

FamilyNet

By

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Table of Contents

	Page
Table of Contents	i
List of Figures	ii
Abstract	iii
1. Statement of the Problem	1
1. 1 Supporting Rational	1
2. Description and Intended Use	2
2. 1 User Profile	3
2.1.1 Inexperienced Computer Owners	3
2.1.2 Regular Internet Users and Beyond	4
2. 2 Design Protocols	5
2.2.1 Web Site Layout	5
2.2.2 Database Tables	6
3. Deliverables	7
4. Proof of Design	8
4. 1 Technologies Used	8
4. 2 Registering for FamilyNet	9
4. 3 Functionality	10
4. 3. 1 Security	10
4. 3. 2 Message Board	11
4. 3. 3 Chat Room	12
4. 3. 4 Photo Gallery	13
4. 3. 5 Games	14
4. 3. 6 Links	15
4. 3. 7 File Sharing	16
4.4 User Interface and Aesthetics	17
5. Conclusion and Recommendations	18
Appendix A. Budget	19
Appendix B. Timeline	20
Appendix C. Software	22
Appendix D. References	23

List of Figures

Figure 1. Web site Layout	5
Figure 2. Database Tables	6
Figure 3. FamilyNet Home Page	8
Figure 4. Registration Page	9
Figure 5. Message Board	11
Figure 6. Chat Room	12
Figure 7. Photo Gallery	13
Figure 8. Links	15
Figure 9. File Sharing	16
Figure 10. Navigation	17

Abstract

The FamilyNet Web site has the potential to create new paths of communication between family members across the globe by simplifying and centralizing the tools and features available today on the Internet. Some family members may not understand how to work on the Internet, and navigating from place to place to use various tools can be confusing and frustrating. FamilyNet combines a message board, chat room, games, links, photo gallery, and file sharing section into a secure Web site for an individual's family. Centralizing these tools into one site makes it easier for novice Internet users to avail themselves of such beneficial kinds of functionality. This presentation summarizes the development of FamilyNet and provides proof of design, design protocols, software requirements, and hardware requirements. This presentation also provides some recommendations that could strengthen FamilyNet

FamilyNet

1. Statement of Problem

The Internet has already made many of our lives easier with its abundance of information and tools, but many people still lack the knowledge or the resources to harness its power for the modern day family. Chat rooms, email, and instant messenger tools all can be used to benefit our families. However, all of these tools are scattered about the Internet and are also vulnerable to abuse. Some family members may not understand how to work on the Internet, and navigating from place to place to use various tools can be very confusing and frustrating.

Communicating with family members across the country by phone can be expensive. And, unless using multiple party calling, the telephone only provides one-on-one conversation. Internet based chat rooms, however, are free and allow for multiple people to join in on one conversation. Scheduling family events can be a chore relying on word of mouth or email, but an easily-accessible Internet based family bulletin board system, similar to ones used in businesses and schools, would work great for that and other purposes.

1.1 Supporting Rationale

The Internet is a massive entity that creates amazing opportunities for all people and families. The number of people using the Internet grows everyday. School children are exposed to it regularly and most middle class families have a computer at home that is used to access the Internet. In the month of October 2001 alone, the Internet was accessed approximately 169 million times from home users in the U.S. (7).

As with many such large complex entities, there is a learning curve associated with the Internet's use. The complexity of the Internet can be intimidating to certain individuals (3, 5, 6). Senior citizens, young children, and non-technical people, in particular, often have problems working on the Internet (3, 5, 6). In an interview with a close friend, the main reason for avoiding Internet use was because of its complexity and his fear of damaging the computer (3). While interviewing a middle-aged, daily Internet user, I asked if he had ever used services such as AOL Instant Messenger, Yahoo Messenger, or ICQ and found that he did not understand how to implement them and was too busy to learn how (5).

The Internet lacks any kind of uniform behavior pattern by its users. This can be expected for we each have our own favorite search engine, sites, and services, but this non-uniform behavior hinders our ability to communicate with our family members. The informed are busy chatting away on their messenger services while the uninformed are wondering how to send a simple email. FamilyNet strives to centralize many features and make it simpler for families to communicate with one another.

2. Description and Intended Use

The FamilyNet Web site has been designed to simplify and centralize communication between family members by using the Internet as a medium. Furthermore, FamilyNet has the potential to decrease communication expenses by reducing the need for long distance phone calls by family members to relatives in different area codes. With easier-to-access lines of communication, family members can stay more informed and consequently more involved in one another's lives, enriching their own and maintaining strong family ties.

FamilyNet supplies all of the tools necessary to broaden our lines of communication between family members. It is a secure, SQL-driven, database Web site that provides a message board, chat room, photo gallery, games, links, and file sharing sections. Some family members lack the knowledge or skill to use the many powerful, but scattered and sometimes challenging tools existing currently on the Internet. That is why FamilyNet combines all of these tools into one secure and easy to use Web site that is an excellent vehicle for keeping in touch with relatives wherever they live.

