


Structured Chart





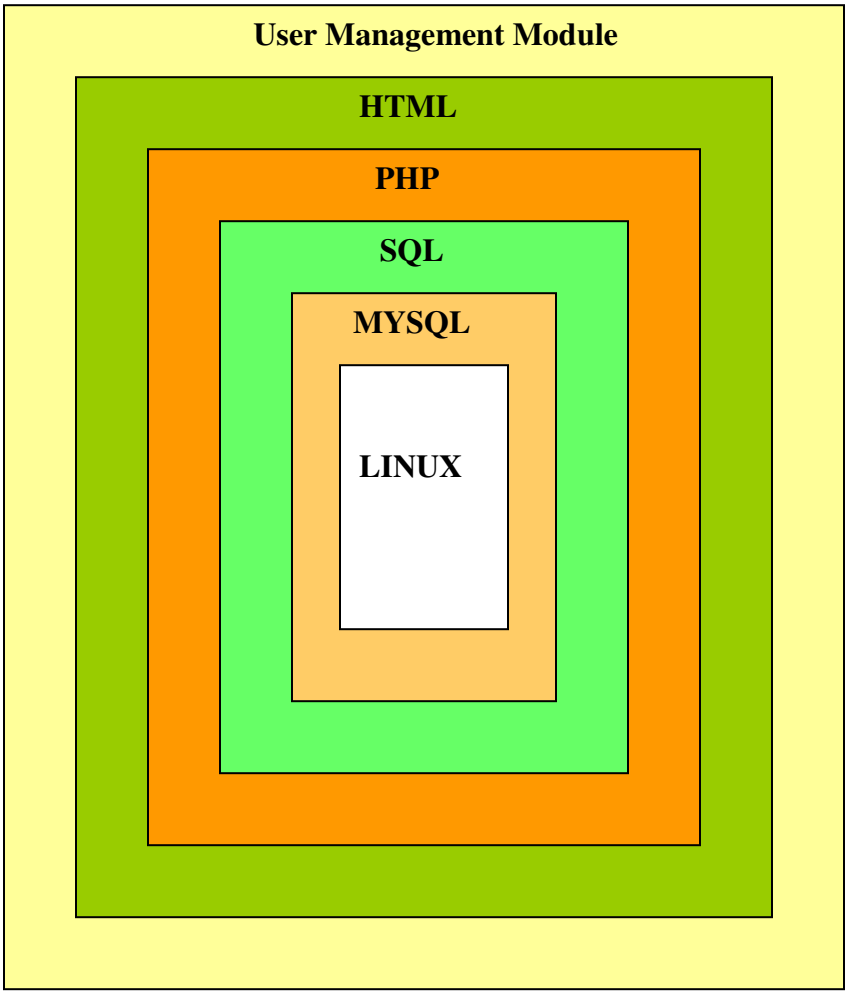

A. User login information sent
B. DB location sent
C. User Validation
D. Thread Message
E. Display Reply
F. Reply successful update
G. New Reply
H. User activity
2.0
Check User Validation
B
.
A
.
B
.
C
.
2.1
Check username/Password
2.2
Check username/password in MYSQL
3.0
Reply to thread
D
.
H
.
3.1
Reply to Current Thread
D
.
E
.
D
.
F
.
G
.
3.2
Display Message Form
3.3
Insert Reply to Topic Thread in Database
3.4
Return User to Topic



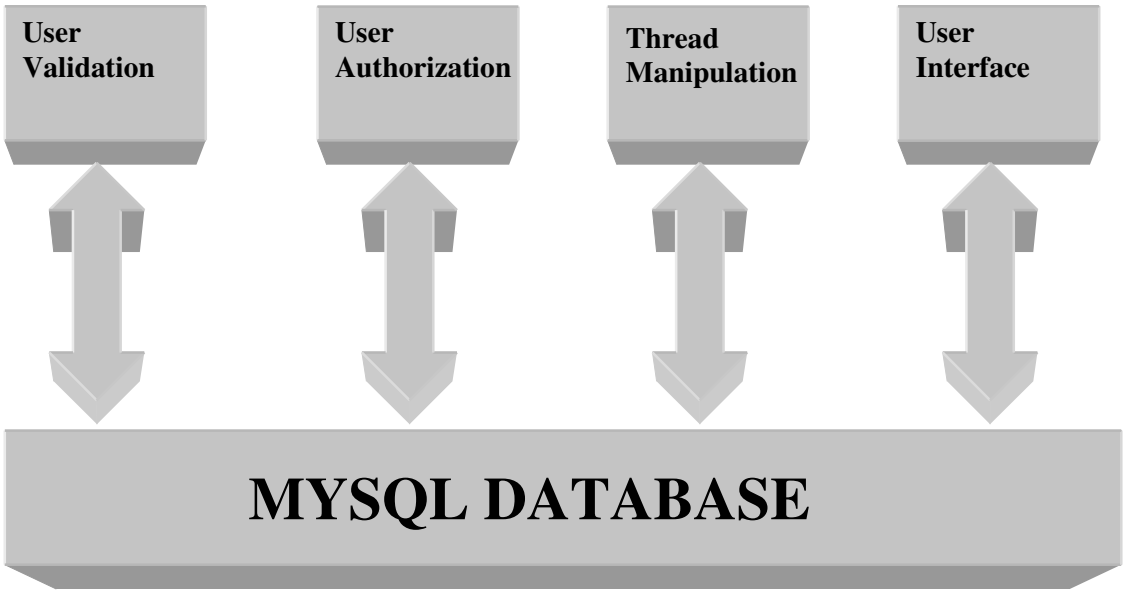
A. User Activity
B. New Thread
C. Display thread
D. Created thread successful message
E. New Thread

Abstract Machine Model

Abstract Machine Model



Repository Model



Appendix 1 :

