Voters United for Equality Database and Web Site

By

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Submitted to
the Faculty of the Information Engineering Technology Program
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for
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Abstract

This report covers the need for and development of a Web site and database for a non-profit civil rights organization. The purpose of this project is to create a database and web site that will increase the organization's productivity and ability to communicate with its members. The organization's missions and goals were considered during the design of the database, user interface, and application functionality. Data architecture, application architecture, and the web layout are described in this report.

Voters United for Equality Database and Web Site

1. Statement of the Problem

1.1 Definition of the Need

Voters United for Equality (VUE) is a nonprofit, political organization that encourages the informed participation of gay, lesbian, bisexual, transgender, and GLBT-supportive citizens in government. VUE also advocates equality for members of the gay, lesbian, bisexual, and transgender (GLBT) community. The organization does not currently have a database to track member, volunteer, or election information. According to the Internet Nonprofit Center, a database will allow the organization to increase productivity, decrease operating costs, and to more efficiently develop a presence on the Internet. The organization also needs to develop a Web site that allows citizens in the community to become members, make online donations, and find election information. Through basic Web design techniques, the Web site will provide a structured, graphical way to allow users to view or access the information contained in the database. The users of the Web site will be able to navigate easily within the Web site in order to find the desired data (2). For example, a user searching for election information will access an Active Server Page (ASP) that runs an SQL statement using VBScript to retrieve election information from the VUE SQL Server database.

The Internet Nonprofit Center also describes the crucial role that a database will play in every VUE initiative. The database will be useful to every staff member and must allow VUE's governing body to track information necessary to evaluate the success of the organization (1). The long-term financial and productivity benefits of the database will offset the initial cost of computer equipment and software (3).

2. Supporting Resources

When developing a database for a nonprofit organization, several factors must be carefully considered to ensure that the organization reaps the maximum possible benefits from the new system. First, the database should be useful to the organization. The system should be designed in a way that allows the organization's members and volunteers to gather the information that they need in order to achieve the organization's goals. This the most important factor to keep in mind when designing database tables.

Second, data should be stored in a single database if possible. If more than one database is created, data becomes more difficult to reference and maintain.

Third, the database should be designed in-house if possible. The members who will be using the database should play an integral role in its design. If a consultant designs the database, the organization would be dependent on an outside party for support of the system. Also, a consultant may not completely understand the goals and mission of the organization. This could result in a database that is not efficient for the purposes of the organization.

Fourth, the database should have security to ensure the confidentiality of member information. Access to modify the structure of tables within a database should be granted only to individuals who have the duty of maintaining the database.

Fifth, the information in the database should be backed up periodically and kept in a safe location. This should ensure that crucial data is not lost in the event of unexpected hardware or software failures. (4)

Sixth, the database should have the flexibility to allow future modifications to its structure and to be used in additional applications that the organization may decide to

develop. Since the goals of nonprofit organizations can change from one year to the next, the database must be designed to allow new tables and fields to be added easily and efficiently. For example, due to time restrictions, accounting information will not be included in this phase of project development. However, the completed system will be designed to allow the flexibility to add this information at a later date. The design should ensure that the organization's reports, queries, personal computer (PC) applications, and World Wide Web pages could easily access the database information.

Considering these aspects in the planning phase will maximize the cost and productivity benefits for the organization. This will result in a reliable and efficient database that can be easily adapted to the future needs and growth of the organization.

3. Description of the Solution

In order to develop a database that will meet the needs of Voters United for Equality, a single database will be developed that organizes the most important information for the organization. Categories of information critical to VUE's mission include:

- Membership
- Revenue
- Volunteer staffing
- Election information

VUE's board of directors will use the database to run membership and financial reports. The database will also be used to produce address labels for newsletter and fundraising mailings.

A Web site will also be developed that interfaces with the database. The Web site will feature a form that allows new members to be added to a mailing list. The Web site will also increase VUE's revenue by allowing users to make online donations. Users who want to perform community service will be able to fill out a volunteer application online. The member, donation, and volunteer information will be keyed on the Web site and stored in the database. Users will also be able to find out election information, such as how to register to vote, what date elections are held, and what candidates are competing for public office. The Web site will display the election information from the corresponding database tables. The database design will take into account the need to efficiently display information on the Web site.

