The Turner Management System

By

Alexandria Merriweather-Turner

Submitted to
the Faculty of the Information Engineering Technology Program
in Partial Fulfillment of the Requirements for
the Degree of Bachelor of Science
in Information Engineering Technology

University of Cincinnati
College of Applied Science

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Alexandria Merriweather-Turner	Date
Hazem Said, Faculty Advisor	Date
James F. Sullivan, Department Head	Date

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I would like to thank God for continuing to walk with me, hearing my prayers, and for all my many blessings. I would like to give special thanks to Caleb O.E. Turner, my husband who has supported and continued to encourage me when I was down and trying to complete this project. I also would like to thank him for being an inspiration to me while he has completed his degree. I would like to give special thanks to Sonya Walton, Small, Minority, Women-owned, and Disadvantaged Business Diversity Supplier Coordinator, for believing in my potential and giving me the basis to develop this project. I would like to thank Ms. Walton for helping me gather information regarding minority-inclusion, access to various documents, and taking time to be my person "Proof Reader". I would also like to thank Christopher A. Butler for being a wonderful friend, tutor, and inspiration to me during my struggle in trying to learn new technology. Finally, I am thankful to all those who believe in me and genuinely care about my success in life.

I am most thankful for the scripture, Philippians 4:12-13, which has guided me through life and kept my determination on solid ground:

I know what it is to be in need and I know what it is to have plenty.
I have learned the secret of being content in any and every situation,
whether well fed or hungry.
Whether living in plenty or living in want.
I can do all things through Christ which strengthens me.

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Abstract

The *Turner Management System* is an interactive Web Application designed to assist a small business consultant in reaching its optimal business objectives by managing the business relationships with its small business clients. I created this application for the novice to intermediate computer user by providing comprehensive interfaces and easy navigation. This application allows the consultant to provide important information to its clients regarding financial and technical assistance resources, increasing growth and development, improving participation in major projects and events, and incorporating networking opportunities among other large and small business enterprises. My Web application was designed using the latest tools: ASP.NET and SQL Server. This application is easy to maintain by the consultant and will prove to be a useful tool in helping to expose its clients to greater communication.

The Turner Management System

1. Statement of the Problem

The number of Small Business Enterprises (SBE) including Minority Business Enterprises (MBE) and Women-Owned Business Enterprises (WBE) in Cincinnati is growing rapidly. There are over 46,000 SBE companies in Cincinnati. The majority of these businesses develop with owners who do not have professional business management or administrative experience (5). Since these businesses lack the essential skills for business stability, office personnel and other professional work systems are not affordable (2).

Many SBE's have difficulty being included on large governmental projects; the Turner Management System has been developed so that consultants can ensure equal opportunities in an advanced environment.

A company without an organized work system and the necessary resources has a greater chance of business failure and of not ever being properly established or recognized (5). There are several ways to ensure business failure.

- When cash outflow is greater than income generated then funds will become depleted faster.
- If the SBE's financial reserves are insufficient, then it cannot provide services to its clients.
- If the primary business focus is not on clients there can be a decrease in the attraction of clients.
- A business obtaining more clients than its manpower can manage, decreases productivity.
- A business that does not demonstrate satisfactory results is less likely to be recommended.

- Not having a systematic business plan creates an unorganized atmosphere.
- Having inadequate or improper work materials reduces the services that can be provided.
- Not taking advantage of available resources can lead to lack of necessary support.

Although an SBE can overcome one or more of these challenges, it can benefit from a Web application that provides assistance for their business to grow. An SBE having a work system that can overcome any of the business failure methods can ensure its recognition (12). Such a system is an interactive Web application, the Turner Management System.

1.1 Definition of the Need

Small businesses need systems that will incorporate its main business objectives, concentrate more on business data and target desired clientele better (2). An SBE can use a system that will allow its owner to collaborate with several of the resource agencies available to avoid company failure. These resource agencies will assist in supporting a system that allows the SBE to minimize a multitude of manual tasks and maximize primary business objectives (12).

In researching a need for this system, I found that very few small businesses had the necessary access to business resources they needed to ensure their growth and development. The need is that many small businesses have a difficult time finding the necessary assistance and networking opportunities that they need to expand, this system will contribute to an opportunity for them to expand.

2. Description of the Solution

The Turner Management System allows communication between the consultant and its clients, client access to personal client profiles and access to data and resources. In addition, the consultant is able to view, add, edit and maintain information as well as consultant information.

The system allows the client to view consultant events and projects. The client creates accounts, login to his/her account, submit and view files.

In two initial discussions with Sonya Walton, President of Walton and Associates and Darraugh Barnes, President of D. Butler Management Consulting, I was able to construct a proposed design for an interactive Web application. This system benefits a small business receiving professional services from a small business consultant to improve its business or networking interests from consultants. In both interviews I found that each company could succeed better with a system that allowing it to use more time to focus on its clients and expand its company. I also found that any small business based on consultants assisting other small businesses benefits from having a system that allows internal affairs to become more efficient. The advantages of this system include:

- A method of allowing the consultant to minimize a multitude of manual tasks, in turn allowing them to maximize primary business objectives.
- An interface allowing certified, financial and administrative forms to be read, completed and submitted.
- A database retaining mass client information to consolidate business information.
- The ability to allow clients to log on, view personal files and add information to files.
- A database that retains financial resources and records to improve, stabilize and accomplish better financial management.

- The ability to configure and publish various directories, personalized letters for distribution and systematize reports for the administrator/consultant.

The design and build of a dynamic web site and database system allows small businesses and consultants to minimize manual tasks that make business owners perform multiple office roles as secretary, manager and/or accountant. The system allows the consultant to focus on primary business objectives. Client and consultant companies having Web and database interactive tasks decreases paperwork including correspondence and reports, mass paper filing and increase report collaboration. This system attracts business from abroad and systematizes other tasks more easily (12).

Small businesses need systems that will incorporate its main business objectives, concentrate more on business data and target desired clientele better (2). An SBE can benefit from a system that allowing it to collaborate with several of the resource agencies available to avoid company failure. These resource agencies will assist in supporting a system that allows the SBE to minimize a multitude of manual tasks and maximize primary business objectives (12). Such resource agencies to join include:

- U.S. Small Business Administration (USSBA)
- Greater Cincinnati Chamber of Commerce (GCCC)
- Greater Cincinnati and Northern Kentucky African American Chamber of Commerce (GCAACC)
- City of Cincinnati Small Business Enterprise Program Office of Contract Compliance
- Hispanic Chamber of Commerce of Greater Cincinnati
- South Central Ohio Minority Business Council
- University of Cincinnati Small Business Development Center

The Turner Management System combines multiple tasks for small business consultants to manage the business relationship between its clients. The system assists the consultant in communicating with its clients in an expansive environment. In addition to assisting the consultant, the system allows small business clients to have better access to the consultant's business objectives, which are to improve the clients' participation in major projects and events, to aid the client in the growth and development of its business and to incorporate networking opportunities among small business enterprises.

2.1 User Profiles

There are two types of users for this Web application. The users include the clients and the consultants, who are also the administrators.

2.1.1 Clients

A client is any business or individual certified as a small business enterprise including being a minority, women-owned and/or disadvantaged business enterprises that registers with the consultant of the Turner Management System. The client has some knowledge on how to use the user interface if he/she has the ability to access the Web site. After the client has accessed the Web site he/she can easily complete the initial registration process and create a personal client profile. After the initial registration and creation of the client profile he/she can access his/her personal client profile, access the Web site, complete and submit forms, download information, access various resources and communicate with the consultant by way of the Web. The client profiles also include methods for document tracking and retrieval and making reservations for various meetings and conferences.

The client user must have basic skills for navigating the Internet and understanding of basic Web interfaces. These skills will allow the client to become a user of the consultant's Web application.

2.1.2 Consultant

The consultant is any small business enterprise operating the Turner Management System as the administrator. The administrator of the Turner Management System is the primary user since it maintains the database. The consultant has the ability to view and verify client profiles as well as the consultant's personal business profile. The consultant has the ability to retrieve the submitted client information from the database, generate various reports and directories, communicate with the clients and maintain financial records of its business. The consultant can also set up and create project profiles, bid and event information pertaining to the projects. The projects, bid information, and event information created have the capability of being viewed by the client users.

The consultant must have knowledge of Microsoft Windows, Office XP, the Internet and how his/her Web site and database are to be operated. The Turner Management System provides a manual to guide the consultant through some of the tasks that the consultant may not be familiar with.

2.2 Design Protocols

The main Web interface outline consists of five major sections that communicate information between the client and consultant. The five major sections include the Client, Consultant/Administrator, Resources, Calendar, and About Consultant pages. The client segment includes registration, login, project and event view, upload and download, and event

search pages. The Consultant/Administrator segment includes login, project, bid and event creation, upload and download information, and edit client pages. The Resources segment includes hyperlinks to SBE information, assistance, financial, technical, administrative, and education. The Calendar segment includes information pertaining to monthly events, access to event search pages, and current information. The About the Consultant segment is a static Web page that includes information about the Turner Management System. The Web interface allows the client to navigate throughout the Web site easily. The interface is designed so that the client can perform multiple tasks such as client registration, submitting documents, viewing submitted documents and retrieving documents submitted by the consultant (See Figure 1).

The database tables include the About_Client, Events, Bid_Information, Projects, and Owner tables. The About_Client table is relational to the Events, Projects, and Bid_Information tables using the ClientID. The Owner table has relationships with the Project and Bid_Information tables using the OwnerID. Microsoft SQL Server was used to implement a many to many relational database. This database is solely under the administrator's control, which the consultant is the administrator (See Figure 2.).