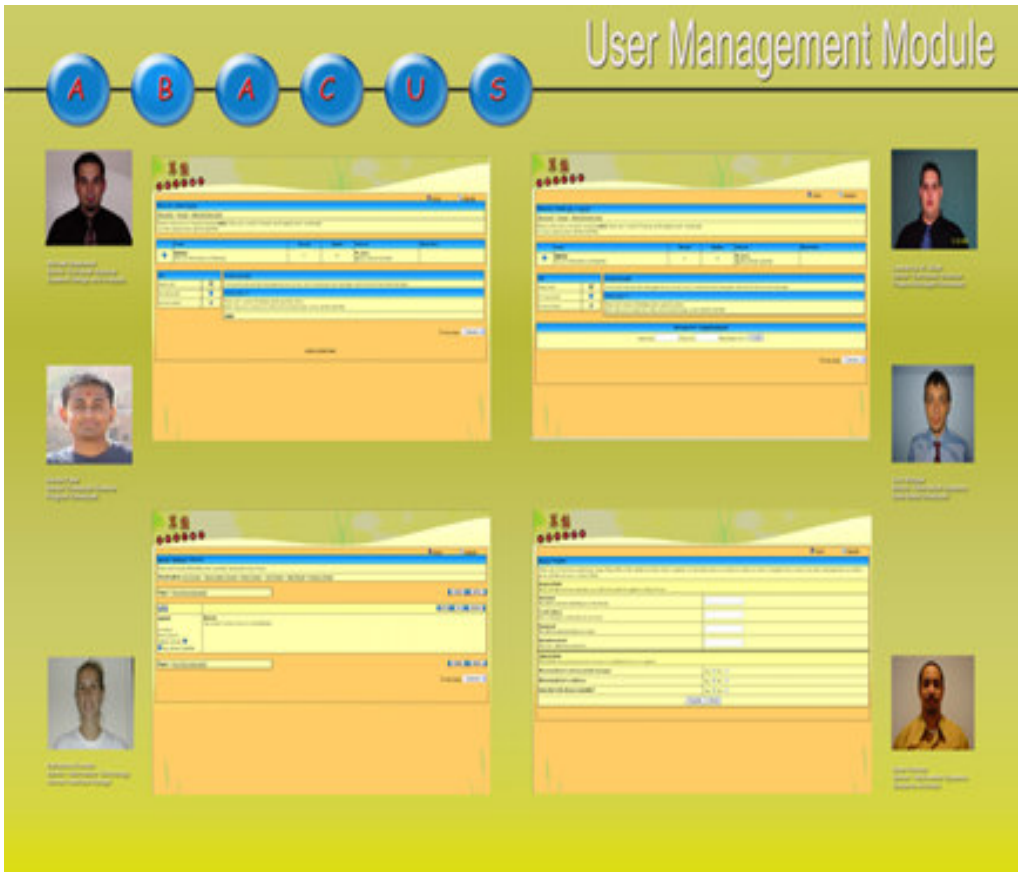
GLOSSARY

- ADMINISTRATOR – person that can make changes, and run help system
- CRUD Functions – CREATE REQUEST, UPDATE, and DELETE data objects.
- DATA DICTIONARY – Database of descriptions/definitions of data objects in a data model that benefit the programmers and others that refer to them during analysis.
- DATA FLOW DIAGRAM (DFD) – map the flow of data within the overall software system.
- ENCRYPTION – processing and changing data so that only the intended recipient can read it.
- ENTITY RELATIONSHIP DIAGRAM (ERD) – show the relationships between the tables of the database.
- GANNT CHART – a graph that represents each task in a project as a horizontal bar. The bar's length is proportional to its time for completion.
- GRAPHICAL USER INTERFACE (GUI) - the final, visible product that user interacts with and can enter data into.
- GUESTBOOK – code on a webpage that allows for site visitors to leave comments or questions.
- METHODOLOGIES – evaluation of the different life cycles that may possibly be used in a project.
- PERT (Program Evaluation Review Technique) CHART – depicts project tasks and their interrelationships.

- PHP – commands that are embedded in the web page's HTML, which allow the web server to execute dynamic HTML pages.
- PROTOTYPE – non-functional version of the software that allows end users to test and give feedback to.
- RAPID APPLICATION DEVELOPMENT (RAD) – a methodology that speeds up the developmental process by having many processes happening in parallel.
- SECURITY – allows system to manage, protect, and distribute sensitive information.
- STAKEHOLDERS – a person who has interest in a new or existing information system.
- USER INTERFACE (UI) – computer interface that allows user to either input data or receive information from the computer.
- WORK BREAKDOWN STRUCTURE (WBS) - breakdown of all the work in the project, with dates, tasks names, and the name of the person responsible for completing it.

Appendix 2:

Poster



Appendix 3:

Flyer

Sponsor Information

Abacus Biocomputing Systems (ABS) is a startup company focusing on web-based delivery of healthcare solutions revolving around proprietary computational algorithms. ABS is developing "Predictive Patient Compliance Tools" for enhancing the accuracy and efficiency of existing questionnaire-based tools that require time and resource-intensive patient reviews. This will be a first test of the clinical utility of the company's computational methods. The goal of the predictive patient compliance tools is to imprve the efficetiveness of assistance devices and equipment used to treat ambulatory patients. This application address a significant problem in healthcare delivery.

Project Highlights:

Login System with backend database support for advanced verification.
Encryption for security interface web pages
Web pages coded using PHP CSS HTML for conformity to ANSI standards
New-User verification system
Logging system to follow site activities
Public and Private Messaging
Subscription-based newsletter

Team Member:

Larry Stark – Project Manager / Programmer
Michael Majdanski – Documentation
Katherine Duncan – Systems Analyst / GUI Analyst
Hardik Patel – Programmer
Sean Harney – Architectural Designer
Tom Motyka – Database Designer