2.1 User Profile

The intended design for FamilyNet was to make navigation and functionality so uncomplicated and friendly that every family member from beginner to power user can equally exploit the FamilyNet Web site.

2.1.1 Inexperienced Computer Owners

- **Description**

These clients have basic computer skills, essentially understanding how to turn on the computer, logon to the Internet, and navigate to a Web site. Using the Internet is difficult and if everything is not easily accessible and explained to them they will be confused. Their application of the type of tools contained within FamilyNet is rare.

- **Design Requirements**

This user profile mandates that an easy-to-use interface is necessary. Navigation must be simple and all tools within FamilyNet are accessible from any web page. Buttons and links are labeled accurately and help is available by just clicking a help link.

2.1.2 Regular Internet Users and Beyond

- **Description**

These clients have a good understanding of how to use the Internet and its tools. They are familiar with the types of tools included within FamilyNet and should have no problem using them.

- **Design Requirements**

Irritation-free computing for these users is a key FamilyNet focus. The help section must be readily available but not intrusive to these clients. If message boxes and hover-text are frequently disrupting these users' sessions they may refrain from using FamilyNet.

2.2 Design Protocol

2.2.1 Web Site Layout

The diagram below displays the Web site layout of FamilyNet.

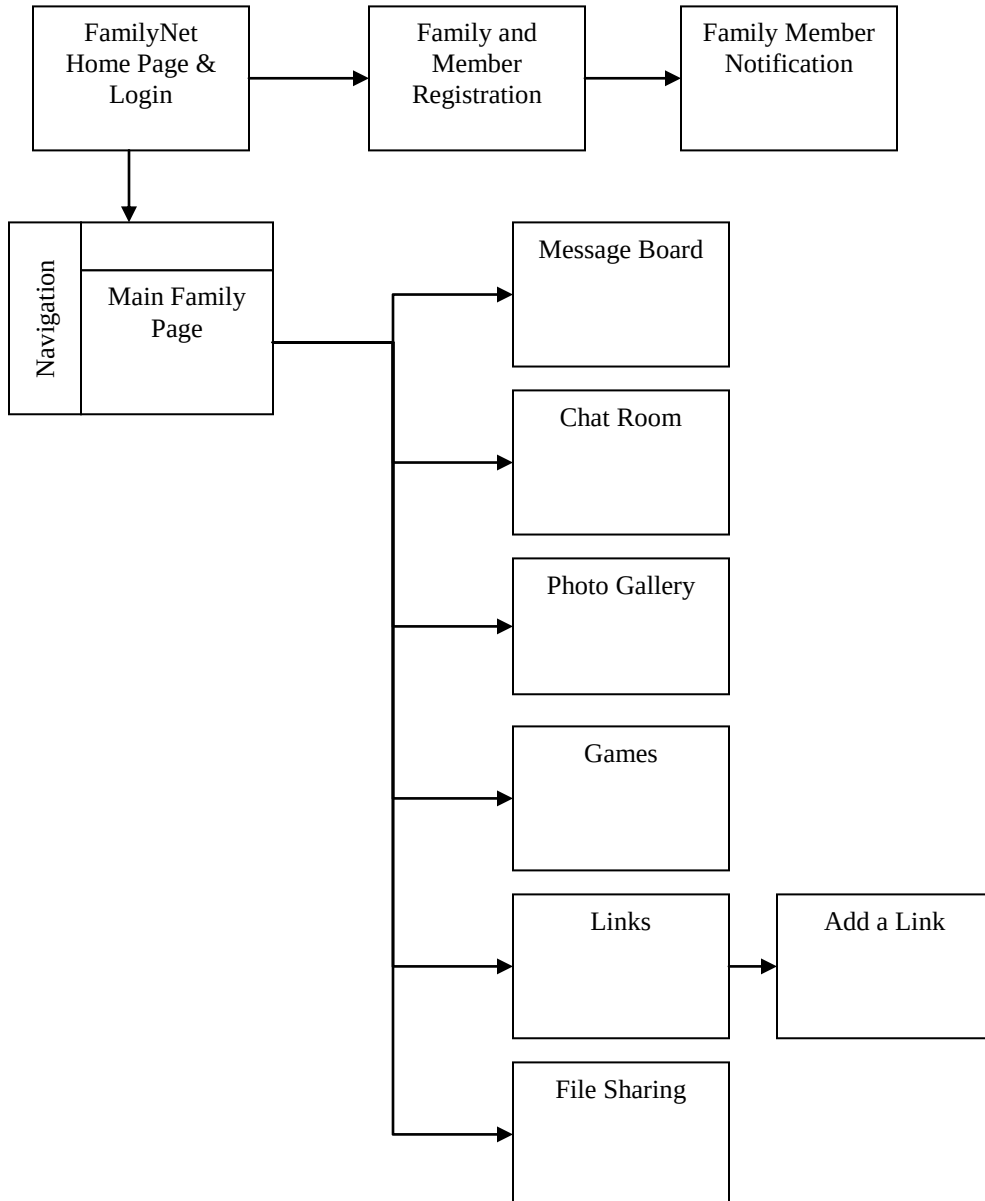


Figure 1. Web site Layout

2.2.2 SQL Database Tables

The figure below list all the tables used to make FamilyNet dynamic and store user information.