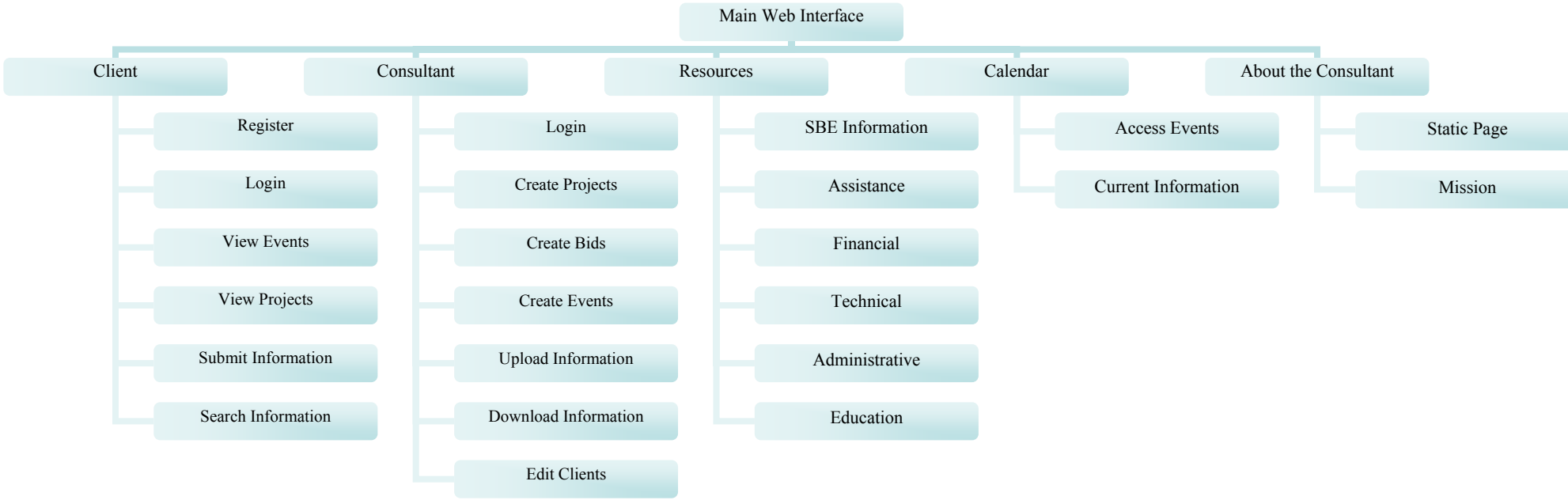


Figure 1. Turner Management System Outline

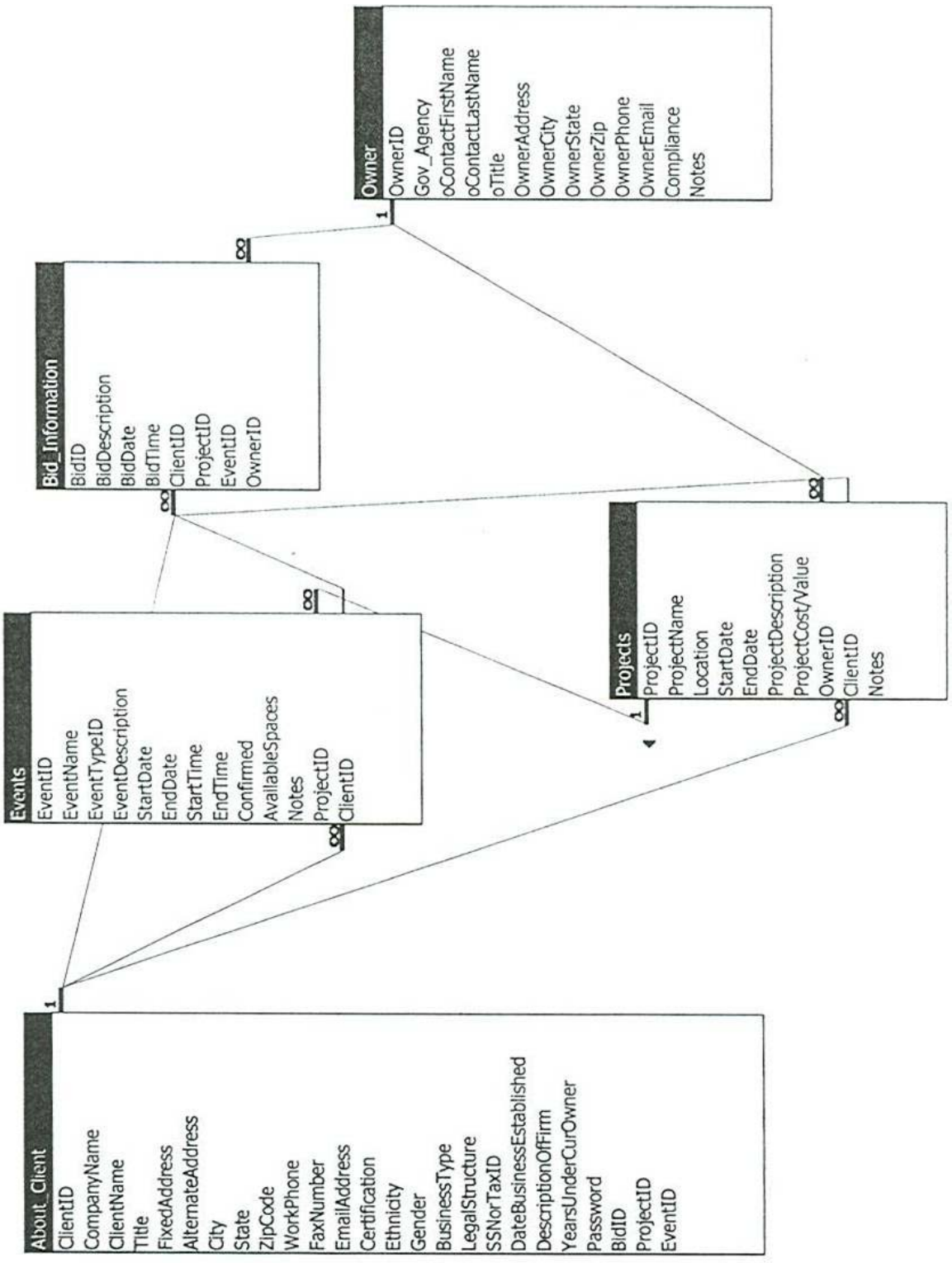


Figure 2. Relational Database Diagram

The database can only be accessed by the consultant. The Web application administrative abilities, allows the Consultant to create and maintain the necessary information used to communicate with the client. The main graphical user interface for the Web application is focused toward the client user. The banners, navigation buttons, and graphics were created using Adobe Photoshop 6.0. Adobe Photoshop is a good graphical image tool for creating images that communicate messages visually. Adobe Photoshop allows many abilities to create, size, crop images, and adjust colors for Web and printing capabilities.

The Web applications forms were created using Microsoft Visual Studio as a tool to create Web forms in ASP.NET using C-Sharp. These forms allowed registration, login, submitting, retrieving, and viewing information.

The administrator of the Web application has the ability to access the same support resources that are available to the client. These resources help the consultant to fulfill its business objectives to support the client. The administrator of the Web application can add new projects, add new bid information to existing projects, add new events to existing projects, upload information, download information, register new clients and edit existing clients.

SQL Server is also a fully Web-enabled database that provides a multitude of support for Web applications. It has a high level of security and allows for more security features which can be incorporated for auditing, tracking, and encryption capabilities.

The client can register a new client profile within the Web application and submit information to the consultant's database. Navigation can be done from the main user interface of the Web application. The client user can easily click on the Registration

button which then links to the new client registration form. The form includes text boxes for submitting unique information, drop down boxes for submitting commonly used information, and check boxes for submitting multiple commonly used information. There is a password textbox that is linked with an error message that directs the potential client create and confirm a password. Once the client has submitted a new client profile, the application redirects the new client to page that uses the submitted company and contact name of the client. The SQL database contains the following information about the client: Company Name, Contact First Name and Last Name, Professional Title, Office Address, City, State, Zip Code, E-Mail Address, Phone and Fax Number, Certification Type, Business Type, Business Description, Legal Structure, Tax Identification Number, Business Establishment Date, Current Ownership Time Length, and Password. The client can then choose to sign in or navigate the Web site's public information like resources and e-mail.

After a client has signed in, he or she can view available bids and events. The client chooses the current available projects from a drop-down list and then the client can choose the available bids regarding the current available project. The labels regarding the project and bids fills bid information labels dynamically. In the available events page, the client chooses an available project from the list and then chooses events that pertain to that event. The page then dynamically fills with pertinent information regarding the project. The client can access submitted files and submit new files. The client can search available events through the calendar.

Both users, client and administrator, can easily navigate the Web site and application with graphical image buttons. The buttons are designed to emulate Web buttons so that users can see them clearly.

The Web site pages are linked to a cascading style sheet, which contains initial link and navigated linked colors and decoration. The color scheme of the Web site and application was chosen to reflect a professional, modern, and clear view for the client and administrative users.

3. Deliverables

1. A Web based application that allows consultants to manage relationships with their clients.
2. The main Web interface is written in HTML, which allows for simple user navigation.
3. The Web application uses ASP.Net to communicate between users and database.
4. Client users will be able to:
    - Create a new account
    - Login to client account
    - Easy to navigate the Web interface
    - Submit, view and update files, forms and documents
    - View available projects, events, and bids
    - Request involvement with events/engagements
    - Register for events/engagements
5. Consultant users (administrator) will be able to:
    - Secure login to consultant/administrator account which is secured by SQL database

- Submit files, forms and documents to clients
- View submitted files by clients
- Manage Web interface and database

4. Design and Development

The next sections describe the project's timeline, accomplishments, budget including hardware, software, and book costs.

4.1 Timeline

This project involved many challenges, learning opportunities, advancement, and accomplishments. My accomplishments are listed below in the Senior Design Project sequence.

4.1.1 Senior Design I

During Senior Design I, I accomplished the following:

- Recognized the need for the Turner Management System
- Analyzed the Small, Minority, Women-Owned, and Disadvantaged Business Enterprise (SBE, MBE, WBE, and DBE) structure
- Analyzed the Hamilton County and City of Cincinnati efforts for SBE, MBE, WBE, and DBE inclusion
- Researched the consultant need for stream-lining and organization of diversity inclusion
- Considered specific consultant and client needs
- Structured Web site design and layout
- Implemented HTML knowledge
- Began development process
- Created database in Microsoft Access

- Submitted proposal for the project and presented to faculty and learners

During my communication with diversity suppliers for the Hamilton County and City of Cincinnati area, I learned about the needs, efforts, and results of diversity inclusion. I researched the City of Cincinnati and Hamilton County Web sites looking for information regarding SBE, MBE, WBE, and DBE's to find information focused on these specific groups. The Web sites that I was able to find most of my information is found in Appendix A. When I looked at these Web sites I was trying to notice how information is handled on-line and how clients and consultants alike would benefit from the Turner Management System. The research assisted me significantly in order to prepare for the development process of this project.

4.1.2 Senior Design II

During Senior Design II, I accomplished the following:

- Became introduced with ASP.NET
- Learned more about Microsoft SQL Server
- Designed a database with Web connectivity
- Improved main user interface
- Started development of ASP.NET Web forms
- Improved database relationships
- Presented Design Freeze documentation and prototype

The improved design of the main Web interface, introduction to ASP.NET, and the new experience with Microsoft SQL Server created many challenges from the start.

4.1.3 Senior Design III

During Senior Design III, I accomplished the following:

- Completed ASP.NET pages
- Modified project design as needed
- Tested project
- Completed documentation for the project
- Presented final project

The detailed timeline can be found in Appendix B., Timeline.

4.2 Budget

Most of the software used for this project included academic licenses. As a result many of the prices listed below are real world costs of software pricing and were not actually my expenditures (See Figure 3.).

Software	Cost
Domain Name	$19.00
DSL Access	125.00
Microsoft Office XP Professional	819.00
Microsoft Small Business Server	1500.00
MS SQL Server 2000	1500.00
Visual Studio .Net	500.00
Microsoft Windows XP	239.00
Adobe Photoshop	545.00
Total Software Costs:	$5,247.00
Hardware	
Dell Dimension Desktop	3000.00
Total Hardware Costs:	$3,000.00
Miscellaneous	
Books	$750.00
Tutoring	1732.50
Workshops	50.00
Professional Courses	750.00
Total Miscellaneous Costs:	$3,282.50
Grand Total	**$11,529.50**

Figure 3. Budget

5. Proof of Design

The next section shows in detail how deliverables of the project were met and what challenges were encountered.

