NJHSTSC

NJIT-HOMELAND SECURITY

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1. Background

1. 1 Background Information

NJHSTSC was created at NJIT, and its mission is to serve as an advisor to evaluate and integrate security based technology.

"The Center operates under an Advisory Board including designees of the Attorney General, the Commissioners of the Departments of Health and Senior Services, Environmental Protection, Military & Veterans Affairs and Transportation, the Director of the Office of Counter Terrorism, the President of the Board of Public Utilities, the Executive Director of the Commission on Higher Education and the Executive Director of NJ Commission of Science and Technology. The Chair of the Advisory Board appointed by the Governor is Sherrie Preische the Executive Director of the NJ Commission on Science and Technology. "

NJHSTSC is a center that has specific goals. This center wants to ensure the State's readiness to, develop, harness, and deploy the most effective technologies. As the name says it, they value homeland security and they want to be able to respond to terrorist attacks and threats. The State established the Homeland Security Technology Systems Center at New Jersey Institute of Technology. The center focuses on reducing vulnerabilities identified by state and federal government as vital to national security.

"This Center is established with full-time technical and program management staff to execute its mission with focus and clarity. By its success, New Jersey assumes a role of national leadership in addressing critical problems that must be

resolved if we are to preserve daily freedoms while safeguarding our people and property from terrorism."

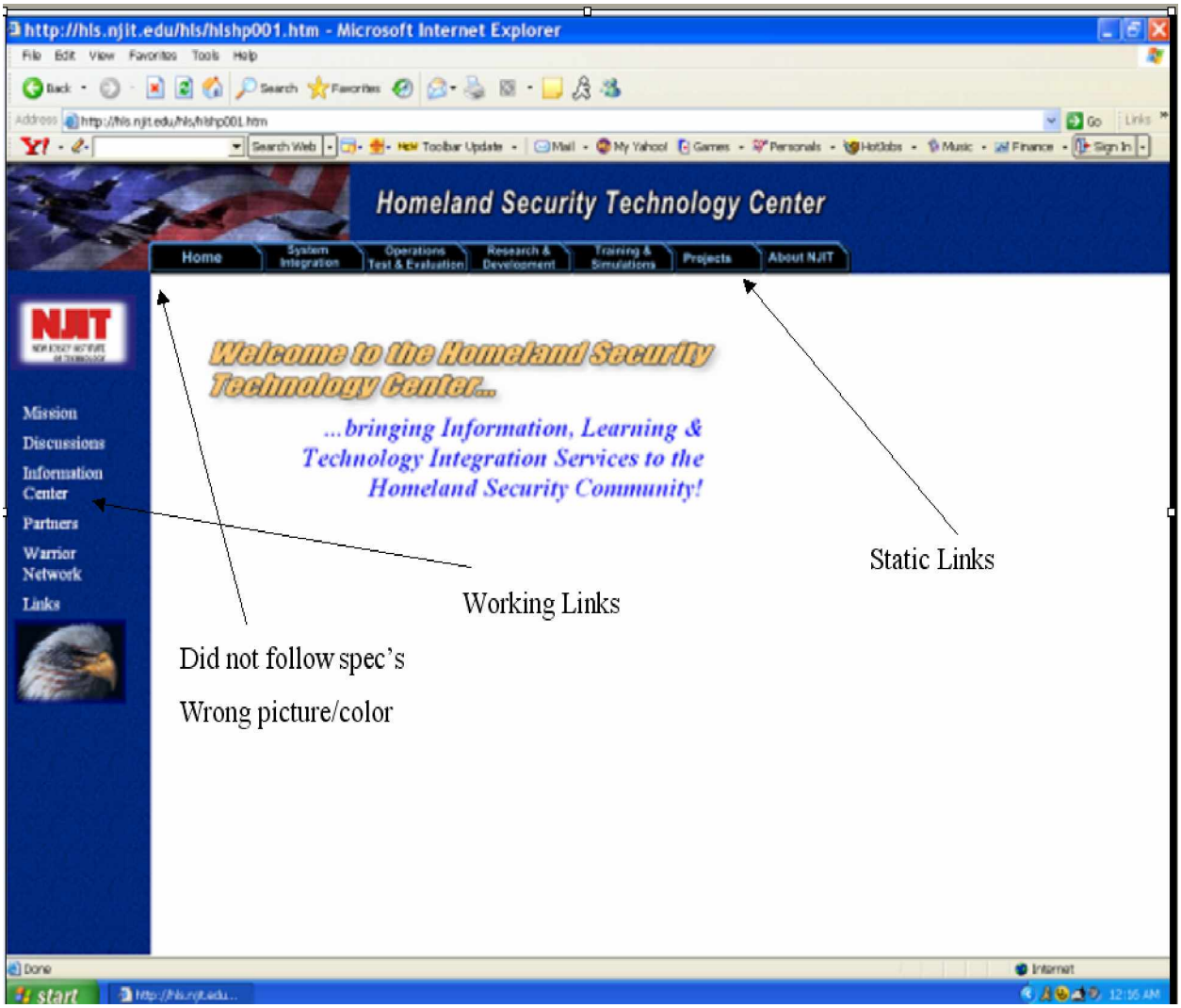
Below are the main ideas presented to us by the NJHSTSC:

- Conduct real-world, in-use tests to find the best technology to protect critical State assets.
- Evaluate prototype commercial technology products against performance standards as advisors for State, county, municipal, federal and interstate agencies. Review and assist in the development of objective performance and interoperability standards consistent with long-range opportunities for technology development.
- Develop comprehensive demonstration and training programs to ensure rapid uptake of systems technology used by all relevant users.
- Assemble teams to address specific technology development needs that are local to New Jersey and needs that may not receive adequate attention at a national level Foster collaboration, coordination and management of multi-organizational grant applications and partnerships involving technology development programs that engage State agencies, New Jersey colleges and universities, military installations and private sector firms.
- Enter into Cooperative Research Agreements with interstate agencies, and military installations.

NJHSTSC asked a previous Capstone Group to design a page that would suit their needs. Unfortunately the group was successful in creating a page but the page was static and therefore did not fulfill the requirements that were set forth. The current page is very simple, not very attractive and there was not much information incorporated in the site for it to be considered fully developed. The webpage is very limited in it's functionality and it currently has only a few links

that actually works. The rest of the page contains static link buttons that share occupation of the page with plain text.

1. 2 Existing Page



2. Problem Statement

NJHSTSC presented us with some key features they wished to incorporate in the design of their web page. We took those features and split them up into categories to facilitate the job. One of the main features they want to have is a dynamic web page. They would like the page to incorporate the various projects they run, various phases of the projects and display some information they have about users of their web page.

NJHSTSC presented us with the Web page that was created prior to us taking over the project. After careful reviewing, we decided that the current page was not at all what the sponsor wanted. In fact, the sponsor used it as a taboo for our new page. The problem with the page was that it was very static, simple and very unattractive. So, with the leadership and instructions of our sponsor our group decided to discard this page, as it would not fit our view of an innovative site. Instead, we decided to start with a clean slate and design the page from scratch.

Not only did the sponsor request a web page, they also requested that a database be connected on the back-end as well. The page will display the basic information about the Center. It will have different menus that will highlight the many different aspects such as SYSTEM INTEGRATION, PROJECTS, and OPERATIONS AND TEST EVALUATION. These menus will be drop down menus, thus creating a highly technological feel with a sharp cutting edge look.

The page was originally supposed to be divided into two main sections. One section would have been referred to as the public domain. Which would not require passwords and the other section would be referred to as a private domain, which would require a password. The NJHSTSC decided that the best approach would be to open the page up to anyone who cared to view it.

The NJHSTSC wanted to create a forum and chat room in order to have real time communication with visitors of their site. This gave members the opportunity to discuss and reference certain areas of the page without actually leaving the site. By incorporating the forum on the page it also creates a more structured approach to the user's set of ideas.

The database will host information about the users and multiple projects. The only person(s) that can modify the contents of the database in any way will be the administrator. The administrator has the option of allowing certain people to become members by reviewing an online application form that will be created as well. This form is then sent to the administrator(s), and the administrator(s) then is able to accept, deny or hold the user application. If the user is denied then an email will be sent to them notifying them that they have not been granted access to those sensitive links. We have automatically established temporary passwords for those affiliates who will have immediate access to all areas of the site. These affiliates will have the option of changing their password at a later time.

The project section of the page will display the projects current status as well as its development. This information will also be a part of the database. Like

the user information, the administrator(s) is the only one who has access to change this area. However, regular users will be able to comment on these projects.

NJHSTC has entrusted us with the job of creating a dynamic and user-friendly site for their organization. We as the capstone group will do our best to fulfill the sponsor needs and hopefully exceed them.

3. Project Histories and Front-End Implementation Information:

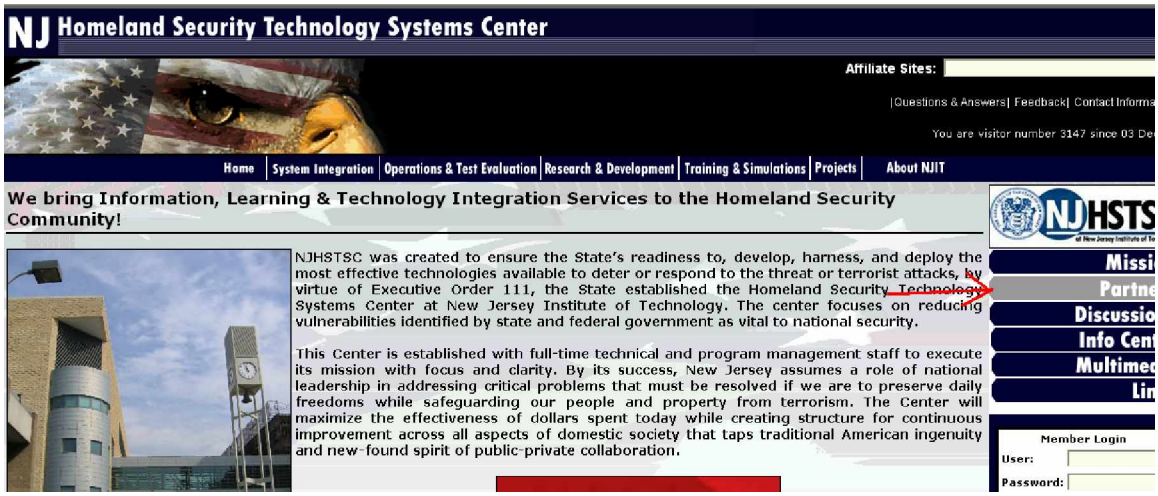
Current Interface:

After typing the URL of the site, the following window will display the homepage of the New Jersey Homeland Security Technology Systems Center web site.

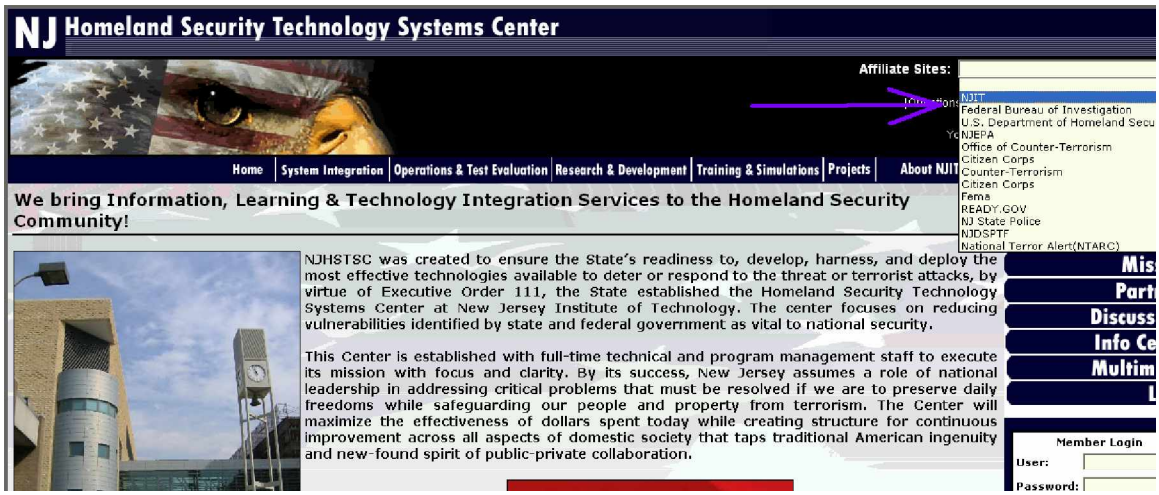
Each page from the Homeland Security Technology Systems Center website interface will contain the top main menu indicated by blue arrow, right-sided subordinate menu indicated by red arrow and the Member Login option indicated by the green arrow. We wanted to make this website very user friendly so we kept the main menu at the top and the secondary menu at the side. This way user does not have to search all over the page to access a menu or try to log on.

The top main menu features mouse-over drop down menu options for each topic except **Home** and **About NJIT** options since the homepage does not have any subclass of those topics.

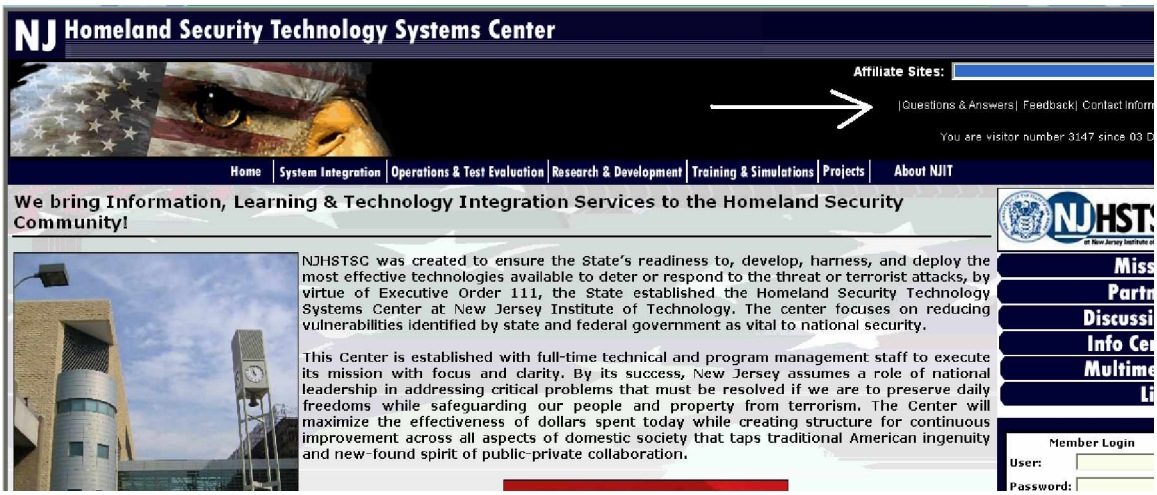
The red arrow on the following indicates the mouse-over highlight feature of the 2nd menu on the right side of the screen.



The purple arrow indicates the third menu option available for user. This menu option allows user to visit HLS affiliated sites.

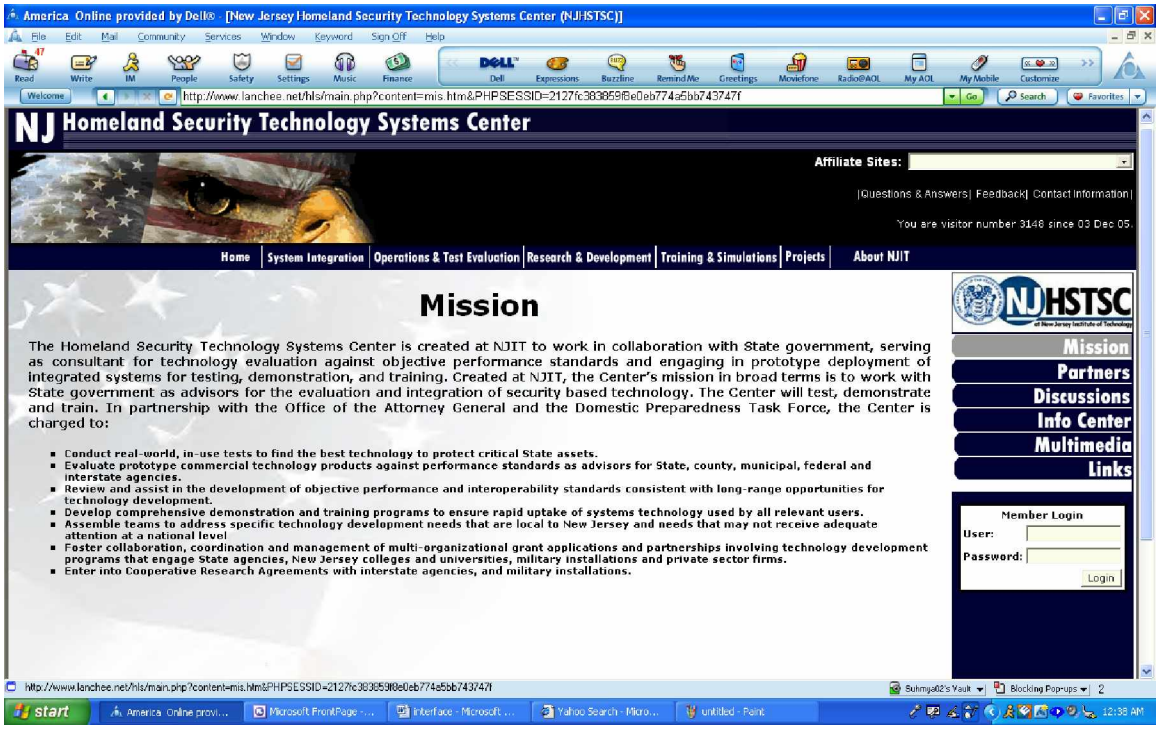


The white arrow on the following screen points to the fourth menu which enables users to find answers to questions, provide feedback or contact HLS for information. Authorized users will also be able to interact with the public users. This feature is available for interactions between the authorized and the regular users. This menu features the following options: **Questions & Answers**, **Feedback**, **and Contacts**.