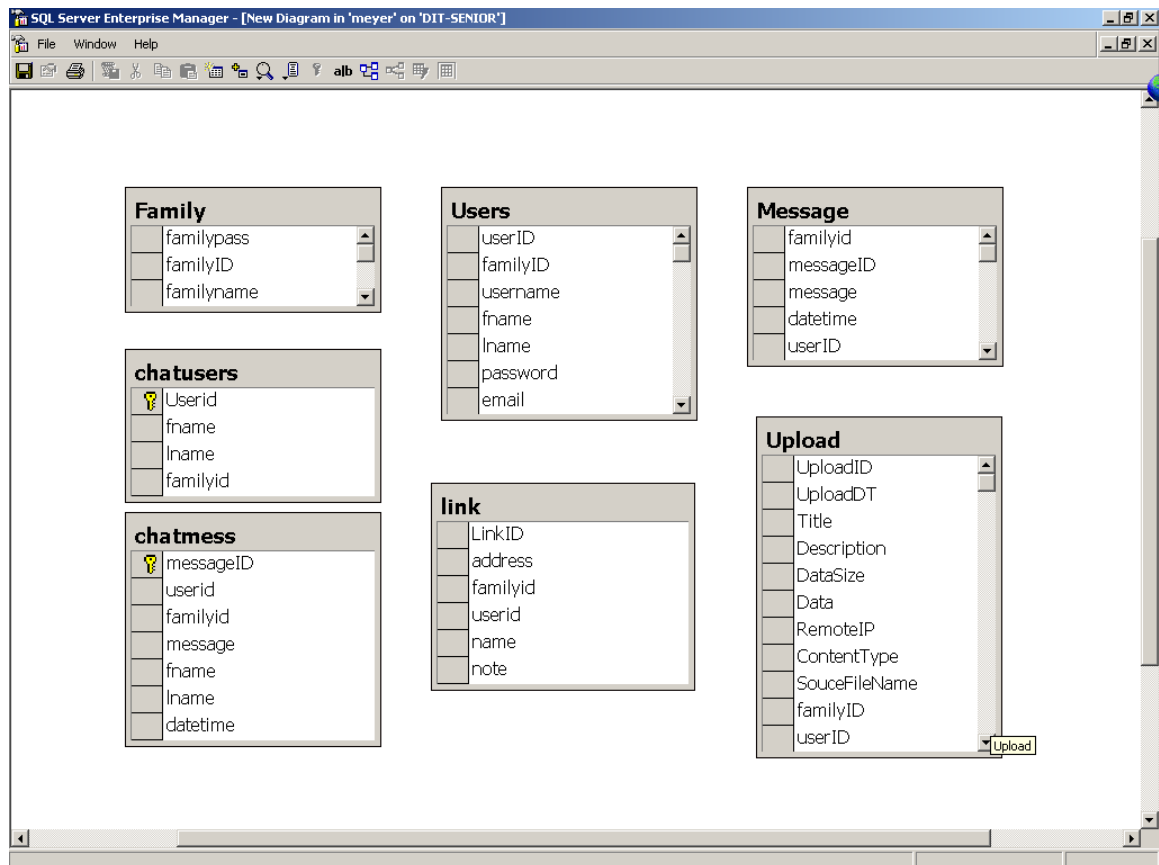


Figure 2. Database Tables

3. Deliverables

- A Web based family communication system designed using:
 - A SQL Server database containing five tables tracking users, families, messages, uploads, and links.
 - ASP
 - HTML
 - VBscript
 - Javascript
- Users will be able to register their family.
- FamilyNet will include all of the following tools for its members:
 - A Secure family Web site that requires family members to logon to use the functionality that is secure to their family.
 - A message board which will allow users to post messages to other family members.
 - A chat room where family members can go to chat with one another.
 - A photo gallery where family members can view and upload pictures.
 - Small game section created using sample code from the Internet.
 - A links section containing links to useful sites and the ability for members to create own links.
 - A file sharing section where members can upload and download files to the server for sharing or storage.
- A user interface which allows for simple user interaction.
- Easy-to-access help information on all sections of FamilyNet.
- Comfortable and distinguishing use of aesthetics.

4. Proof of Design

4.1 Technologies Used

The FamilyNet Web site was designed using HTML, ASP, vbscript, JavaScript, SQL, Flash, and DHTML technologies. In the list of deliverables only five of the seven technologies were listed that I used to develop FamilyNet. To broaden my Web development skills I took it upon myself to learn Flash and some dHTML to incorporate it into this project. The relational database used for FamilyNet contains seven tables that store information on users, families, messages, chat (two tables), links, and files. Each table is related by familyid which is required to keep information about each family separate from one another.



