NEED
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Community Partner: Sylvester Pace, Arlene Tyler

About the Organization

The Negro Emergency Educational Drive (NEED) is a non-profit organization located in Pittsburgh, PA. NEED's stated mission is to provide financial assistance and educational counseling to under-privileged and deserving African American students with limited means who seek higher education. The organization was founded in the early 1960's in Pittsburgh, and has since established ties with local churches, civic and social groups, private companies, and alumni and other individuals. A total of more than 16,000 students have been assisted in attending over 150 different colleges and universities by NEED's fundraising and counseling efforts. About 2000 students apply annually, and approximately five hundred of these students are awarded a grant or scholarship.

The major activities of NEED are:
-   Solicit and collect donations to support higher education for individuals.
-   Collect information from applicants, and choose who they will support.
-   Use the money for selected applicants in the form of grants, counseling, etc.
-   Collect history on the use of the money and the value that it provided.
-   Use the history as feedback to donors in order to get more donors.

Sylvester Pace, the Executive Director of NEED and his Administrative Assistant Anita Moore are mainly responsible for raising funds, whereas Ms. Tyler takes care of the student services and information technology related tasks.

The organization has kept track of its donors and received gifts in an Excel spreadsheet. They were aware that this is not a scalable solution and have been looking into the possibility of using a program from the *FundRaiser* family, designed for this purpose. A former Carnegie Mellon University student who compared different programs of this nature has recommended this software to NEED.

Since January 2003, NEED uses a database built on top of Microsoft Access to keep track of students who apply for grants. This program was built together with a website that allows students to fill in online application forms, which can be directly into the database. Prior to this new software, this information was stored in Excel spreadsheets.

Last year, a group of Carnegie Mellon Information Science students created a new homepage for NEED – the page can be found at www.needld.org. NEED's website is a significant aspect of the NEED organization, as it provides critical information for associates and prospective grant applicants.

NEED acquired brand new computer equipment in November 2002 consisting of four workstations and a server with Win XP Professional installed. All workstations are equipped with Microsoft Office XP for applications such as Word, Excel, Access, and Outlook. NEED's server hosts their files and provides the ability to share information between computers; it also permits shared printing and backup services. For more information on NEED's current computer equipment, refer to the Appendix.

Ms. Tyler and Mr. Pace are largely responsible for the technological environment. There is no formal planning committee and NEED does not have a specific or explicit formulation of an ongoing technology plan, but spending on hardware, software, and technology services has to be approved by Mr. Pace.

Major Consulting Task 1 Fundraiser software, Roland

My initial task concerning the new fundraiser software was to help Ms. Moore in importing the currently used spreadsheet into *FundRaiser Basic*, a very user-friendly and simple program. It turned out very fast that this software was too limited and would not satisfy all requirements of NEED. We decided that I investigate in the possibility to use *FundRaiser Jr.*, the next level of this software family.

The most important requirements that the new software must meet are:
- User-defined types that can be associated to each donor and specific gifts
- The possibility to keep track of pledges
- Automated letter and address-label printing
- Built in statistic functions, but also the possibility to perform queries
- The vendor should provide a help-service that can be asked in case of problems

I approached this task using the following steps:
- Familiarize myself with the Fundraiser software
- Understand the structure of the currently used Excel spreadsheet
- Figure out what might have gone wrong when Ms. Moore tried herself to perform the import and do the necessary changes to the Excel spreadsheet
- Import the data together with Ms. Moore and verify that Fundraiser Basic really did the expected thing
- Introduce Ms. Moore to the functionalities of the new Software
- Write a user-guide that describes the most important steps for importing donors and gifts, sending letters and printing reports. Unfortunately, such a user-guide is not available from Fundraiser.

Fundraising is one of the most important activities of NEED: With fewer funds, the organization must reduce either the grants or the number of students they support. To perform well in this business, it is very important to keep in touch with all donors by sending letters of gratitude, ask for another donation after a certain time and also inform them about how everything is going.

