Volunteer Management

User's Guide

By Adam Huffman and Jonathan Spencer
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Background

After Hurricane Katrina, the Central Mississippi Chapter of the American Red Cross needed a system to handle volunteers. The approached Dr. Donald Schwartz, Chair of the Computer Science Department at Millsaps College, who recruited senior computer science majors Adam Huffman and Jonathan Spencer to work on the project. They designed a web-based, database-driven application to handle volunteer management, which was presented to the Red Cross in December, 2005. After further work on the system, they presented the Red Cross with a finished server running the volunteer management system in April, 2006.

# System Requirements from the Red Cross

The Red Cross' first and foremost requirement was that the system would be consistent; that is, that data is always entered and retrieved in the same manner. This helps avoid data loss due to redundancy and omissions when several volunteers are working on the same task.

Next, the system had to have a way to quickly search through all the volunteers to find those who met certain criteria. The Red Cross needed to find volunteers who lived in certain areas, had specific skills and certifications, and had worked on previous events. They also wanted to know at what times their volunteers were available to work, whether they had their own transportation, whether they had ever been convicted of felonies, etc. "Thank You" and "We Miss You" letters should also be generated for volunteers who worked recently or have not worked in a specified amount of time.

Another requirement was that the system had to be accessible to many people simultaneously from different locations over the Internet. Inherent in this requirement was the need for user roles and accounts for different levels of authorization within the system. The Red Cross also wanted some way for non-connected computers in the field to log volunteer work histories and later merge that data with the master database.

Getting Started

To begin using the application all users both Volunteers and Administrators arrive at the following screen:
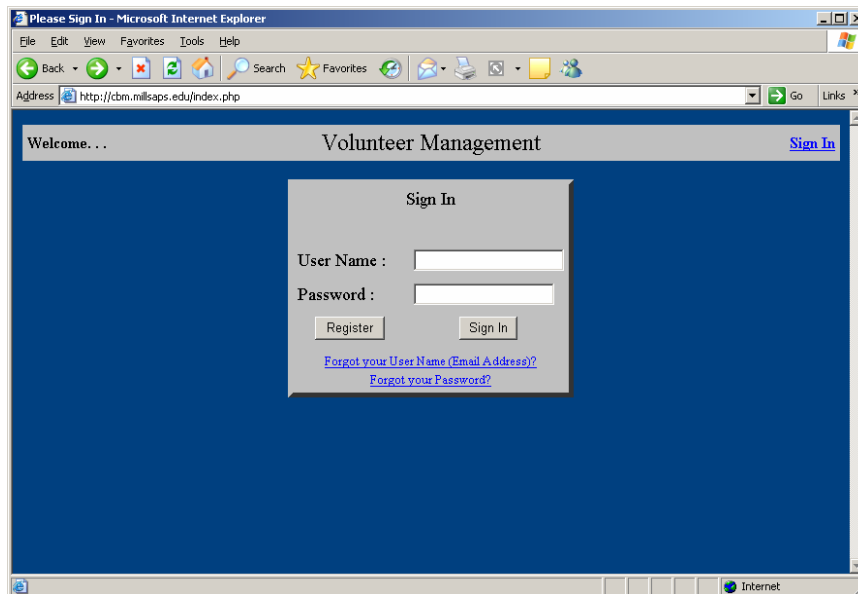
If the individual is already a user and know their username and password then they will be able to sign in. To do so have the user type in their username, usually their email address, in the textbox labeled **User Name:** and their password in the textbox labeled **Password:**. Then the user will click **Sign In** to take them to their personal **My Info** page. If the individual does not know their username or password then haven them select one of the blue links below **Register** and **Sign In**.
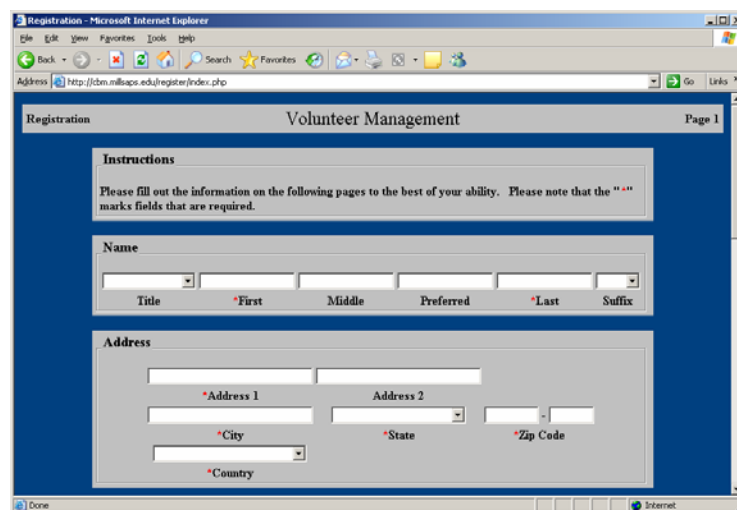
If the individual is new to the system they will need to select the **Register** button to begin the registration process as a volunteer. If the individual needs to become an Administrator then he or she will need to register as a volunteer, then a current Administrator will set their privileges to administrator.