Figure 3. FamilyNet Home Page

4.2 Registering for FamilyNet

FamilyNet allows people to register for its service in two different ways; one, you may create a new FamilyNet for your family; two, join an already existing FamilyNet that has been created by another family member. The registration page, shown in figure 5, requires you to choose either of these two options for registration. If creating a new FamilyNet a family password needs to be created by this user which allows new family members to join. If joining a current FamilyNet you must enter the family password in order to be able to join a current FamilyNet. The registration page contains client-side and server-side validation to assure the data being entered is in the correct format and also to prevent server spoofing. If the data inputted passes validation and the username is not in use by another person, then all information is inserted into the SQL database using ASP and ADO.

The screenshot shows a web browser window with the address bar displaying `http://dit-senior.cas.uc.edu/FamilyNet/register.htm`. The page content is titled "FamilyNet Registration" and includes a blue banner with the text "Join FamilyNet Today and Open New Lines of Communication with Your Family!". Below the banner, the registration form consists of the following sections:

- First Name:** A text input field.
- Last Name:** A text input field.
- Email Address:** A text input field with a placeholder example `xyz@xyz.com`. To the right, a note states: "Your email address will be posted within your Familynet for family members to quickly reference."
- Family Name:** A text input field. To the right, a note states: "This is the family name for which you are registering since your last name may not reflect the family name."
- New Family Registration?** A radio button option. To the right, a note states: "If you want to create a new FamilyNet for your family then select this button. Remember your family password, other family members will need it to join your familynet."
- Member of Existing Family?** A radio button option. To the right, a note states: "If you want to join an existing family that has been registered already click this button and enter the family password."
- Do you wish to notify other family members of this service?** A checkbox. To the right, a note states: "Checking this box will allow you to send email invitations to other family members."
- Login Info:** A section with two input fields: "Create Username:" and "Choose Password:". To the right, a note states: "Remember this information, it is used to login to your FamilyNet."

Figure 4. Registration Page

4.3 Functionality

4.3.1 Security

FamilyNet is secure to individual families and requires all users to enter a username and password to enter their family's FamilyNet. This is done through the use of session objects, cookies, and hidden fields within FamilyNet. If the user tries to go to a page within FamilyNet without logging on, the page will check for the appropriate sessions, or cookies and if not present will redirect them to the home page to logon again. Although this is not highly encrypted http traffic it provides for good security nonetheless. A hidden field is used once in the chat section to pass on the user verification information to the multiple frames in the chat room.

4.3.2 Message Board

FamilyNet provides a message board, secure to the family, which will allow users to post messages for other family members to read. It displays the nine most recent messages to keep the board up to date. Also this page displays all family members currently registered within the user's family. An email link is shown beside family member's names to facilitate and simplify the sending of email. All data displayed and enter is stored in the database making all webpage information dynamic.

The text area on this page is an HTML form which resubmits the text entered back to this page. The ASP code identifies the post back and inserts the text message into the database along with who submitted it and when.