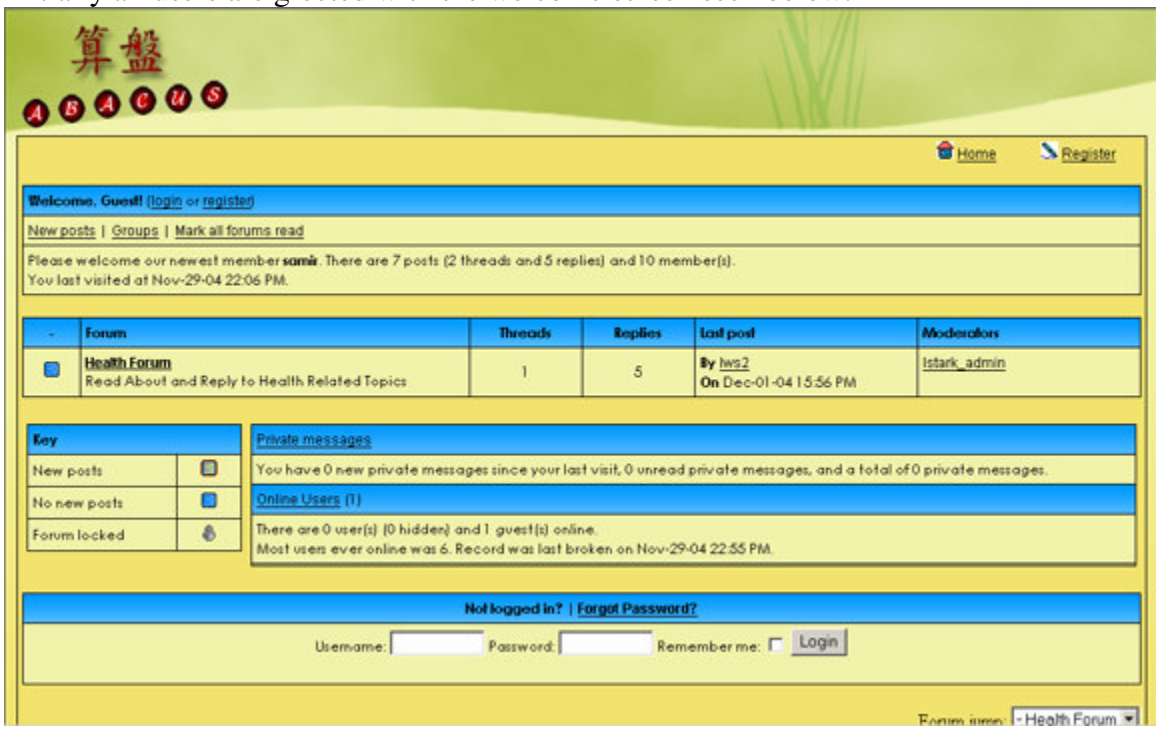
Appendix 4: Instruction Manual

Phase One: Accessing the forum

The URL for the forum should point to http://%document root%/files where %document root% is the root directory for the website.

Currently, the forum resides at: http://web.njit.edu/~lws2/abs/files where http://web.njit.edu/~lws2/abs/ is the document root for the Abacus Biocomputing Systems project on the NJIT AFS system.

Initially all users are greeted with the welcome screen seen below.



From this screen, users are presented with a number of choices which correspond to access levels in the site.

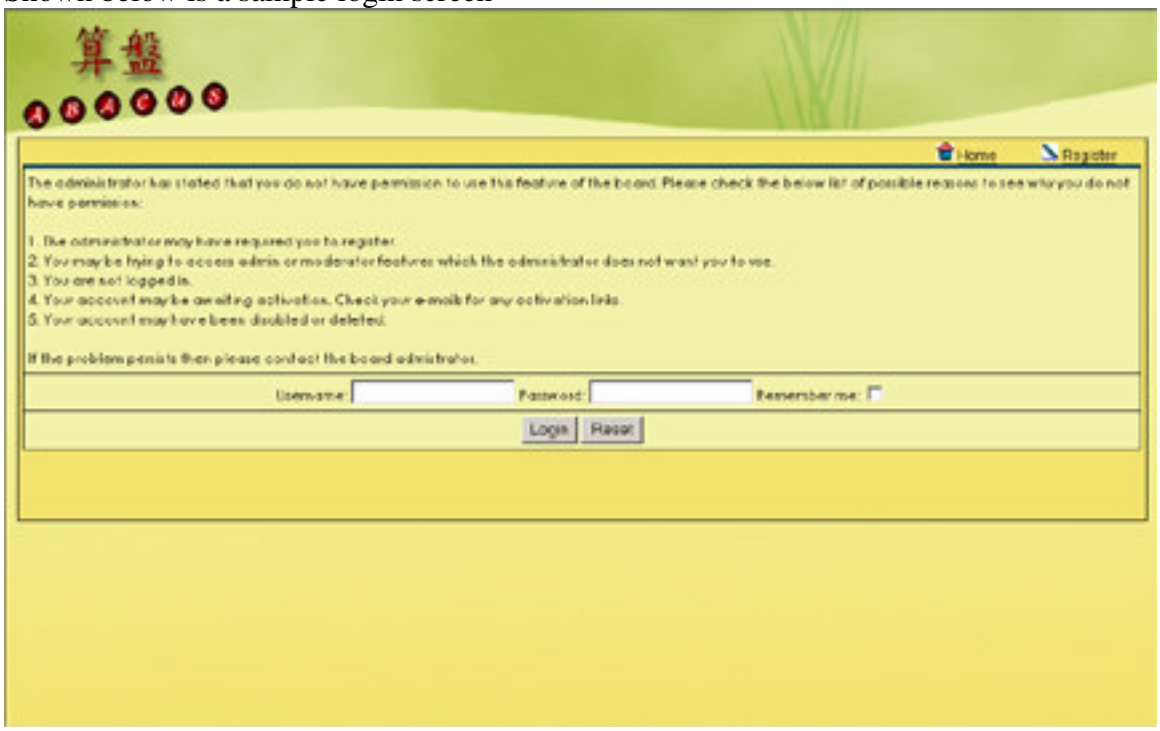
Please note that Guest Users (users who are not logged in) have limited access to information although they are allowed to view topics in the various forums.

Phase Two: Logging in and Out

Users can login using the username and password fields at the bottom of the screen. Users who do not initially see this section will notice a 'login' link at the top of the screen which will automatically scroll the screen to the bottom for them.

Alternatively, users can also begin reading posts and when the try to create a reply message they will be prompted for login information

Shown below is a sample login screen



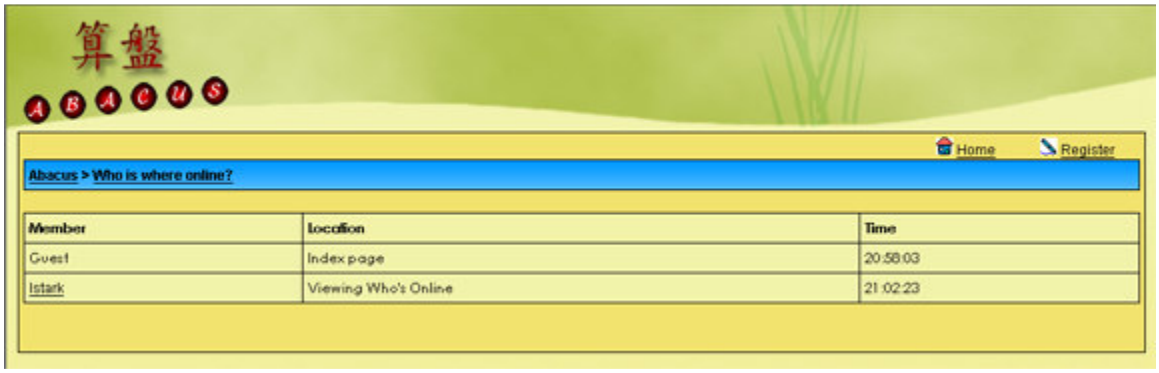
Once a user has completed his or her visit to the site, he or she can log out from the main page using the logout link at the top of the screen. The logout link replaces the 'login' and 'register' link in the top left corner.

Once a user has logged out, that user is treated as a guest if they continue to view forum postings until they log in again.

