

Written Proposal

**Working with the Atlanta Day Shelter for Women and Children to meet
their technology needs**

**ECE4007: Senior Design
L01: Dr. Smith-Advisor**

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Executive Summary

There is a real need in the non-profit community for help in dealing with technology problems. The Shelter Helpers have decided to provide assistance to the Atlanta Day Shelter for Women and Children (ADSWC) this semester because of the humanitarian benefit as well as the personal consulting experience. The ADSWC needs help developing their website, integrating donation software and with internal networking and security issues. This project is a continuation of last semester's work started by a previous senior design group. Last semester's senior design group worked with the shelter to manage their security, add a donation section to the web site and also did a lot of research to determine the best software to manage their incoming donations.

This semester, the Shelter Helpers will build upon last semesters work by repairing several broken PC's, setting up new workstations areas to manage their volunteer and donation check-ins and implementing the Donor Perfect software that was purchased as a result of last semester's research. In addition, the Shelter Helpers expect to provide assistance with a multitude of smaller issues that are outlined in the body of this proposal as well as ones that come up during the semester.

The total costs of purchasing new workstation PC's, mice, keyboard, monitors and miscellaneous items will total approximately \$7356. The equipment cost breaks down to \$846.00 for four computers, \$150 for keyboards and mice and \$600 for monitors. The labor cost totals \$5760. This breaks down to three Georgia Tech students each working 4 hours on both Monday and Wednesday from the end of January to the end of April for a total of 288 hours at an hourly rate of \$20.00/hour. This money will be donated by several outside organizations.

The work that is left by this group will be completed by either next semesters senior design group or by the Georgia Tech Association of Women Engineers.

1. Introduction

The Shelter Helpers will pick up where the previous senior design team's work left off last semester. The previous team accomplished many items such as sifting through a room full of computers to determine which ones were working to researching the best software available for use in tracking donations to initially setting up the

passwords and badges to help with security. They also set up Active Directory on the server to help manage network passwords and enabled roaming profiles so that the staff could log onto any PC and still have their desktop information at hand.

The ADSWC has no paid IT staff with advanced technical knowledge, thus it makes it hard for them to fulfill their technological needs. They need help with everything from loading new software and upgrading their website to maintaining and upgrading their network infrastructure.

1.1 Objective:

The objective this semester is to further enhance the website by integrating volunteer scheduling as well as implementing the Donor Perfect software that was purchased as a result of last semester's research and store all of the donor and volunteer data into a single database. In addition, the Shelter Helpers will add further security and organization to the internal network through the implementation of a VLAN, use of network passwords, network printers and organization of network cabling.

There are still over a dozen computers that were left at the shelter in unknown condition. Along with the PC's are dozens of keyboards and some mice, monitors, UPS' and network switches. The Shelter Helpers will work on identifying which of this computer equipment works and which ones do not. They will attempt to fix the units that are repairable and discard all the rest to gain some room for other donations.

1.2 Motivation:

The humanitarian aspect of this project was what primarily drove the members of the Shelter Helpers to get involved. In addition, the experience of acting as consultants to this organization, the ability to manage this project independently, interfacing on a one-to-one basis with the staff and being able to juggle many simultaneous issues was a large factor in participation.

The ADSWC does a tremendous job helping women and children by easing their burden and helping them get back on their feet. They have a fantastic staff and facility. The facility has five computer clusters to help the women and children who come there. They have two training labs for women to get certified for computer jobs, a lab for

writing resumes and looking for employment, a lab for young adults to work on their homework and play on the computers and a similar set up for teens.

Here is an excerpt from the ADSWC's web site that helps explain who they are and what they accomplish. "The Atlanta Day Shelter for Women and Children is an ecumenical ministry that was founded in 1984 as a resource center to help homeless women throughout the Atlanta area. Over the years, our services and programs have expanded, responding to the needs of 4,976 women and children last year, serving between 150-250 daily. Many of the women who come to us are physical, emotionally, and spiritually worn down. By the time they arrive on our doorstep, they have exhausted every other avenue and are without hope. We help these women become self-sufficient through participation in our programs. Among the programs we offer that help women stabilize their lives are job readiness, job placement, computer training, access to on-site medical care, psychiatric counseling, on-site childcare (while mothers participate in our programs), social security guidance, legal assistance, housing assistance, self-esteem classes, and many other self-improvement workshops." [1]

1.3 Background:

There are many existing issues to be resolved at the shelter as well as many more that will come up during the semester, but the major issues fall into three categories: website enhancements, Donor Perfect software implementation into a single database and network organization, maintenance and security.