The database and its corresponding Web site will be designed in-house. This will also save the organization valuable funding that it can put toward other community service initiatives.

3.1 User Profile

The majority of users for this system will be external users who connect to the Web site. These users will have a wide range of computer experience and will consist of the average citizen to information technology (IT) professionals. The users will be able to perform many tasks, including becoming members of VUE, making online donations, and finding election information. Therefore, the Web site must be easy to navigate so the external users must be able to easily find the information that they are seeking. The database tables must be designed to allow efficient display of information on the Internet.

VUE board members and volunteers will be the internal users of this system. These users will have a low to moderate level of computer experience. Data entry forms will be

developed so that the database can be easily maintained. For security and privacy reasons, only a few individuals within the organization will have access to maintain the system.

3.2 Design Protocols

The design protocols for the VUE database and Web site have been kept very simple so that use of the application will be easier visually and functionally for the users. The database tables were designed using SQL Server 7.0. Figure 1.0 shows the entity

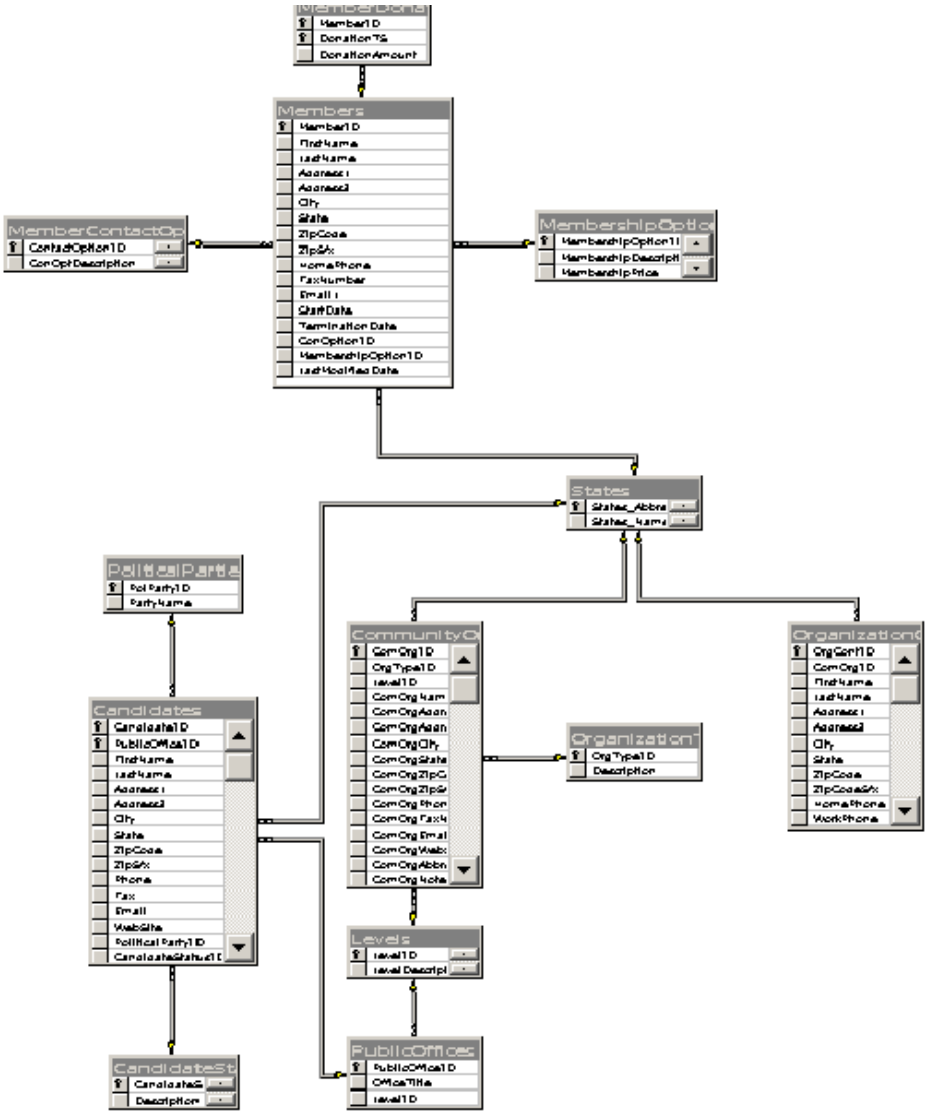

Figure 1.0 - VUE Database Entity Relationship Diagram

relationship diagram for the database tables. There are three main categories of information stored in the tables: membership, community resource, and candidate data. There are also two tables that are referenced by each category of the table. The Level table is used to indicate the level of government at which an organization functions or for which a candidate is running for office. The State table contains a list of all the U.S. states and territories.