Phase Three: Gathering more information about who is online

Both registered users and guests can click the 'Online Users' link from the main page. This will show the user name, location where the user is currently as well as the time for each logged in user plus all 'guests' currently viewing the system.

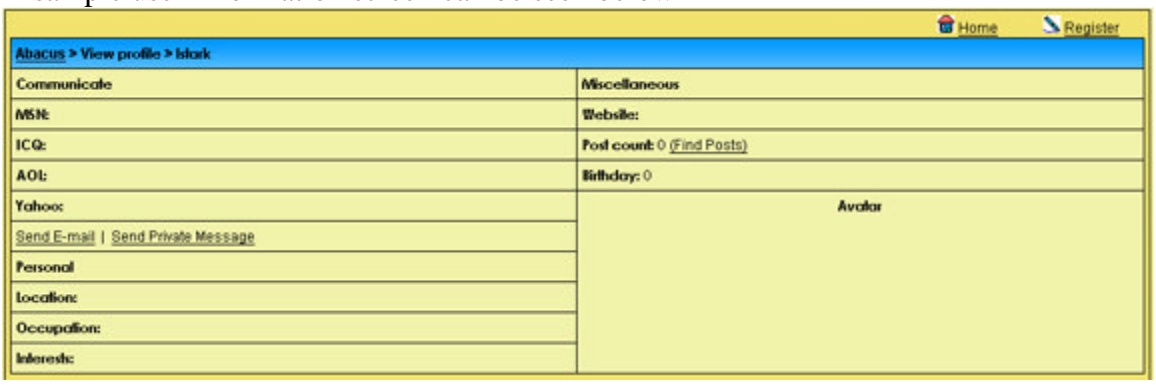
The 'Online Users' Screen can be seen below



Each username is also a link to bring the viewer to that users detailed contact information which includes e-mail addresses, instant messenger names and assorted other personal details.

Please note that this feature is constant throughout the site. Anywhere a username is listed, it can be clicked on and will bring the user to the page with that person's details.

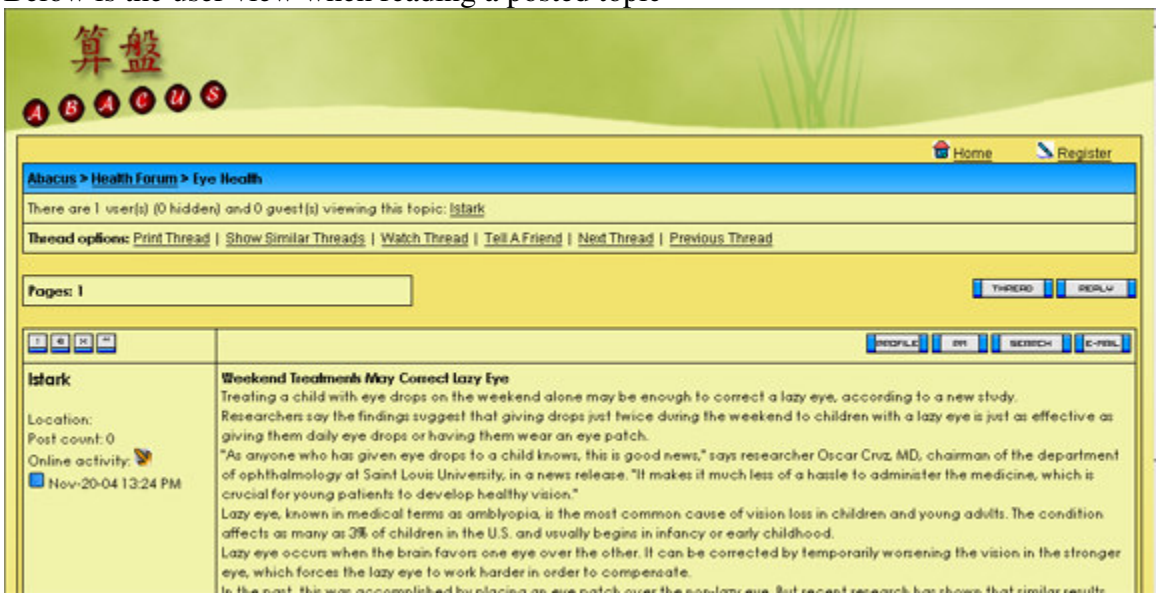
A sample user information screen can be seen below



Phase Four: Reading and Replying to topics

From the main ‘Health Forum’, users can access a number of different health-related threads. Within each of these threads is more detailed information pertaining to the topic as well as other users’ posted replies.

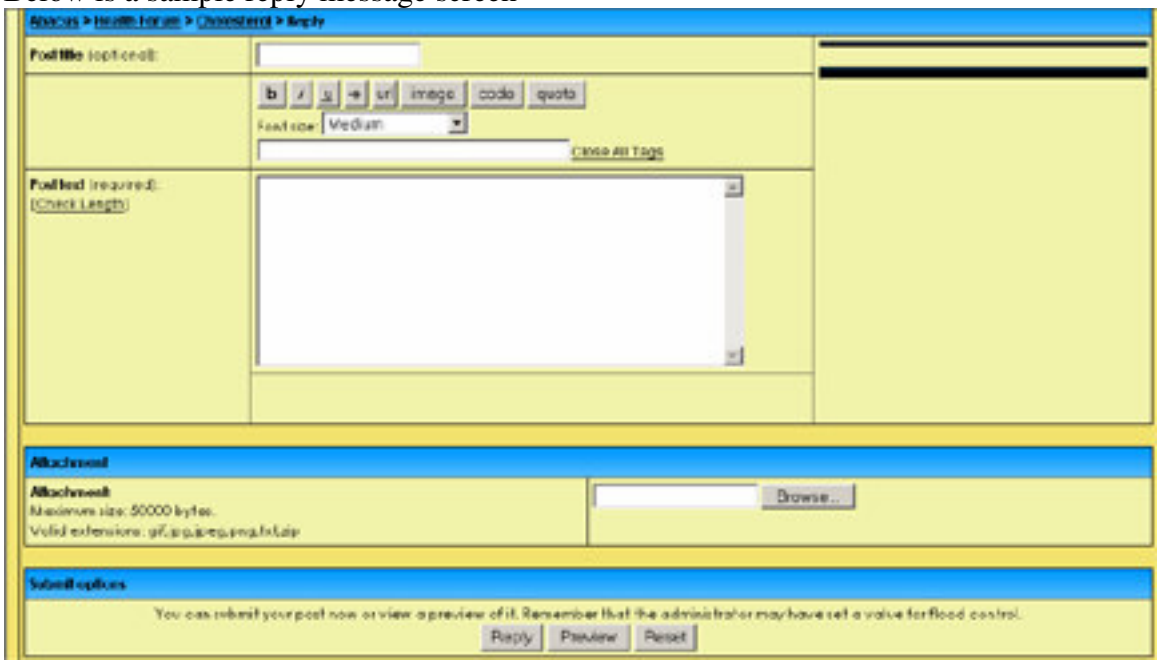
Below is the user view when reading a posted topic



There is a button to the right side labeled ‘Reply’ which will allow the user to create a reply message to the topic currently being read.