FundRaiser Jr. has an impact in the information management and the communication of the organization: It helps the staff a lot to keep a neat record of each donor, which was a pain in Excel. Furthermore, it allows storing the fundraising information of all coming years in one place, which allows the organization to look at a donors' entire history and also make much more elaborate queries and statistics.

The communication is facilitated in the way that the software provides all different kinds of reports that had to be done manually before. Sophisticated queries allow the employee to send mass letters to a certain group of persons, which was not possible but desired while NEED was working with the spreadsheets.

Outcomes

Fundraiser Jr. is installed with the imported data and works fine. Mass mailings to groups of donors can be printed, donors, gifts and pledges can be added and modified easily and with a few mouse-clicks, and different comprehensive reports can be printed. Before using Fundraising Jr., each week Ms. Moore made a little report containing all gifts received so far in the current year split up by donor-type. She collected this data in the spreadsheet and wrote them in a Word document. This information is now directly available through one of the reports generated by the software. The different reports provide a very broad overview of all fundraising activities that were not accessible through the Excel spreadsheets before.

I imported parts of the Excel spreadsheets together with Ms. Moore which gave her some insight into what might have gone wrong when she tried to import it herself. However, she didn't do the whole procedure on her own and might not be able to perform an import herself. This is not surprising, as this is a rather complex task in which every piece must fit together to have good results.

Ms. Moore has seen the steps to enter new donors and gifts, and she added some new donors and gifts on her own. However, shoe does not yet feel very comfortable with those steps, as she did not have a lot of practice so far. Those instructions are written down in a document that was created during the consulting period and can be used as a user manual.

During the test-phase, Ms. Moore wanted to print a report covering all foundations and corporations that have given in the year 2002 but not in the year 2003. I did not know the exact steps she had to go and she called the technical support of Fundraiser to whom she described precisely what kind of report she wanted to print. She got the instructions and finally printed a neat report of what she was looking for.

The organization has decided to buy Fundraiser Jr. and to start using it in July, when their new administrative year starts. Until this time, Ms. Moore will insert incoming gifts and new donors in both, the Excel spread sheet and the Fundraiser software, in order to gain more experience.

Recommendation

The time after the data was imported in the new software was not sufficient to provide Ms. Moore with the necessary practice she would need to manage herself most different cases without problem. I will list some steps that the organization might take to help Ms. Moore go through this sometimes difficult first time of using new software.

- o **Ask** You've bought support with the product. This gives you the possibility to call or email a member of the software company to ask when you do not understand something or when you do not know how to attack a certain task. Those people are there to help you, this is their job. Their contact information can be found on the website in the section 'Contact us'.
  You should have Fundraiser Jr. running before you call them. It makes it a lot easier to talk about a program when you see it. Furthermore, you might want to write down your questions before you call. This facilitates your part, as you then can really listen to the answers and do not have to keep in mind some other questions that you also wanted to ask.
  The phone number is **800-880-3454** and their office hours are Monday – Friday 9:00-5:00 Central Time. The email-address is support@FundRaiserSoftware.com.

- o **FAQ** The company provides a list of frequently asked questions (FAQ) . Read the topics that are of interest to you. The link is http://www.fundraisersoftware.com/support/answersj01.html

- o **Read** The Fundraiser company writes a monthly *News letter* that talks about different aspects of fundraising, also talking about the utilization of their software. You might want to subscirbe to this newsletter. You can do this on their webpage on the url
  http://www.fundraisersoftware.com/fundclass.html

Major Consulting Task 2 *Updating the NEED Web Page, Alex*

An organization's web page constitutes much of the organization's public face. A well-made, informative web page can help attract donors and interested applicants to a non-profit organization, as well as providing a number of useful functions (i.e. in the case of NEED, the ability to apply for a grant on-line).

My first task involved making modifications to the NEED web page. Certain sections of the page, such as the Director's Message and Scholarship section, were in crucial need of an update. The organization could not perform updates without outside help, and does not have a budget dedicated to hiring technical assistance.