Information will be entered into the tables using Microsoft Access data entry forms. Microsoft Access is used as a front end to link to the tables in the SQL server database. The database will also include a switchboard that launches whenever the Access front end is opened. The switchboard contains options, which will allow users to add or edit information in any of the linked tables. Figure 2.0 shows the main menu of the switchboard. The red, white, and blue color scheme was chosen for the switchboard

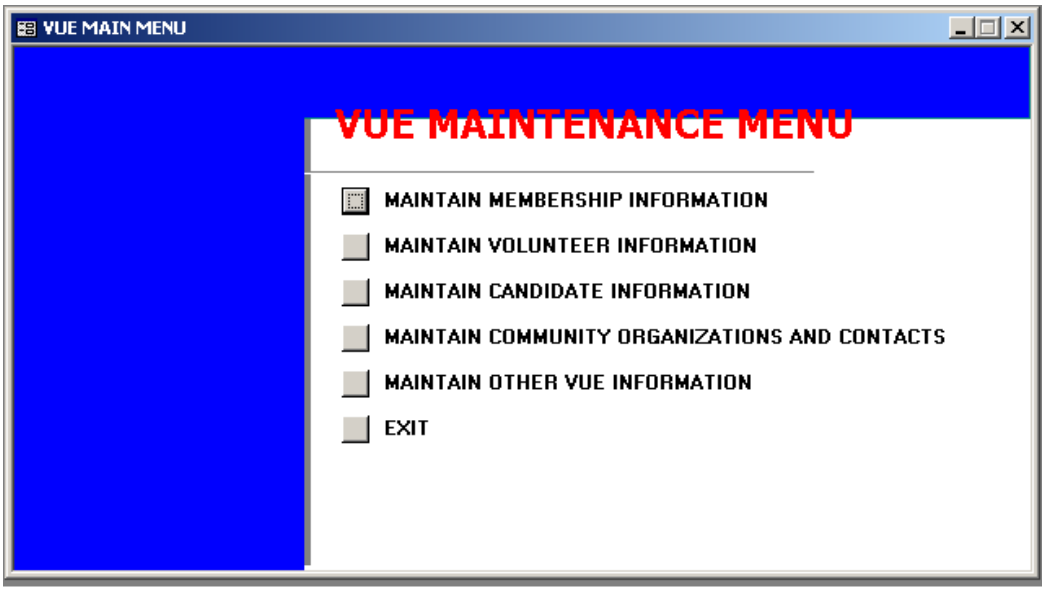

Figure 2.0 - VUE Switchboard Main Menu

because these colors are often associated with patriotism and political activity. Simple, neutral colors were chosen for the data entry forms (see Figure 3.0) since these are for internal use only and because bright colors can become tiresome to look at for long periods of time.