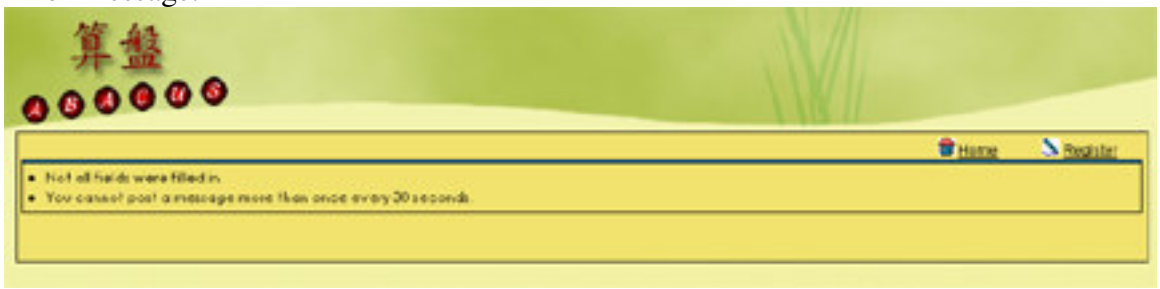
In the reply screen, the user can type a title for his or reply, type the message (up to a certain size that is limited by the site administrator) and even attach an attachment.

Below is a sample reply message screen



After hitting the reply button, if all fields are not filled in properly (i.e. There must be content in the 'Post Text' text box) the user will be prompted with an error message.

Error Message:

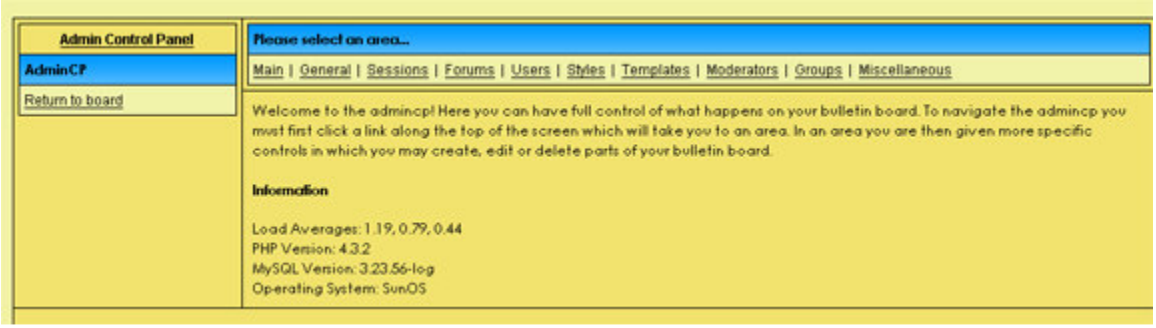


If everything was filled in properly then the user is prompted with the standard redirect page while the information is being written to the database. After the redirect is complete, the user is returned to the topic he or she was last reading and will be viewing the reply post that they just created.

Phase Five: The administrator Control Panel

When a correct username and password are used to login to the website that correspond to an administrator, a link appears at the bottom of the screen to allow access to the administrator control panel.

The main administrator control panel screen looks as follows:



The Links:

Main – This is the main navigation screen. From here the user can access any other part of the administrator control panel, or he or she can return back to the form by click the 'Return to Board' link.

General – This link provides access to the newsletter feature, the configuration settings and a few other useful tools. Please note that the configuration tool should only be used when initially implementing the forum for the first time or when significant changes are being made. This is important to consider because certain options like the 'Board URL' will cause system-wide changes and can cause the forum to stop functioning if input incorrectly.

Sessions – This allows the administrator to prune session information for Guests and Registered Users. There is also a drop down box that allows for pruning session which are older than a given time frame (i.e. One Week).

Forums – This link allows the administrator to specify privileges for each forum based on group policies. By default, Guests can only read posts, but it is possible to change that for one or more forums to allow guests to communicate with forum members before registering.

Users – This link provides the facilities to manually create new users, manually activate existing users and modify the settings for registration.

Styles – This link allows for the customization of a new color-scheme for the board. Everything from font-size and color to table background color and boarder thickness can be adjusted. The administrator also has the ability to create assorted other style templates and then set the default and currently active template has he or she sees fit.

Templates – This allows the administrator the ability to manually edit the HTML stored in the abs_templates table without logging into the MySQL database. CAUTION: This is a very advanced feature and used improperly could render the website non-functional. Please create a full database backup before performing any operations on this table.

Moderators – This link allows the creation of moderators as well as the specification for which forms that user will be the moderator of. Allow privileges for the moderator are specified in the Forums link by the group policies set there.

Groups – By default, the forum is designed to have 5 groups (Guest to Administrator). Through this link, the creation of new groups is possible which allows even greater customization over the privileges of registered (and Guest) users. Using this feature, it is possible to divide the group 'Registered Users' into multiple sub-groups each with its own set of policies.

Miscellaneous - There are two main features here. The first is the ability to add emoticons. Currently this feature is only allowed when sending e-mails. The second feature is the ability to add censored words. By adding a censor, certain words deemed to be inappropriate are automatically replaced with terms or symbols which are more user-friendly.

Appendix 5 : Surveys

Survey 1:

Abacus User Survey

Please rate our web pages on the following aspects:

	Excellent	Very good	Good	Average	Poor	Didn't notice
Homepage	◉	○	○	○	○	○
Technical support	○	○	◉	○	○	○
Corporate information	○	○	◉	○	○	○
Forums	◉	○	○	○	○	○
Functionality/Merit	○	◉	○	○	○	○

How did you feel about the orientation of the website?

	Excellent	Very good	Good	Average	Poor	Didn't notice
Health information	○	○	◉	○	○	○
Color scheme	◉	○	○	○	○	○
Corporate information	○	◉	○	○	○	○
Professionalism	◉	○	○	○	○	○
Functionality/Merit	◉	○	○	○	○	○

How likely are you to:

	Very likely	Somewhat likely	Somewhat unlikely	Very unlikely	Not sure
Revisit this site on a regular basis	◉	○	○	○	○
Recommend our site	○	◉	○	○	○

How often do you think that you might visit our site?