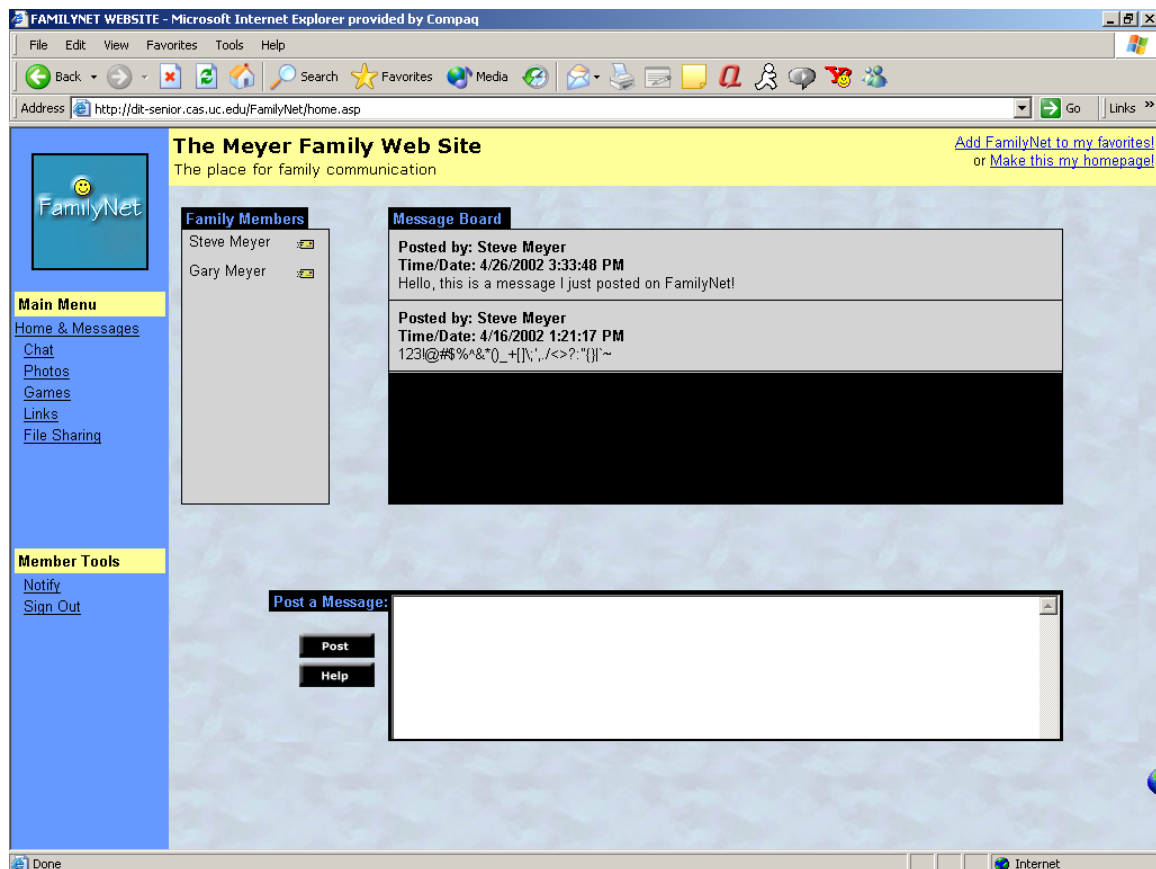


Figure 5. Message Board

4.3.3 Chat Room

The chat room contained within FamilyNet is secure to the family and allows members to chat in real time with one another over the web. The chat room was created using three framed html pages, ASP, and JavaScript. The three pages contained current messages, members in chat, and an input form to type your messages and submit them. No download is necessary to use this chat room because it is HTML based and uses the “meta refresh” method to refresh the page every few seconds. After every refresh the database is re-queried and any new messages or members are displayed in the chat windows.

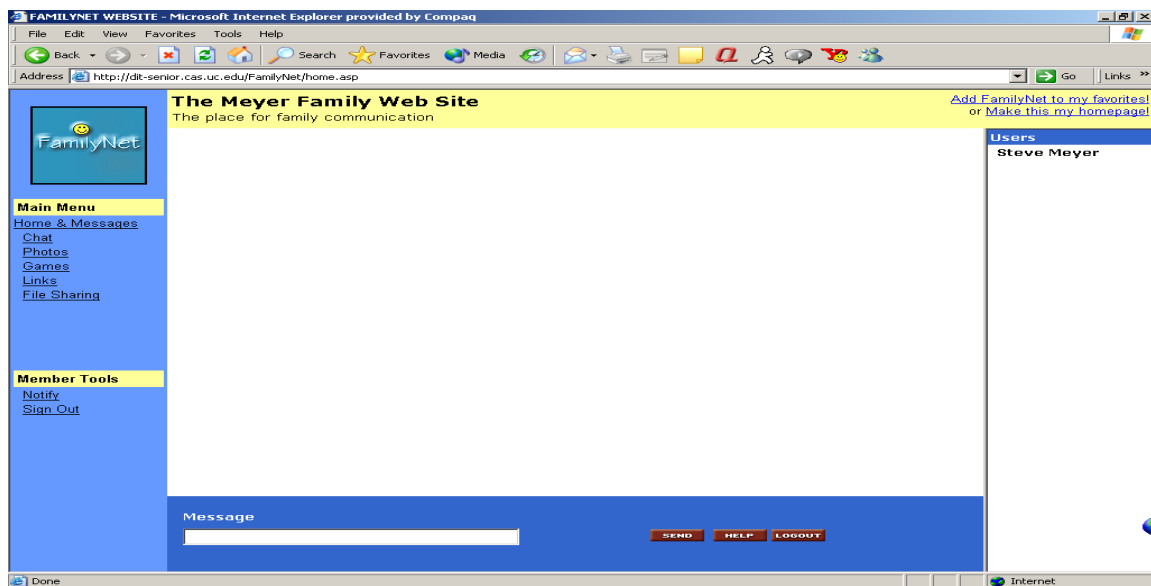


Figure 6. Chat Room

Since standard Internet use has a stateless connection, the chat room had to be designed to “know” when a user logged out or exited the chat room. If users hit the logout button in chat when finished, the logout event is triggered removing them as expected, but often times users will either close the window or navigate to another site without hitting the logout button. To solve this problem I used a small JavaScript that

was triggered by the close of the chat frame. When triggered this script opens a small window thanking the user for chatting and triggers the same logout event that the logout button would trigger. If the logout event was not triggered, users would not be unloaded from the chat room list and other members would think they were present.