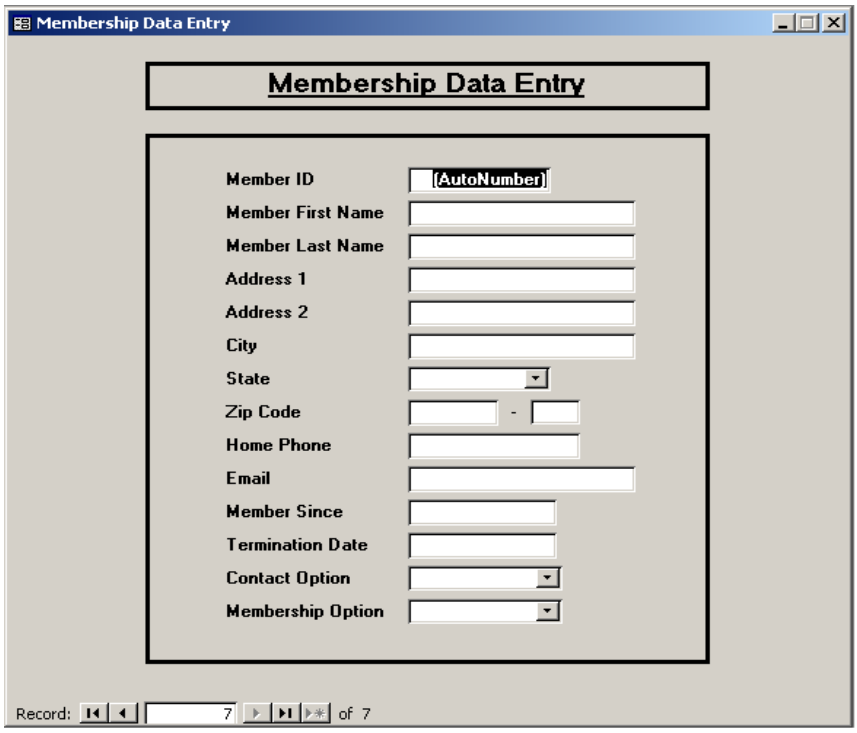

Figure 3.0 - Sample VUE Data Entry Form

The Web site designed to allow users to easily navigate through the application and to easily find information. The Web page design is shown in Figure 4.0.

From the Web site, the user will be able to fill out an online membership form or a volunteer application. The user's information will be inserted into the database. A sample Web page, the membership form, is shown in Figure 5.0. The red, white, and blue color scheme is used because of its association with political and civil activity.