Website Enhancements:

Volunteer organizations often struggle with managing and organizing their volunteers' schedule due to its dynamic nature. Consequently, several companies have developed software designed specifically for part-time volunteer scheduling at an affordable price. These programs are also very user friendly, allowing everyone to access and use the software despite their lack of technical savvy.

Three of the most effective volunteer software scheduling packages includes WhentoHelp, Droster, and ScheduleAnywhere. WhentoHelp seems to be the best as it was specifically designed for volunteer-based organizations due to its ability to cross-

match volunteer availability and preferences with the organizations needs [3]. The program is then able to determine an optimal schedule for both parties which is then submitted to volunteers for minor updates and changes [3]. All the information is stored on a secure website, providing easy and safe access to staff and volunteers [2]. In addition, the software can keep track of the number of hours worked by a volunteer as well as several other statistics [2]. Since the schedule is maintained online, there is a maintenance fee ranging from \$100 to \$600 a year depending on the number of volunteers per day; however, there are no setup charges [2].

The majority of volunteer scheduling software provides an online user interface and allows volunteers and organizations to easily access all the necessary data [2]. By storing data on the maintained server, the exchange of information between volunteers and organizations can remain dynamic. The data storage also allows the program to calculate statistical data on the volunteers, such as total hours worked. However, due to the ease of access, the server and software have additional security measures to ensure that the schedule is not tampered with or that any sensitive data is protected [4]. These security measures include password protection, data encryption, as well as routine server backups.

Donor Perfect Software Implementation:

Donor Perfect Software has many different features, but the most prominent ones are its Donor contact information, Tracking and Accounting donations, and Volunteer management [7][6][8][9].

Donor Perfect software allows its users to organize hundreds of donors along with their contact information in one easy-to-use database application. The main technology behind the Donor Perfect software is its database [5]. A database is a structured organization of records and Donor Perfects database allows any computer to access the database which allows user mobility and simplifies data management. Another great feature of Donor Perfect software is its scalability. It varies to suit the needs of any size of organization by scaling the database and contact information for large and small organizations.

The Donor Perfect software installs on a server and can be accessed by a group of computers. It organizes all of their records into an easily accessible storage container [6]. An example is a simple address book to keep contact information, a calendar to schedule volunteers and important fundraising events, and using a spreadsheet to keep accounting information such as donations.

Network Management:

Out of all of the shelters network management needs, one issue rose above the rest. This issue is network security and the proliferation of spyware and virus' throughout the network mainly originating from the teen lab. One way to manage this problem is to separate the teen lab from the rest of the network by using a VLAN.

A Local Area Network (LAN) is a physical connection of wires used to connect host devices (PC's and Printers) together on the same broadcast domain network so that they can communicate with one another [10]. Instead of using physical wires or routers, a Virtual LAN (VLAN) uses software running on a layer 3 Switch to segregate devices into separate broadcast networks [11]. A VLAN is similar to a physical LAN in that it allows a group of host devices to be divided into distinct physical broadcast domains or cable segments and still let them communicate together securely as though they are on the same network. Most companies use a combination of LAN and VLAN technology for securing their network communications.

Most companies rely on VLAN's for their primary means of securing their internal network by separating devices into zones of trust or discrete broadcast domains [12]. Although physical separation of networks through the use of routers and switches is the best method of separating zones of trust, this is not always possible in today's complex networks [13]. One example of this is where many devices that are physically close to one another need to be on separate broadcast domains and the expense of separating the domains through routers and switches would be very costly. A VLAN deployed on a layer 3 switch is most commonly employed in networks where the additional expense of a router and multiple switches cannot be afforded or a reduction of hardware is desired.

Although there are many switch manufacturers, Cisco Systems is the industry leader in utilizing VLAN's by implementing VLAN technology in all of their Cisco Catalyst layer 3 series switches. A single Cisco switch running a VLAN can be used in place of two switches and a router, thus saving \$1,925 for the switch and \$1,586 for the router for a total of \$3,511 in savings [14].