At the lower part of the **Home** page, we have included current articles and news relating to Homeland Security:

The following window will display the **Mission** page when the user clicks on Mission on the secondary right side menu. This page just states the mission for NJ Homeland Security Technology System Center:



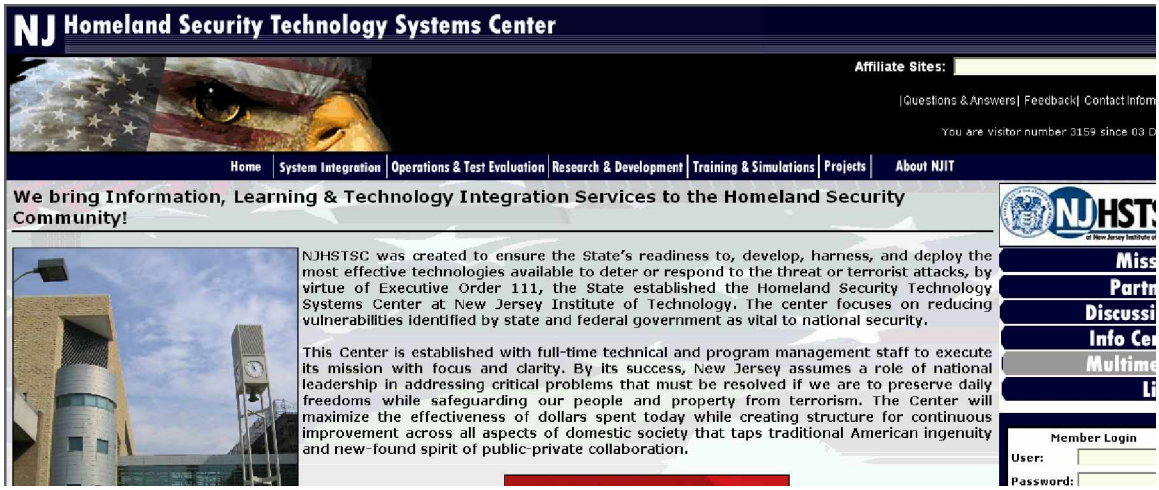
The following is the **Partners** page when the user chooses the topic on the right side menu; this page contains all the links and logos of all affiliated partners of Homeland Security:

The following is displayed when the user chooses **Discussion** option from the right side secondary menu. This feature allows all users to communicate and discuss issues or concerns that are relating to Homeland Security and operations, etc:

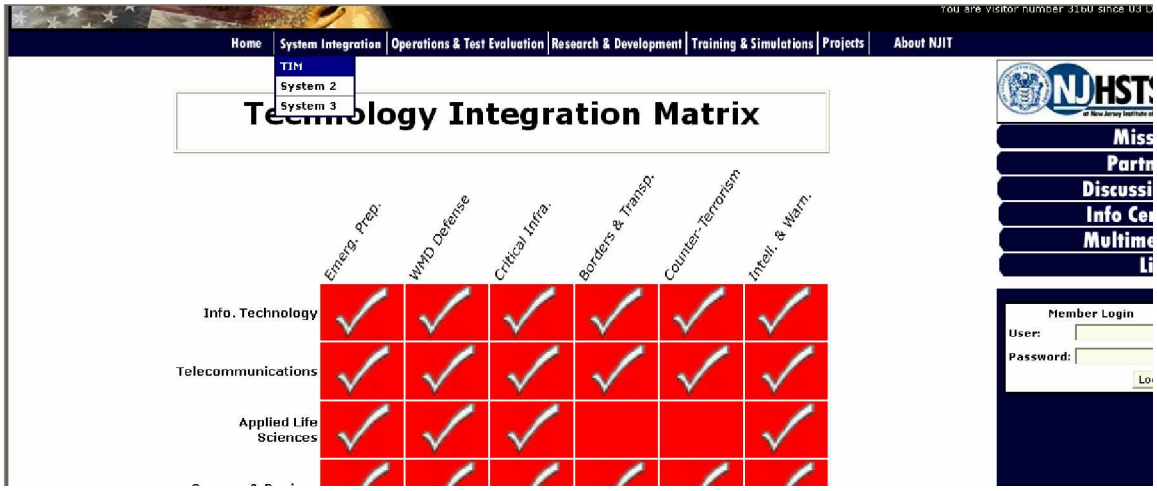
The following page displays event information and agenda taking place or will take place relating to Homeland Security and such as its partners. This page is displayed when the user chooses the **Info Center**:

The following are all the links related to the Homeland Security and its affiliates under the **Links** option on the right side secondary menu:

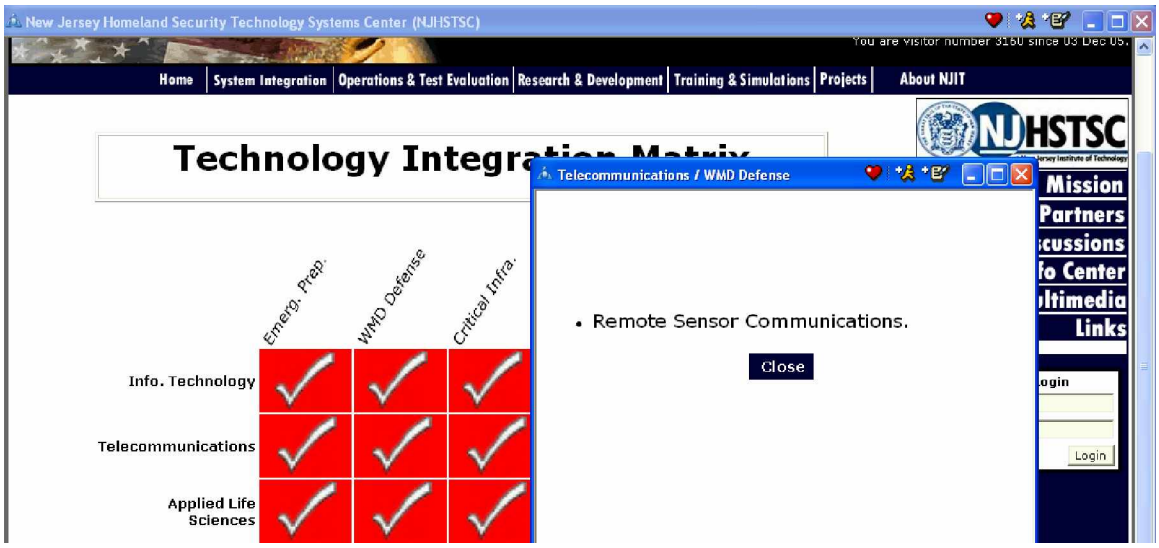
The following is **Multimedia** page. This page will be used to house any type of Multimedia such as flash presentations they wish to incorporate on their site. The next capstone team will do these additions. Since there is no information, the default is the information on the home page.



The following is under the **Systems Integration** option from the main top menu, under the **TIM** link. This is a matrix chart and each check on the grid can be clicked on to take the user to the information regarding the matrix.



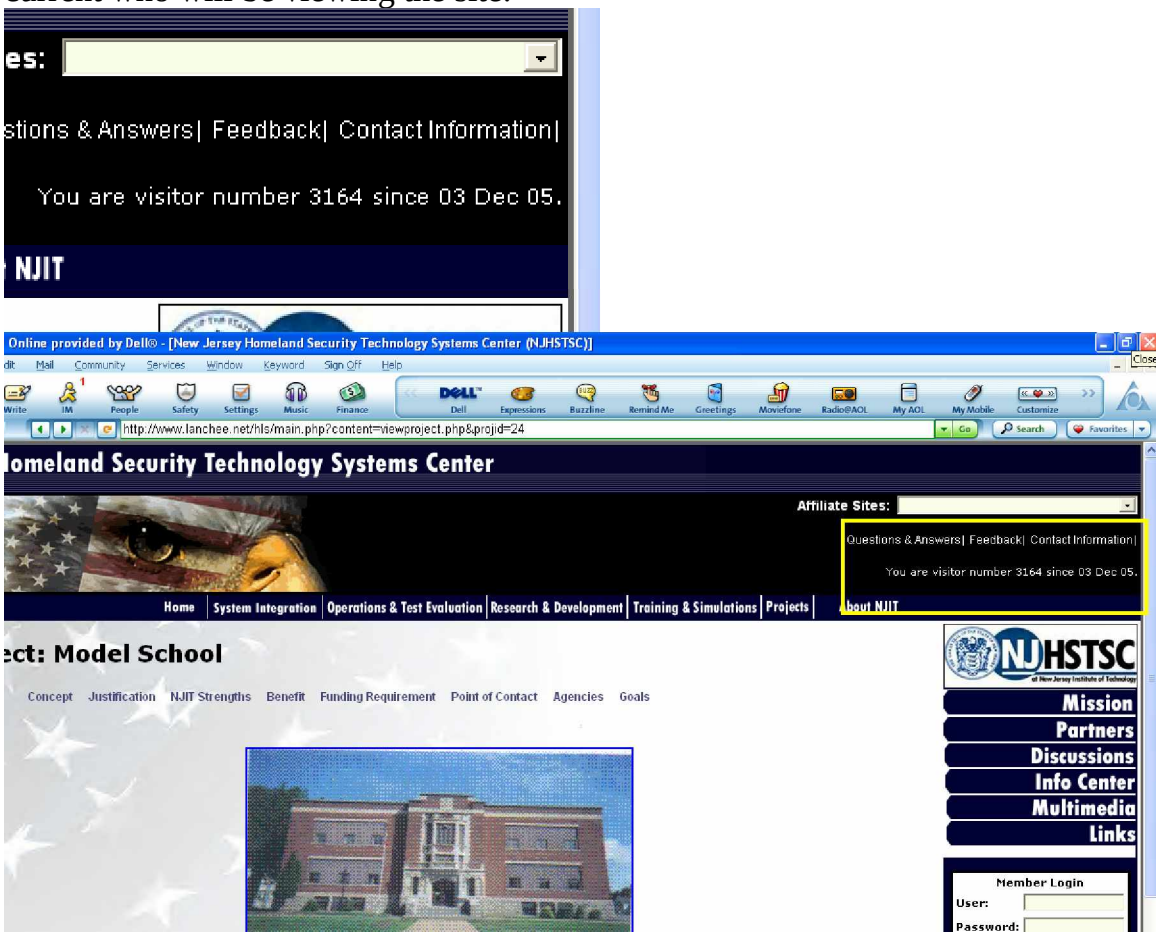
The following is what a user will expect if they click on a particular matrix.



The following is what a user will see when they choose on **Project** options from the top main menu and choose the **Browse all Projects** link:

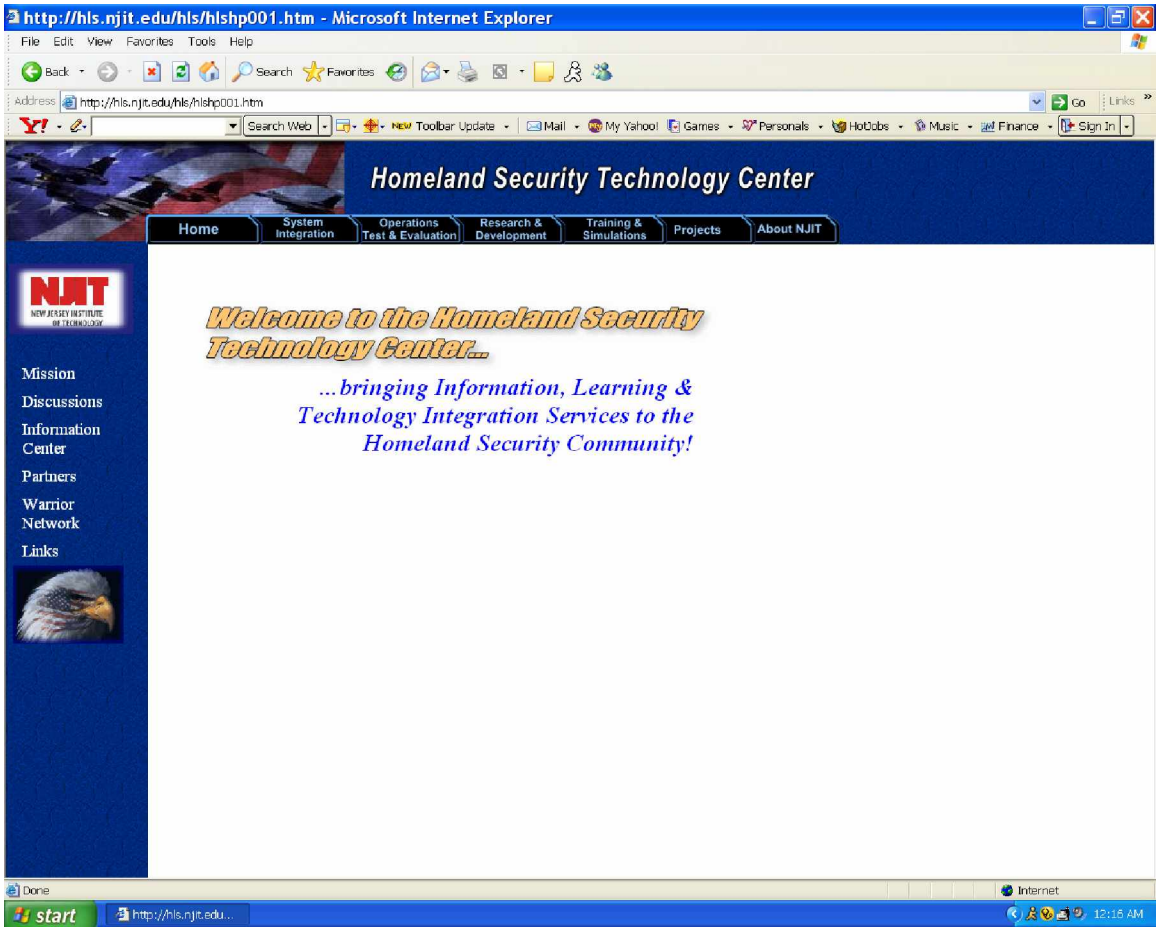
The above page can be accessed by any users to view all the projects conducted by the Homeland Security team and if the user clicks on the project title, the user will see information about that particular project which is the following window:

Each page will have the following feature indicated with the yellow box and zoom in of telling the user the number status of that site viewed by past users up to the current who will be viewing the site:



Previous Interface:

The following interface was the initial design of the New Jersey Homeland Security Technology Center website. This site lacked many important dynamic features such as the drop down menu, graphics, sponsor logo, user login section, user feedback section and the affiliated link menu. As displayed below this design layout lacked sophistication and distinguishing attractiveness. Most importantly the site was very plain and lacked the necessary dynamic features for information display.



The following is the first modified design layout. This was a basic a prototype so none of the features worked. This layout lacked any background conformity, thus, the page looked out of place. The layout made the information that was required for the site to look very unorganized. The second menu is on the bottom of the screen, which would make a user scroll down to locate the menu. This is not practical because the user would never realize there are other options on the page unless they happened to scroll all the way down. Another problem with this prototype was the distortion of images. In order to maintain a professional looking site the icons and images needed to be perfect.

The following are some of the test designs that were put together. None of these designs were chosen because they were unattractive, unprofessional and lacked a sleek look.

MISSION

DISCUSSIONS

INFORMATION CENTER

PARTNERS

WARRIOR NETWORK

LINKS

MISSION

DISCUSSIONS

INFORMATION CENTER

PARTNERS

WARRIOR NETWORK

LINKS

As we met with our sponsors, we discussed each design prototype. Little by little our site evolved into a sophisticated and user-friendly site that accomplished all the requirements and features that were requested.

The following design layout contained multiple dynamic features. One example is the mouse over drop down menu. We agreed that the secondary menu on the left side of the screen was too generic. From this layout, we established the mouse-over highlighted menu. However, they were looking for a more modern looking page.

After routine discussion, and JAD sessions, we were able to modify the design and add more features according to our sponsors request and needs. Since the page contained frames the information appeared more organized.

At last our final improved design was implemented. Compared to the initial design, we still kept the patriotic look with the American flag on the eagle's eyes. The eagle is magnified and only the eye part is displayed to make it seem watchful for the theme that it is watching over our country. Since the site is more of informative content rather than entertainment, we cut down on unnecessary use of graphics and pictures and kept it simple but dynamic. We used translucent effect of an American flag to tone out the dark color used around the body of the page. All the menus are dark navy blue color while the back wall for the main header is black. All the dark colors tones out with the rest of the page. Thus, our page looks contemporary and because of all the cool features, it makes the website very dynamic.

4. Work Breakdown Structure:

Work Breakdown System	Start Time	End Time	Allocated person(s)
PROJECT INITIATION			
Initial project selection	8/10/2005	8/10/2005	Ranya
Complete Group Formation	8/10/2005	9/13/2005	Group
Problem Statement	9/21/2005	9/21/2005	Group
Information gathering	8/10/2005	12/5/2005	Group
Assigning group roles	8/10/2005	9/13/2005	Ranya
Scheduling of meetings and deadlines	9/13/2005	12/5/2005	Ranya, Sandra
PROJECT PLANNING			
Putting together the features List	9/27/2005	9/27/2005	Ranya
Feasability Study	9/21/2005	12/1/2005	Scott, Rouell, Ryan
Identifying users of site	9/21/2005	9/21/2005	Group
Distributed Questionaire to sponsor	9/21/2005	9/21/2005	Group
Determining Objectives of Page	9/21/2005	9/21/2005	
Desiging Front page	9/21/2005	12/1/2005	Ryan
Incorporating ideas/Creative Brainstorming	9/21/2005	12/1/2005	
Outlining Strategy and approach of DB	9/21/2005	11/15/2005	Scott and Rouell
Outlining Strategy and approach of Web Page	9/21/2005	11/15/2005	Ryan
Creating Prototype of Page	9/21/2005	9/28/2005	Ryan
Creating mock prototype of DB	10/3/2005	10/6/2005	Scott and Rouell
Desiging DFD for DB	10/3/2005	10/6/2005	Scott and Rouell
Risk Management	10/6/2005	10/6/2005	Muntaha
Risk Minimization techniques	10/6/2005	11/1/2005	Group
Creating Scheduling and Design Strategies	9/27/2005	10/6/2005	Ranya, Sandra, Muntaha
SYSTEMS ANALYSIS			
Stakeholders Identification	10/7/2005	10/7/2005	Ryan, Ranya
Gathering Requirements	9/21/2005	12/1/2005	Group
Documenting requirments	9/21/2005	12/4/2005	Group
Setting naming conventions	10/3/2005	10/6/2005	Scott and Rouell
Determining Navigation	9/21/2005	11/20/2005	Ryan
User information	9/21/2005	12/1/2005	Scott and Rouell
Creating Flash and Audio	put off for spring	put off for spring	Ryan, Rouel
SYSTEM DESIGN			
Considering Web/DB integration	on hold	on hold	Scott, Rouell, Ryan
Navigation Control	on hold	on hold	Ryan
Passwrod Links	not a requirment anymore	on hold	Scott, Rouell, Ryan
Chat Room	10/13/2005	11/14/2005	Scott and Rouell
Message board	on hold	on hold	Scott and Rouell
Ease of adaptation and administrative control	11/15/2005	12/5/2005	Scott and Rouell
Quality Assurance	9/21/2005	12/5/2005	Sandra
SOFTWARE TESTING			
Functional Test	9/21/2005	12/4/2005	Scott, Rouell, Ryan,Sandra
Performance Test	9/21/2005	12/4/2005	Scott, Rouell, Ryan, Sandra
Visual Stimulation Test	9/21/2005	12/4/2005	Group
Sponsor Acceptance Test	9/21/2005	12/5/2005	Group
Implementation Test	11/2/2005	11/3/2005	Scott, Rouell, Ryan, Sandra
Integration Test	on hold	on hold	Scott
Testing Usability	9/21/2005	12/4/2005	Group

5. Time Management:

5.1 Project Team and Roles

Project Manager: **Ranya Tawfik**

- Selection of the initial project.
- Helping with the gathering of requirements.
- Contribute in the documentation and deliverables.
- Make sure that those members who should be collaborating are collaborating.
- Completing progress reports on a sprint-by-sprint basis.
- Always keeping the lines of communication open.
- Listening to group members and collaborating with them as well.
- Organize the group with respect to:
    - Meetings
    - Project Deliverables
    - Presentations
    - Documentation
    - Deadlines
    - Relaying appropriate information to the sponsor

Quality Assurance Specialist: **Sandra Silva**

- Taking the minutes at sponsor meetings.
- Contributing with documentation.
- Contributing with pictures for the web site.
- Contributes in the requirements gathering,
- Assists the Project Manager.