- [ ] Every day
- [ ] Several times a week
- [ ] About once a week
- [ ] Several times a month
- [x] About once a month
- [ ] Less than once a month
- [ ] Never

When browsing our site, how long did you spend there? 25min

How frequently do you surf the web?

- [x] Every day
- [ ] Several times a week
- [ ] About once a week
- [ ] Several times a month
- [ ] About once a month
- [ ] Less than once a month
- [ ] Not sure (don't keep track)

In a typical week, how many hours do you spend surfing? 5

What do you regularly use the web for? (Check all that apply)

- [ ] News
- [x] Work research

- [ ] Health
- [ ] Investments
- [x] Shopping
- [ ] Auctions
- [x] E-mail
- [ ] Chat/communities
- [ ] Web-based address book/calendaring
- [ ] Banking
- [ ] Other

How often have you used the web to gather Health information?

- [ ] Every day
- [ ] Several times a week
- [ ] About once a week
- [ ] Several times a month
- [x] About once a month
- [ ] Less than once a month
- [ ] This is my first time

When would you plan to use our sight to get Health related updates?

- [ ] Immediately
- [ ] Within the next week
- [x] Within about a month
- [ ] Within 3 months
- [ ] Within 6 months
- [ ] Within a year
- [ ] More than a year

- [ ] Not sure

What do you think the primary use of the Abacus web-site is?

- [ ] For work
- [x] For home
- [ ] For school
- [ ] Other

Based on your experience, how would you rate the quality of this website?

- [x] Very high quality
- [ ] High quality
- [ ] Average
- [ ] Below average
- [ ] Unacceptable

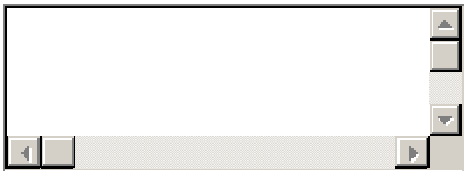
We are continually improving our Web site to make it as useful to you as possible. Please take a few moments to answer these questions about our site. Thank you.

Experience

Did the menu of items on the home page make sense to you?

- [x] Yes
- [ ] No

If no, what would you like to see changed?



Did you experience any problems moving through the web-site?

- [ ] Yes
- [x] No
- [ ] Did not try

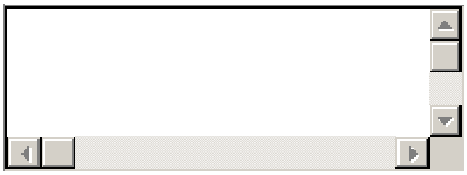
Approximately how many options did you use during your visit?

- [ ] 1 to 3
- [x] 3 to 5
- [ ] 5 to 8
- [ ] More than 10

How satisfied are you with your experience with the Abacus?

- [ ] Very satisfied
- [x] Satisfied
- [ ] Neutral
- [ ] Dissatisfied
- [ ] Very dissatisfied

If you are not totally satisfied, please describe the reasons for your dissatisfaction below.



What additional information or features would you like included on the Abacus?

Maybe you could add in an expert doctor's forum where doctors discuss positives and negative of new medicine.

What would do you think would prompt you to visit our site more often?

- [x] Comprehensive research
- [ ] School affiliation
- [x] Recommendation of friend/associate
- [x] Games
- [x] Affiliation with search engines
- [ ] Downloadable files
- [x] Automatic updates newer/hot information
- [ ] Professional development
- [ ] Links from other site
- [ ] Other

How would you rate yourself as an Internet user?

- [x] Expert
- [ ] Good
- [ ] Beginner

Thank you for taking the time to complete our survey.

Survey 2 :

Abacus User Survey

Please rate our web pages on the following aspects:

	Excellent	Very good	Good	Average	Poor	Didn't notice
Homepage	☑	☐	☐	☐	☐	☐
Technical support	☐	☐	☑	☐	☐	☐
Corporate information	☑	☐	☐	☐	☐	☐
Forums	☑	☐	☐	☐	☐	☐
Functionality/Merit	☑	☐	☐	☐	☐	☐

How did you feel about the orientation of the website?

	Excellent	Very good	Good	Average	Poor	Didn't notice
Health information	☐	☐	☑	☐	☐	☐
Color scheme	☑	☐	☐	☐	☐	☐
Corporate information	☐	☑	☐	☐	☐	☐
Professionalism	☑	☐	☐	☐	☐	☐
Functionality/Merit	☑	☐	☐	☐	☐	☐

How likely are you to:

	Very likely	Somewhat likely	Somewhat unlikely	Very unlikely	Not sure
Revisit this site on a regular basis	☐	☑	☐	☐	☐
Recommend our site	☐	☑	☐	☐	☐

How often do you think that you might visit our site?

- [ ] Every day
- [ ] Several times a week
- [ ] About once a week
- [ ] Several times a month
- [ ] About once a month
- [x] Less than once a month
- [ ] Never

When browsing our site, how long did you spend there? 30miin

How frequently do you surf the web?

- [ ] Every day
- [x] Several times a week
- [ ] About once a week
- [ ] Several times a month
- [ ] About once a month
- [ ] Less than once a month
- [ ] Not sure (don't keep track)

In a typical week, how many hours do you spend surfing? 10

What do you regularly use the web for? (Check all that apply)

- [x] News
- [x] Work research
- [ ] Health

- [ ] Investments
- [x] Shopping
- [x] Auctions
- [x] E-mail
- [ ] Chat/communities
- [ ] Web-based address book/calendaring
- [x] Banking
- [x] Other: School

How often have you used the web to gather Health information?

- [ ] Every day
- [ ] Several times a week
- [ ] About once a week
- [ ] Several times a month
- [x] About once a month
- [ ] Less than once a month
- [ ] This is my first time

When would you plan to use our sight to get Health related updates?

- [ ] Immediately
- [ ] Within the next week
- [ ] Within about a month
- [x] Within 3 months
- [ ] Within 6 months
- [ ] Within a year
- [ ] More than a year
- [ ] Not sure

What do you think the primary use of the Abacus web-site is?

- ☐ For work
- ☐ For home
- ◉ For school
- ☐ Other

Based on your experience, how would you rate the quality of this website?

- ☐ Very high quality
- ◉ High quality
- ☐ Average
- ☐ Below average
- ☐ Unacceptable

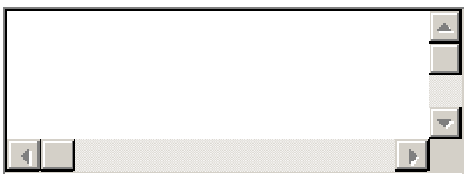
We are continually improving our Web site to make it as useful to you as possible. Please take a few moments to answer these questions about our site. Thank you.