The modifications I performed included the following: updating the NEED logo, updating data in the Scholarship, Director's Message, and Testimonials sections, and adding links to other scholarship programs. The web page is based on the scripting languages, PHP and HTML, and given the availability of the code and my experience with these languages, it could be easily modified. In determining which parts of the page to modify and in performing the updates, the following approach was taken:

- NEED staff and I determined which parts of the page need to be updated
- I studied the code of the web page
- I edited the appropriate parts of the page
- The updated version of the page was presented to NEED staff
- The above steps were repeated as required

It was anticipated that communications with potential student grant applicants and potential donors would be improved. The web page is crucial in providing information to interested parties, and an outdated page could be useless, or misinforming - an update was necesssary to prevent the possibility of such a situation from arising.

Outcomes

By looking at the page after the updates, it was apparent that the page would be a more useful tool for the organization - the updated page provides more information about the organization than the previous version of the page, and the new references/links section is helpful to students who cannot benefit directly from the NEED program.

Also, it is worth noting that the organization is in the midst of a a significant appliation period. Previously, when there have been problems with the page, students have e-mailed members of the organization to inform them of this. If the some of the previous complaints are absent from the incoming e-mails this application season, it may be concluded that the organization's ability to communicate with interested parties has improved.

This is a short-term task, and thus, the issue of sustainability does not pertain directly to this task. However, my second task is an extension of this task - that is, the second task is to ensure that members of the organization are able to perform certain updates (although not major changes, as that would require a serious investment of resources by staff members into learning PHP/HTML) without outside assistance. Sustainability will be accomplished through extensive documentation, which was created jointly be the organization staff and myself.

I hope that the discussions regarding the web page between the NEED staff and myself have encouraged the staff to consider formulating a technology plan. If the organization had a technology plan and budget,

there would be more options for dealing with the issue of the web page not being updated as frequently as needed: for instance, they would be able to hire a professional web designer to perform updates. Of course, the formulation of a technology plan would have larger implications than suggested in the above example, and the process of formulating a technology plan may in itself prompt the organization to come up with a new vision for technology.

Recommendation

The NEED web page, having recently been constructed by a group of Carnegie Mellon Information Science students, certainly fits the specification of presenting an attractive, easily-navigable, and informative source of data about the organization to interested parties. However, as the page becomes outdated, it becomes less useful to the organization which it represents. Furthermore, when dealing with a relatively new page, an organization may desire to add a number of functions that the page lacks, or to change the layout of the page to enhance the experience of the person browsing the page.

Although the documentation that I'm leaving for the organization to assist in the modification of the organization web page is meant to be thorough and useful for dealing with a variety of situations, not every possible scenario can be anticipated. The organization may have to perform web page updates in the future which are beyond the scope of the documentation. The web page "HTML Basics" (http://freespace.virgin.net/r.cawley/index.html) may be an extremely useful resource for helping NEED perform updates. This site introduces the visitor to the basics and the most useful elements of the HTML language - it includes concise and informative tutorials which are aimed at people who do not necessarily have a technical background in the information sciences, and who are primarily interested in HTML for practical purposes. Furthermore, the page contains an abundant amount of valuable reference information: it contains links to other HTML-related web-pages and has a list of highly recommended books on web design. Ms. Tyler, who is going to be the primary person in charge of web page maintenance, will surely find this page to be a very useful resource; however, if someone else were to take over the web page maintenance task in the future, they would also find the page extremely accessible and helpful.