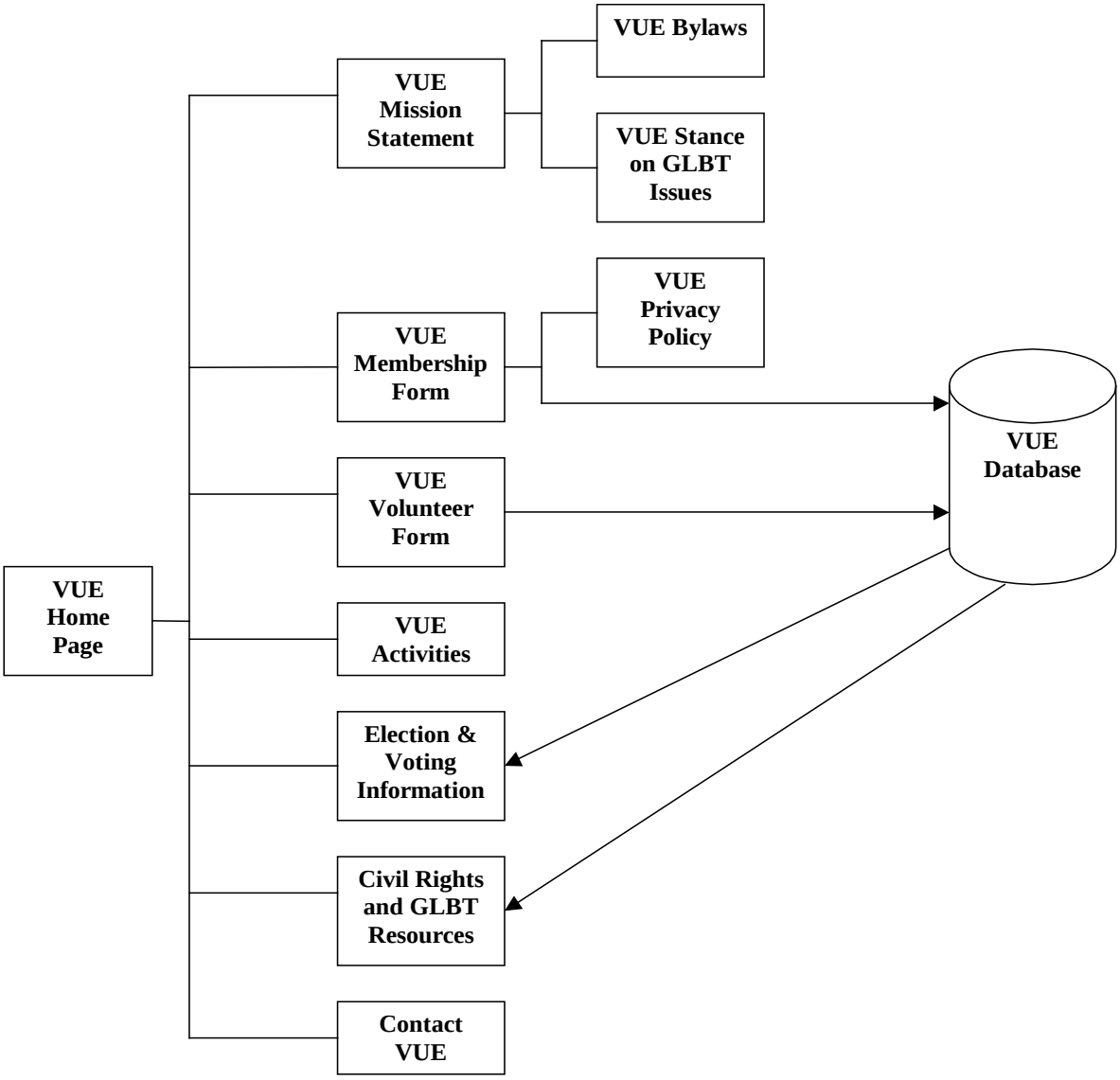

Figure 4.0 – VUE Web Page Design

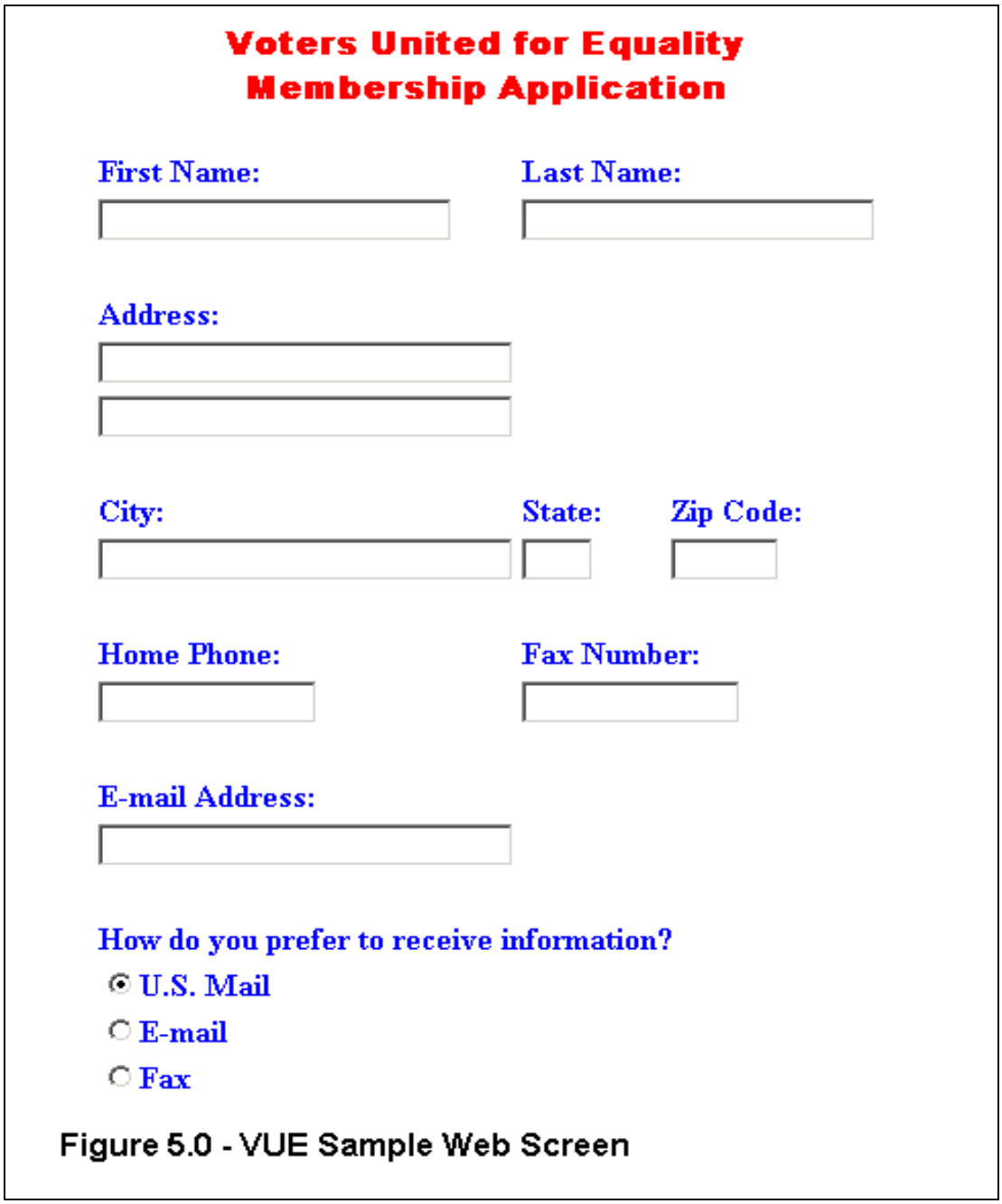

Figure 5.0 - VUE Sample Web Screen

4. Project Objectives and Deliverables

The deliverables for this project are as follows:

- Develop a SQL Server database for this project with front-end data entry forms allowing users to easily add or update information to each table in the database.

- Develop a Web site allowing users to become members, to fill out an online volunteer application, to view election information, and to find community resources.
- Design the Web site to allow user interaction. Users should be able to send an email and navigate easily to another page.
- Design the Web site to allow dynamic updates. The information displayed on the Web pages should be stored in the database whenever possible. If the information ever needs to be changed, values in the database can simply be changed without altering the design of the Web page.

5. Design and Development

5.1. Budget

One major goal of this project is to keep the total budget for database development to a minimum. Although VUE can easily find other nonprofit organizations willing to donate the hardware and software necessary to complete this project, the projected budget will not reflect this. Instead, the budget details the hardware and software costs assuming that VUE will have to buy each piece of hardware and software. Items marked with an asterisk indicate components of the project that VUE can currently obtain free of charge.

*MS Visual Studio 6.0 Professional Edition	$469.99
*MS Office 2000 Professional Edition	$488.99
MS SQL Server 7.0	$1299.99
*Personal Computer with Monitor	$999.00
*Reference Books	$100.00

Total Budget	**$3357.97**

5.2 Software

VUE's board of directors made the final decision about which software should be used to complete this project. Since the database and Web elements will play a vital role in every aspect of the organization's operations, the development software must be easy to learn and must be a software package with which a large number of people are familiar. For this reason, web development tools, such as Dreamweaver, were ruled out. Instead, VUE's board of directors decided to