4.3.4 Photo Gallery

The photo gallery section is secure to each family and allows for the posting of jpeg or gif images to the Web site for sharing between family members. This was done using ASP, vbscript, and SQL. The uploaded images are stored in a binary format within SQL. Writing in binary to a browser can only be done once and can only contain binary information. Therefore, querying the database and writing multiple images to the screen was not an option. To work around this problem I used two ASP pages and the methods shown in figure 8.

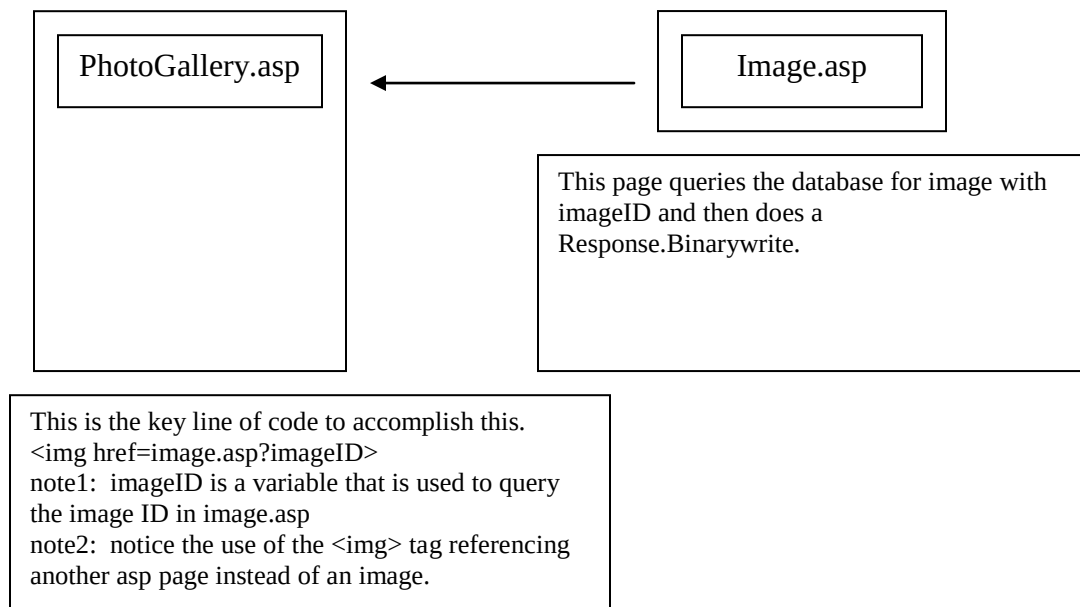


Figure 7. Photo Gallery Design

In essence the image.asp page is having an image written to it and then is displayed by photogallery.asp. This process loops until all images in the FamilyNet are displayed.

4.3.5 Games

The games section of FamilyNet contains three games that were obtained from free code available on the Internet. The three games are called tet~, Galaxy, and ASP BlackJack. They are single player and simple to use.

4.3.6 Links

The links section of family contains a categorized list of standard links to commonly used sites. This page also gives family members the ability to add new links to share with their family. This is done by clicking an *Add Link* button and then filling out a form with the site's name, URL, and any comments about the site. This data is then stored in SQL and displayed anytime the links page is called by a family member.