The following books referenced on the site are especially recommended:
- HTML 4.0 Bible (Bible Series)
- Creating Cool HTML Web Pages

The following web pages referenced on the site may also prove very useful:
- http://archive.ncsa.uiuc.edu/General/Internet/WWW/HTMLPrimer.html
- http://www2.utep.edu/~kross/tutorial/
- http://www.willcam.com/cmat/html/toplevel.html

Major Consulting Task 3 *Web Page Documentation, Alex*

My second task entailed creating documentation so that NEED staff could modify aspects of the web page which do not necessarily involve design or layout, but which provide information regarding the organization and its applicants - the purpose of this task was to give NEED staff the ability to edit the web page without outside assistance. At present, NEED relies on the help of a Carnegie Mellon Information Sciences student to perform maintenance work on their web page. However, it is uncertain how much longer this individual will be able to provide assistance. Consequently, it would benefit the organization to become self-sufficient in the domain of making updates to their web page. For major changes (i.e. completely redesigning the page), the organization has to seek outside help – however, it is unlikely that this would be necessary, given that the page was implemented only recently. The purpose of this task was

not to make NEED staff experts at web design or to enable them to completely change the look or feel of the page, but to enable them to make updates to information and images on the page in a timely fashion.

Ms. Tyler and I made an assessment of which parts of the web page would require editing in the future. The documentation which was created focused on specific parts of the page, and Ms. Tyler and I went over the rough draft together. The parts of the documentation which were unclear were edited and revised. The above steps were repeated as necessary until the code and documentation were to the satisfaction of the organization.

The approach of providing documentation rather than training was chosen in order to maximize sustainability. As long as the NEED page does not undergo a major redesign, the documentation should remain valid and useful. However, it must be noted, that in order for this solution to be sustained, the person performing modifications to the current NEED page should make sure that the modifications they make are readable and easy to understand, in accordance with their own judgement.

By helping me with the process of formulating the documentation, and by subsequently making use of it, Ms. Tyler has gained a greater understanding of information technology. She is now able to edit the page in order to help the organization communicate more effectively with interested parties.

Outcomes

The expected outcome was that Ms. Tyler, who is in charge of many technical tasks at NEED, would be able to modify portions of the NEED web page when necessary by following the documentation. The documentation does not require any specific technical background, and it was designed so that anyone who has access to the web page code and the server which hosts it would be able to perform updates using a simple text editor, such as Windows Notepad.

The NEED staff has approved of the documentation which was provided. No updates are required at the present time because I performed all necessary updates as my first task. However, Ms. Tyler has taken a look at the documentation and has been able to follow it. For the sake of practice, and to test the usefulness of the documentation, Ms. Tyler was able to follow the documentation to edit three sections of the NEED web page. After it was apparent that Ms. Tyler was able to use the documentation, the page was reverted to its past state.

For the time being, Ms. Tyler will be responsible for addressing web page maintenance issues. She has been the technical backbone of NEED for quite some time, and will continue to do so for the foreseeable future. Thus, it is not possible to test whether future staff members will be able to follow the documentation. However, there is a possibility that the current web page will be completely replaced in the future, and thus, given that the documentation is designed to be specific to NEED's current website, much of the documentation may become obsolete. Hopefully, comparable documentation will be provided if the site is redesigned.

Recommendations

A. Student Database *Roland*

NEED has kept track of all information related with applying students in Excel spreadsheets and Access databases for over ten years. During this time, they have changed several times their systems as well as how they wrote down this data. Last year, a group of Carnegie Mellon University students implemented an Access database that provides them all necessary functions with a nice user interface. My task would have been to import the data from previous years into the new Access database. Due to the limited time and the complexity of this task, I did not implement this.

Having all the student-data in one single database gives NEED the possibility to perform more easily statistical analysis that help visualizing the impacts of NEEDs services. Such statistics are well founded and give donors the certainty they need to not only believe, but to know that they help. It will also be a great help for a future fundraising campaign that addresses alumni that have been assisted. Those individuals know from their own experience what a great job NEED does and might be willingly to donate, perhaps even as a sort of payback of what they once got.

Well-chosen statistics can help the members of the Board to guide NEED in the right direction for the future by analyzing what has happened in the past. Some examples of statistics are the average amount per student and year, how many grants a student gets, the distribution of the students on the schools, the number of applying students per year and their gender.

The employees of NEED do not have the necessary skills to perform this import themselves. They are dependent on external help. The salary of a professional in this filed may be too expensive for the organization. I suggest, that NEED looks into the possibility to hire a student from one of the surrounding Universities that performs the work.