1 Volunteer

A volunteer is a person who is willing to and/or performs work for the Red Cross. A volunteer has a core set of contact and identification information, may posses many of several skills and certifications, may be affiliated with many of several organizations, etc.
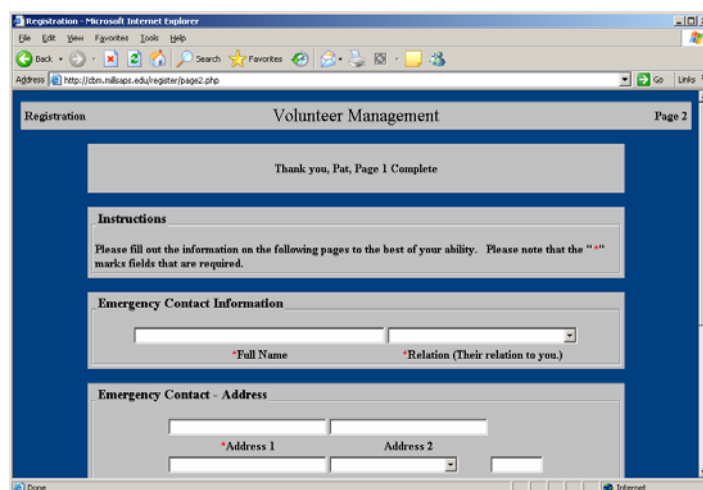
1.1 Registration

Registration is a replacement for the volunteer information paper forms that volunteers currently complete. After completing this process, a volunteer has a user account with the Canadian Blue Minus system and has inserted her information into the database.

The set of required information consists of the user's first and last name, street address, city, state, zip code, unique email address, date of birth, gender, and a password. The user can use her email address and password to login to the system from any computer connected to the Internet.

The subsequent screens collect extra information about the volunteer. This includes the user's skills, classes she would like to take, languages that she speaks, emergency contact, etc. This also includes the times that the user is available to volunteer, divided into days, then morning, midday, and night, and finally into thirty minute time slots.

If the user has questions about the registration process or needs some option changed (such as an organization added to the list), she can click "Contact Administrator" at any time. This will bring up a form with information relevant to the current section and send it to the administrators upon submission.

1.2 My Info

Upon logging into the system as a registered user, a volunteer may click the "My Info" button to see a complete listing of her information as recorded by the Canadian Blue Minus system. This includes her personal information, availability, affiliations, certifications, skills, classes, and work history. If a volunteer needs a receipt for working at a certain event to fulfill a philanthropic requirement, she may simply login to the system and view this page.
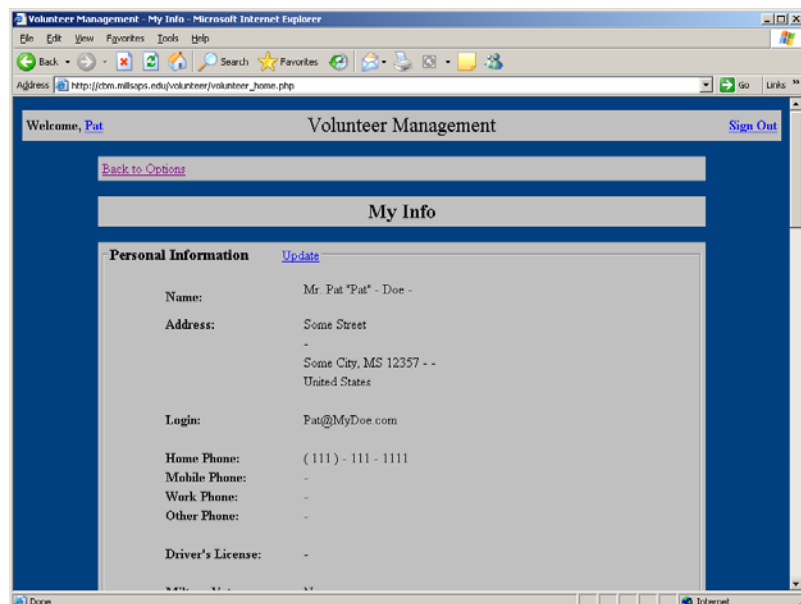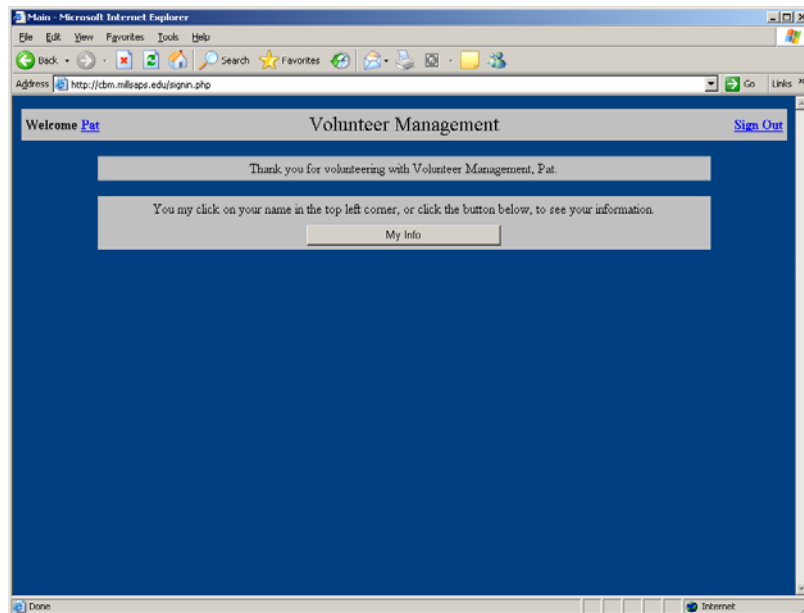
1.3 Update