5.1 Main User Interface

The first impression is very and important and needs to impact the user. Therefore, a visually appealing look is needed to continue the interest of the user. A beginner-friendly interface was created in HTML including clever and visually interesting banners, a scrolling marquee, time and date stamp coded using VB Script, and professionally attractive navigation buttons and links lined on the left margin of the Web page. A screen shot of the Main user interface and its description was mentioned in the Design Protocols section (See Figure 4.).

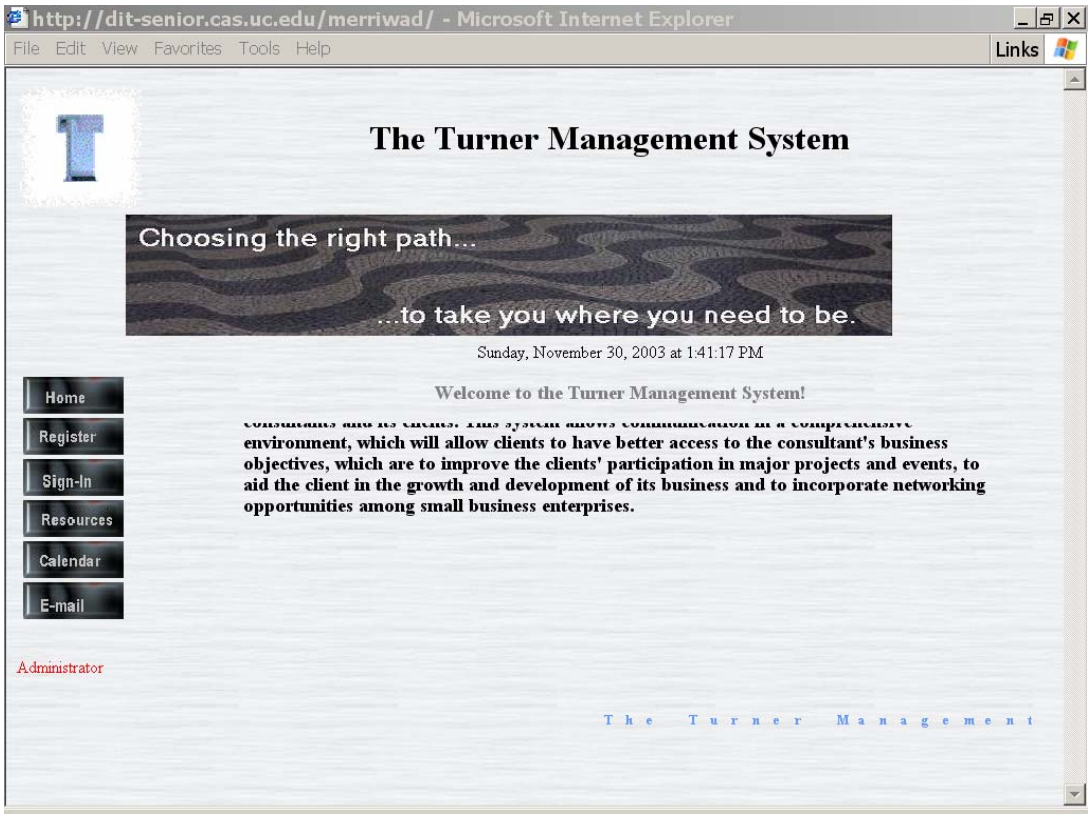


Figure 4. TMS Main Page

5.2 Client Registration

After a user has entered the Web site, the user can choose to register a new client profile. This Web form is the initial access for a client user into the database. This was discussed in the Design Protocols section (See Figure 5.).

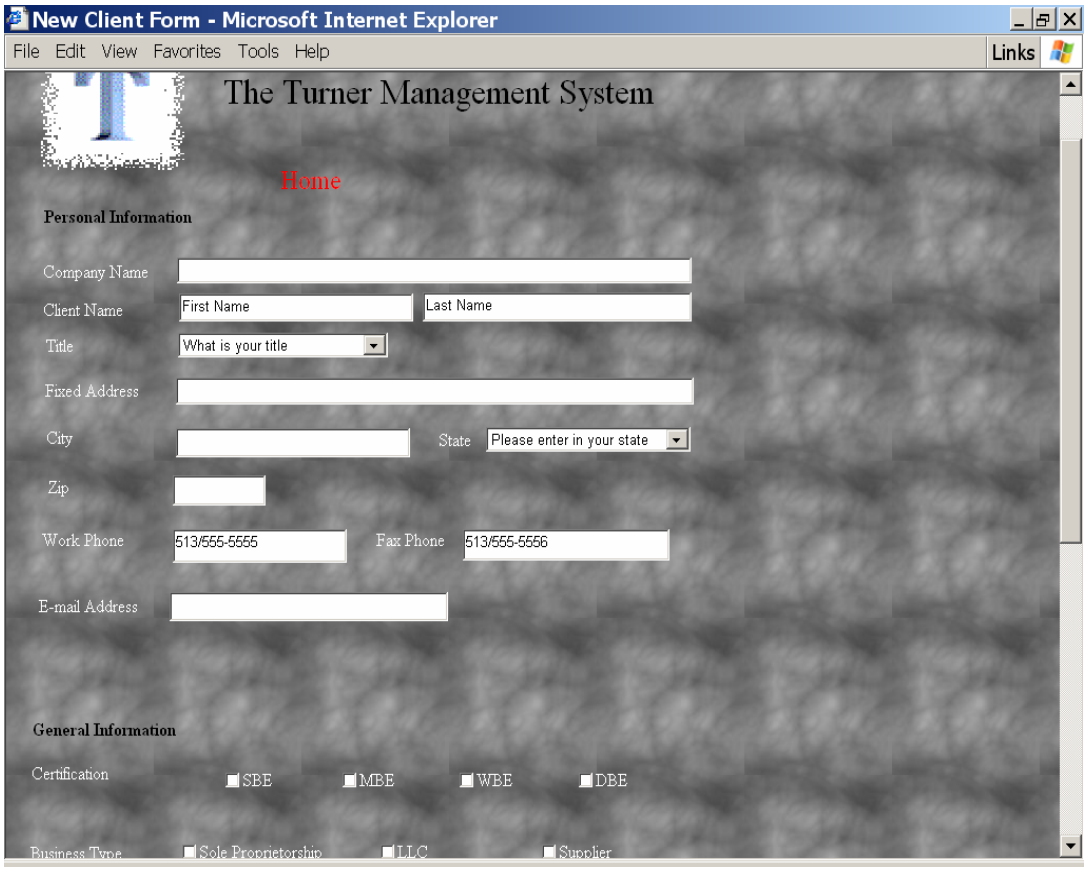


Figure 5. New Client Registration Form

5.3 Client Registration Confirmation

Once the new client has submitted the "New Client Registration" form. The client is redirected to the "Confirmation" page, which immediately retrieves the client first and last name entered on the form from the database (See Figure 6.).

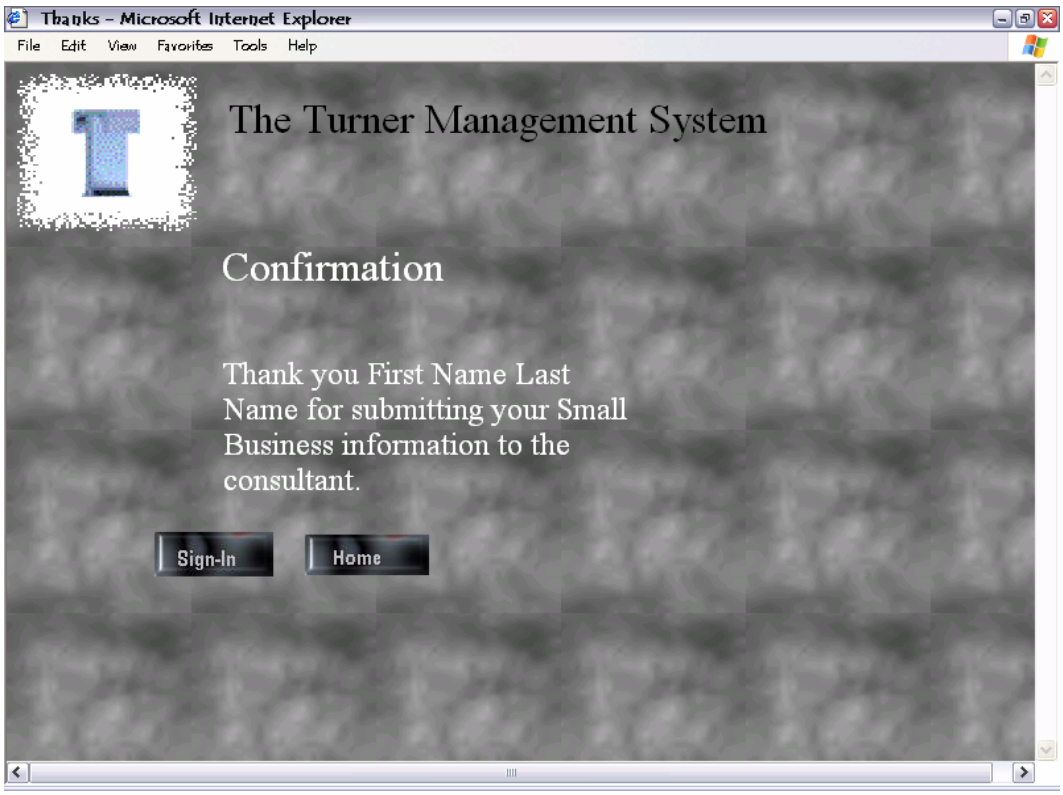


Figure 6. Thank You Page

5.4 Client Login

The client user can login using a previously registered e-mail address and password combination. The client login page is also created with a professionally modern outlook with a light background and simple textboxes (See Figure 7.).