Chief Architect/ Web Developer: **Ryan Chen**

- Designs the overall look of the web site.
- Incorporate all features in the site as dictated by the sponsor.
- Create Flash and Audio components for the site.
- Explore creative and innovative features to include in the site
- Research aspects of web pages.
- Help in the integration of the database with the site.
- Ensure ease of navigation throughout the site.
- Ensure that the look is modern and sleek
- Setup a password area on page as well as a hit counter
- Make the appropriate modification as set forth by sponsor and team members
- Conduct feasibility studies.

Assistant to the Web Developer: **Muntaha Ahmed**

- Assist the web developer in all aspects of the site.
- Assists in the documentation
- Assists in finding pictures for the site.
- Develop the risk management categories and evaluate how they effect or project.

Chief Architects/ DB Developers: **Scott Vivianni**

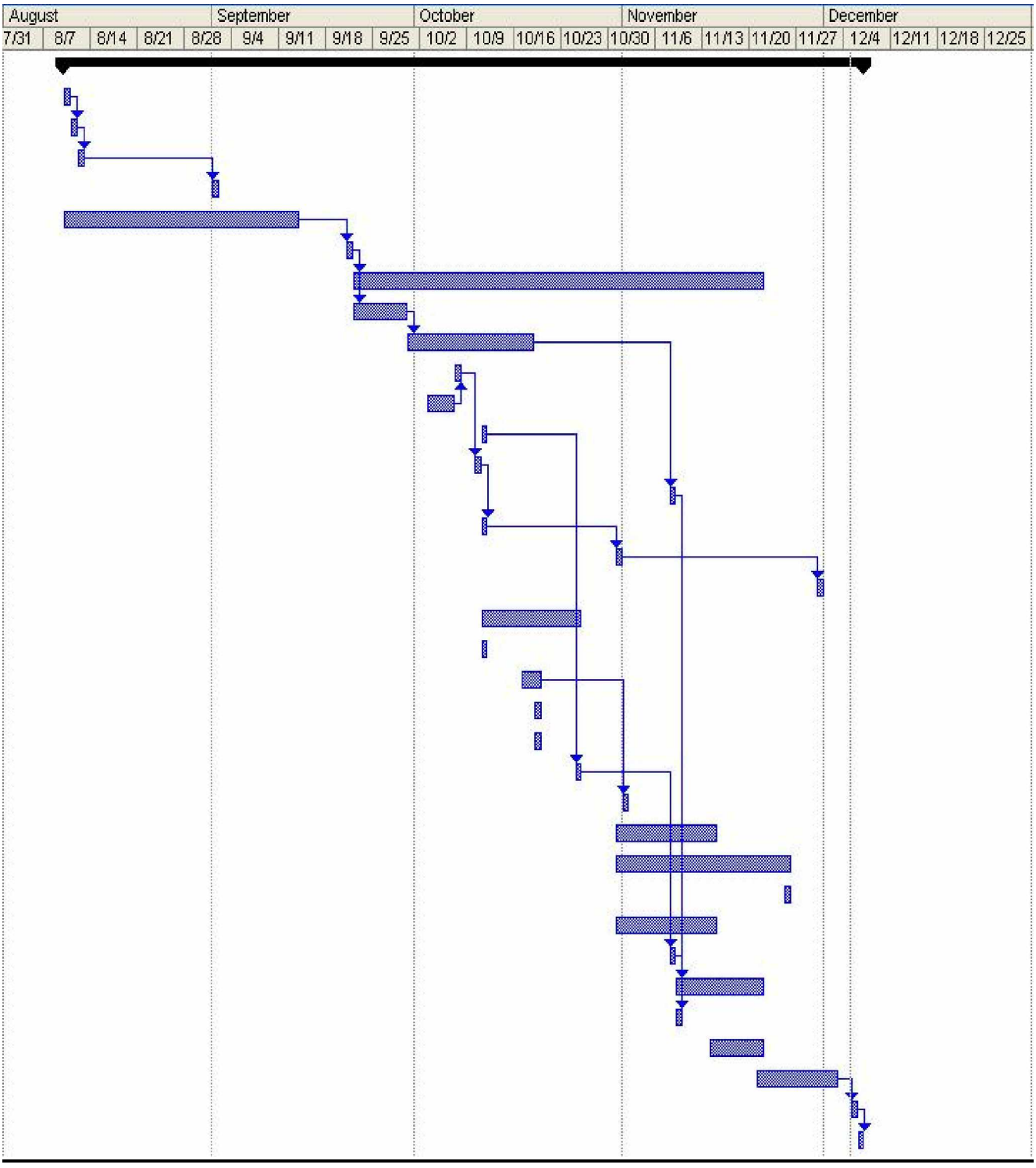
Rouel Lanche

- Conduct feasibility studies.
- Outline different strategies and approaches to the development of the site.
- Design and Develop DB.
- Incorporate all features in the DB as dictated by the sponsor.
- Create Prototypes
- Help in the integration of the site and DB
- Make sure that all links that should be secure are secure.
- Designing the sequence diagrams.
- Communicating with the web developer to ensure ease of integration.

5.2 Gantt Chart

Task Name	Duration	Start	Finish	Predecessors	Resource Nar
Critical: No	**85 days**	**Wed 8/10/05**	**Tue 12/6/05**		
Initial Project Selection	1 day?	Wed 8/10/05	Wed 8/10/05		
Meet with sponsor for the first time	1 day?	Thu 8/11/05	Thu 8/11/05	1	
Choose the first member of the group	1 day?	Fri 8/12/05	Fri 8/12/05	2	
Showed first prototype in meeting	1 day?	Thu 9/1/05	Thu 9/1/05		
Selection of the rest of the group members	25 days?	Wed 8/10/05	Tue 9/13/05		
Kickoff meeting with the sponsor w/all members of the group	1 day?	Wed 9/21/05	Wed 9/21/05	5	
Requirements gathering	43 days?	Thu 9/22/05	Mon 11/21/05	6	
Planning and designing of initial prototype for web page	6 days?	Thu 9/22/05	Thu 9/29/05	6	
Continued Planning and designing of webpage	13 days?	Fri 9/30/05	Tue 10/18/05	8	
Test all features up to date	1 day?	Fri 10/7/05	Fri 10/7/05	11	
Documentation for sprint 1	4 days?	Mon 10/3/05	Thu 10/6/05		
Sprint 1 presentation	1 day?	Tue 10/11/05	Tue 10/11/05		
Requirements gathering	1 day?	Mon 10/10/05	Mon 10/10/05	10	
Continued Planning and designing of webpage	1 day?	Tue 11/8/05	Tue 11/8/05	9	
Find out the status of the server to begin backend prototype	1 day?	Tue 10/11/05	Tue 10/11/05	13	
Put unfinished web page up on the server	1 day?	Mon 10/31/05	Mon 10/31/05	15	
Began to use Rouell's space for the page because of security issues w/serv	1 day?	Wed 11/30/05	Wed 11/30/05	16	
Backend prototype planning and designing	11 days?	Tue 10/11/05	Tue 10/25/05		
Meet w/ sponsor to discuss back and front end dsign and project progress	1 day?	Tue 10/11/05	Tue 10/11/05		
Begin the design of the flash intro	3 days?	Mon 10/17/05	Wed 10/19/05		
Test all features up to date	1 day?	Wed 10/19/05	Wed 10/19/05		
Meet with sponsor to discuss server and database issues	1 day?	Wed 10/19/05	Wed 10/19/05		
Sprint 2 presentation	1 day?	Tue 10/25/05	Tue 10/25/05	12	
Decided not to have a flash intro	1 day?	Tue 11/1/05	Tue 11/1/05	20	
Designed chat room	11 days?	Mon 10/31/05	Mon 11/14/05		
Began developing DB	20 days?	Mon 10/31/05	Fri 11/25/05		
Test all features up to date	1 day?	Fri 11/25/05	Fri 11/25/05		
Designing Messageboard	11 days?	Mon 10/31/05	Mon 11/14/05		
Sprint 3 ends	1 day?	Tue 11/8/05	Tue 11/8/05	23	
Requirements gathering	9 days?	Wed 11/9/05	Mon 11/21/05	29	
Continued planning and designing of webpage	1 day?	Wed 11/9/05	Wed 11/9/05	14	
Developed web site Matrix	6 days?	Mon 11/14/05	Mon 11/21/05		
Project Testing	10 days?	Mon 11/21/05	Fri 12/2/05		
Final presentation to sponsor	1 day?	Mon 12/5/05	Mon 12/5/05	33	
Final presentation to class	1 day?	Tue 12/6/05	Tue 12/6/05	34	
Critical: Yes	**1 day**	**Thu 12/15/05**	**Thu 12/15/05**		
Begin integration of front and backend on the server	1 day?	Thu 12/15/05	Thu 12/15/05	33	

5.3 Gantt Layout



5.3 Pert Chart

To see the Pert chart please click here.

Conclusions:

The critical path shows the route of tasks that needed to be completed in that order at that time in order for the project to run as planned. Fortunately for us, there was not too much time for slack because of the many obstacles that our team faced. The first obstacle was not having access to the server. Then once we obtained access we realized that the server needed to be cleaned and modified in order to host the site without threat of being compromised or hacked into. Currently the site is being housed on Rouel Lanche's space where it will remain until we get the o.k. to integrate to the NJHSTSC server, which will be after the semester, has ended.

6. Risk Management:

6.1 Risk Definition:

Risk is defined as the probability of loss. Risk plays a huge part in the way we evaluate a project. Some risks can be overcome while others can null the feasibility of a projects progress. Our group has come together to identify and research some of these risks. We have taken the liberty organizing them in a way that they may be easily understood. Please find the explanation of the risk management diagram below.

6.2 Diagram Explanation:

The impact level is on a scale from 0-4. They are defined as follows:

- 0 being insignificant
- 1 being very low
- 2 being low
- 3 medium
- 4 high

Probability of Occurrence specifies the probability that this risk will or has occurred and the impact that it would have if it has or were to occur.

6.3 Risk Management Diagram:

Analyisis and Ranking of Possible Risks				
Phase	**Risks**	**Impact**	**Impact Definition**	**Probability of Occurance**
Initiation				
	Unclear of Sponsor's choice of features	4	High	Medium
	Unclear of design layout	3	Medium	Medium
	Not feasible	2	Low	Low
	Inadequate amount of information available	3	Medium	Medium
Planning				
	Inadequate risk management planning	2	Low	Low
	Hasty planning	3	Medium	Low
	Poor specification	4	High	Low
	Poor time management	4	High	Low
	Poor role definition	0	Insignificant	Insignificant
	Inexperienced team	0	Insignificant	Insignificant
Execution/Implementation				
	Changing of requirements	3	Medium	Medium
	Team members schedule differences	3	Medium	Medium
	Unskilled labor	4	High	Low
	Tools development	3	Medium	Low
	Future change implementaiton enabling	4	High	Low
	Bad weather	2	Low	Low
	Database Problems	4	High	High
	Server Problems	4	High	High
Implementation				
	Not user-friendly	4	High	Low
	Data overflow	3	Medium	Low
	Unfunctional Features	4	High	Low
	Sponsors expectations not met	4	High	Low

6.4 Risk Minimization:

In order that we may minimize risk our group holds weekly meetings with the sponsor to ensure that all features are being abided by and that the project is going according to planned. There are times when the project gets held up because the group is waiting for feedback or information from the sponsor. In addition to physical contact we have continuous contact with the sponsor via telephone and e-mail. The group in our e-mail, phone or personal meetings immediately addresses issues that occur.

6.4.1 Risk Minimization Chart:

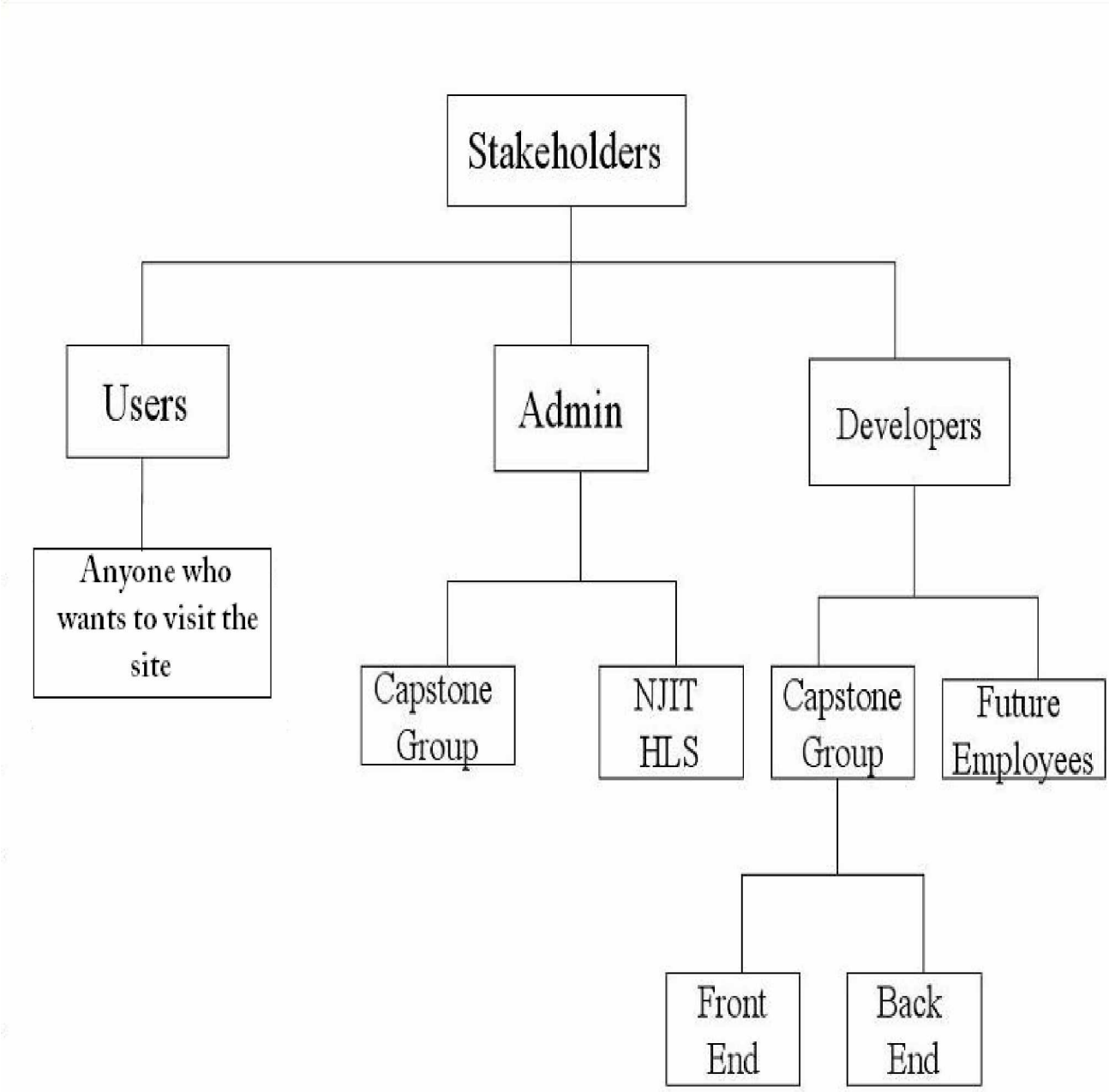
Inadequate amount of information available	The group formed focus groups with the sponsor to pinpoint the exact features and the best design to better suit all the stakeholders involved.
Unclear of Sponsor's choice of features and design layout	The group made sure that the information needed for the different phases of the project was conveyed early to the sponsor so that the sponsor could produce the additional information in a timely matter in an effort not to hinder the team's progress.
Poor Specification	The group kept written documents and also voice recorded JAD sessions with the sponsor so that all specifications of the sponsors requirements and expectations were cared for.
Poor time management	The project manager kept detailed Gantt and Pert charts and saw to it that the group and sponsors were staying true to all deadlines so that the group could continue to make progress and meet milestones on a timely basis.
Hasty Planning	By implementing the FDD process hasty planning was eliminated by the

	repeated delivery of working software so that the sponsor could give feedback each meeting and witness the evolution of the system.
Changing of requirements	The FDD process of spiral development made it so that if the sponsor changed requirements the group would find out about it quickly so that the software developers can make the necessary changes and present them by the next meeting.
Team member schedule differences	The team was forced to make sacrifices and change work and class schedules so that the entire team can meet with the sponsor once or even twice a week
Unskilled labor	The software development spent time reading up on and experimenting with available technologies that would best suit the requirements of the system.
Tools development	The group formed focus groups based on skills and experience to create tools that are both effective and user friendly.
Future Change	The software developers implemented a system that is purely dynamic so that the sponsor can easily change or add pages in the future.
Database and Server Problems	The solution to database and server problems was outside the scope of the group. While the sponsor worked to get a working server and a database license, the group developed the prototypes on a third party server and database.
Data Overflow	The group fine-tuned the user interface in accordance with modern ergonomic standards to engineer a user interface that does not overwhelm the user with information.
Not User Friendly	The group formed focus groups with the sponsor to discuss other user-friendly designs and then developed a user friendly/oriented design for the system.
Unfunctional Features	Software developers researched and

	experimented with technologies so that features would have all the functionality required by the sponsor.

7. Stakeholders:

7.1 Stakeholders Graph:



7.2 Stakeholders Definition:

Admin:

Sponsor (NJIT HLS):

Homeland Security has sponsored our team to develop a website that focuses on reducing vulnerabilities identified by State and Federal government as vital national security: intelligence and warning; border and transportation security; protecting critical infrastructure and key assets; emergency preparedness and response; and defending against catastrophic threats and domestic counter-terrorism. The sponsors will play an active and very important role in the development of the system. Their participation will define specific requirements and expectations to successfully implement this system.

Capstone Group:

The students that make up the group will play a key role in developing the system to meet the needs of Homeland Security. It is their responsibilities to meet with the sponsor to ensure that the system will meet their criteria and in the future become the administrator of the website. Students will be required to maintain the website throughout the project.

Users:

The users of this page are anyone who want to visit the website. It can be an affiliate that is already stored in the database or it can be anyone surfing the web that would like to get some information on the different projects and events that are going on.

Developers:

Capstone Group:

Front End/ Back End:

The Front and Back End Designers are those group members that develop the actual project. Their main duties are as follows:

- Design well-structured and user-friendly system
- Use of scripting languages to create the system
- Implement all requirements provided by the sponsor
- Front-End / Back-End must collaborate together
- Developers must meet the needs of quality assurance specialist

Future Employees:

Future employees are those who will be hired by NJHSTSC to keep up the site and the database. Future employees may incorporate the spring capstone group.