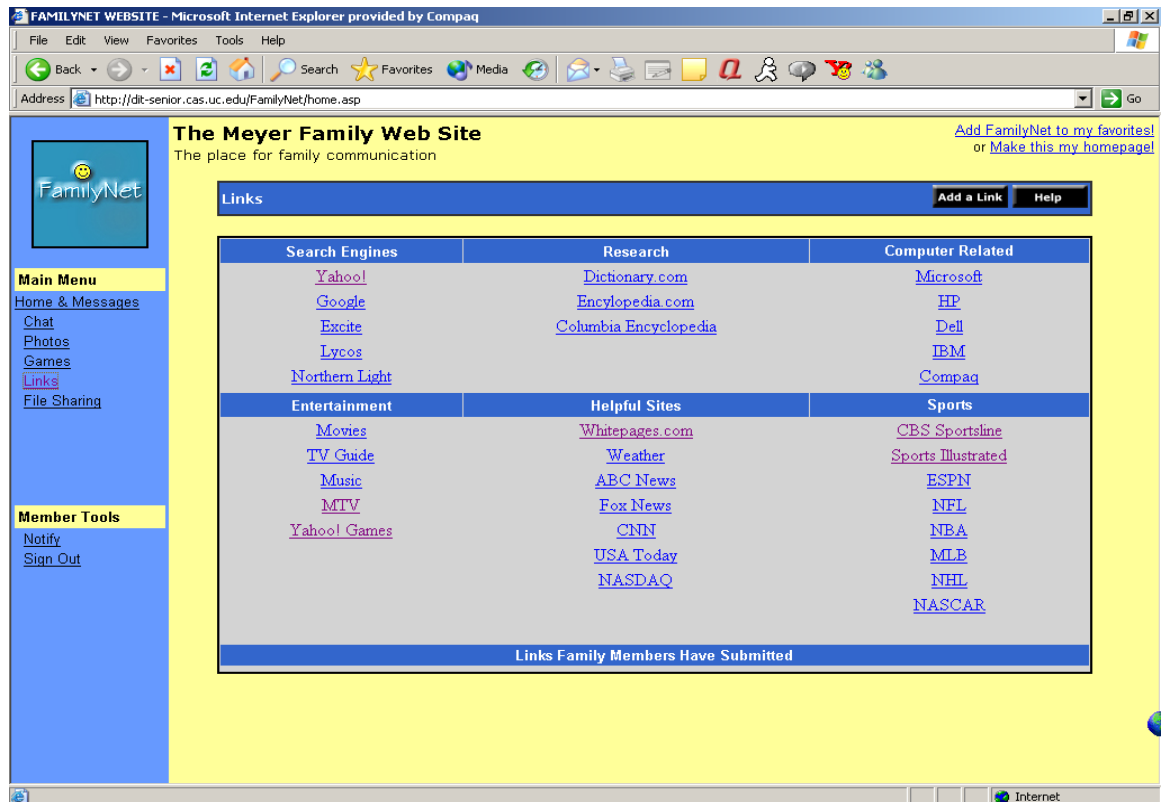


Figure 8. Links

4.3.7 File Sharing

The file sharing section of FamilyNet provides users the ability to upload, download, and delete files to/from FamilyNet. A short form will allow users to browse to a file on their machine and select it for upload. They can also add a comment if they wish. Once that is complete the file can be submitted and uploaded. This is done by breaking the file into binary and using the ASP Reponse.GetChunk method. This data is then stored in SQL. The file sharing page also list files that have been uploaded to the FamilyNet, in this list you may delete or download the files.

File Sharing [Help] [Close]

Upload a File

File to Store: [Browse...]

Description:

[Upload the File >>>]

Download a File

Files Stored on Your FamilyNet

User	Date\Time	File Name	Description
Steve Meyer	4/29/2002 4:02:00 PM	dom.bmp	

[Download] [Delete]

Figure 9. File Sharing

4.4 User Interface and Aesthetics

The user interface was designed to be easy to navigate and easy on the eyes.

Navigation, when inside a family's Web site, is done using a framed window on the left side of the screen. This navigation window is always visible while navigating to other areas of FamilyNet. The navigation to areas within a certain page, such as the links page, is done by a title bar which includes buttons for help and any other areas related to the page. The use of color and layout was based on typical design protocols of web sites today and complimentary color scheme. Each section within FamilyNet has a different background color to provide a distinguishing effect between sections.