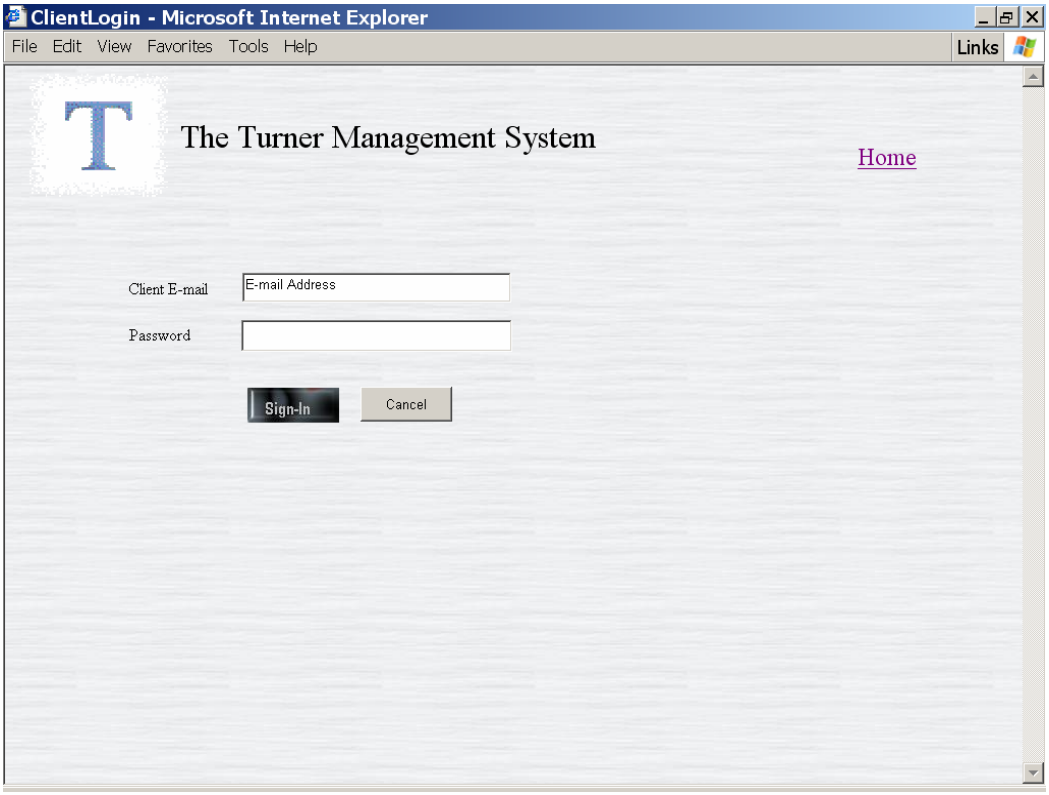


Figure 7. Client Login Page

5.5 Client Profile Analysis

The client can access all the Web forms and documents that are available to the client user once they have signed in. This allows the client user access to available bids, available events, uploading and downloading capabilities, and ability to search events through the calendar. The client user must return to the initial page to navigate between each of these individual pages. The client user can return to the main user interface at any time (See Figure 8.).

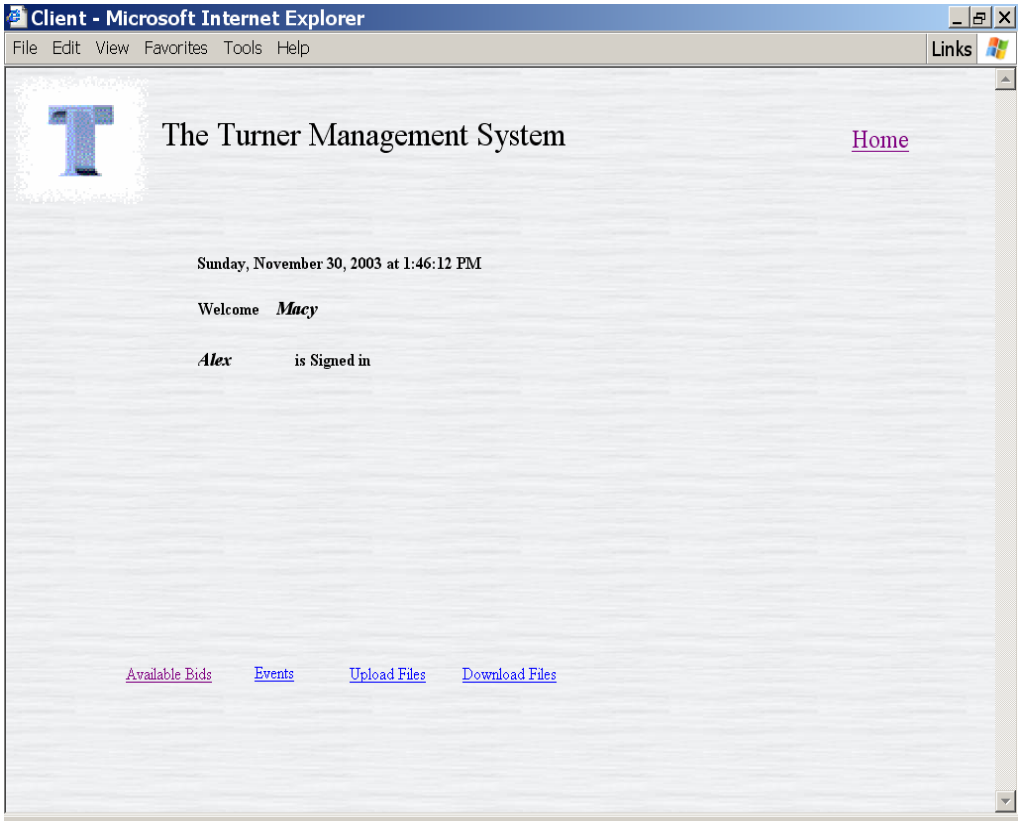


Figure 8. Logged In Client Page

5.5.1 View Bid Information

By selecting the "Available Bids" link, the client user can view all the projects that the consultant has access to. The client can e-mail the consultant if they are interested or have questions regarding the available projects and bids (See Figure 9.).

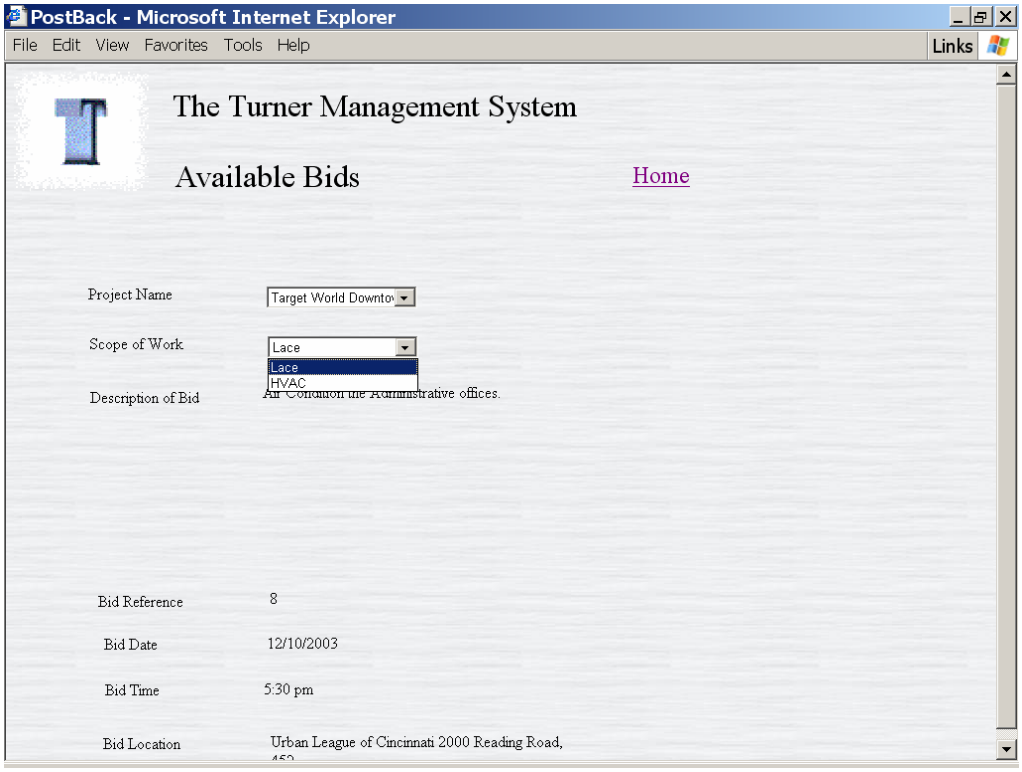


Figure 9. Available Bids Page

5.5.2 View Events

By selecting the "Available Events" link, the client user can view all the projects that the consultant has access to and the events that correspond with them. The client can e-mail the consultant if they are interested or have questions regarding the available projects and events (See Figure 10.).

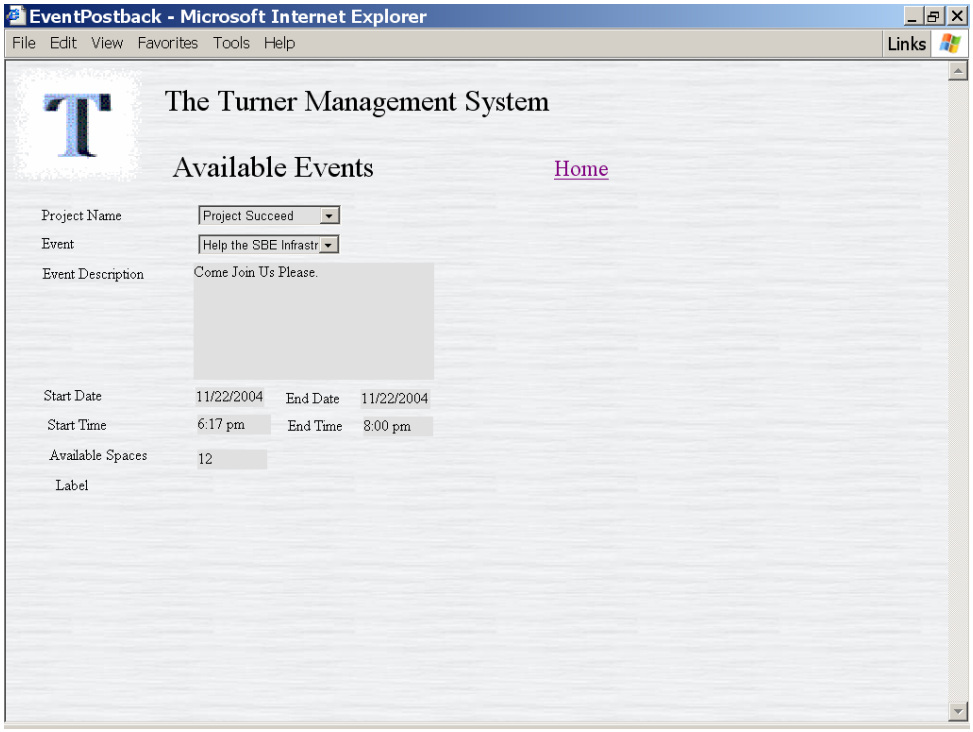


Figure 10. Available Events Page

5.5.3 Client Upload Information

By selecting the "Upload Information" link, the client user can upload any document, image file, portable document format, Excel spreadsheet, or log file and submit to the database. The client has to choose the file to upload, give a brief description of the file, and indicate the file extension of the file being uploaded and pressing the submit button. The client has a choice to reset and start over on the choices he or she has made before submitting by pressing the reset button (See Figure 11.).