8. Requirements Gathering:

Throughout the construction of the project the group has used various requirements gathering techniques. One of the first techniques we used was a detailed structured interview. Interviewing is one of the central ways analysts gather information about an information system project. Early in a project, an analyst may spend a large amount of time interviewing people about their work, the information they use to do it, and the types of information processing that might help their work. The group developed an open-ended structured interview for the sponsor to examine before we had our initial meeting. The group was interested in getting the questions out quickly so the group could get answers about what the sponsor's vision were for the project. The questionnaire also asked technical questions about the technologies the sponsor had available for the group to use. This was a main concern for the programmers of the group so they could get a head start on any technological learning curves that would have to be addressed throughout the development of the project.

8.1 Structured Interviews:

On the first meeting we presented the sponsor, Mr. Tokle, with some basic questions about the project and the design of the project.

Wednesday September 21, 2005

Homeland Security Capstone-Project

Questions/Concerns (Technical)

1. What platform will host the site (windows or UNIX BASED?)

(I recommend .NET framework support and Microsoft SQL because it's easy

to use and threes a lot of resources available on it, but I'm comfortable in Unix too)?

2. Who will be using the site (Case Use)?

3. Will there be any dynamic content at the site (besides message board, chat, and affiliate website linkage)?

4. What does he think about the Katrina stuff Prof. Eljabiri wants included. Any ideas about an entry point for it, and what it consists of?

5. Who will be taking care of the hosting of the site (registering domain names, dealing with hosting company, us or Him)?

6. Is it possible to house the server on campus or someplace where I

Can administer the database (I can do it remotely too of course but it's easier when your working right on the host machine)?

7. Where is this site going to be in a few years (what will it offer, who will be using/administrating it)?

8. Will this be a user strict type message board (where users have to be registered users with a valid email address to post messages)?

9. Could you define the roles of the users?

Examples would be:

1) Roles of the web administrator

2) Roles of the visitor of the site

3) Roles of members of site

*This would be useful for the first deliverable because we can use this information to create use case diagrams.

10. Will this site be placed on its own web server?

11. What web technologies will be available to us (PHP/ASP/Cold fusion)?

12. What database servers are available for use (MYSQL/ORACLE/Microsoft SQL Server)?

13. What specific Admin tools would you need?

-Editing Tool, which will edit content on a specific webpage or add links

-Notification system to alert system users of outages or to send special announcements

-upload files to the web server

14. Is there a need to create the site more attractive in order to increase site traffic?

15. How important is the load time of the site? What would be the ideal load time for all connection types?

16. Who are the target audience for the site?

17. In the future, do you believe it will be necessary to create user logins in order to create customizations for the users?

18. Will there be multimedia content on the website?

19. Would there be any reporting needed to be done; i.e. Reporting on how many times a user logs in?

20. What are the security issues that must considered when creating the database and configuring the web server?

Questions/Concerns (Overall Scope)

1. What do you want the web page to do (accomplish)?

2. What do you not want the web page to do (consist of)?

3. What is the whole purpose of the site?

4. What types of specific features would you like to incorporate in the site?

i.e. –icons (animation)

-Flash

-password driven security sections

-Hit counter

-announcements page

5. What type of expandability would you be looking to incorporate in your site.

-what should we take into consideration when constructing the site and database

THINGS WE NEED

-Logos of affiliates

-Names of affiliates for the database

-color codes for the logos

-titles of all links

From this initial questionnaire we were able to understand the concepts and what the sponsor was trying to accomplish with this project. This questionnaire gave us the raw data that we needed in order to begin the development of our project

Interviewing is one of the central ways analysts gather information about an information system project. Early in a project, an analyst may spend a large amount of time interviewing people about their work, the information they use to do it, and the types of information processing that might help their work. The group developed an open-ended questionnaire style interview for the sponsor to examine before we had our initial meeting. The group was interested in getting the questionnaire out quickly so the group could get answers about what the sponsor's vision was for the project. As a group we interviewed the sponsor, Mr. Tokle to clarify and obtain more information about the webpage.

8.2 JAD Sessions:

The group engaged in several JAD sessions with the sponsor. JAD stands for joint application development, which can be defined as a structured process in which users, managers, and analysts work together for a series of intensive meetings to specify or review system requirements. In these JAD sessions, we would always have a scribe, who would take down notes for the meeting and later e-mail them to the whole group including the sponsor. The JAD

sessions consisted of the group showing the sponsor the current updates, modification, and innovations of the webpage, the sponsor then stated his ideas and dislikes. The JAD sessions helped to synchronize both the group's vision and the sponsor's vision of the finished product while adding beneficial features along the way

In our JAD sessions we would always make sure everyone could attend, and in those sessions where not all members were presented, we always had at least one member in charge of the database (Rouel or Scott) and one member responsible for the design of the webpage (Muntaha or Ryan) were present at all meetings. The project manager and the quality control were also present at the meetings. Each member would pose questions and input their ideas to the sponsor and from those we would get feedback in order to start developing the project.

The Project Manager would take the role of the facilitator since she was in constant contact with both the sponsor and the team. She would comprise a list of issues from both sides and bring them up in the meetings so that they may be resolved in an organized fashion.

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MEETING MINUTES

Meeting Title: _2nd meeting__ Meeting Time: 3:00pm

Meeting Location: NJIT Date: September 28, 2005

Note taker: Sandra Silva Timekeeper: Scott Vivianni

Attendees:

Ryan Chien – web developer
Sandra Silva – quality control
Ranya Tawfik – project manager
Scott Vivianni – database developer
Arthur Tokle - sponsor
William Marshall - sponsor

Meeting Started at: 3:05pm

Mr. Marshall by explaining what were the key elements that he wanted to incorporate in the website

Key element – user friendly

Security issues

Page will be mainly for use of other entities

Logon and password

Cookie capture

Hit counter

Be able to see how many times a person accesses the page

Matrix for products

To demonstrate the readiness

status of project

"have we tried it"

Evaluation

Does it meet its design

Flash Intro

Intro at the beginning of the page with picture of Dr. Donald Sebastian

Music – Undecided about the song

Video of Dr. Sebastian speaking

We concluded that putting a video would be a problem when people try to access the page through a slow connection. Voice will stutter and picture would take too long to load

Users

Do not touch the database
They can add comments
The team suggested adding a forum

Difference between friends and visitors
Mr. Marshall suggested that the users that use the page mostly would have more friendliness

Database
Three databases need to be created in order to accommodate for the page's needs
User
Products

Future
Gen.Marshall believe that the page will become self supported
User will have to pay a fee to use the page
A look at marketing
Push information
Data mining

Ryan showed the existing page, only a few things have to be changed as per Mr. Tokle and Mr. Marshall
The matrix is too simplistic – looks more like a table
Make it more dynamic

Ranya suggested using the top ten posts as a way to monitor users. Everyone agreed, however this information will only be available to those with administrative access.

Database Issues
No authorization to set up database on NJIT. This issue was trying to be solved. Mr. Tokle and Mr. Marshall will get in contact with the person responsible in order for Scott and Rouel to start building the database
Mr. Tokle showed cardscan.com as an idea in order to implement in our user database.

Meeting ended at: 3:53pm

8.3 Exploratory Prototyping:

A throwaway prototype used to clarify project goals, to identify requirements, to examine alternative designs, or to investigate a large and complex system. We began by presenting a basic website. Exploratory prototyping was used to clarify requirements, discover desirable features of the target system, and encourage discussion of alternative solutions. The website was a bit innovative than the other that they currently had. From this model, the sponsor was able to tell us what they expected the website to look like.

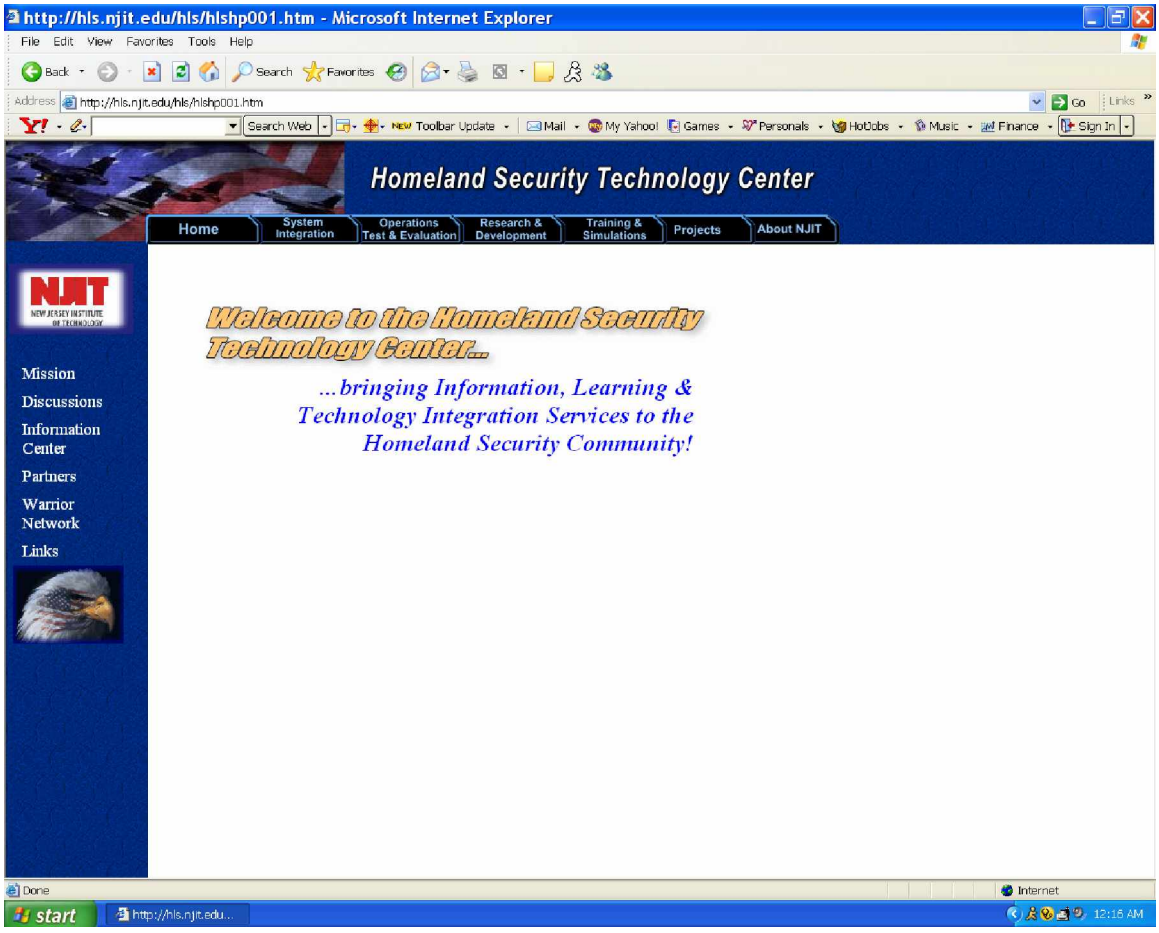


Figure 1: Original Page

Figure 1 shows the original webpage that was designed by a previous group had design. We used this page for the sponsor to give us feedback on what the previous group did accomplish and what they did not, thus providing a basis for our design.

Figure 2: First Design

We followed the concepts of improving the webpage according to the sponsor's standards. Here we did a basic design in order to incorporate the main goals. Once again this page was showed to Mr. Tokle, and the page was criticized and re-arranged. Different designs (Figure 3 & 4) were showed to our sponsor, and those too were used for the sponsor to express his ideas, by criticizing the page.

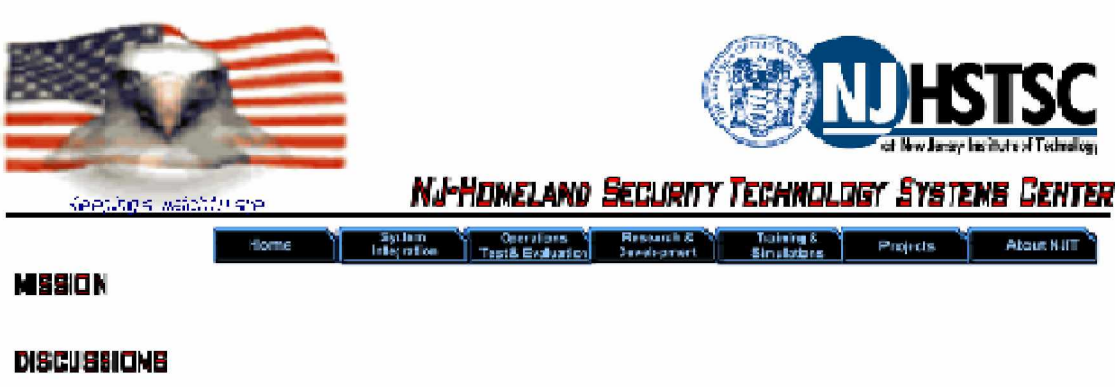


Figure 3: Design 3

Figure 4: Design 4

The group and the sponsor came to a consensus, thus to include the NJHSTSC logo and also an American eagle to represent the strength and patriotism of the center. We also decided with the approval of the sponsor to change the links from file tabs to menus with the mouse over creating a more dynamic look, as it can be seen in Figure 5.

Figure 5: Design 5

The page still went for through a few color schemes in order to provide a more appealing website. The group decided to change the menu bars to maroon on the left hand side and gray on the right hand side, however, the sponsor did not like the color scheme, and once more the page was changed.

Figure 6: Design 6

Finally we were able to understand all the sponsor's needs and thus create a new and final design with some simple alterations. The sponsor agreed to our new design and we proceeded in only creating some alterations and maintaining this design as our design.

Figure 7: Design 7

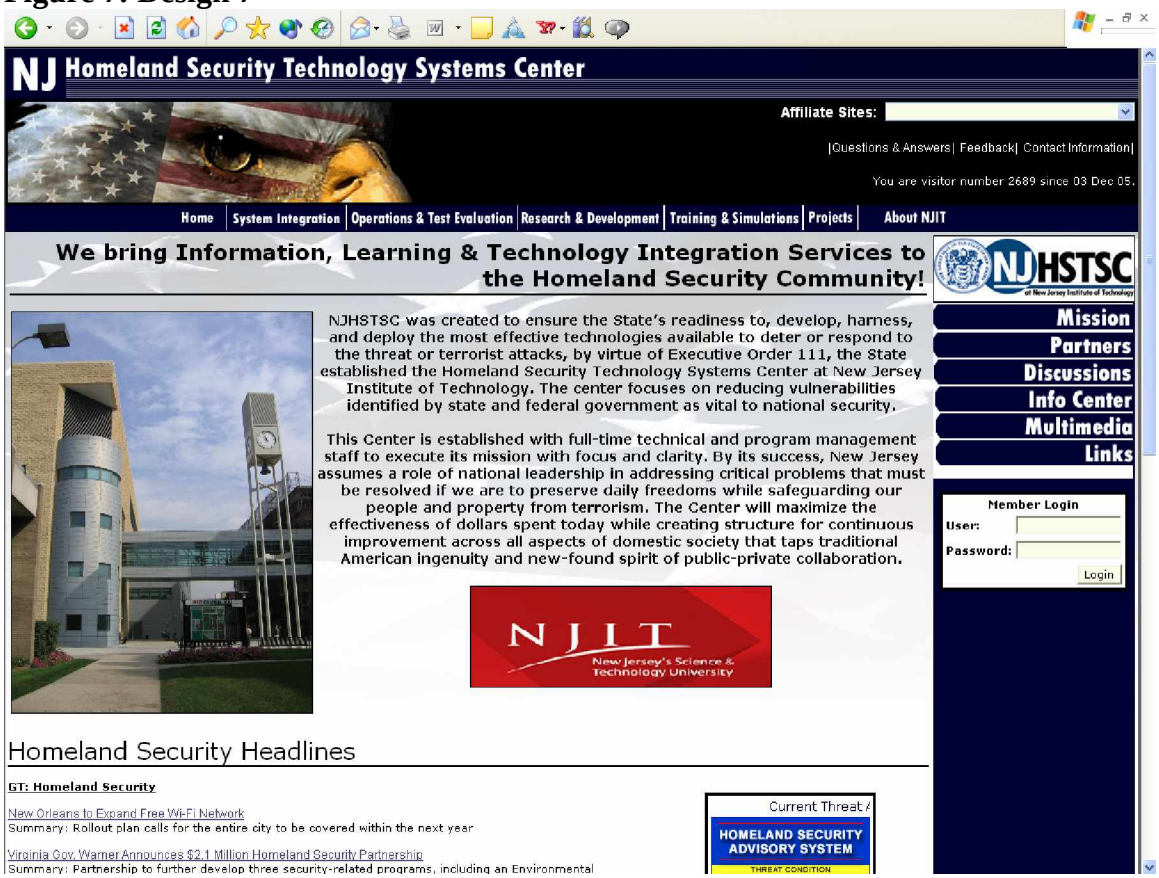
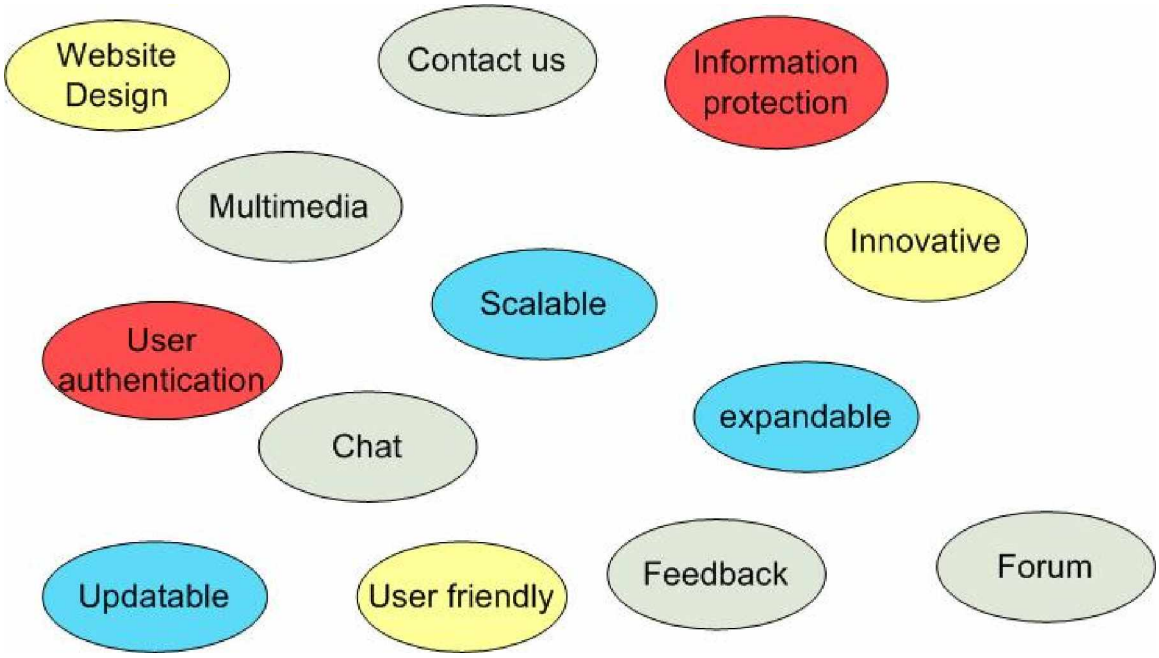


Figure 8: Final Design

The final design was the approved by the sponsor and only then did we begin to include all the content of the page, and finally finishing our work with the page design. Figure 8 shows the final design, where the new dynamic and innovative look can be seen.