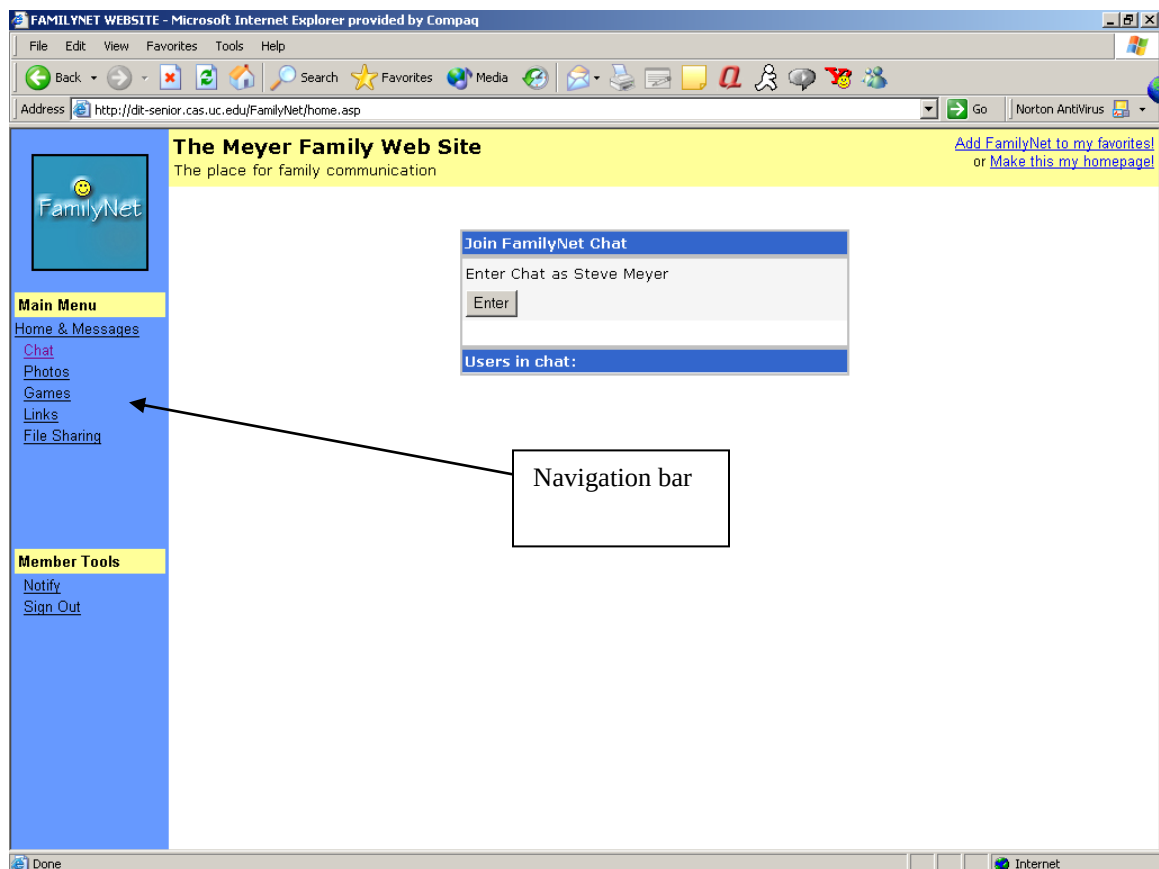


Figure 10. Navigation

5. Conclusions and Recommendations

The FamilyNet Web site meets all the deliverables promised in Senior Design II and is fully functional. The design and development of FamilyNet, although tedious at times, was extremely educational. I learned new aspect of HTML, ASP, JavaScript, and SQL and other completely new technologies such as Flash and dhtml. The written part of FamilyNet helped to develop my writing skills in a technical environment. This experience will assist me in upcoming career endeavors.

All areas of FamilyNet function properly, but some recommendations can be made to improve it.

- The use of dhtml in the homepage creates a very attractive page; however the dhtml does not function properly in Netscape and should be corrected to work for both IE and Netscape.
- The chat room has its advantages and disadvantages. A Java Applet based chat maybe more efficient but would require a download of some type to run. The current HTML based chat room does not require a download, however, it is a little slower than a applet based chat.
- The file sharing section could be more secure within the family by only allowing the user who posted a file to delete it. Currently everyone has full control over all files.
- A genealogy tool would be very interesting to implement, allowing all family members to view and edit their family tree information. This could be a very appealing feature.
- The use of session objects should be replaced by other methods of verification because of scalability issues.

With further refinement and additional investment of time and money, FamilyNet has the potential to be an alluring new site on the Internet creating closer bonds between family members.

Appendix A. Budget

The cost of hardware and software requirements is shown below. Prices have been taken from leading IT manufactures with competitive prices. Items listed below are based on what is available and will meet the requirements for FamilyNet.

Hardware/Software	Purpose	Price
Compaq iPAQ – • Pentium III 500Mhz • 128MB RAM • 8.4G Hard Drive • Windows XP	For design, development, testing, and maintenance of FamilyNet	\$499
Compaq Proliant ML370 Server – • Intel Pentium III 1.26Ghz • 512MB RAM • SCSI controller • RAID 5 • 6 X 72GB SCSI hard drives • Windows 2000 Server • SQL Server	Server for hosting the Web site and database.	\$16,598
Internet Information Server	-	inc. w/ Server Package
Domain Name Registration	<i>FamilyNet.com</i>	\$25
T1 – high speed internet access	-	\$800/month
Windows 2000 Server	-	inc. w/ Server Package
Microsoft SQL Server 2000	-	inc. w/ Server Package
Microsoft Visual Interdev	For design and maintenance	\$497
Total start-up cost w/ 1-month of operation:		\$17,967

Appendix B. Timeline

Senior Design I - Fall 2001

Weeks 1-5

- Develop a product idea
- Research the product idea
- Research the requirements for FamilyNet

Weeks 6-10

- Design basic schematic and functionality of Web site
- Preliminary design of database layout
- Submit proposal for project
- Present project proposal

Senior Design II – Winter 2002

Weeks 1-5

- Create and design database in SQL Server
- Design Main web page and logon
- Complete user registration page
- Complete family home and message board
- Complete links page
- Complete file sharing page

Weeks 6-10

- Complete photo gallery
- Complete games section
- Start help documentation section
- Start chat room page
- Submit Design Freeze
- Present working prototype

Senior Design III – Spring 2002

Weeks 1-5

- Complete chat room
- Complete Help Section
- Final Testing and Revision

Week 6-10

- Submit rough draft of final report
- Submit final report
- Present project

Appendix C. Software

The list below identifies the software needed to create and host FamilyNet from set-up to final product.

- Microsoft Windows (Any recent version)
- Microsoft Visual Interdev 6.0
- Microsoft Window NT 4.0 Server or greater
- Internet Information Server 4.0 or greater
- SQL Server 2000
- Macromedia Flash

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