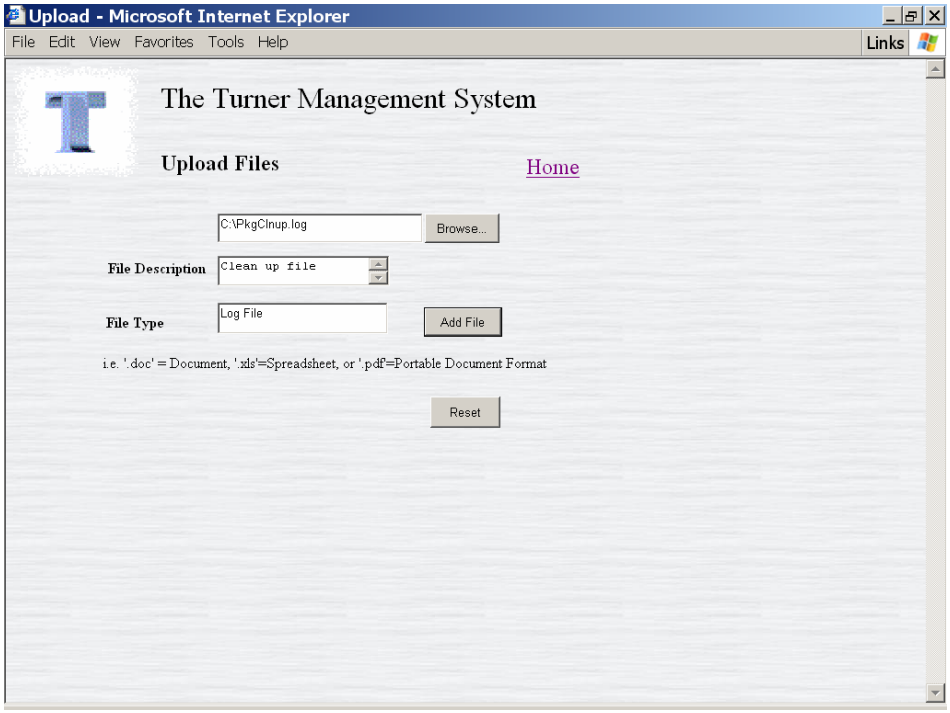


Figure 11. Upload File Page

5.5.4 Client Download Information

By selecting the "Download Information" link, the client user can download any file that has been submitted to the database. This Web form uses a data grid to represent the information that can be downloaded. The client has the ability to view file name, description of the file, and the file extension of the file being downloaded. The client user chooses the file link by clinking on it and the link opens a Graphical User Interface (GUI) that allows the client user to open or save the chosen file (See Figure 12.).

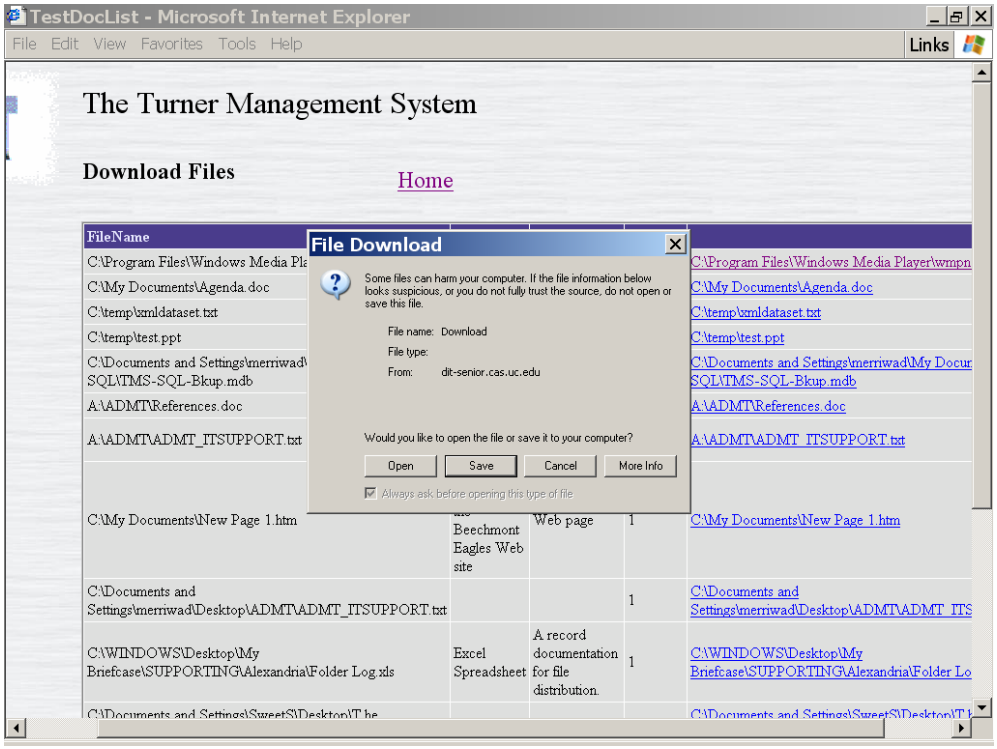


Figure 12. Download File Page

5.5.5 Client Search Events

A client user can access the searchable events by entering the "Calendar" link from the main page and choosing a date that has a thumb-tack image attached. Once the client user clicks on the thumb-tack image the client is then redirected to the "Search Events" page. The search link searches words in the Event description (See Figure 13. and Figure 14).

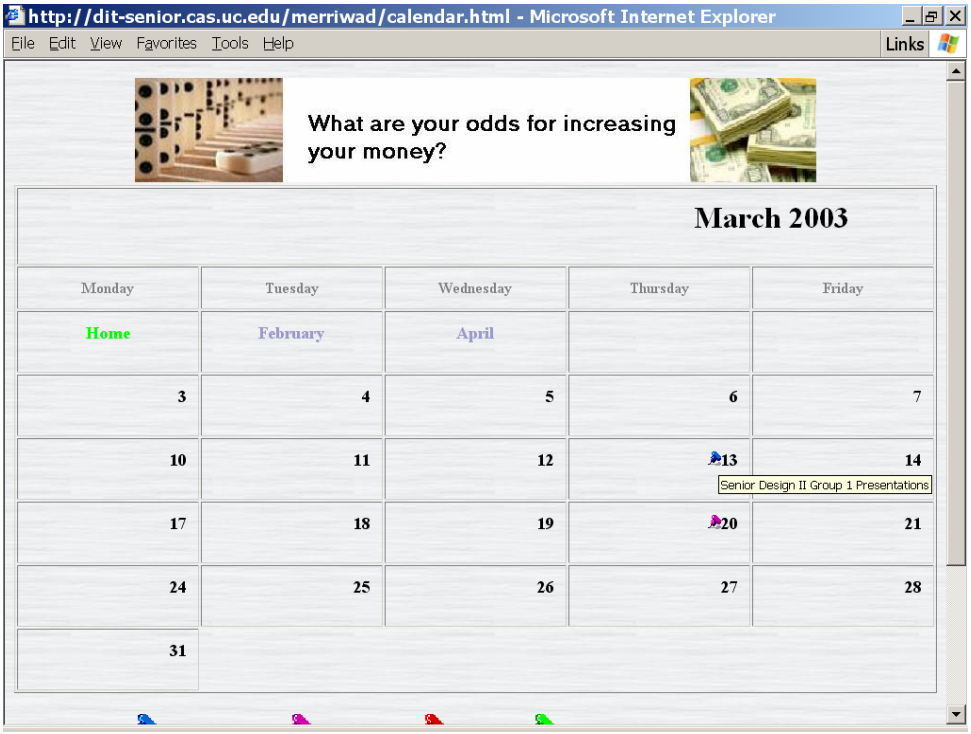


Figure 13. Calendar Page

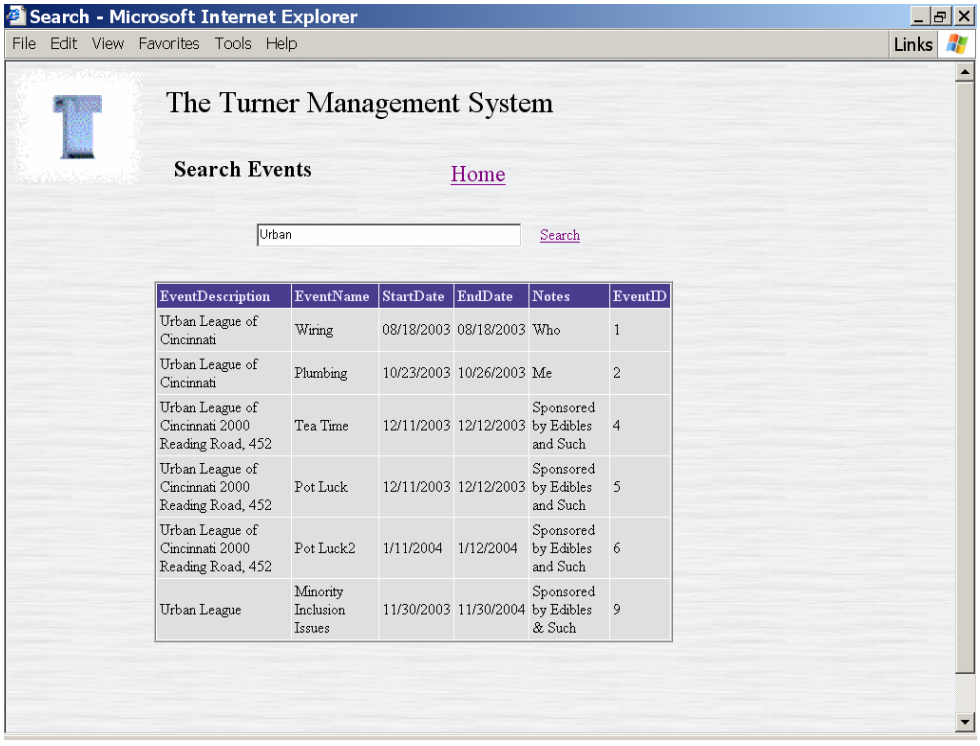


Figure 14. Search Events Page

5.5.6 Research Resources

The client user will enter the home page of the site to navigate to the "Research" link. By selecting the "Research" link, the client user can access all of the support resources the consultant has access to. The client can e-mail the consultant if they are interested or have questions regarding the available resources (See Figure 15.).

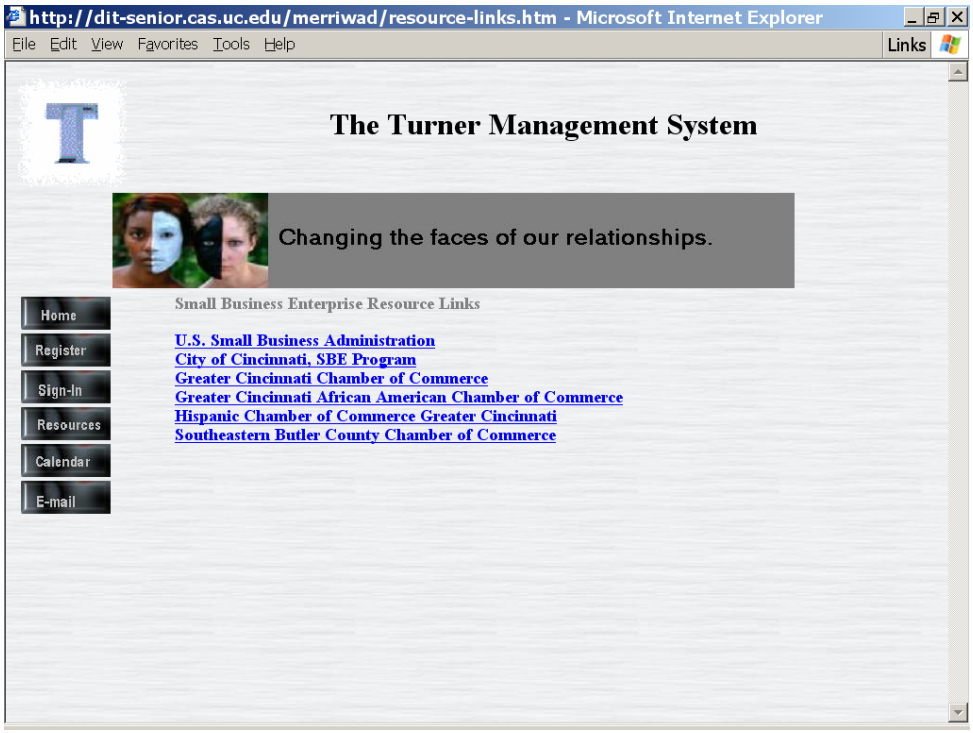


Figure 15. Research Page

5.6 Administrator Login

The administrative user can login using an e-mail address and password combination. The administrator login page is also created with a professionally modern outlook with a light background and simple textboxes (See Figure 16. and Figure 17.).