Experience

Did the menu of items on the home page make sense to you?

- ◉ Yes
- ☐ No

If no, what would you like to see changed?



Did you experience any problems moving through the web-site?

- ○ Yes
- ◉ No
- ○ Did not try

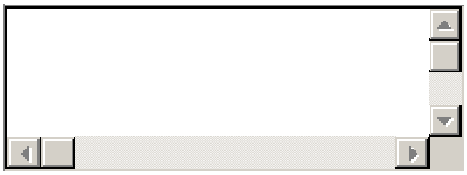
Approximately how many options did you use during your visit?

- ○ 1 to 3
- ○ 3 to 5
- ◉ 5 to 8
- ○ More than 10

How satisfied are you with your experience with the Abacus?

- ◉ Very satisfied
- ○ Satisfied
- ○ Neutral
- ○ Dissatisfied
- ○ Very dissatisfied

If you are not totally satisfied, please describe the reasons for your dissatisfaction below.



What additional information or features would you like included on the Abacus?

What would do you think would prompt you to visit our site more often?

- [x] Comprehensive research
- [ ] School affiliation
- [x] Recommendation of friend/associate
- [x] Games
- [x] Affiliation with search engines
- [ ] Downloadable files
- [x] Automatic updates newer/hot information
- [ ] Professional development
- [x] Links from other site
- [ ] Other

How would you rate yourself as an Internet user?

- [ ] Expert
- [x] Good
- [ ] Beginner

Thank you for taking the time to complete our survey.

Survey 3 :

Abacus User Survey

Please rate our web pages on the following aspects:

	Excellent	Very good	Good	Average	Poor	Didn't notice
Homepage	☑	☐	☐	☐	☐	☐
Technical support	☐	☐	☑	☐	☐	☐
Corporate information	☐	☑	☐	☐	☐	☐
Forums	☐	☑	☐	☐	☐	☐
Functionality/Merit	☑	☐	☐	☐	☐	☐

How did you feel about the orientation of the website?

	Excellent	Very good	Good	Average	Poor	Didn't notice
Health information	☐	☐	☑	☐	☐	☐
Color scheme	☐	☑	☐	☐	☐	☐
Corporate information	☐	☐	☑	☐	☐	☐
Professionalism	☑	☐	☐	☐	☐	☐
Functionality/Merit	☐	☑	☐	☐	☐	☐

How likely are you to:

	Very likely	Somewhat likely	Somewhat unlikely	Very unlikely	Not sure
Revisit this site on a regular basis	☐	☑	☐	☐	☐
Recommend our site	☐	☐	☑	☐	☐

How often do you think that you might visit our site?

- [ ] Every day
- [ ] Several times a week
- [ ] About once a week
- [ ] Several times a month
- [ ] About once a month
- [x] Less than once a month
- [ ] Never

When browsing our site, how long did you spend there? 30 min

How frequently do you surf the web?

- [x] Every day
- [ ] Several times a week
- [ ] About once a week
- [ ] Several times a month
- [ ] About once a month
- [ ] Less than once a month
- [ ] Not sure (don't keep track)

In a typical week, how many hours do you spend surfing? 12

What do you regularly use the web for? (Check all that apply)

- [x] News
- [ ] Work research
- [ ] Health

- [x] Investments
- [ ] Shopping
- [ ] Auctions
- [x] E-mail
- [ ] Chat/communities
- [ ] Web-based address book/calendaring
- [x] Banking
- [ ] Other

How often have you used the web to gather Health information?

- [ ] Every day
- [ ] Several times a week
- [ ] About once a week
- [ ] Several times a month
- [x] About once a month
- [ ] Less than once a month
- [ ] This is my first time

When would you plan to use our sight to get Health related updates?

- [ ] Immediately
- [ ] Within the next week
- [ ] Within about a month
- [x] Within 3 months
- [ ] Within 6 months
- [ ] Within a year
- [ ] More than a year
- [ ] Not sure

What do you think the primary use of the Abacus web-site is?

- [ ] For work
- [x] For home
- [ ] For school
- [ ] Other

Based on your experience, how would you rate the quality of this website?

- [ ] Very high quality
- [x] High quality
- [ ] Average
- [ ] Below average
- [ ] Unacceptable

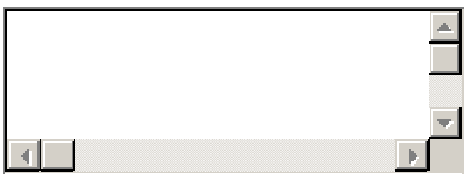
We are continually improving our Web site to make it as useful to you as possible. Please take a few moments to answer these questions about our site. Thank you.

Experience

Did the menu of items on the home page make sense to you?

- [x] Yes
- [ ] No

If no, what would you like to see changed?



Did you experience any problems moving through the web-site?

- ○ Yes
- ◉ No
- ○ Did not try

Approximately how many options did you use during your visit?

- ○ 1 to 3
- ◉ 3 to 5
- ○ 5 to 8
- ○ More than 10

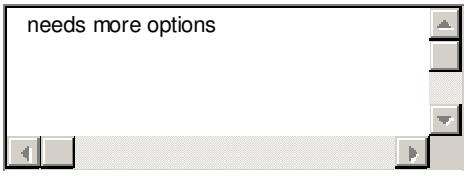
How satisfied are you with your experience with the Abacus?

- ○ Very satisfied
- ◉ Satisfied
- ○ Neutral
- ○ Dissatisfied
- ○ Very dissatisfied

If you are not totally satisfied, please describe the reasons for your dissatisfaction below.

you should have more to do on the site

What additional information or features would you like included on the Abacus?



What would do you think would prompt you to visit our site more often?

- [x] Comprehensive research
- [ ] School affiliation
- [ ] Recommendation of friend/associate
- [x] Games
- [x] Affiliation with search engines
- [x] Downloadable files
- [x] Automatic updates newer/hot information
- [x] Professional development
- [ ] Links from other site
- [ ] Other

How would you rate yourself as an Internet user?

- [x] Expert
- [ ] Good
- [ ] Beginner

Thank you for taking the time to complete our survey.

Survey 4:

Abacus User Survey

Please rate our web pages on the following aspects:

	Excellent	Very good	Good	Average	Poor	Didn't notice
Homepage	☐	☑	☐	☐	☐	☐
Technical support	☐	☐	☑	☐	☐	☐
Corporate information	☐	☐	☐	☑	☐	☐
Forums	☑	☐	☐	☐	☐	☐
Functionality/Merit	☑	☐	☐	☐	☐	☐

How did you feel about the orientation of the website?