The student is required to have a lot of experience in VBA and Microsoft Access programming as well as good knowledge of SQL and Microsoft Excel. If possible, the student should have taken a database course, such as 15-415 at CMU to have the necessary background about how databases should be built and how they work.

The major tasks of this work are to prepare the data in the different databases, import them it into the new Access database and write the desired queries that are not yet available. I estimate that this work should be feasible in about 80 to 120 hours of work. I think that there are still many students looking for some work during the summer break that might have the necessary skills for your project.

If you intend to find a student from CMU, contact Mark Stehlik, Assistant Dean for Undergraduate Education. You find his contact information on his homepage which can be found at http://www-2.cs.cmu.edu/~mjs/. He often forwards labor-requests from organizations in Pittsburgh to Computer Science students.

In the following section, I try to give a rough work-plan for this project. It should help the student to get started with the work and lead her in the work to achieve the goal. However, note that the plan is far from being complete. It contains the most important steps that probably have to be taken. Doug Campbell, my mentor in this course, assisted me a lot for this section.

Suggested Work-plan

Prerequisites
You should have a clear understanding of all different statistics that you would like to retrieve afterwards from the database. You should create a list and include some simple hand-drawings of how you think the representation of the statistics should look like. This will help the student afterwards when she is implementing the queries and representation of the statistics.

Guideline for the student
1. Make a copy of the current Access database and all old databases. Only work with those copies and never modify the original files. This gives you a level of security. If something goes wrong, you don't risk modifying or evening loose accidentally valuable data.

2. Document all of your steps you do. This is very important, as problems may arrive after you have done your job. This will help track back where the error might have happened and facilitates the recovery a lot.

3. Make a new MASTER spreadsheet with the column headings exactly the field names that you have, in the same order that they are in the Access database. The MASTER will hold all the data from all the old spreadsheets. Add one more field name: DataSource (text / length 50 bytes) which is the name of the file that the data came from. This is to make it easier to trace any import problems. Make sure that the data for each column is formatted for the type of data it will have: numeric, time/date/text.

4. Now look at each spreadsheet of source data and check the formatting of the data. One problem you may find is that time/date data may be formatted as text. It may need to be re-formatted with "Format/Cells" menu command. You may also find data that is a mixture of numerical and text data. That has to be cleaned up manually. Just examine the source spreadsheets, determine what has to be done to convert it to a clean spreadsheet, and write the instructions.

5. Now take each spreadsheet of clean source data and copy/paste it into the MASTER spreadsheet - one column at a time. Here's where you need to be careful. When you paste, use the "Edit/Paste Special" command and paste "values" only. This way, the data will be interpreted in the format specified when you created the MASTER. Look at the pasted data to see if there are any problems - you may find that the source needs more cleaning. Add the name of the source data file into the column that you made for it.

6. Now make a table in the Access database - call it tbl_Import. This will contain the imported data from the MASTER. Make sure that the fields are of the correct data type. Use the Import command in Access to get the data - pay attention to the way Access interprets the format for each column. And look at each column to see that the data was translated correctly. Once again, you may have to go back and clean up some data.

7. Now you can run queries on the Access table tbl_Import to see if there are other problems.

8. Finally, you have a table tbl_Import that has all the data that you want to transfer into the main table in the Access database. Just for safety, add the field name for the data source file. Now use an "Append Query" to add the data to the main table. Note that the imported data will have a file name in the DataSource field. Old data will have a "null" in that field. This way, the user can always go back and check data if there seems to be a problem.

9. Once the import is finished, you can write the desired statistical analyses. You might want to give the user a graphical and numerical output. The graphical output is to watch the diagrams in the Access database and the numerical output can be used to recreate the diagrams in other programs, such as Word. Test them thoroughly; this gives you further confidence that the import was done successfully.

10. Some technical remarks about the database: You will find out that the database is designed to contain duplicate datasets. If a student applies for a second grant, a total new entry is created. All information, including the address is duplicated. The primary key of student-table is the social-security-number appended by the application year.