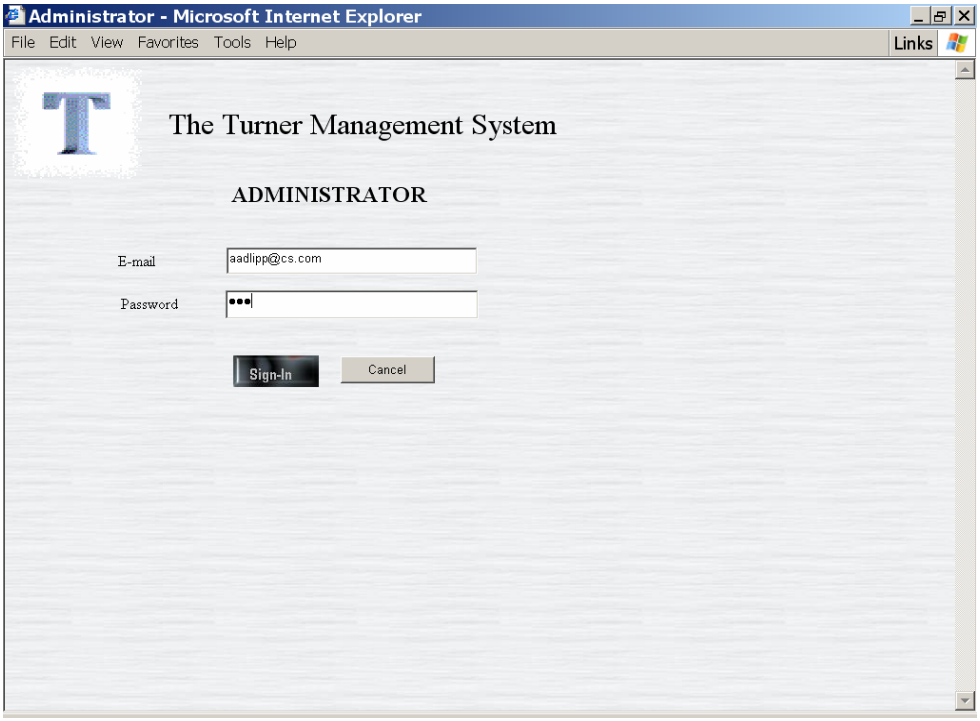


Figure 16. Administrator Login Page

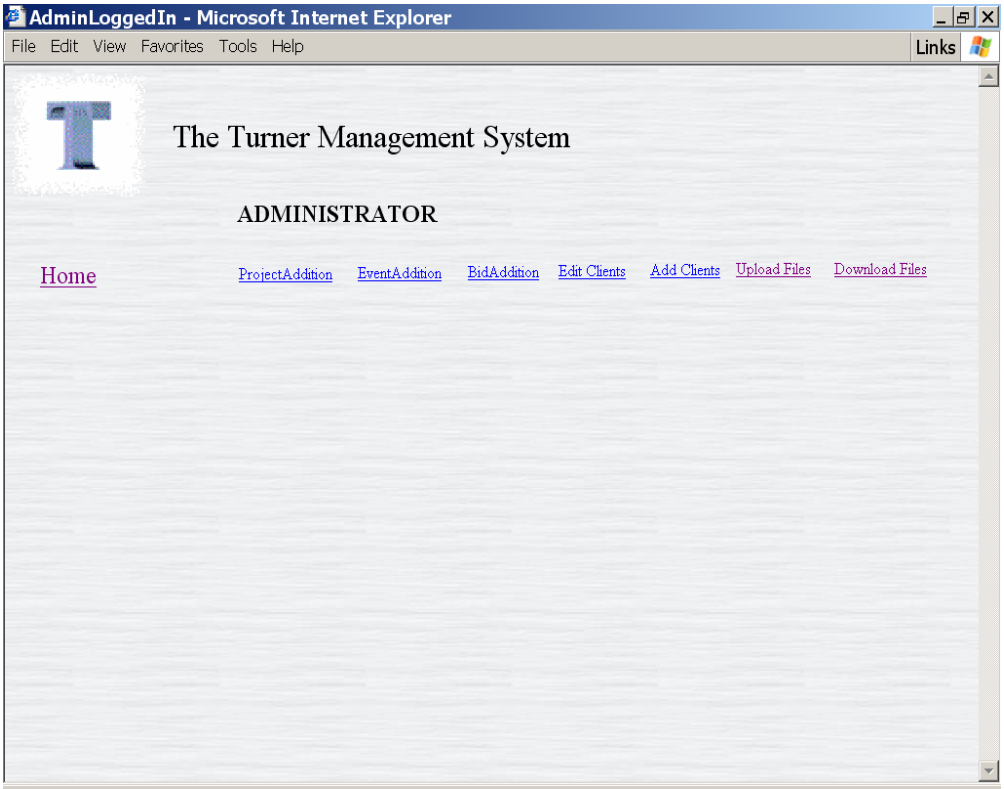


Figure 17. Administrator Logged In Page

5.7 Administrator Profile Analysis

Once the administrator or consultant of the Web application has entered the e-mail and password combination, the administrator has access to making project, bid information, and event additions. The administrator has the ability to submit information to or retrieve information from clients. During the Administrator's login session he or she is redirected to the administrator login page every 20 seconds to ensure security.

5.7.1 Project Addition

By selecting the "Project Addition" link, the administrator can create new projects under the Hamilton County or City Cincinnati Project Commission. The administrator can submit new projects to the database, which become immediately available to the client user. Should the administrator need to change his or mind they have the ability to press the reset button to start over or return later (See Figure 18.).

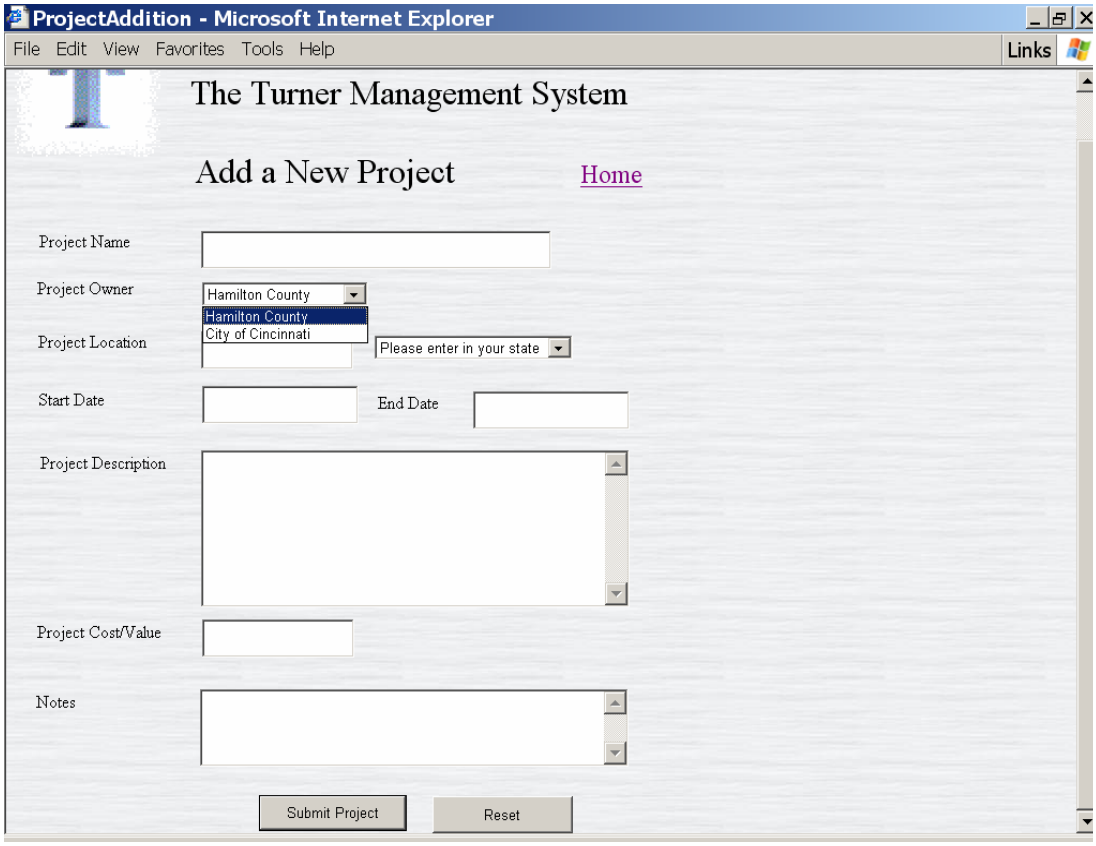


Figure 18. Project Addition Page

5.7.2 Bid Information Addition

By selecting the "Bid Information Addition" link, the administrator can create new bid information under the current projects. The administrator can submit new bid information to the database, which become immediately available to the client user. Should the administrator need to change his or mind they have the ability to press the reset button to start over or return later (See Figure 19.).