use Microsoft Visual InterDev 6.0 and Microsoft Visual Basic 6.0 in order to develop the web portions of the project. Both of these products are included in Microsoft Visual Studio 6.0. The cost of purchasing MS Visual Studio is equivalent to purchasing MS Visual Basic and MS Visual InterDev separately. Therefore, the cost of MS Visual Studio is used in the budget.

For the database, the board of directors originally decided to use Microsoft Access. After further research and discussion, the board decided to use Microsoft SQL Server 7.0. Though more people are familiar with MS Access, MS Access is not designed to function fully in a client-server environment. For example, any user connecting the Web site would need a local copy of the Access database. With MS SQL Server 7.0, this problem will not occur and MS Access can be used to link to the SQL server database. MS Access will be used to develop data entry forms for each table in the database.

5.3 Hardware

The database and Internet functionality for this application will be developed using a PC. While the database functionality can be tested on any PC, Web testing will

be performed on the IET servers at the University of Cincinnati Ohio College of Applied Science. The Web server must meet the following minimum requirements:

- 133 MHz or higher Pentium-compatible CPU.
- 256 megabytes (MB) of RAM.
- 2 GB hard disk with a minimum of 1.0 GB free space. (5)
- Windows NT 4.0 Server, Microsoft Internet Information Server (IIS), and TCP/IP installed.
- Disk storage formatted for NTFS.
- A method, such as DNS or WINS, for resolving IP addresses to computer or domain names. (6)

Once application development and testing have been completed for this system, it will be transferred to a server with an active Internet connection for hosting of the application on the World Wide Web. The organization has not yet chosen an Internet service provider to host the Web site. This selection will be made at an undetermined date in the future. Therefore, the cost of hosting the application is not included in the budget of this project.

5.4 Timeline

The timeline below shows the start and finish dates for development and testing of the project's most crucial components.