	Excellent	Very good	Good	Average	Poor	Didn't notice
Health information	☐	☐	☐	☑	☐	☐
Color scheme	☐	☑	☐	☐	☐	☐
Corporate information	☐	☐	☑	☐	☐	☐
Professionalism	☐	☑	☐	☐	☐	☐
Functionality/Merit	☐	☑	☐	☐	☐	☐

How likely are you to:

	Very likely	Somewhat likely	Somewhat unlikely	Very unlikely	Not sure
Revisit this site on a regular basis	☐	☐	☑	☐	☐
Recommend our site	☐	☑	☐	☐	☐

How often do you think that you might visit our site?

- [ ] Every day
- [ ] Several times a week
- [ ] About once a week
- [ ] Several times a month
- [ ] About once a month
- [x] Less than once a month
- [ ] Never

When browsing our site, how long did you spend there? 20 min

How frequently do you surf the web?

- [x] Every day
- [ ] Several times a week
- [ ] About once a week
- [ ] Several times a month
- [ ] About once a month
- [ ] Less than once a month
- [ ] Not sure (don't keep track)

In a typical week, how many hours do you spend surfing? 15

What do you regularly use the web for? (Check all that apply)

- [ ] News
- [x] Work research
- [ ] Health

- [ ] Investments
- [x] Shopping
- [ ] Auctions
- [x] E-mail
- [ ] Chat/communities
- [ ] Web-based address book/calendaring
- [x] Banking
- [ ] Other

How often have you used the web to gather Health information?

- [ ] Every day
- [ ] Several times a week
- [ ] About once a week
- [ ] Several times a month
- [ ] About once a month
- [x] Less than once a month
- [ ] This is my first time

When would you plan to use our sight to get Health related updates?

- [ ] Immediately
- [ ] Within the next week
- [ ] Within about a month
- [ ] Within 3 months
- [x] Within 6 months
- [ ] Within a year
- [ ] More than a year
- [ ] Not sure

What do you think the primary use of the Abacus web-site is?

- ☐ For work
- ☐ For home
- ◉ For school
- ☐ Other

Based on your experience, how would you rate the quality of this website?

- ◉ Very high quality
- ☐ High quality
- ☐ Average
- ☐ Below average
- ☐ Unacceptable

We are continually improving our Web site to make it as useful to you as possible. Please take a few moments to answer these questions about our site. Thank you.

Experience

Did the menu of items on the home page make sense to you?

- ◉ Yes
- ☐ No

If no, what would you like to see changed?

Did you experience any problems moving through the web-site?

- ○ Yes
- ◉ No
- ○ Did not try

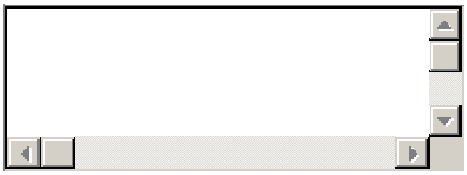
Approximately how many options did you use during your visit?

- ○ 1 to 3
- ○ 3 to 5
- ◉ 5 to 8
- ○ More than 10

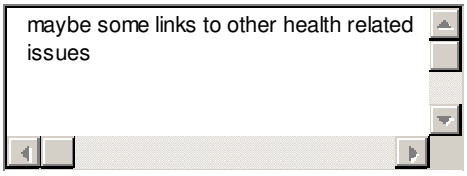
How satisfied are you with your experience with the Abacus?

- ◉ Very satisfied
- ○ Satisfied
- ○ Neutral
- ○ Dissatisfied
- ○ Very dissatisfied

If you are not totally satisfied, please describe the reasons for your dissatisfaction below.



What additional information or features would you like included on the Abacus?



What would do you think would prompt you to visit our site more often?

- [x] Comprehensive research
- [x] School affiliation
- [x] Recommendation of friend/associate
- [x] Games
- [x] Affiliation with search engines
- [ ] Downloadable files
- [x] Automatic updates newer/hot information
- [ ] Professional development
- [ ] Links from other site
- [ ] Other

How would you rate yourself as an Internet user?

- [x] Expert
- [ ] Good
- [ ] Beginner

Thank you for taking the time to complete our survey.

Survey 5 :

Abacus User Survey

Please rate our web pages on the following aspects:

	Excellent	Very good	Good	Average	Poor	Didn't notice
Homepage	☑	☐	☐	☐	☐	☐
Technical support	☐	☐	☐	☑	☐	☐
Corporate information	☐	☐	☑	☐	☐	☐
Forums	☑	☐	☐	☐	☐	☐
Functionality/Merit	☐	☑	☐	☐	☐	☐

How did you feel about the orientation of the website?

	Excellent	Very good	Good	Average	Poor	Didn't notice
Health information	☐	☐	☑	☐	☐	☐
Color scheme	☑	☐	☐	☐	☐	☐
Corporate information	☐	☑	☐	☐	☐	☐
Professionalism	☑	☐	☐	☐	☐	☐
Functionality/Merit	☑	☐	☐	☐	☐	☐

How likely are you to:

	Very likely	Somewhat likely	Somewhat unlikely	Very unlikely	Not sure
Revisit this site on a regular basis	☐	☐	☑	☐	☐
Recommend our site	☐	☑	☐	☐	☐

How often do you think that you might visit our site?

- [ ] Every day
- [ ] Several times a week
- [ ] About once a week
- [ ] Several times a month
- [ ] About once a month
- [x] Less than once a month
- [ ] Never

When browsing our site, how long did you spend there? 20 minutes

How frequently do you surf the web?

- [x] Every day
- [ ] Several times a week
- [ ] About once a week
- [ ] Several times a month
- [ ] About once a month
- [ ] Less than once a month
- [ ] Not sure (don't keep track)

In a typical week, how many hours do you spend surfing? 10

What do you regularly use the web for? (Check all that apply)

- [x] News
- [x] Work research
- [ ] Health

- [ ] Investments
- [ ] Shopping
- [x] Auctions
- [x] E-mail
- [ ] Chat/communities
- [ ] Web-based address book/calendaring
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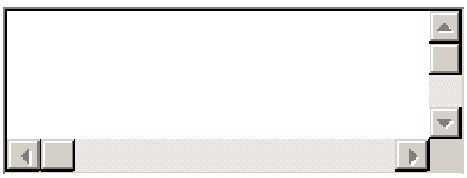

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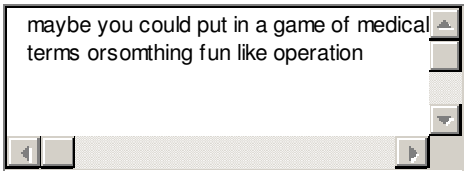
site needs more to do

What additional information or features would you like included on the Abacus?



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