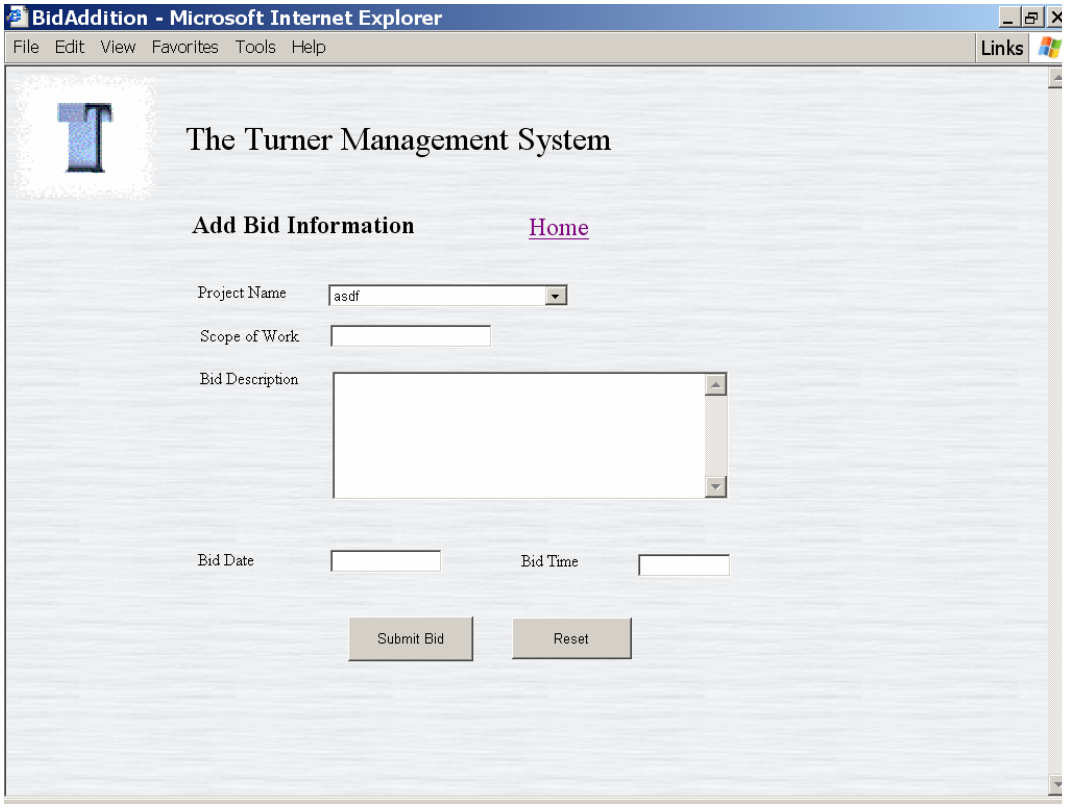


Figure 19. Bid Information Addition Page

5.7.3 Event Addition

By selecting the "Event Addition" link, the administrator can create new events under the current projects. The administrator can submit new event information to the database, which become immediately available to the client user. Should the administrator need to change his or mind they have the ability to press the reset button to start over or return later (See Figure 20.).

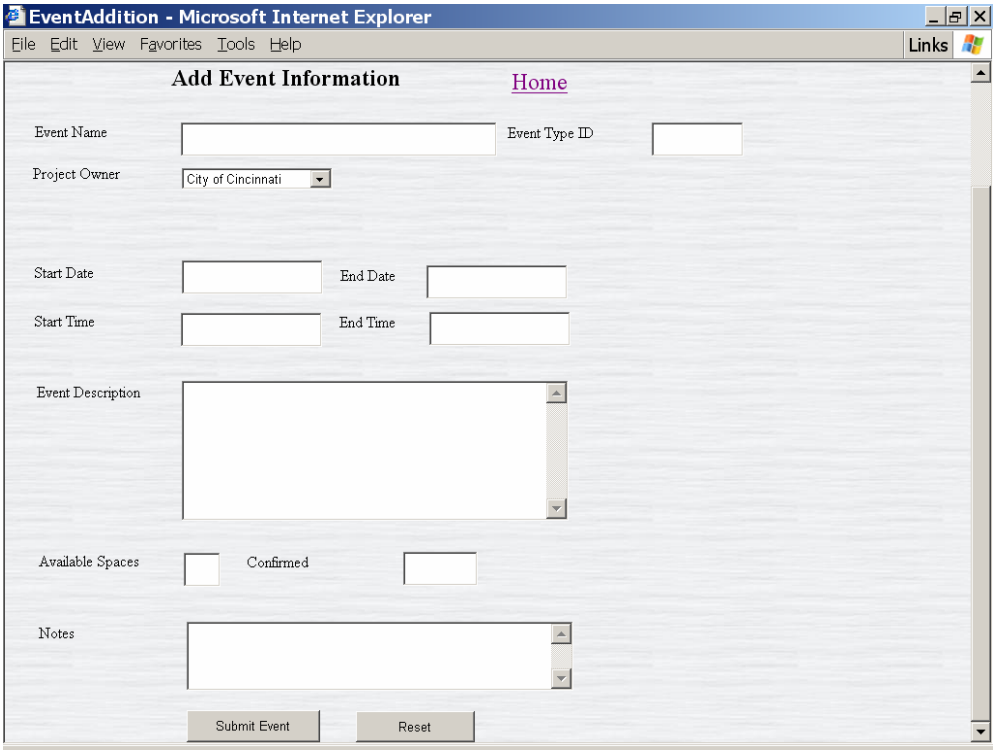


Figure 20. Event Information Addition Page

5.7.4 Upload Information

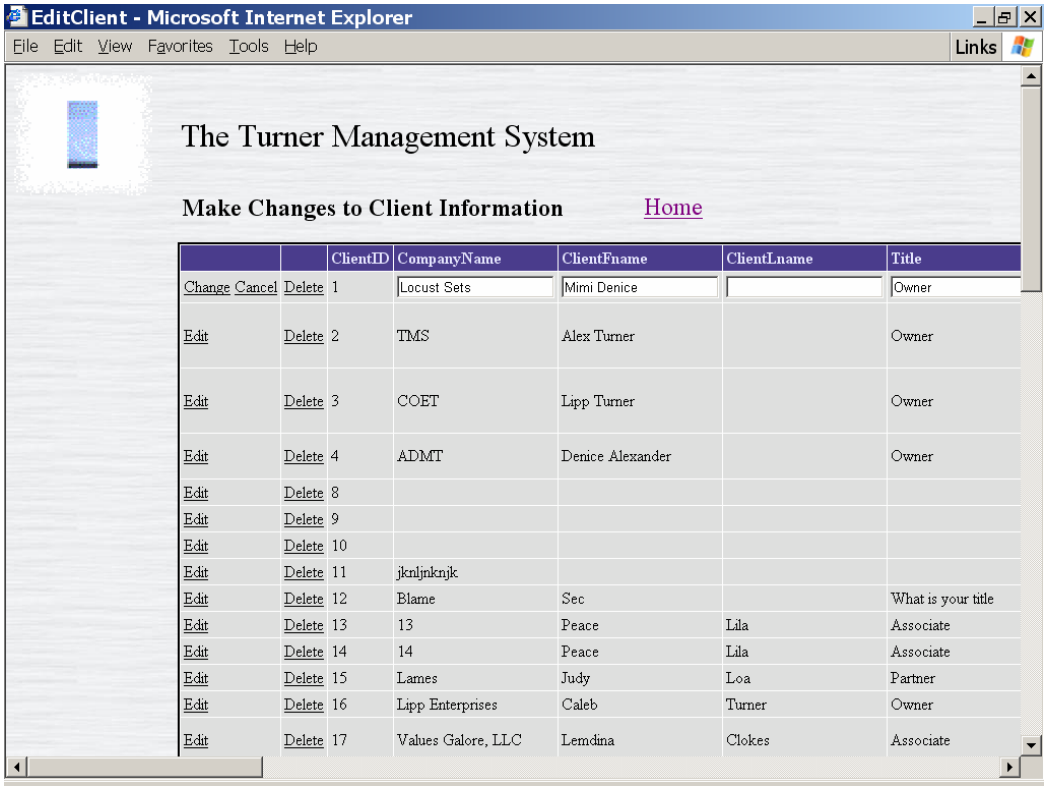
By selecting the "Upload Information" link, the administrator has the same opportunity as the client user to upload any document, image file, portable document format, Excel spreadsheet, or log file and submit to the database. The administrator has to choose the file to upload, give a brief description of the file, and indicate the file extension of the file being uploaded and pressing the submit button. The administrator has a choice to reset and start over on the choices he or she has made before submitting by pressing the reset button. The administrator can submit new event information to the database, which become immediately available to the client user (See Figure 11.).

5.7.5 Download Information

By selecting the "Download Information" link, the administrator has the same opportunity as the client user to download any file that has been submitted to the database. The administrator has the ability to view file name, description of the file, and the file name being downloaded. This Web form was discussed in Client Upload Information section (See Figure 12.).

5.7.6 Edit Client Information

By selecting the "Edit Client" link the administrator has all rights and accesses to update, change, or delete client information. Should the administrator need to change his or her mind they have the ability to press the cancel button to start over. This Web page has an .aspx file extension and uses a data grid to represent the information from the database (See Figure 21.).



		ClientID	CompanyName	ClientFname	ClientLname	Title
Change Cancel	Delete	1	Locust Sets	Mimi Denice		Owner
Edit	Delete	2	TMS	Alex Turner		Owner
Edit	Delete	3	COET	Lipp Turner		Owner
Edit	Delete	4	ADMT	Denice Alexander		Owner
Edit	Delete	8				
Edit	Delete	9				
Edit	Delete	10				
Edit	Delete	11	jknljnknjk			
Edit	Delete	12	Blame	Sec		What is your title
Edit	Delete	13	13	Peace	Lila	Associate
Edit	Delete	14	14	Peace	Lila	Associate
Edit	Delete	15	Lames	Judy	Loa	Partner
Edit	Delete	16	Lipp Enterprises	Caleb	Turner	Owner
Edit	Delete	17	Values Galore, LLC	Lemdina	Clokes	Associate

Figure 21. Edit Client Profile Page

6. Testing Procedures

Testing of the ASP.NET pages and SQL database submissions was an integral part of the development process. The testing procedures implemented the learning opportunities that increased my knowledge on the design of this Web application. Organized planning and outlines to test the Web application were thought out carefully to ensure the best learning.

6.1 Testing ASP.NET Web Forms

Each code entry in the ASP.NET Web form was tested. Once modifications were made to the ASP.NET Web forms, client users were used to test the Web form with specific directions to try different things to break the code. This testing helped to alleviate minor syntax errors and logic errors in C-Sharp.

Testing was completed on the following operating systems: Microsoft 98 and Windows XP. The following browsers were tested: Netscape 7.0 and Internet Explorer 5.0 and later.

Users with skill levels ranging from beginner to intermediate were used to give feedback for changes that allowed modifications. These users gave feedback on readability of the Web forms, use of the Web forms, and ease of the Web forms. Information regarding overall effectiveness, visual interest, and further recommendations were considered to implement modified Web forms using ASP.NET.

6.2 Testing Microsoft SQL database

Each SQL code command was tested. Once modifications were made to SQL data, client users were used to test the data submission by way of the ASP.NET Web forms. Test users were given specific directions to test the SQL commands and the feedback was taken very seriously. A temporary data grid for the Web forms that connected to the database allowed users the ability to see information submitted to the database without accessing the SQL database manually.

Testing was completed on the following operating systems: Microsoft 98 and Windows XP. The following browsers were tested: Netscape 7.0 and Internet Explorer 5.0 and later.

Users with skill levels ranging from beginner to intermediate were used to give feedback for changes that allowed modifications. These users gave feedback on readability of the data entered, effectiveness of the data, and scalability of the data.

7. Conclusions and Recommendations

7.1 Conclusions

This project was created based on the evaluated need for consultants to minimize manual tasks. The Turner Management System was aimed toward both the consultant and the consultant's clients allowing the focus on primary business objectives. This type of system in turn would attract business easier from abroad, systematize correspondence and generate reports easily using a database (12). In response to several discussions with Sonya Walton, I was able to create The Turner Management System for the novice to intermediate computer user by providing visually interesting graphical user interfaces and easy navigation. This application was designed using, Adobe Photoshop 6.0, ASP.NET using C-Sharp in Microsoft Visual Studio, and Microsoft SQL Server 2000. This application allows easy maintenance for the consultant and resourceful information for its clients.