2. Project Description and Goals

There are many project goals which are listed below, but the main goal is to help relieve the ADSWC personnel from having to deal with computer issues that clog up their ability to perform the main task of helping homeless women and children. The Shelter Helpers are considered consultants to the ADSWC. As consultants, the Shelter Helpers have had to take all of the existing issues presented to them and categorize them into individual units and decide which of the issues can be dealt with during the timeframe of one semester.

Below is a list of the Shelter Helpers project goals:

Website Assistance:

- Interface volunteer portion of Donor Perfect with the website so that volunteers can see open and available spots and schedule themselves to work.
- Website Upgrades: YouTube video links and Facebook links without changing the donation portion of the web.

Donation/Volunteer Assistance:

- Set up a donation Station in the rear of the building. Enter donator's info into the computer and issue thank you letter and receipts. Integrate this into the Donor Perfect Software.
- Identify whether or not a bell and/or a camera can be installed for the rear donation station.
- Use the current security station as a volunteer check-in area.
- Use Access Database for verifying volunteers, etc.

- Badges – Issue guests badges with bar codes and use the barcode scanner to check them in. Check the badges against a database list and notify if staff if there are any security alerts.

Upgrades:

- Download/upgrade Publisher 2007 – possibly it add onto the server and use with Active Directory.
- Download/upgrade additional Microsoft Software.
- Implement Donor Perfect Software.

Network Maintenance:

- Install a UPS onto the switches and the DSL.
- Interface the UPS software with the “ADSWC” server so that it will do a controlled shutdown in case of a power loss.
- Map out the Ethernet cabling.
- Move all of the printers onto a print server for network printing.

Network Security:

- Implement stronger passwords. Add Admin passwords to PC’s in case users forget their password.
- Install a VLAN to isolate the teen lab from the rest of the network and the server.
- Check Virus/Spyware versions on Server and PC’s and install if necessary.

Enhancements:

- Utilize Flash drives with USB extension cables where necessary.
- Repair two teen lab computer

Other:

- Fix computer Latency on Nancy’s and Sam’s PC’s.
- Work on identifying repairable computers and peripherals.

To accomplish all of these goals, the Shelter Helpers will need to spend approximately \$7356, which will be donated by several outside organizations. The total costs will be approximately \$7356. This includes the purchase of new workstation PC's, mice, keyboard, monitors, miscellaneous items and labor. The equipment cost breaks down to \$846.00 for four computers, \$150 for keyboards and mice and \$600 for monitors. The labor cost totals \$5760. The labor cost breaks down to three Georgia Tech students each working 4 hours on both Monday and Wednesday from the end of January to the end of April for a total of 288 hours at an hourly rate of \$20.00/hour.

3. Technical Specifications

There are a few technical specifications that need to be met to accomplish the above stated goals.

Computers:

The computers that need to use the Donor Perfect software have the following technical specifications:

- CPU required: 600 MHz
- Minimum memory required: 256 MB
- Minimum hard disk space required: 20 MB
- Operating system version: Windows NT/2000/ME/XP/Vista.
- Web browser versions: Internet Explorer 5.5 and higher.
- 2.0 USB capable.

Switches:

The switch to be used for the VLAN must meet the following specifications:

- Must be a Layer-3 switch.
- Have VLAN compatibility.
- Be able to accommodate at least 24 new network ports.

UPS':

The UPS used for the network must meet the following specifications:

- 1000 Watt capability.
- UL Rated.

The UPS used for the ADSWCSEV2 server must meet the following specifications:

- 1500 Watt capability.
- UL Rated.

Cabling:

Data Cabling:

- CAT-5e standard, 4 pair wire at least 200' in length.

Camera Cabling:

- Coaxial 50 ohm cabling at least 200' in length to reach the back of the building.

Doorbell Cabling:

- 18 AWG, two wire, low voltage cabling at least 200'

Barcode Scanner:

- PDF417 compatible.
- 2010 GS1 Sunrise compliant.
- USB capable.
- RoHS compliant.