ID	Task Name	Duration	Start	Finish
1	First Progress Report	16 days	Thu 1/4/01	Thu 1/25/01
2	Complete Draft of Final Report	31 days	Thu 1/4/01	Thu 2/15/01
3	Complete Development of Membership Component	37 days	Thu 1/4/01	Fri 2/23/01
4	Second Progress Report	21 days	Thu 1/25/01	Thu 2/22/01
5	Test Membership Components	10 days	Fri 2/23/01	Thu 3/8/01
6	Proof of Concept Presentation	16 days	Thu 2/15/01	Thu 3/8/01
7	Complete Development of Volunteer Components	15 days	Mon 3/12/01	Fri 3/30/01
8	Complete Development of Election Components	10 days	Mon 4/2/01	Fri 4/13/01
9	Complete Development of Resource Links Component	10 days	Mon 4/16/01	Fri 4/27/01
10	Application Testing	5 days	Mon 4/30/01	Fri 5/4/01
11	System Documentation	5 days	Mon 5/7/01	Fri 5/11/01

6. Proof of Design

This project has successfully met the four deliverables described in Section 4 of this document. The first deliverable of this project is to develop a SQL Server database with data entry forms. The database for this project contains sixteen tables, which were designed with the knowledge that the data would need to be dynamically displayed on the Web. In order to allow for easy data entry, forms developed in MS Access are used. MS Access is simply used to link to the SQL Server database through an ODBC connection.

The second deliverable of this project is to develop a Web site allowing users to become members, to fill out an online volunteer application, to view election information, and to find community resources. The Web project for this application contains nineteen HTML and Active Server pages (ASP). The project includes membership and volunteer forms into which users can enter data. The data is inserted into the database when the users click a submit button on the form. Users of the Web site can also view election and voting information. The Web site contains pages that tell users how and where they can register to vote, that allow users to view candidates for a particular political office, and that allow users to view a specific candidate's stances on GLBT issues. The Web site also has a page that lists the contact information for GLBT and civil rights organizations.

The third deliverable of this project is a Web site that allows user interaction and easy navigation. The VUE Web site contains only a basic level of functionality with which users can interact. Users can send an email with questions or comments to VUE by clicking on a link in the main menu. The site is designed so that the main menu is always displayed on the left side of the browser and the Web site content fills up nearly

all of the remaining space in the browser. If a user clicks a link that is displayed in the content section, the link is displayed in another window so that the user still has access to the main menu. Interaction is also required on the membership and volunteer forms. Users must enter data and click a submit button when they are finished. To view information on candidates, users must select an option from a list box and then click a submit button to view the desired information.

The last and most crucial deliverable of this project is to design the Web site to allow dynamic updates. This makes it easier to maintain the application. In order to make the application more dynamic, the database had to be designed for the Web. For example, the links on the main menu and the election information pages are stored in a table called PageLinks. When these pages are accessed, the links from the table are displayed. In this way, a link can be added to or deleted from the database without editing the Web page. For the candidate and community resource pages, the data is retrieved from the database and displayed on the page. In this way, new records can be added without requiring modifications to the Web page. Also, on the membership and volunteer forms, membership options, contact options, and the states appearing in the list box are all dynamically retrieved from tables in the database.

7. Conclusions and Recommendations

The development of a database and Web site for VUE will result in many benefits for the organization and the community. The goals of VUE were used as the basis to design a system that will increase VUE's productivity, efficiency, and revenue. The unique circumstances that must be considered by nonprofit organizations when

developing a system were used to determine the hardware and software necessary to complete the project.

Future phases of this project should be used to add additional functionality to the application. One possible new component is a Web page that allows users to view a list of their state and federal congressional representatives. Also, a survey feature could be added to monitor user opinions on current GLBT issues. Another good additional component would be to allow users to sign up for an "action alert" list, which emails members urging them to contact their representative concerning pending GLBT-related legislation.

This application could also be improved by making some of the Web components more dynamic. For example, Microsoft InterDev allows the use of style sheets, which are used to give each Web page a consistent design. For example, Web page background colors and fonts can be defined in a style sheet. This would make the application easier to maintain since the background color or font could be changed in the style sheet. Currently, these properties would have to be changed in each individual page.

The design of this system will allow the easy addition of new components and bring many benefits to VUE. From this design, a system can be easily created within the given budget and time constraints and play a small but vital role in achieving equality for all people.

Notes

Resources

1. Coyote Communications Technology Tip Sheet. "Database, Software and Technology Use Tip Sheet". http://www.coyotecom.com/database/ . August 7, 2000.

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