7.2 Recommendations

I recommend that anyone making an addition to this Web application add a component, which allows it to host a discussion board for client-to-client and client-to-consultant communication. This will enhance the client user's experience and networking opportunities by allowing them to interact directly with other small businesses.

I recommend writing a manual for the use of this system and creating an interactive CD-ROM that assists the consultant in learning the system and software. In making modifications to this system, I recommend considering and making relative focus

to disadvantaged-business enterprises. I suggest making this system easier for people who have disabilities to use this system.

Appendix A.

Research Information

During my research of diversity supply for county and city projects I found that quite a few companies, small businesses, and organizations could use such a Web application as the one I have created. Because of the lack of similar Web applications I relied solely on feedback regarding the development of the Turner Management System.

Http://www.cinocci.rcc.org – The Web site for the City of Cincinnati Small Business Enterprise Program Office of Contract Compliance was one site that offered information regarding who, what, and how SBE, MBE, WBE, and DBE's are classified. This Web site also offers information on how to become a certified Small Business.

Http://www.dbutlermanagementconsulting.com – The Web site of Diversity Supply and Minority Inclusion company D. Butler Management Consulting. This Web site and company offers information on diversity needs and minority inclusion efforts being made in Hamilton County and the City of Cincinnati. This site assisted me in finding a better and a more in depth need for my project.

Http://downtowncincinnati.com – The Web site of Downtown Cincinnati, Inc. is a not for profit organization dedicated to the growth and vitality of downtown Cincinnati.

Http://gcaacc.org – The Web site of the Greater Cincinnati and Northern Kentucky African American Chamber of Commerce. This Web site and organization offered a better understanding for the basis of my project. The GCAACC works to identify new market opportunities, improve access to capital and economic growth for established and emerging African-American businesses.

Http://hamilton-co.org – The Web site of the Hamilton County Department of Administrative Services is one Web site in affiliation with the major projects in Hamilton County working to include minorities and small businesses. This office works to increase participation of Small Businesses on county projects by establishing goals for the utilization of Small Businesses.

Appendix B.

Original Project Timelines

Senior Design I Autumn Quarter 2002

	Oct-02	Nov-02	Dec-02	Jan-03	Feb-03	Mar-03	Apr-03	May-03	Jun-03
Research	Oct-02	Nov-02	Dec-02	Jan-03	Feb-03				
Write Proposal		Nov-02							
Present Proposal			Dec-02						
Develop/Test Database			Dec-02	Jan-03	Feb-03				
Develop/Test Web Site					Feb-03	Mar-03			
Test Project					Feb-03	Mar-03	Apr-03		
Implement						Mar-03			
Complete Initial Project						Mar-03	Apr-03		
Write Manual								May-03	
Present Completed Project									Jun-03

Figure 22. Original Senior Design I Timeline

Senior Design II Winter Quarter 2002-2003

Week of	Task
1/06/2003	1. Prepare a Web form format and layout.
1/13/2003	1. Schedule first meeting with my advisor for SDII. 2. Format Excel spreadsheet into an Access database.
1/20/2003	1. Prepare a document to submit to Prof. Said that reflects my goals for the SDII course. 2. Set-up a Web server account in the CAS (IET) lab.
1/27/2003	1. Develop an initial Web site format. 2. Program using .NET framework. 3. Submit Draft of Project Description and Intended Use and User Profile.
2/03/2003	1. Continue formation of Web site and uploading any information that will be used for the project. 2. Set up a SQL server account using the Senior Design computer. 3. Submit Progress Report #1
2/10/2003	1. Attempt to integrate Access database in SQL 2. Develop & test a connection to the Web site using the Access database.
2/17/2003	1. Test formation of Web site and database. 2. Develop and test a connection to the Web site using SQL server.
2/24/2003	1. Implement a functioning prototype for Senior Design II. 2. Test the functionality of the prototype.
3/03/2003	1. Continue to make changes where needed on the project. 2. Set up a meeting with my advisor for final review. 3. Submit Progress Report #2.
3/10/2003	1. Submit a functioning prototype to the advisors of Senior Design II. 2. Present a functioning prototype to the advisors and learners of Senior Design II. 3. Submit final Design Freeze and present prototype to faculty and fellow learners.

Senior III Spring Quarter 2003

3/17/2003	1. Begin process of finalizing project. 2. Begin writing manual for this project.
3/24/2003	1. Continue building the project to its final state. 2. Write manual based on current project status.
3/31/2003	1. Test project and make any necessary changes. 2. Implement project using company information and test users.
4/07/2003	1. Do follow-up on test users' capability. 2. Implement any changes to satisfy follow-up.
4/14/2003	1. Continue writing process for manual.

4/21/2003	1. Test project ability on security. 2. Implement project security.
4/28/2003	1. Implement project using company information and test users.
5/05/2003	1. Do follow-up on test users' capability and likeness.
5/12/2003	1. Continue writing process for manual. 2. Make any necessary changes to project based on users' follow-up.
5/19/2003	1. Continue writing process for manual. 2. Test user on capability of following manual while using Web application.
5/26/2003	1. Finalize manual for this project. 2. Complete any final testing of project.
6/02/2003	1. Present completed and final Senior Design project to faculty and fellow learners.

Figure 23. Original Senior Design II Timeline

Senior Design III Spring Quarter 2003

Month/Week of	Task
May	
Week of 5/26/03	Submit IP timeline with completion of project to Professor Said
June 2003	
Week of 6/2/03	Develop client Info form (signed-in client)
Week of 6/9/03	Test forms with client and get feedback
Week of 6/16/03	Review client feedback and make changes to form
Week of 6/23/03	Re-test changes with client and get feedback and make changes
Week of 6/30/03	Study upload and download process for Web forms
July 2003	
Week of 7/7/03	Begin upload and download processes with client form
Week of 7/14/03	Continue working with upload and download processes
Week of 7/21/03	Continue working with upload and download processes
Week of 7/28/03	Test upload and download processes with client
August 2003	
Week of 8/4/03	Review client feedback based on upload and download processes
Week of 8/11/03	Make changes to Web forms based on client feedback and re-test
Week of 8/18/03	Develop back-end event form for consultant
Week of 8/25/03	Integrate event form with calendar for client-side use
September 2003	
Week of 9/1/03	Test form with client and get feedback
Week of 9/8/03	Review client feedback and make changes
Week of 9/15/03	Re-test event form and make changes based on client feedback
Week of 9/22/03	Develop back-end project form for consultant
Week of 9/29/03	Test project form and make changes
October 2003	
Week of 10/6/03	Develop back-end bid form for consultant
Week of 10/13/03	Test bid form and make changes
Week of 10/20/03	Develop bid form for client-side use
Week of 10/27/03	Test and make changes
November 2003	
Week of 11/3/03	Develop back-end consultant form to add, edit or delete client, project, event and bid information
Week of 11/10/03	Integrate all forms and test with client
Week of 11/17/03	Re-test entire Web application with client and consultant
Week of 11/24/03	Write final paper and submit as draft
December 2003	
Week of 12/8/03	Prepare final documentation and presentation
Week of 12/15/03	Present completed project to learners and advisors

Figure 24. Original Senior Design III In-Progress Timeline

Appendix C.

Code

C 1. VB Date and time stamp

VBScript was used to format the time and stamp on the main Web interface and the Client Logged In page. The script code uses a document write naming convention for making the script visible to the page. The now command identifies with the users clock settings.

```
<script type="text/vbscript">


     document.write(FormatDateTime(date(),vblongdate))
               document.write(" at ")

     document.write(FormatDateTime(now(),vblongtime))
               document.write("<br>")
</script>
```

C 2. Password Validation on New Client Registration Form

The password and confirmed password textboxes are set to strings and are set to be equal to each other. If the confirmed password is equal to the password, the password column in the database is updated and validated to true.

```
string password = txtPassword.Text;
string confirmedpassword = txtConfirmedPassword.Text;

if(password.Equals(confirmedpassword))
     {
          row[“Password”] = password;
          dsDataSet.Tables[0].Rows.Add(row);
          sqlDataAdapter1.Update (dsDataSet);
     }
else
     {
          CustomValidator1.Visible = true;
     }
```

C 3. Sign in SQL

```
     sqlDataAdapter1.Fill(dsDataSet1);
     for (int i = 0; i <
dsDataSet1.Tables[“Table_Name”].Rows.Count; i++)
```

```
{
     if (dsDataSet1.Tables[“Table_Name”].Rows[i]
[“Column_Name”].Equals(txtTextBox.Text.Trim()))
     {
          if
(dsDataSet1.Tables[“Table_Name”].Rows[i][“Table_Column2”].E
quals(txtTextBox2.Text.Trim()))
          {
               Response.Redirect(“New_Page.aspx”);
               Return;
          }
     }
```

C 4. Search

The search command on the Web form uses the SQL commands to search the database. Using the SQL wildcard command “%” allows the search of any sentence including the word typed into the textbox. Once the command has initialized, it will fill the dataset with the correct information and bind the information to the datagrid.

```
sqlDataAdapter1.SelectCommand.Parameters[“@SearchText”].Val
ue = “%” + TextBox1.Text + “%”;
sqlDataAdapter1.Fill(dsDataSet1);
dgDataGrid.DataBind();
```

C 5. Upload

An open connection to the database must be established. Once the connection is established a test to make sure that the database that is to be uploaded is not null. The data set is then filled using the data adapter, this communicates information between the Web and the database. A new row must be added to the database table using a byte reference to the table. Putting the file into a new row allows the fileupload object including the postedfile property will store the file in the database. Creating an array of bytes to store the file in from the input stream reads the information as bytes, starting from 0.

```
if(fileUpload.PostedFile != null)
     {
          sqlConnection1.Open();
          sqlDataAdapter1.Fill(dsUpload1);
          DataRow row = dsUpload1.Tables[0].NewRow();
          row["FileName"] = fileUpload.PostedFile.FileName;
          byte[] file = new
          byte[fileUpload.PostedFile.ContentLength];

     fileUpload.PostedFile.InputStream.Read(file,0,fileUplo
ad.PostedFile.ContentLength);
          row["FileContents"] = file;
```

```
                row["ClientID"] = 1;
                row["Description"]= txtDesc.Text;
                row["FileType"]= txtType.Text;
                dsUpload1.Tables[0].Rows.Add(row);
          sqlDataAdapter1.Update(dsUpload1);
     }
```

C 6. Download

There must be an open database connection. Once the an open connection is established, a temporary id must have string value that will be requested from the browser. The data adapter fill a dataset to translate information being retrieved from the database. The identity of the files to be downloaded from the database must be in byte form which forms a link for the information to be retrieved from the database.

```
String fileid = Request["fileid"];
sqlConnection1.Open();
sqlDataAdapter1.SelectCommand.Parameters["@Param2"].Value =
fileid;

sqlDataAdapter1.Fill(dsDLoad1);
if(dsDLoad1.Tables[0].Rows.Count >= 1)
     {
          DataRow row = dsDLoad1.Tables[0].Rows[0];
          string filename = row["FileName"].ToString();
          Response.AddHeader("content-
disposition","attachment; filename=" + filename);
          byte[] file = (byte[])row["FileContents"];

Response.BinaryWrite(file);
     }
```

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