4. Design Approach and Details

4.1 Design Approach:

The approach taken on this project is from a consulting viewpoint. The Shelter Helpers will act as consultants to the ADSWC and determine along with the shelter Director which of the shelter's needs are the most important and which ones can be accomplished within a one semester timeframe. The design of the network, security precautions and organization of the overall network will be performed independent of anyone outside of the Shelter Helpers group. The ADSWC staff has indicated that these decisions should be based on the Shelter Helpers experience and what is best for the shelters network.

4.2 Codes and Standards:

- Microsoft Windows XP requirements
- Layer-3 switching capabilities on switch.
- The donation receipts must conform to 501C Federal guidelines.
- The barcode scanner must be 2010 GS1 Sunrise compliant.
- Online software must be compatible with several Internet browsers.

4.3 Constraints, Alternatives and Tradeoffs:

There are many constraints, alternatives and tradeoffs that have to be acknowledged during this project such as budgetary constraints, alternatives to purchasing new equipment and other tradeoffs.

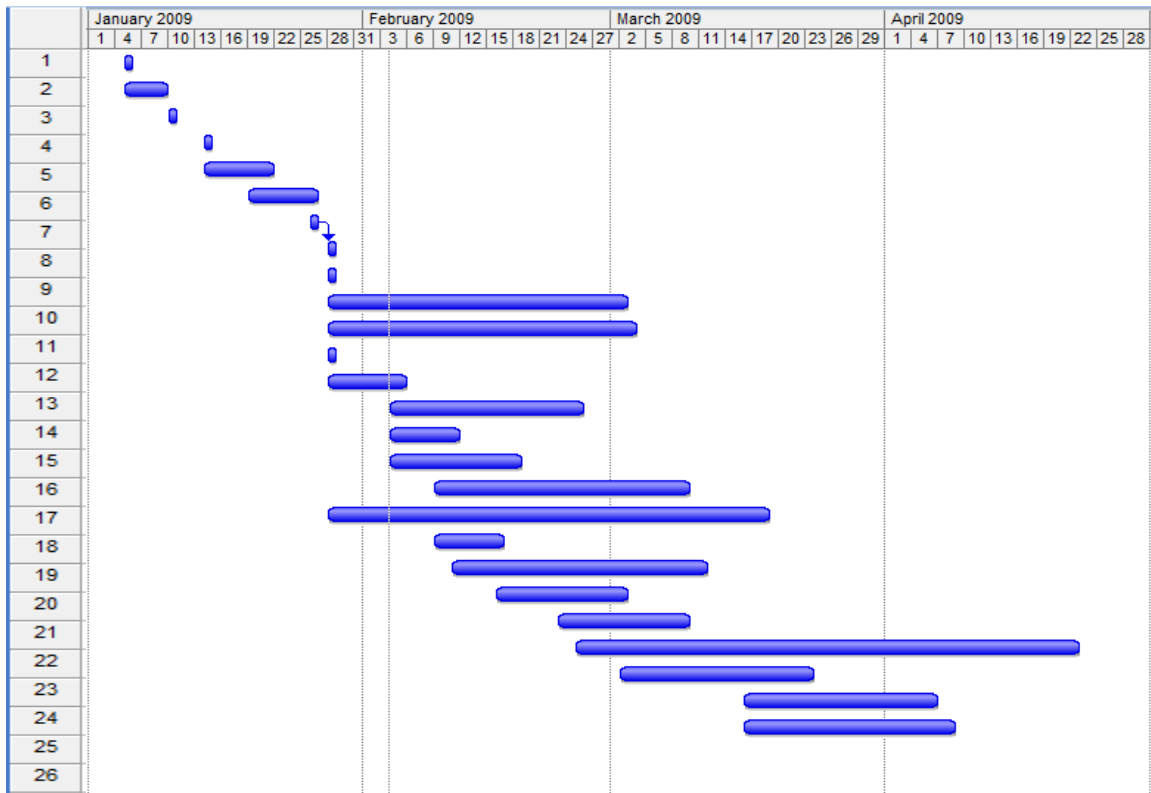
Budgetary constraints exist due to the nature of the non-profit organization. Since this is not a revenue and profit-generating organization, the money brought in for technological needs is smaller than in other industry related businesses. The total budget for this semester is \$7356, which is a very conservative figure since the hourly wage was set at only \$20/hour. Normally, an experienced IT person will cost between \$50-\$75/hour. Due to the lack of money, the labor portion of this budget (\$5760) cannot be paid. A tradeoff has to be made, which requires the Shelter Helper team members to volunteer their time instead of actually getting paid.