From the My Info section, a user may click the "Update" link from any segment to add or change information as she pleases. This brings up a form that allows direct input by the user to modify the current information in the system.
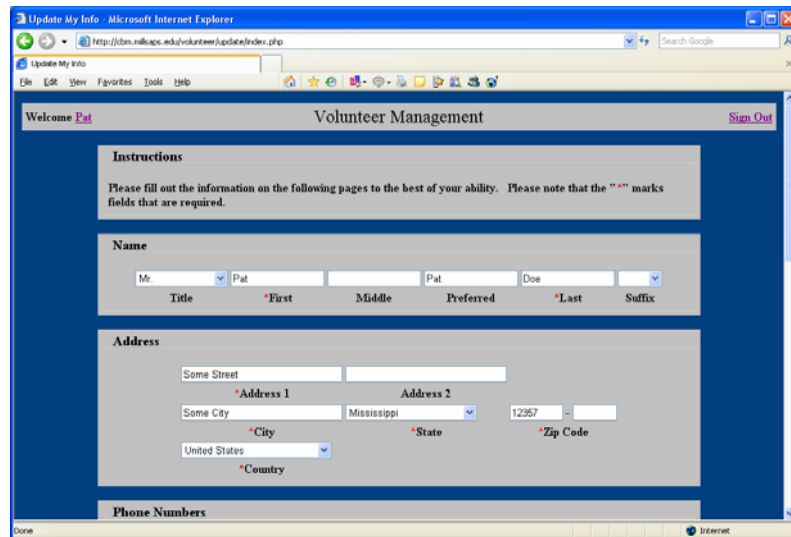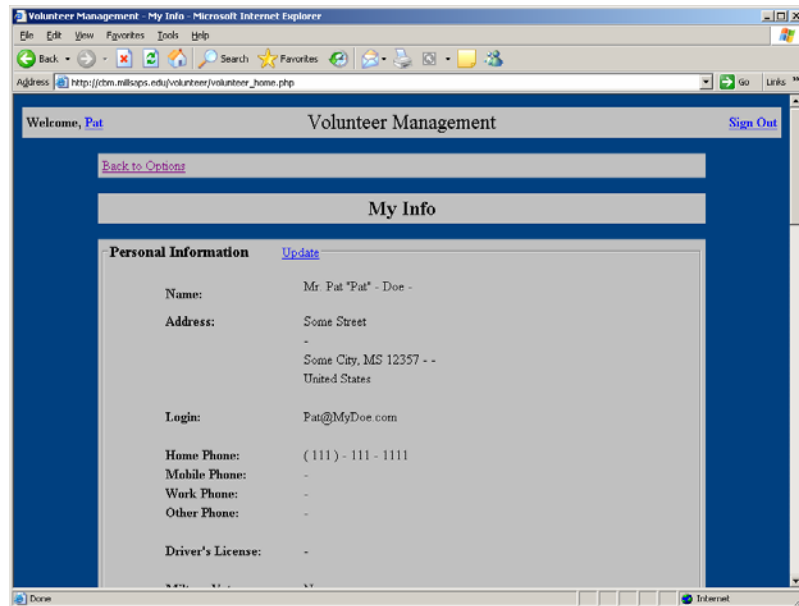
1.4 Contact Administrator