8.4 Brainstorming:

8.4.1 Brainstorming

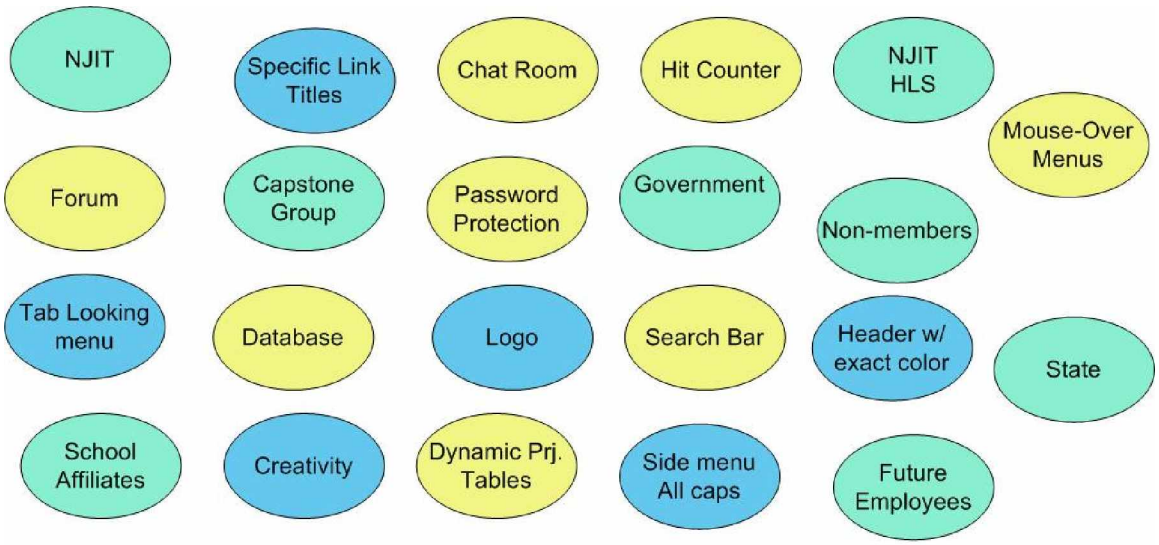


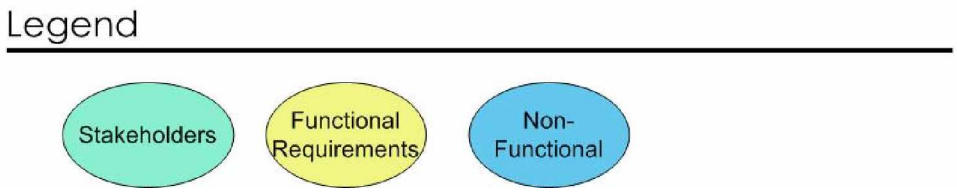
- Features
    - Chat
    - Multimedia
    - Feedback
    - forum
- Security
    - User authentication

- Information protection

- Future
  - Scalable
  - Expandable
  - Updatable

8.4.2 Brainstorming





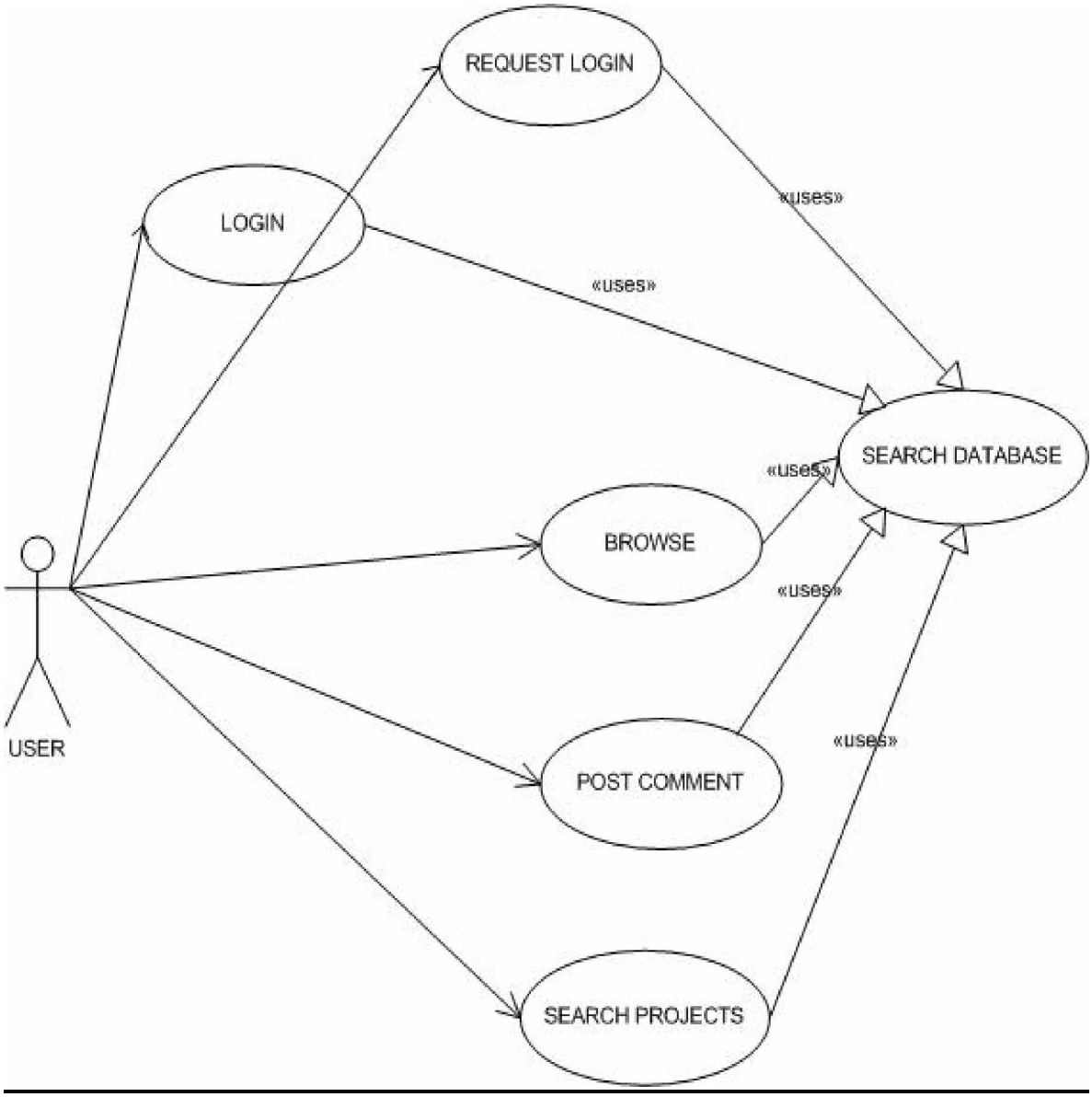
8.5 $100 Test:

The 100-Point Test is to prioritize the aspects of the webpage development. 100 points were distributed between all the users to see what aspects we needed to concentrate on. Here we took into consideration the higher score, standing for the most important aspects of the page. As the project developed and the sponsor needs changed so did the prioritization.

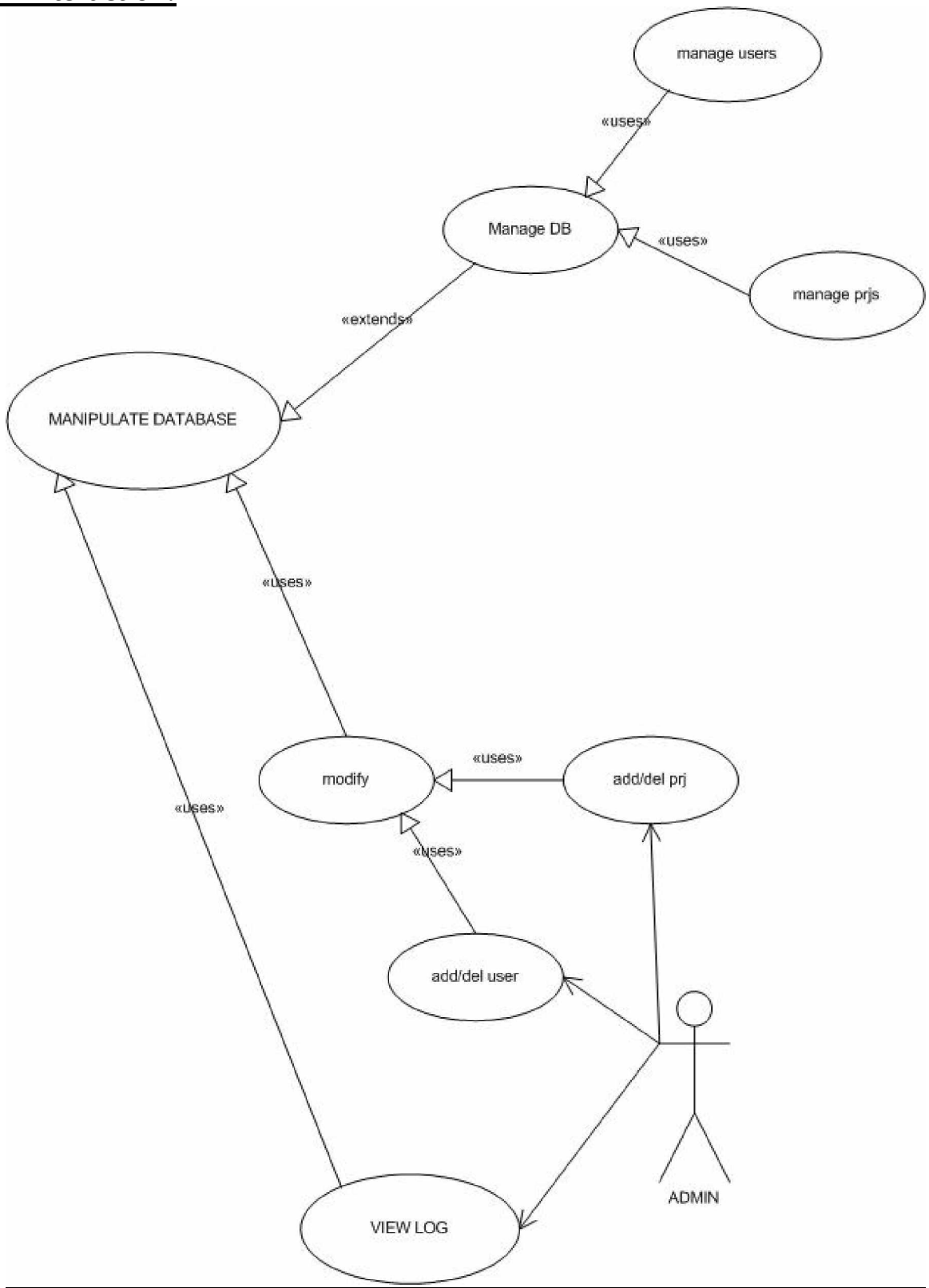
USER	SECURITY	REALIABILITY	EASY TO USE
Administrator	**35**	**30**	**35**
Member	**20**	**40**	**40**
Non-Member	**10**	**45**	**45**
NJIT	**20**	**40**	**40**
School Affiliates	**20**	**40**	**40**
Totals	105	195	200

8.6 Use-Case Clusters:

User Interaction



Admin Interaction:



9. Requirements Definition and Specification:

9.1 Web Page

Requirement	Functional/Non-Functional
Mouse-over menu bars	Functional
Specific Link Titles	Non-Functional
Chat room	Functional
Hit counter	Functional
Forum	Functional
Search bar	Functional
Flash intro with Dr. Sebastian	Functional
Skip intro option	Functional
Header with exact logo color	Non-Functional
Cookie capturing: Who comes into the site How long they are in the site	Functional
Drop down menu with Affiliates	Functional
Users can only comment don't want them to change any content	Non-Functional
Eagle on header with logo	Non-Functional
Change side menu to caps	Non-Functional
Project tables to be dynamic	Functional
Scroll over menu (highlighted)	Functional
Be creative!!	Non-Functional

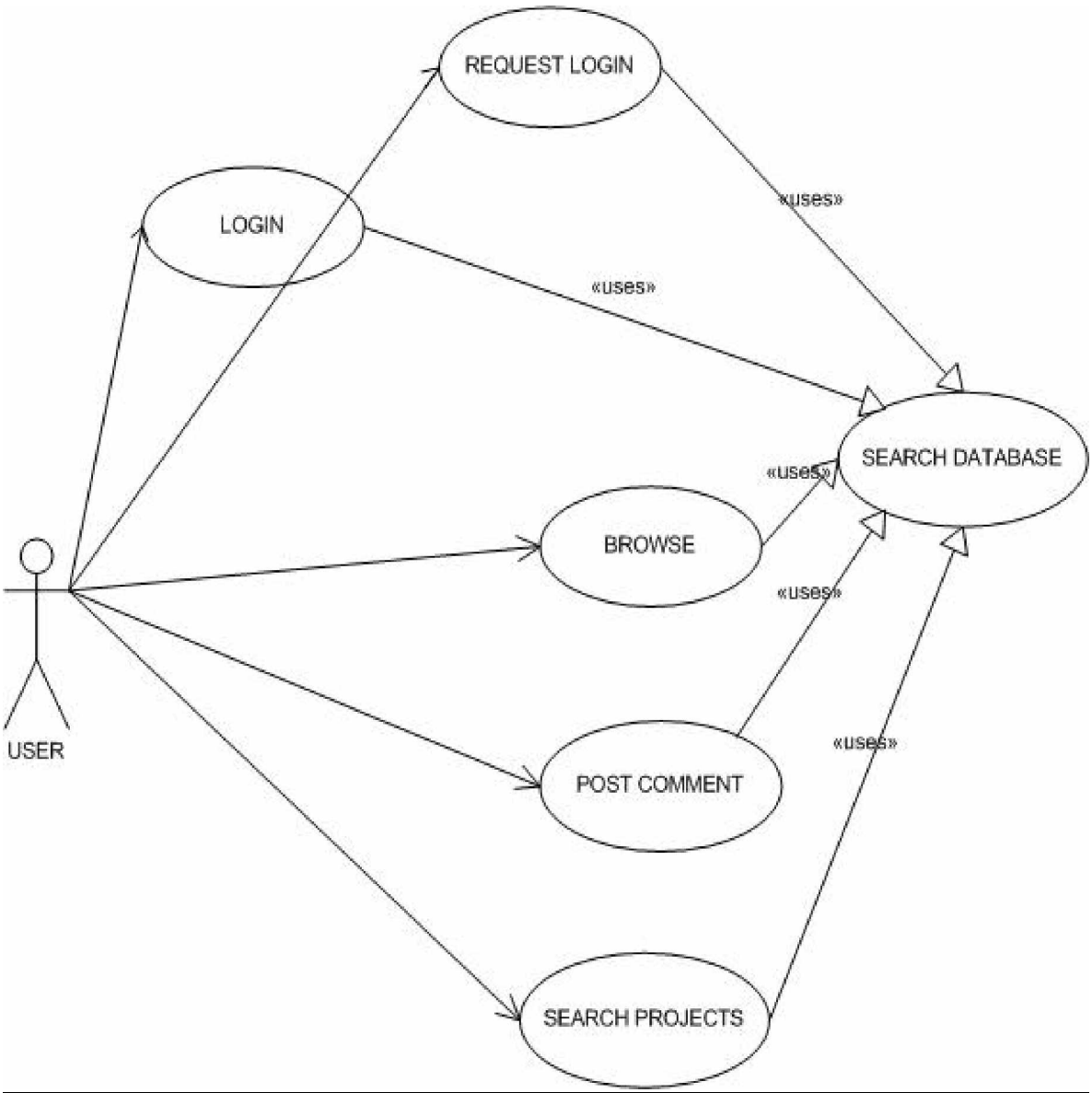
9.2 Database:

Requirement	Functional/Non-Functional
Projects would link to technologies	Functional
Matrix would link to several areas	Functional
Drop Down Menu for NJHSTSC implementations	Functional
Right Adjusted Menu for general NJHSTSC information	Functional
Highlighted Mouse-Over menu selections	Functional
Right Adjusted User/Password login field	Functional
Secured: Non-members will not gain access	Functional
View/Edit Account Information	Functional
View/Edit Current Projects	Functional
View/Edit Message board	Functional
Log-out	Functional
Current Hit Counter	Functional
Drop Down Menu for Affiliate Sites	Functional
View/Edit Questions & Answers	Functional
Website auto adjusts to window size/user display settings	Functional
User Feedback	Functional
Contact Information	Non-Functional
Meta Name	Non-Functional
NJHSTSC Banner	Non-Functional
NJHSTSC Logo	Non-Functional