In addition, the budget does not have money to purchase the four new computers and switch needed for the network. As an alternative, the computers will be donated by Vision Computers and the switch will be donated by Chris Higginbotham. Another alternative is to use existing VGA monitors instead of purchasing new flat screens for the new PC's.

One goal is to integrate a barcode scanner with the Access database so that guests can be checked into the shelter using a barcode on a badge. The Shelter Helper team is working on this, but the barcode scanner and software are approximately \$150 total. In addition, the integration to the Access database might not be possible. An alternative to using a barcode would be to use a PC workstation and just have the guests checked in manually by the staff, which would still utilize the existing database for security alerts.

5. Schedule, Tasks and Milestones

	Task Name	Duration	Start	Finish
1	Class Begins	1 day	Mon 1/5/09	Mon 1/5/09
2	Select Project and Teams	5 days	Mon 1/5/09	Fri 1/9/09
3	Initial visit to the ADSWC location	1 day	Sat 1/10/09	Sat 1/10/09
4	Second visit and meeting with director, Nancy Yarnell	1 day	Wed 1/14/09	Wed 1/14/09
5	Write Technical Review Paper	6 days	Wed 1/14/09	Wed 1/21/09
6	Write Technical Research Paper	6 days	Mon 1/19/09	Mon 1/26/09
7	Start date at the ADSWC location	1 day	Mon 1/26/09	Mon 1/26/09
8	Donor Perfect meeting with Fontaine	1 day	Wed 1/28/09	Wed 1/28/09
9	Delivery of new computers	1 day	Wed 1/28/09	Wed 1/28/09
10	Donor Perfect software implementation	24 days	Wed 1/28/09	Mon 3/2/09
11	Website Upgrade and Implementation of Scheduling	25 days	Wed 1/28/09	Tue 3/3/09
12	Install UPS onto the network	1 day	Wed 1/28/09	Wed 1/28/09
13	Map out Ethernet cabling	7 days	Wed 1/28/09	Thu 2/5/09
14	Set up a donation Station in the rear of the building	16 days	Wed 2/4/09	Wed 2/25/09
15	Repair two teen lab computers	6 days	Wed 2/4/09	Wed 2/11/09
16	Use current security station as volunteer check-in area	11 days	Wed 2/4/09	Wed 2/18/09
17	Issue guests badges with bar codes	21 days	Mon 2/9/09	Mon 3/9/09
18	Implement Donor Perfect Software	36 days	Wed 1/28/09	Wed 3/18/09
19	Interface the UPS software with the "ADSWC" server	6 days	Mon 2/9/09	Mon 2/16/09
20	Check Virus/Spyware versions on Server and PC's	21 days	Wed 2/11/09	Wed 3/11/09
21	Move all the printers onto print server for network printing	11 days	Mon 2/16/09	Mon 3/2/09
22	Utilize Flash drives with USB extension cables	11 days	Mon 2/23/09	Mon 3/9/09
23	Work on identifying repairable computers and peripherals	41 days	Wed 2/25/09	Wed 4/22/09
24	Implement stronger passwords	16 days	Mon 3/2/09	Mon 3/23/09
25	Install a VLAN to isolate the teen lab	16 days	Mon 3/16/09	Mon 4/6/09
26	Fix computer Latency on Nancy's and Sam's PC's	18 days	Mon 3/16/09	Wed 4/8/09



6. Project Demonstration

The project demonstration will occur at the ADSWC at different periods of time during the semester. Some of the demonstrations will be performed after the successful completion of individual projects such as the installation of the new PC's, volunteer check-in station and donation station. Demonstration of individually accomplished projects during the semester will be accomplished by showing Nancy and necessary staff members how to use the projects such as the PC workstations and check-in areas.

The final demonstration encompassing the final proposal, network accomplishments and everything that was not already demoed will also be held at the ADSWC at the end of the semester and will be attended by the shelter director, Nancy Yarnell, ADSWC staff, the advisor, Dr. Smith and possibly by the shelter board members.