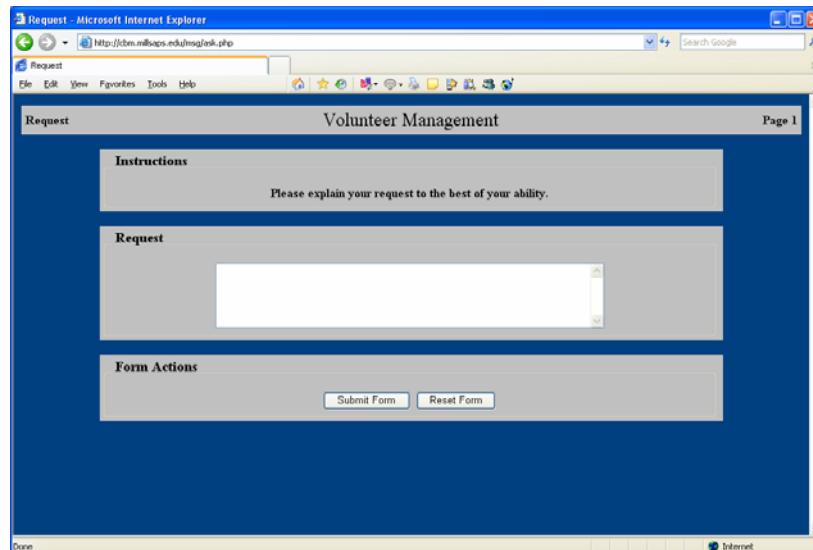Some aspects of the My Info section should not be changed by the user, such as the listing of certifications and work history. When the user clicks the Update link for these sections, she is given a form to contact the system administrators with the necessary information and automatically attach her email address and the time of the message.

2 Administrator
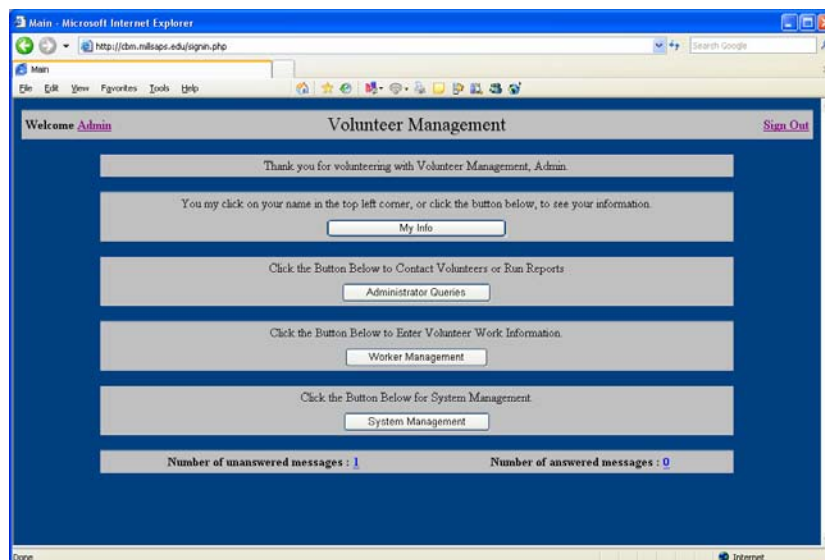
An administrator is a volunteer who has been granted privileges to make modifications and updates to the system by another administrator. An administrator also inherits all the privileges and has access to all the features of a volunteer.