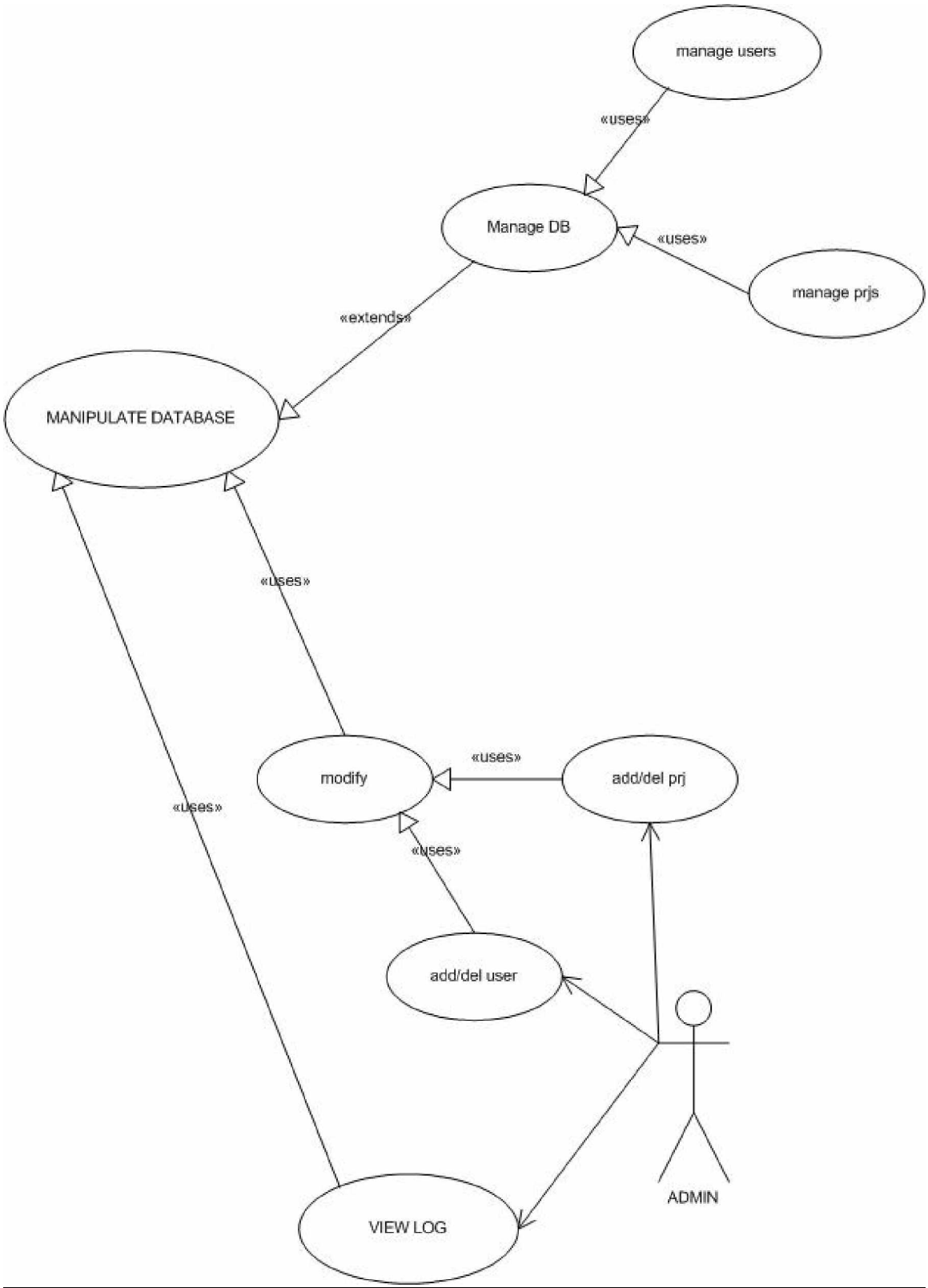
10. Design Strategies:

10.1 Use Case Diagrams:

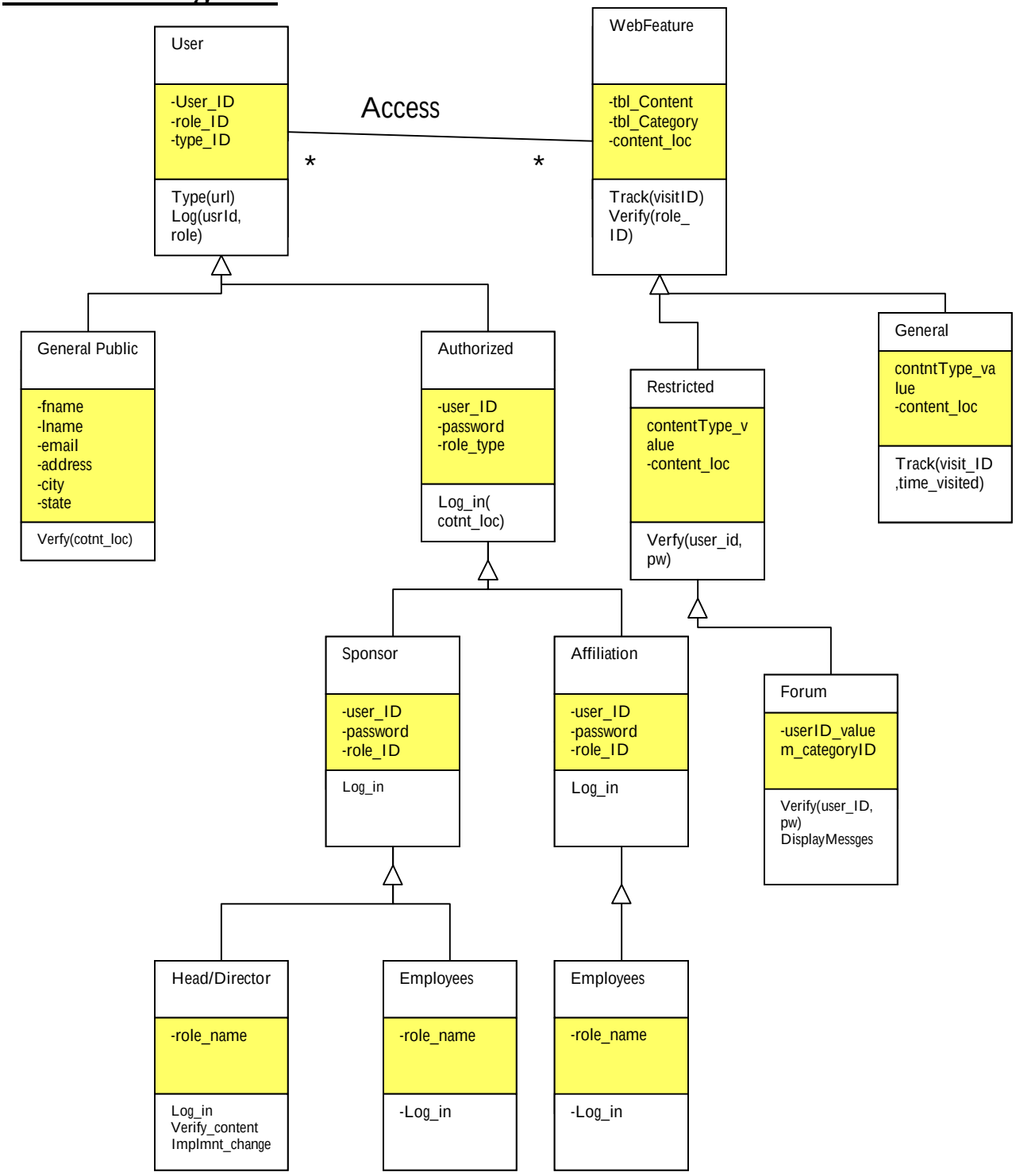
10.1.1 User Interaction:



10.1.2 Admin Interaction:

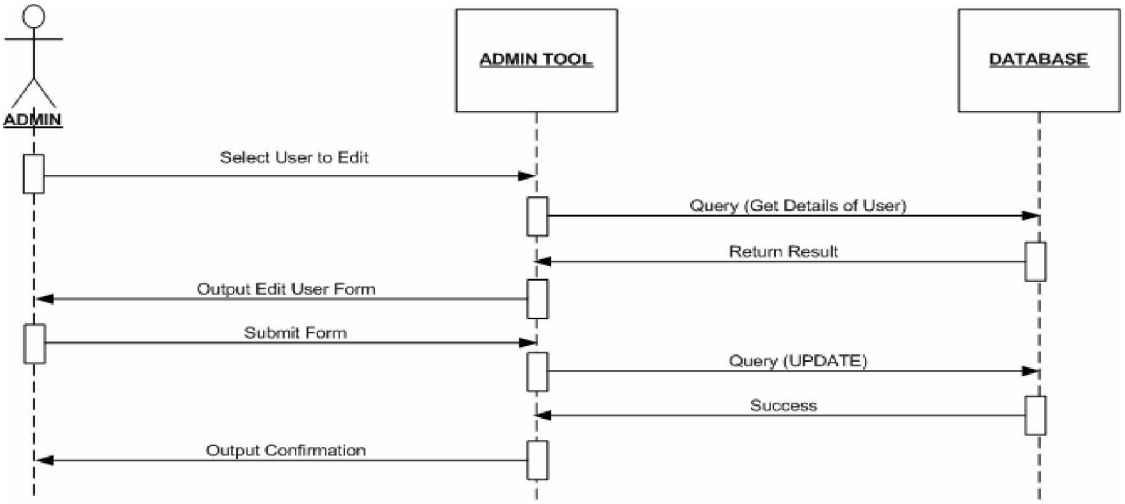


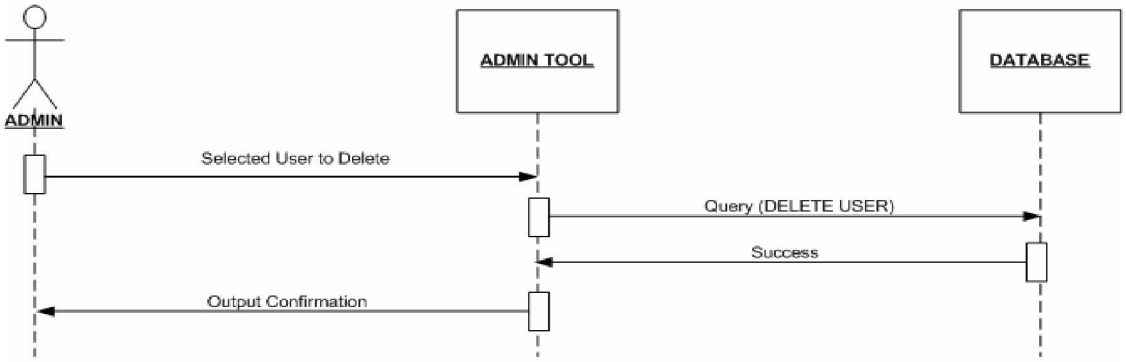
10.2 Class Diagram:

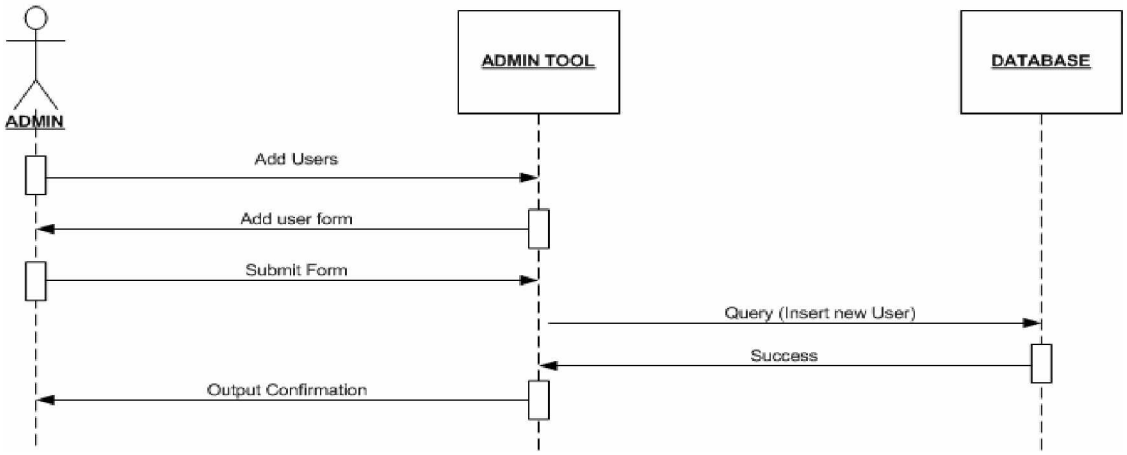


10.3 Sequence Diagrams:

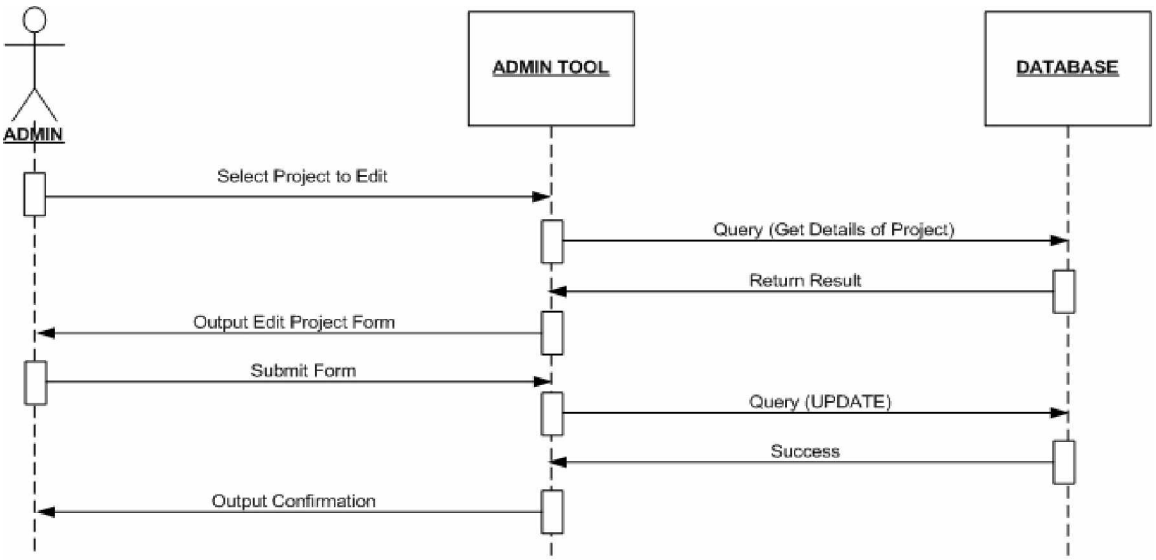
10.3.1 Admin Functions:

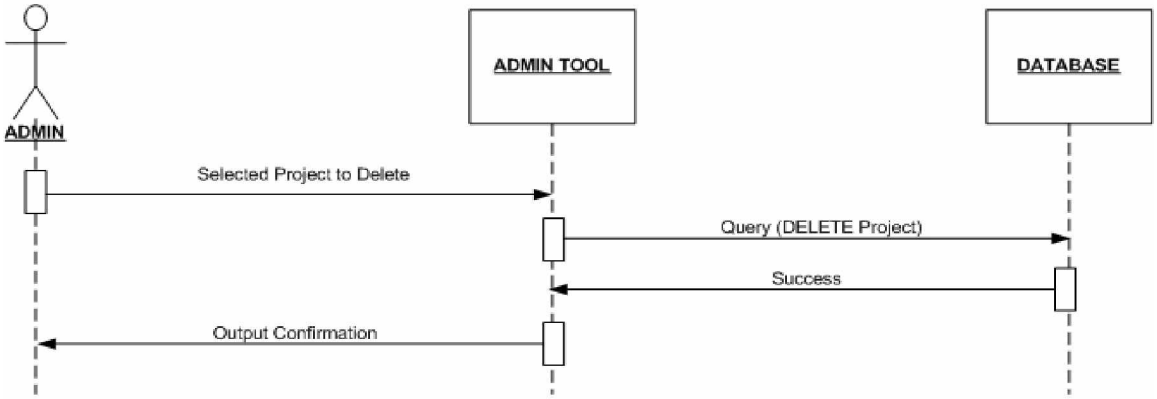


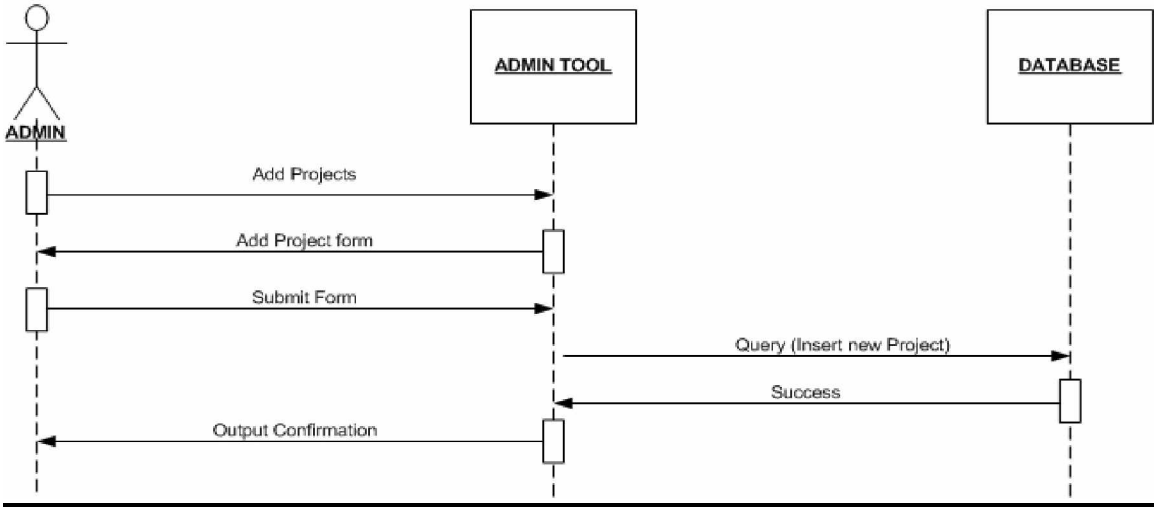




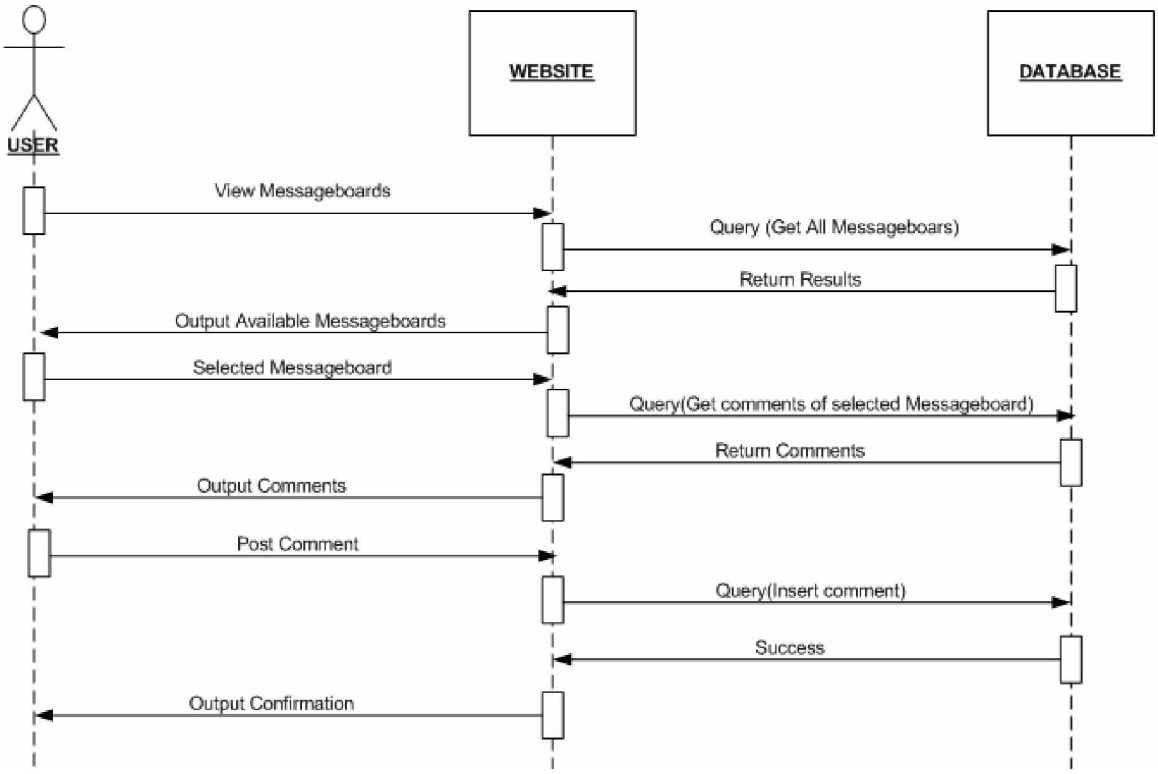
10.3.2 Admin. Mange Projects:



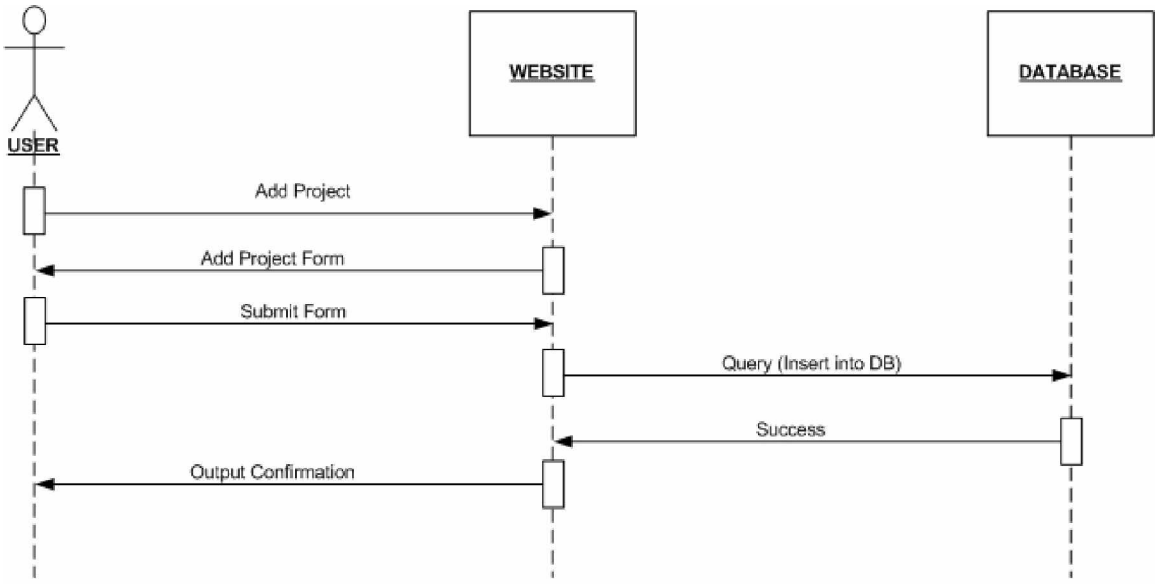


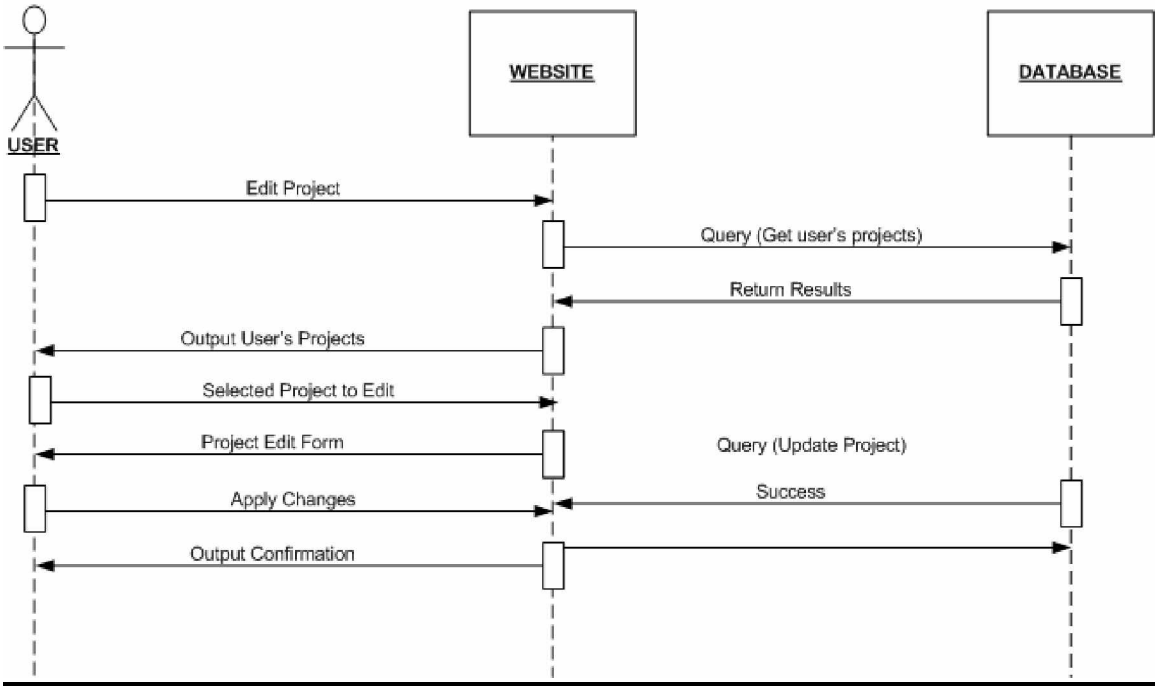


10.3.3 User Message Board:

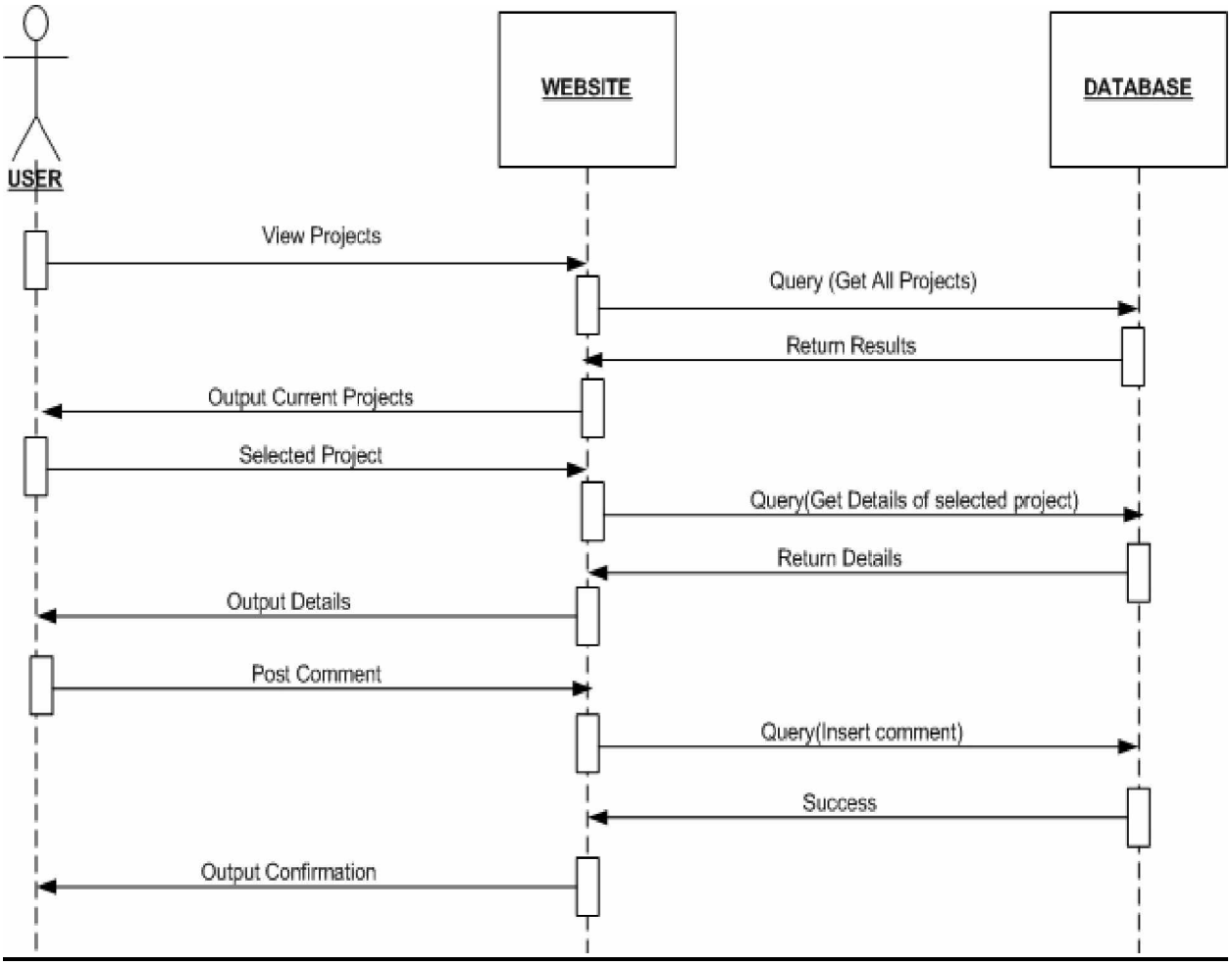


10.3.4 User Add/Edit/Delete:

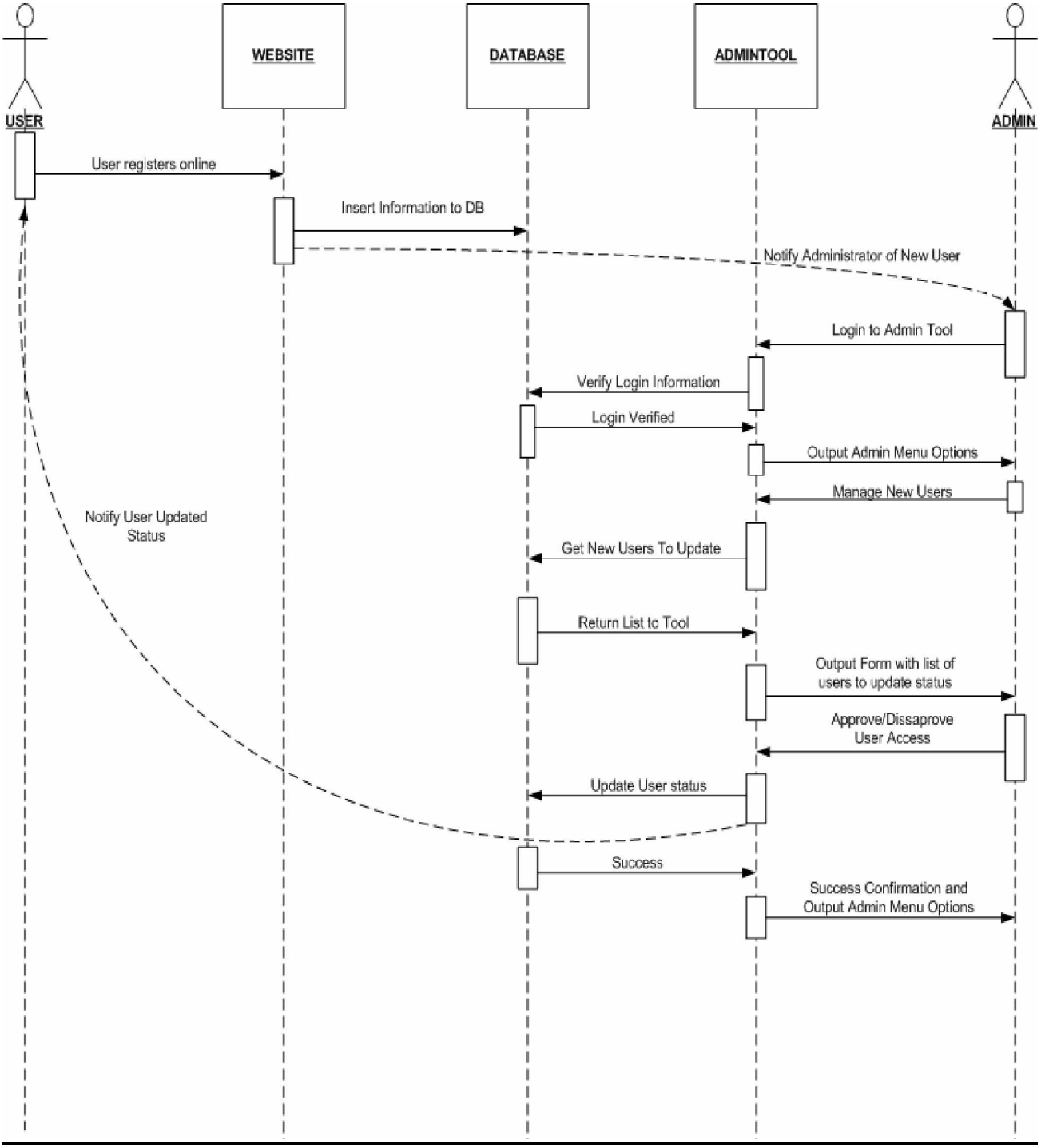




10.3.5 User Project View:

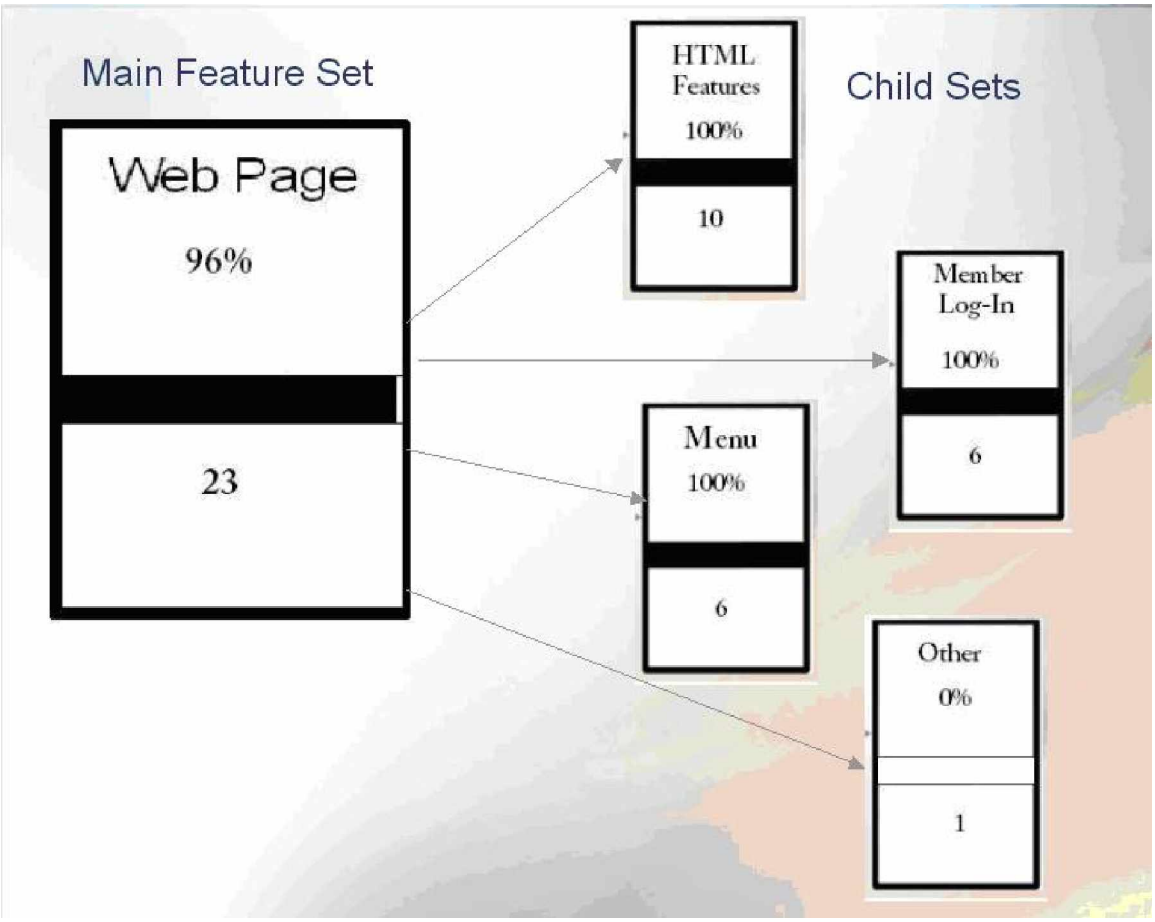


10.3.6 User Registration:



10.4 FDD Feature Sets:

10.4.1 Web Page Feature Sets:



Features that are incorporated in these sets are as follows:

- ü **Indicates that the feature has been completed**

Menu

- ü Drop Down Menu for NJHSTSC implementations
- ü Right Adjusted Menu for general NJHSTSC information
- ü Highlighted Mouse-Over menu selections
- ü Eagle header
- ü NJHSTSC Logo
- ü Mouse-over menu

Member Login

- Right Adjusted User/Password login field
- Secured: Non-members will not gain access
- View/Edit Account Information
- View/Edit Current Projects
- View/Edit Message board
- Log-out

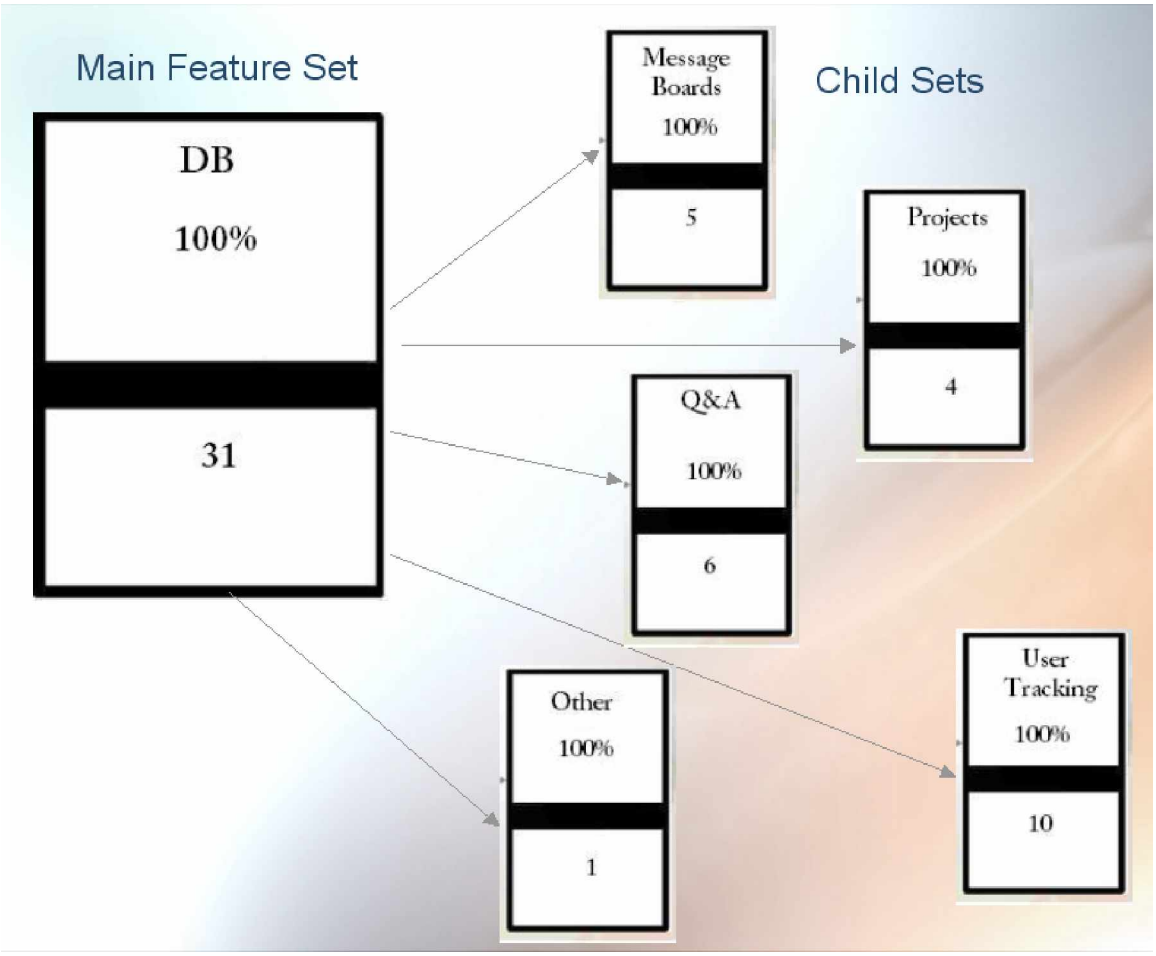
Basic HTML Features

- Current Hit Counter
- Drop Down Menu for Affiliate Sites
- View/Edit Questions & Answers
- Website auto adjusts to window size/user display settings
- User Feedback
- Contact Information
- Meta Name
- NJHSTSC Banner
- NJHSTSC Logo
- Watermark Background for Member Log-in