B. Implementing and maintaining a Disaster Recovery Plan *Roland*

NEED is an organization that works a lot with computers and handles large amount of data, such as the address information and gifts of donors and all critical information about each student that applies for a grant. This data is processed using computers, which facilitates the tasks a lot. Even though the organization relies very much on the functionality of this technology, it does not have a Disaster Recovery plan or a Technology plan at present. They acquire new technology according to their needs if the financial resources are available.

A Disaster Recovery Plan is one possibility to prepare an organization for unforeseen incidents that prevent them from doing their normal operations. Such incidents can range from a terror attack to fire, a serious computer malfunction or data loss caused by wrong utilization.

To have a written disaster recovery plan does not mean that the organization is completely prepared to such situations. Its main goal is to make the employees think about such incidents and indicate precautions they might take to ensure the basic functionality in case of a disaster. While writing down the necessary recovery steps, the organization should become conscious of what they have to do already now to be able to restore what they had. The test phase of the recovery plan will show up even further requirements for restoring a previous state.

At the moment, NEED does not have such a disaster recovery plan. If they would loose all their data on all computers, it would be probable that they cannot restore all information. As an example, the daily backup is only taken from the server. Those backup tapes don't include the data from the user workstations.

Furthermore, there are four backup tapes that are overwritten in turn, but there is no backup checkpoint that reflects the total state of all digital information every week or every month. If it would turn out after a week that the organization has lost data due to a virus, they would have lost all their data in spite of regular backups, as they kept overwriting the previous backups. Weekly or monthly backups that are stored for several years would be a solution.

In case of a total loss of all information, the organization might have severe problems to come back to their business, as processing this data is their major work: fundraising needs the address information of prior donors as well as some analysis of the student data. The entire student dataset is needed to process applicants and also to draw the history of the organization.

A rough list of tasks to be done:

- One of the first tasks to be done is to prepare a comprehensive list of the potentially serious incidents that could affect the normal operations of the organization. The list should also include incidents that seem very improbable.
  Some examples might be
    - Fire in the office that destroys not only all paperwork, but also the technical equipment
    - Virus attack to the computers that deletes / infects a large amount of the data on the workstations as well as the Server
    - Malfunction of a workstation or the server
- The next step would be to imagine what would be the impact of the previous listed incidents. I.e. if the server goes down, the users cannot access the files stored there. This disallows them to retrieve or enter data to the fundraiser database as well to the students' database.
- Once this accomplished, the Recovery Plan can be attacked. The first part of this plan should include persons and organizations that must be informed. This includes for sure all staff members, the Board of Members and the insurance company.
- The second part should cover procedures that allow the organization to continue their business without their technical equipment during the recovery time. One way to attack this is to prepare paper-based forms that can be filled in instead of the database. After recovery, this data could be typed in the system. This is important to keep the most basic functionality of the business running.
- The third part of the Disaster Recovery plan should describe the tasks that bring back the organization from a disrupted state to a working one. It must include
    - The situation/problem that must be solved
    - The priority of the task
    - What must be done to solve the problem
    - Who must do it / who must be contacted to do it
    - Where the necessary resources can be taken from
    - Describe actions that must be done to inform insurances, if appropriate
- After writing down a recovery plan, it should be tested. This is important to make sure that your described steps really fit together and lead to the desired result. Your whole work is lost if you forget to store some data on your daily backup and discover this only when it is too late.
  This work should be performed by the people who are destined to do this job in a real recovery situation. The outline and outcomes of the tests should be documented. This feedback will give you important information on what parts of the plan do not work yet and therefore must be changed.
- The plan must be maintained every couple of months, especially if structural changes are made to the organizations technology that would require a new or modified recovery procedure. Furthermore, all employees should know the content about the disaster recovery plan. All of them could be affected by a disaster, even if it seems very unlikely.
- The disaster recovery plan as well as sets of the prepared sheets for working without computers should be stored in different places to increase its availability in case of a catastrophe. Those places include the employees' home.