2.1 Administrator Queries

The administrator queries section allows administrators to search for volunteers based on their chosen criteria and generate statistics based on the current volunteer information in the database. Sample queries include:
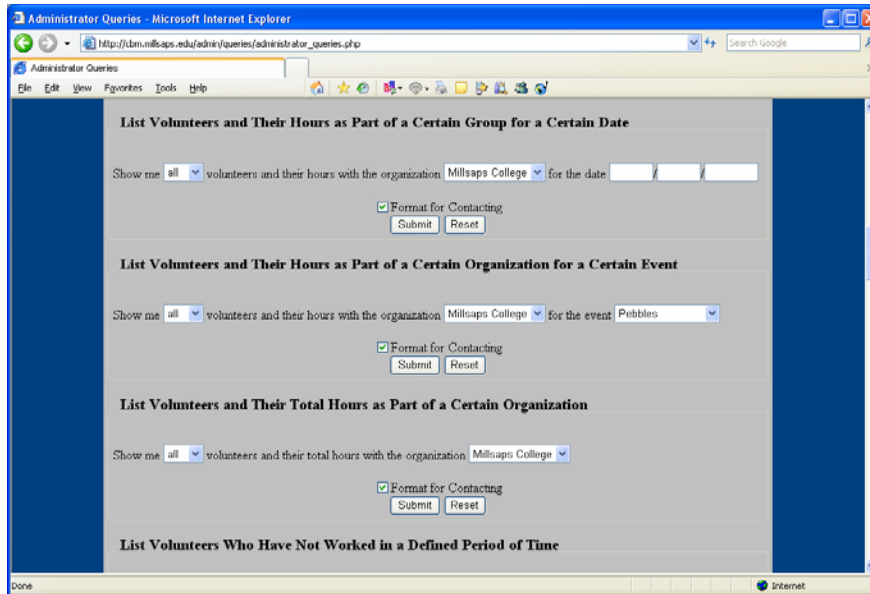
- List volunteers from a certain city
- List volunteers and their hours for a certain date/event
- List volunteers and their hours as part of a certain organization for a certain event/date
- List volunteers who have received a certain certification
- List volunteers who have not been contacted in a defined period of time
- List volunteers who are available at a particular time
- List the number of volunteers who have (not) completed each training
- List the average age of volunteers
- List volunteers who have not worked in a defined period of time
- List volunteer who recently worked
- List volunteers whose information recently changed
- List volunteers who desire an upcoming course

The last four queries return the information necessary to send letters to volunteers for "We Miss You" and "Thank You" letters as well as general notification letters.
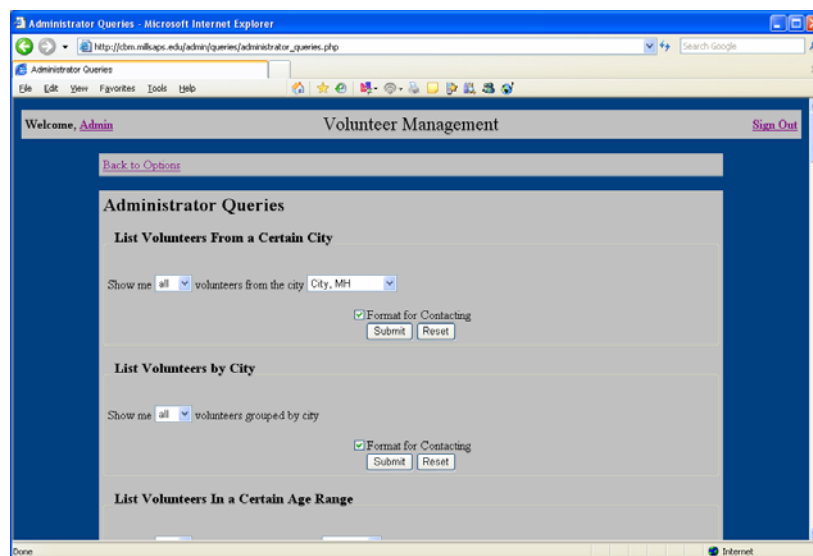
2.1.1 Contact Wizard
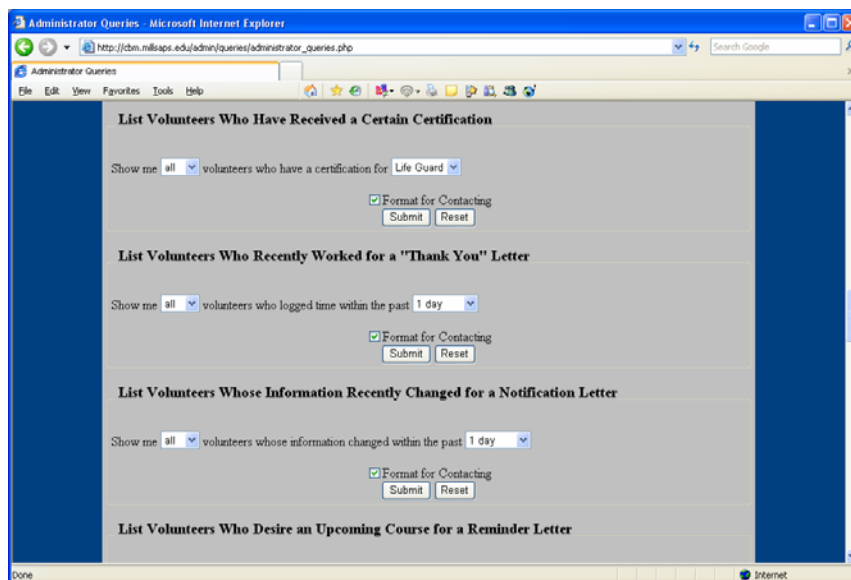
The administrator queries section gives administrators a fast and easy way to find volunteers and solicit their help. Using this section of the application replaces searching through filing cabinets and reading thousands of potentially out-of-date forms to find aid.