Other

Integration/Transfer to new server

10.4.2 Database Feature Sets:



Features that are incorporated in these sets are as follows:

ü **Indicates that the feature has been completed**

User Tracking (3rd Party Solution)

- ü Display all hits on site
- ü Display browsers used
- ü Display countries user connected from
- ü Show hits by day
- ü Show hits by hour
- ü Display languages used
- ü Display OS user used
- ü Show referring countries
- ü Show referring domains
- ü Show hits by Bots

Projects

- Add project
- Search projects
- Disable / enable projects
- View comments about projects

Message Boards

- Add board
- Search boards
- Disable / enable boards
- Set Access rights to board content
- View and delete feedback

Q & A

- Search Q & A
- Add Q & A
- Disable / enable Q & A
- Delete Q & A
- View User Q & A
- View Active Q & A

User

- Add user
- Delete user
- Disable / enable user
- Modify user
- Set passwords for users

Other

- Chat room

10.5 Exit Criteria

VERIFICATION:

All group members tested every aspect of the features list. We made sure that all testing occurred after every sprint and before the next sprint to ensure that any problems would not continue on into the new sprint. Our quality assurance specialist made a checklist of all features that were to be completed in every sprint and the Project Manager comprised a list for the final project. Above you will see the features broken down into two sub-categories. The first is whether it belongs to the website or the database and the second is the category in which it falls under in the super class. After each feature is either a check or nothing. If there is not a check next to the feature it means that it has not been completed during these 5 sprints and will be completed after the semester is over. If there is a check mark that means that the feature is completed and working properly.

11. Glossary

For terms that are defined well on the Internet, a hyperlink to those sites has been included where a detail description (and pictures) can be found.

Term	Definition
Scrum	is an agile, lightweight process that can be used to manage and control software and product development using iterative, incremental practices
Class Diagram	to depict the classes within a model. Classes have attributes (member variables), operations (member functions) and relationships with other classes.
Sequence Diagram	depicts the sequence of actions that occur in a system, order in which the invocation occurs
RSS Feeds	RSS is a family of XML file formats for web syndication used by news websites and web logs. They are used to provide items containing short descriptions of web content together with a link to the full version of the content. This information is delivered as an XML file called RSS feed, web feed, RSS stream, or RSS channel.
JAD	Joint Application Development, . Open communication sessions between to groups. Everyone hears what the rest of the group has to say.
Protocol analysis	consists of employing proper software and/or hardware tools to capture, decode, interpret, and react to the contents of data packets as they transit a network's media
Mind Mapping	the technique of arranging ideas and their interconnections visually -- is a popular brainstorming technique
VORD	Viewpoint – Oriented Requirements Definition, A method to define requirements.
Gantt Chart	A Gantt chart is a graphical representation of the duration of tasks against the progression of time
Pert Chart	A PERT chart is a project management tool used to schedule, organize, and coordinate tasks within a project

Prototyping	overcome potential user misunderstandings and to test the technical feasibility of a suggested design and its production
WBS	(work breakdown structure) to break the project into pieces, organize the pieces in a logical way using a WBS, and then get help from the rest of your project team.
Interviewing	Asking someone a set of questions, a method of data gathering technique
Structured Interview	Series of questions designed to elicit specific information to the users
One hundred dollar test	Use the Hundred Dollar Test when you have created a number of ideas and you want to select those to carry forward to the next stage of development.

13. Testing Documentation:

13.1 Functional Test:

The functional test was developed for us to see if we met all the functional requirements that were previously established. The following table shows those functional requirements that we met and those who were left for future projects.

Functional Requirements	Satisfaction
Mouse-over menu bars	YES
Administrator Tool	YES
Database	YES
Chat room	YES
Hit counter	YES
Flash intro with Dr. Sebastian	NO
skip intro option	NO
Search bar	NO
Forum	YES
Password protection on certain links	YES
Project tables to be dynamic	YES
Scroll over menu (highlighted)	YES
Automatic email sent	FUTURE-PRJ
Top ten posters	FUTURE-PRJ
Site greeting after 5 logins	FUTURE-PRJ

Those functional requirements that were not met were do to the following reasons:

- Flash Intro – We decided to implement a separate page with multimedia in order for users that do not have a high-speed connection to lag when they reach the HLS page.
- Search bar- we decided to incorporate the search option in the project section, thus being the center of attention of the webpage
- Email sending, site greeting after 5 logins – these options we could not incorporate due to lack of server access. These aspects are still part of the sponsor's requirements, whenever the server is available those option will be incorporated.
- Top ten posters – this was changed since the site is going to be mainly public, there will be no need for that now, possibly, and sponsor will incorporate in future implementation.

13.2 Performance Test

The performance test is used to demonstrate if all the non-functional requirements were met. These non-functional requirements were defined by the sponsor, and in order to verify if these non-functional requirements were met, a questionnaire was sent to Mr. Tokle.

Non-Functional Requirements	Satisfaction
Specific Link Titles	YES
Tab looking menus	NO
Header with exact logo color	YES
users can only comment	YES
Specific E-mail Address -HLS contact	YES
Eagle on the header logo	YES
User registration form	NO
Side menu with CAPS letters	YES
Admin can approve/ deny users	YES

13.3 Acceptance Test:

We develop a questionnaire where the main goal was to verify the acceptance of the webpage. The survey was given to 25 random people, and various questions regarding the page were asked.

The main objective was to test user satisfaction when using the HLS page. The questionnaire contained simple, and direct questions with options from strongly agree, to strongly disagree.

NJHLSTC Acceptance Questionnaire

1. Do you like the layout of the page?

Strongly Agree				Strongly Disagree
1	2	3	4	5

2. Easiness of navigation?

Very Easy				Very hard
1	2	3	4	5

3. Do you like the color scheme of the page?

Strongly Agree				Strongly Disagree
1	2	3	4	5

4. Do you think the page is innovative and up to today's standards?

Strongly Agree				Strongly Disagree
1	2	3	4	5

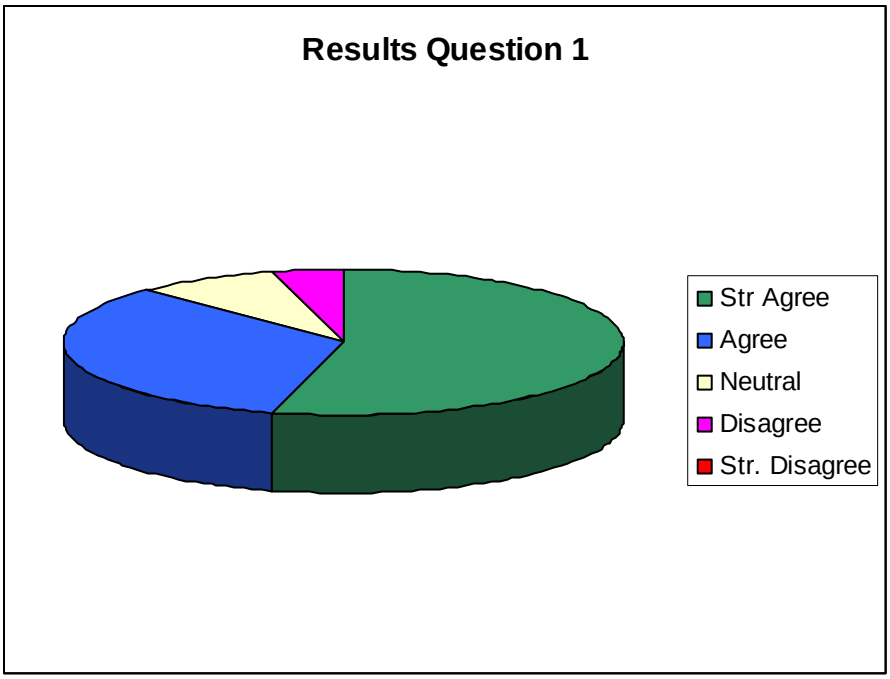
5. Do you think the page needs major changes in its layout?

Strongly Agree				Strongly Disagree
1	2	3	4	5

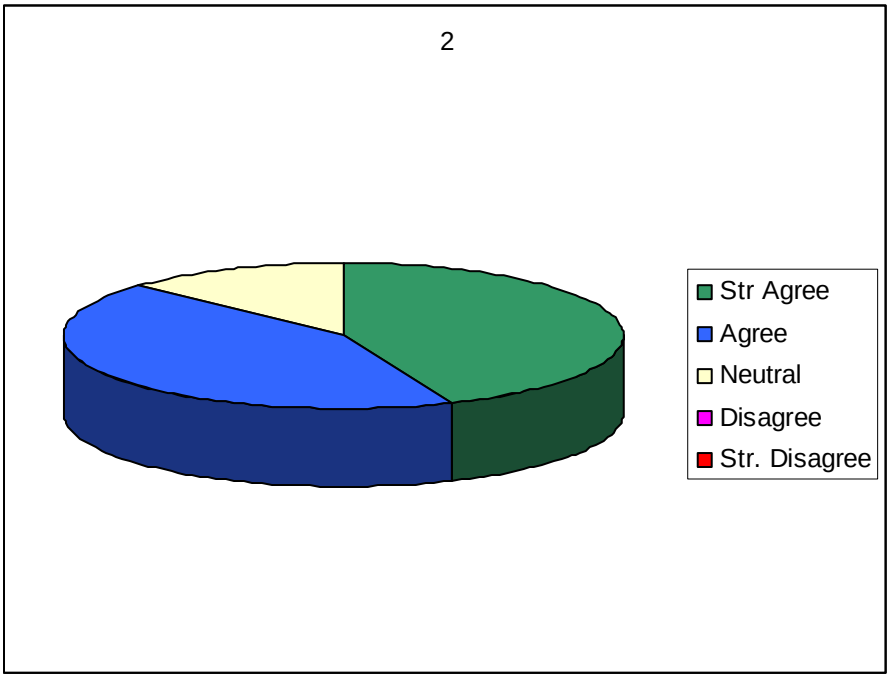
Figure: Acceptance Questionnaire

		Results			
Question #	1	2	3	4	5
1	13	8	2	1	0
2	10	10	3	0	0
3	13	7	4	1	0
4	12	10	3	0	0
5	0	3	0	7	15

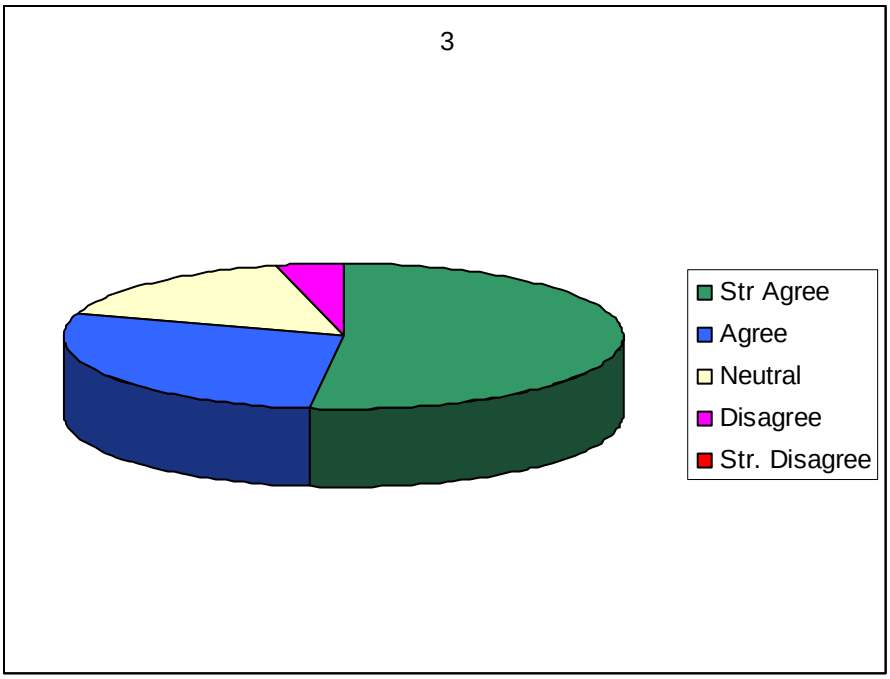
As it can be seen by the results of the questionnaire, for the most part those who visited the page, found it easy to use, and they liked the way the page was designed and according to most participants they think the page meets today's standards. This questionnaire only tests a portion, sample, of the population. The participants that were given the questionnaire have ages ranging from 18 years old and 53 years of age. This sample included both males and females of different ethnic backgrounds.



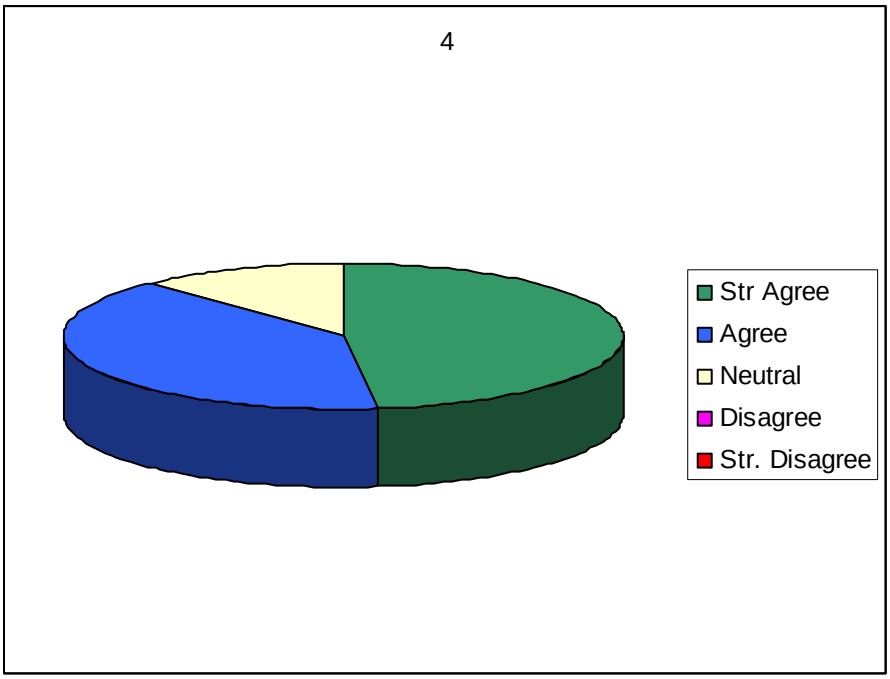
Results Question 1



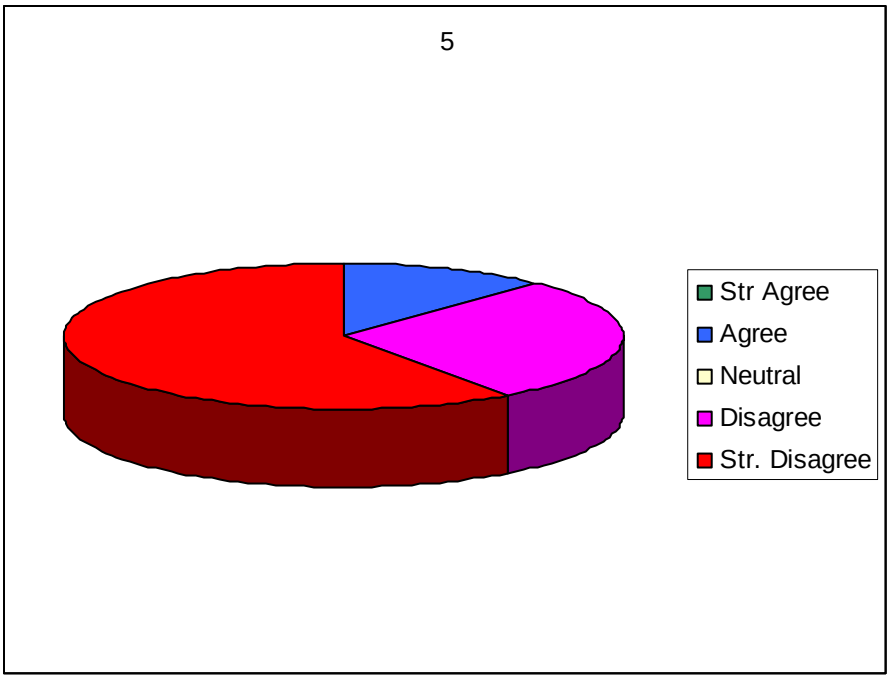
Results Question 2



Results Question 3



Results Question 4



Results Question 5

13.4 Implementation Phase:

The implementation testing was used to test the versatility of our website. The website was created on our personal computers and implemented on Roué's personal web server. Later the webpage will be implemented on NJIT's HLS server. However, for testing purposes, the webpage that is hosted on Rouel's personal server is fully functional.

The page was tested on various systems to analyze the functionality and the overall appearance of the page. At different monitor settings, from larger settings

to smaller settings, the page always displayed correctly, without any distortion. Even though the page is not distorted, the page is best viewed in smaller screen settings, such as 1024 x 768.

The option of other people outside our group, the questionnaires were helpful in seeing that we accomplished our goal, in creating a dynamic, user-friendly page. Both users and sponsors seem to be satisfied with the page, and also we are pleased to have accomplished such outcome.

13.5 Integration Testing:

Since the server is unavailable for now there is no integration testing until the site and DB are integrated in the future.

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