To work out a good Disaster Recovery Plan, NEED should be assisted by a professional that has experience with backing up system and also restoring the information. Especially the testing of the plan might not be obvious, as the organization cannot perform this test on their system, as it would work out in the real case.

Recommended Resources
http://www.drj.com/glossary/glossleft.htm
An online glossary describing some technical terms in this field
http://www.contingency-planning-disaster-recovery-guide.co.uk/
A short introduction to the topic.
http://www.utoronto.ca/security/drp.htm
A Project Layout describing may important steps – probably too many for your organization, but that would have to be decided during the process.

Go to a search engine such as http://www.google.com, http://vivisimo.com, http://www.altavista.com or your preferred site and search for the keywords 'disaster recovery plan' and/or similar words.

Additional Resources I used to write this recommendation
http://www.tekcentral.com/teknetwork/Disaster_Recovery/Sample_Plans/
A link to several pages describing disaster recovery planning
http://www.drj.com/drpol/drp.html
Disaster recovery plan for large organizations/companies
http://archive.devx.com/enterprise/articles/drecovery/DRPlan/DRPlan-1.asp
Another short step-by-step procedure

C. Promoting the NEED Web Page *Alex*

A well-made and informative web-page can help attract applicants to a non-profit organization's program, and it can help to convince potential donors of the significance of an organization's work. However, even the most well-constructed web-page is useless if the general public, or the people who would be interested in the organization which the web page represents, do not know that the web page exists.

At present, if one is to perform a search on the name of the NEED organization in a search engine such as Yahoo or Google, the NEED website is the first search result that is produced - however, such a search presupposes that the individual performing the search already knows of the existence of the organization. More general searches (i.e. "African American scholarships") do not produce the NEED web page as one of the top-ranking results. A number of strategies can be recommended to increase NEED's public profile on the web:

- When adding a link to the NEED web page, work out an agreement with the proprietors of that page so that their page contains a link to the NEED site (one of the strategies which search engines use to rank search results involves summing up the number of pages which contain links to a search result)
- Find web pages of organizations with a similar mission and ask them to add a link to the NEED website
- Find general scholarship web pages and ask them to link to the NEED websites
- Find scholarship search engines, and ask the proprietors to add a link to the NEED site
- When contributing the URL of the NEED web page to a search engine which categorizes links by directory
  (i.e. http://dir.yahoo.com/Education/Financial_Aid/Scholarship_Programs/), first, perform a number of searches using that engine to find a.) the most relevant directories and b.) the most popular of the most relevant directories.

The following is a list of web sites which may be interested in adding the NEED page to their links sections:

http://www.collegeboard.com/
(A general scholarship page)
http://pittsburgh.about.com/cs/scholarships/
(Links to scholarship organizations based in Pittsburgh)
http://www.pittsburghfoundation.org/
(Another page with links to scholarship organizations based in Pittsburgh)

Appendix 1: Computer Specifications

Computer Friend, confirmation of purchase, September 12, 2002

HP Netserver TC2110 Server:
- Intel P4 2.0GHz, 256 MB RAM, CD-ROM, 18GB SCSI HD, 10/100 MB Ethernet Adapter
- HP Superstore DAT 24GB Tape Drive
- Windows XP Server

Workstations (x4)
- Intel P4 1.7 GHz, 256 MB RAM, CD-ROM, 40GB HD, 48/16/48 CDRW, Video and Sound capability, 10/100 MB Ethernet Adapter, Floppy Drive, Windows XP Professional, peripherals
- 17" Monitor

Alexander Dovgopoly is currently a 3rd year student in Carnegie Mellon University's SHS program. He intends to complete a major in Cognitive Science and a minor in Computer Science. After graduation, he would like spend a year working in the Information Technology sector. Following this experience, he will attend grad-school.

Roland Flury is currently a 3rd year student in Computer Science at Carnegie Mellon University. He is an exchange student from the Federal Institute of Technology, Switzerland, and intends to attend grad-school after his graduation.