Each section of the administrator queries that returns a list of volunteers has the option to format the results for contacting. This adds an input field and contact summary to each resulting volunteer's information. To contact a volunteer, an administrator tries one of the contact methods listed, then records the results of the contact session in the text field and submits the form.

Each contact summary contains the name of the administrator who contacted the volunteer, the time of the contact session, and the details of the session. The first two fields are captured automatically when the administrator submits the details of the session.

2.2 Worker Management

Once a work session is over, the Canadian Blue Minus system makes it easy to enter the results into the system. The worker management section contains the same information as a sign in sheet, such as volunteer in/out times, the skill they used, the organizations with which they were working, and the event.

2.2.1 Register

If an administrator tries to enter information for a volunteer who is not a registered user of the system, the administrator is prompted to setup a temporary account that contains the core information for a volunteer.

2.3 System Management

As the number of volunteers grows, some information will need to be updated or added to keep the system current. The system management section allows administrators to add and update certifications, courses, events, languages, and skills, as well as grant (or take away) administrative privileges to other users.
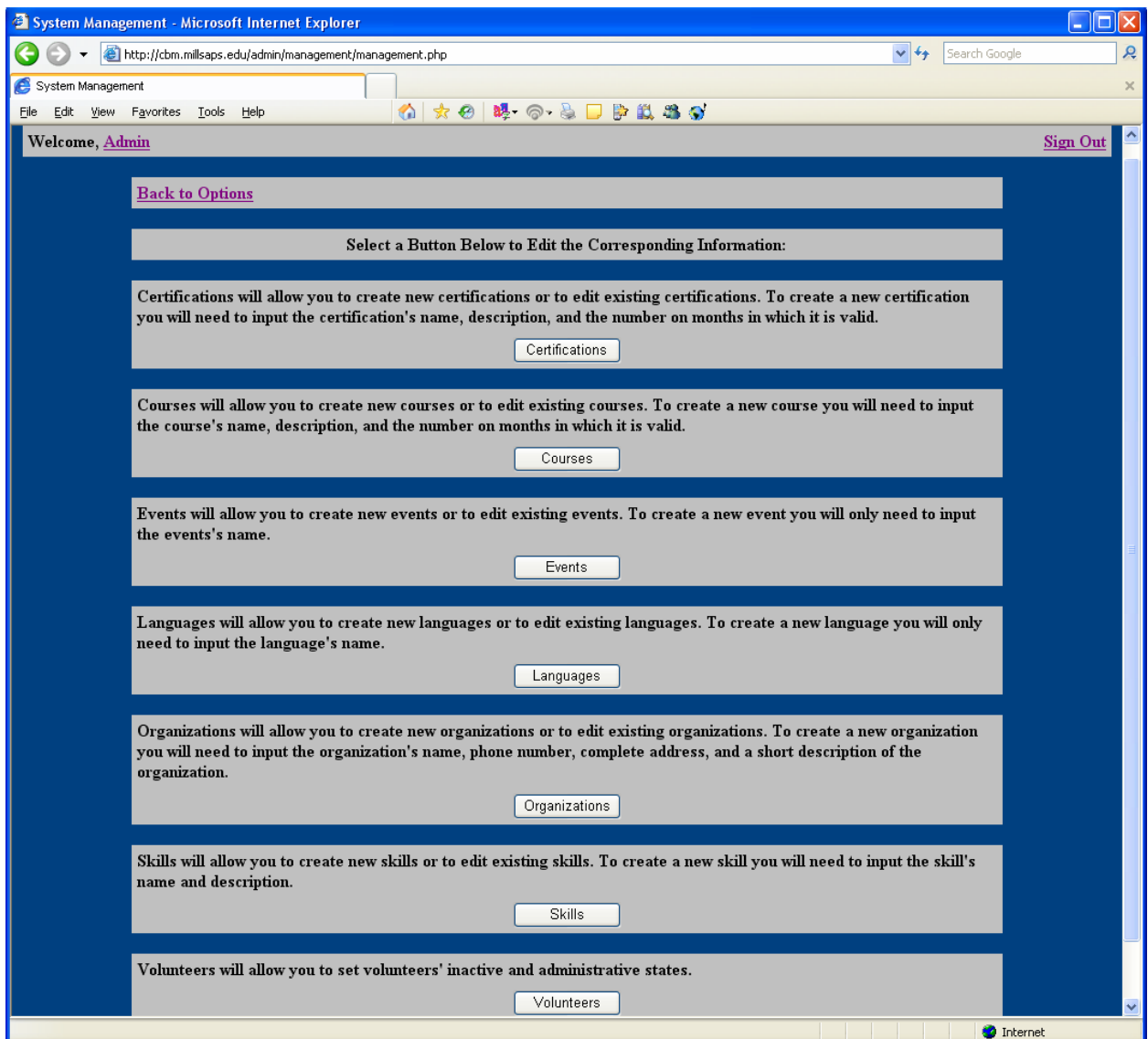
2.4 Message Center