The following outlines how some of the final projects will be demonstrated.

- Website upgrades will be demonstrated to the audience by accessing the website and walking them through a volunteer check-in and scheduling process.
- VLAN utilization will be demonstrated by logging into the switch and showing the audience the technical aspects of the VLAN.
- Donor Perfect implementation will be demonstrated by showing the audience how the volunteers are stored in the database and how to access them through the Access database menu system.
- The Donation station will be demonstrated by walking through a mock donation by entering the donator's information and printing out a receipt.
- The Ethernet mapping can be easily shown to the audience through a handout that documents the organization of the cabling.

being allowed to participate in this endeavor and hope to achieve not only all of the stated goals in this proposal, but also many other items that will come up during the semester.

The Shelter Helpers have met with the shelter director, Nancy Yarnell several times during meetings and have personal contact with her at least twice a week. Nancy has passed on all of the present issues at the shelter and has listed the items according to priority for their needs. The Shelter Helpers have also met with their senior design advisor, Dr. Smith several times and have laid out the groundwork from which to start based on the information given to them by Nancy. Dr. Smith has been incredibly helpful in getting everything needed as far as equipment goes to meet the ADSWC's needs.

The Shelter Helpers will continue to work their proposal plan every week and will also try to document how the network is setup, how everything works and what the passwords are for each device so that future volunteers will have an easier transition.

After this semester is done, there will still be a lot of work that needs to be completed. Some of these items include sifting through newly donated equipment to determine working status, maintenance of the network, upgrades to existing software and saturation of network passwords to new and existing staff members.

References

- [1] “About Us” [Online]. [Accessed: January 28th, 2009, Available: <http://www.atlantadayshelter.org/> .
- [2] WhentoWork, Inc. (2008). WhentoHelp Volunteer Management Software Online Volunteer Scheduling. WhentoHelp Website. [Online]. Available: <http://whentohelp.com/volunteer-software.htm>.
- [3] G. Apke. (2008, January). Volunteer Scheduling Solution Solves Charity Woes. WhentoWork. Tustin, California. [Online]. Available: <http://whentowork.com/w2wpressrelease1-08.pdf>.
- [4] Atlas Business Solutions, Inc. (2009). ScheduleAnywhere Features and Benefits. ScheduleAnywhere Website. [Online]. Available: <http://www.scheduleanywhere.com/site/features.aspx>.
- [5] Philip M. Parker, “Database,” *Webster’s Online Dictionary*. [Online], 2009. Available: <http://www.websters-online-dictionary.org/definition/database>
- [6] DonorPerfect, “Donor Perfect Fundraising Software,” [Company Website], [cited 2009 Jan 19], Available HTTP: <http://www.donorperfect.com/index-us.asp>
- [7] Laura S. Quinn. (2008, Dec.). Selecting Software on a Shoestring. *TechSoup* [Online]. Available: techsoup.org/learningcenter/software/page11062.cfm
- [8] Rich Christ and Paul Clolery. (2008, May 15). *Giving The Donor The Chance To Say Yes*. [Online]. Available: <http://www.nptimes.com/08May/npt-080515-2.html>
- [9] Corinne Waldenmayer. (2002). A User’s Guide to Selecting Fundraising Software. *The Grantsmanship Center* [Online]. Available: <http://www.tgci.com/magazine/Selecting%20Fundraising%20Software.pdf>

[10] IEEE Computer Society. IEEE Std 802.10, IEEE Standards for Local and Metropolitan Area Networks, 1998.

[11] “*Virtual LAN*” [Online]. [Accessed: January 15th, 2009, Available: <http://en.wikipedia.org/wiki/VLAN> .

[12] @stake. Secure use of VLANs: An @stake security assessment. Research report, @stake, August 2002.

[13] H. F. Tipton and M. Krause, “An Examination of Firewall Architectures”, in *Information Security Management*, 5th Ed. New York: Auerback Publications, 2006, pp. 112-115.

[14] “Shop CDW” [Online]. Available: <http://www.cdw.com/shop/search/results.aspx?key=cisco+router&searchscope=All&sr=1> [Accessed: January 15th, 2009].