When administrators login to the system, they have the option of checking answered and unanswered messages from the system users.
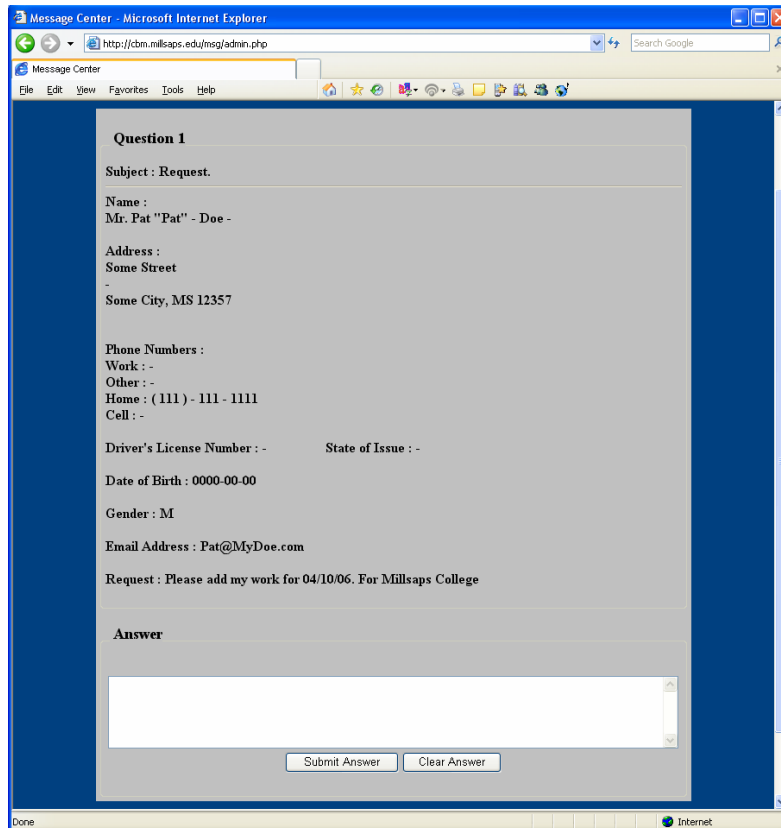
The unanswered messages section lists questions and requests from users that have not yet been handled. These messages include information about the request and the user who posted the request, as well as an input field. Upon answering the question or handling the request, the administrator types a summary of her actions in the text field and submits the response.
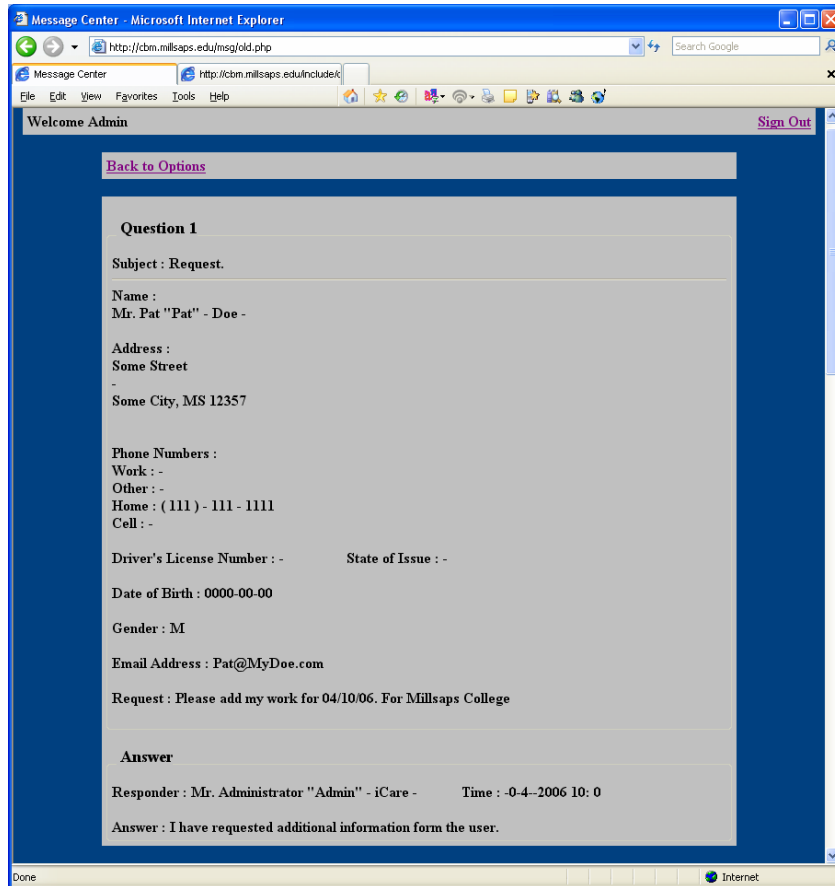
Requests that have already been handled appear in the list of answered messages. Along with each question is the response by the administrator who handled it, the name of the administrator, and the time that the response was submitted.

APPENDIX A - Implementation

Since the Red Cross is a non-profit organization, the system is implemented using free/open source software to keep the cost of the system as low as possible. The combination of technologies is commonly referred to as L.A.M.P., short for Linux, Apache, MySQL, and PHP.

Linux 2.6.11-1.1369

Linux is an open source operating system originally written by Linux Torvalds based on the POSIX operating system. It provides a great deal of flexibility while still maintaining security and stability.

Fedora Core 4

Fedora Core 4 is a Linux distribution jointly maintained by the Fedora Community and RedHat. It strives for user-friendliness and stability to push Linux into the mainstream.

Samba Server 3.0.14a

Samba Server allows *nix-based machines to mimic the functions of Windows-based short message block network servers. The Canadian Blue Minus server uses Samba Server to host a network share that gives certain users access to the contents of the website for remote editing and deployment.

Apache HTTP Server 2.0.54

Apache HTTP Server is an open source web server that runs on most operating systems, including Linux. It allows easy and powerful interoperability with PHP and MySQL.

MySQL 4.1

MySQL 4.1 is a relational database management system designed by the Swedish company MySQL AB. MySQL 4.1 is available as free software under the GNU General Public License (GPL), but they also dual-license it under traditional proprietary licensing. At the time of system design MySQL 4.1 was the most stable and documented version available.

MyISAM

MyISAM is the default storage engine for MySQL. It is based on the older IBM Indexed Sequential Access Method (ISAM). Upon creation of a MyISAM table MySQL automatically selects the table to be dynamic or static if the table does not contain and VARCHAR, BLOB, or TEXT columns. Most tables contained within Canadian Blue Minus are dynamic.

Database Entity Relationship Diagram

Canadian Blue Minus ER-Diagram

info   c_ts

time_slot
ts_id
ts_desc

prerequisites

contacted by

coures_date

language
lang_id
lang_name

availability

volunteer
pid
sal_name
name_f
name_pref
name_m
name_l
add1
add2
city
state
zip
ezip
country_id
email
phone_h
phone_c
phone_w
phone_o
dl_num
dob
option_io
gender
worked_before
transport
e_id
damage
create_date
update
password

speaks

affected

course
course_id
course_name
course_desc
course_expire

pass

desire

teach

coures_date

event
e_id
e_name
e_type_id
e_start
e_end

implies

implies

worked

certification
ccert_id
cert_name
cert_desc
cert_expire

possessed

w_ts

affiliation

implies

skill
skill_id
skill_name
skill_desc

possessed

organization
org_id
org_name
org_desc
add1
add2
city
state
zip
ezip
country_id

skill set

MySQL Administrator and Query Browser

MySQL Administrator and MySQL Query Browser are free utilities provided by MySQL AB. MySQL Administrator is a GUI for editing the total schema of a MySQL database system. It allows for graphical creation of tables, views, and users. The application also allows for the creation of automatic backups, and has the ability to show the health of the table structure and database. MySQL Query Browser is a GUI for running queries, checking views, and editing data.

PHP 5.0.4

PHP, the PHP Hypertext Processor, is a server module and scripting language that allows server side dynamic websites to be created with a C-like syntax. It supports direct communication with MySQL and runs as a module for Apache.

Sessions

PHP supports the handling of sessions, which allows information about each user's individual connection to the application to be contained on the server. Upon logging in to the Canadian Blue Minus application, the session is created and filled with the user's credentials. Each restricted page checks to see if the user is logged in and has the proper credentials before displaying its contents; if not, the user is sent to the login page. When the user logs out, the session is destroyed, preventing her from accessing restricted pages.

Includes

PHP allows some degree of code reusability through the use of the include() function. Instead of entering the code to connect to the database on every page of the application, one can instead make a single page that establishes the connection and include it on all the pages that need to connect to the database. Similarly, a page including constants that will be used throughout the application can be created and included.