

BTC Center, Inc.
Student Consultant, Nathan Ide
Community Partner, Louise Jenkins

Part I: The Consulting Situation

About the Organization

The BTC Center, Incorporated was founded in 1997 as a 501(c)3 as a non-profit organization initiated by the Baptist Temple Church. The church created the BTC Center with the goal of better serving the surrounding Homewood-Brushton community needs. Their vision is defined as follows:

The vision of the BTC Center Inc. is to become a beacon in the community; a location where children and youth can be nurtured; a place where families can be strengthened and a support site for senior citizens.

The BTC Center building is located on 6329 Race Street, in the center of a Homewood residential complex. In the 1990 census, over 50% of households in the immediate area had a net income of less than \$15,000. Only 26.6% of the Homewood residents are under the age of 17. Of the 1,859 households in the community, over 900 of them are single person households. As described in the BTC Center's *Weed and Seed*¹ grant proposal:

Homewood-Brushton has a high concentration of low-income families. Many homes don't have telephones, some that do, don't have long distance service. As such, having access to a computer has not been viewed as a basic need. Therefore, many residents are falling behind in the technology world. Many of our children are not being prepared to compete in the increasing technology-based economy.

As a recipient of Weed and Seed funding, the BTC Center seeks to provide technology access to the Homewood area to benefit the community. The BTC Center aims to accomplish this through many avenues:

- Provide Internet access to local residents
- Provide a gateway for online job applications
- Provide resources to allow visitors to create resumes
- Teach technology classes to youth and adults
- Provide food services through the hunger services network

Staff

The staff of the BTC Center is comprised of Louise Jenkins and two part time employees in charge of secretarial and janitorial duties. All administrative duties of the organization are accomplished through a Board of Directors.

Louise Jenkins serves as the Executive Director and head of the project. Mrs. Jenkins was selected as the Executive Director of the BTC Center seven months ago, shortly after receiving a Weed & Seed grant. Louise researched current computer technology when their systems were being purchased, and managed those technology purchases.

¹ Operation Weed and Seed is a project of the Office of the Mayor of Pittsburgh and is funded through a grant from the US Dept. of Justice. http://www.weedandseeddatacenter.org/PA-pittsburgh_homewood/

In addition to Mrs. Jenkins, there are several established partnerships outside of the BTC Center. Rita Ferris operates two computer labs through Weed & Seed grants for the Mount Ararat Baptist church. This center has been established for roughly 3 years, and has had a significant amount of time to develop and evolve into a large community resource. Rita works with the East End Network, and her partnership with the BTC Center provides for a link between them and the BTC Center's Homewood Network, and can assist in the early stages of the BTC Center's programs.

Another formal partnership has been established with Donna Smallwood, who is the Program Administrator for the Bethany Center. Bethany Center partnered with the BTC Center to obtain the Weed & Seed Technology grant. Bethany received the exact same equipment from Dell that BTC has. Their partnership allows the BTC Center to further network and incorporate services that each provides in one another's programs.

Curtis Baker and Debra Holt have also been hired by the BTC Center as class instructors.

The Technology Situation

At the start of the consulting partnership, the BTC Center owned 6 Pentium II machines running Windows 98 operating system software. They had recently purchased four Dell Pentium 4 machines running Windows XP, and a Dell rack-mount server with no operating system installed. The six older machines had been used previously, but none of the new machines were set up, and were in their original packaging. Three printers were also available, two of which were still in packaging. The BTC Center had arranged a DSL subscription, but had not yet utilized their email account or connected to more than one machine. No network connectivity had been arranged.

The BTC Center owned a 20-port Ethernet hub. The BTC Center also had phone jacks designated for the office phones and the DSL connection. They did not own a cabinet for the server.

The BTC Center also owned a scanner, which had been used previously on the older machines, but was not set up.

As part of the Weed & Seed grant, an independent consultant had been hired to install operating system software and set up the server.

For a complete description of the technology available, please see Appendix A.

The Use of Technology

Initially, none of the technology was in a useful state. The Internet connection had not been installed, and none of the printers were set up. Mrs. Jenkins had to write all reports and correspondence from home, where she had access to a working PC with Internet connectivity. A typewriter was used to fill out forms and provide hard copies of documents.

Problems and Opportunities

At the onset of the consulting partnership, the following problems and opportunities were identified:

- Computer hardware not set up – most of the hardware at the BTC Center was not set up at the start of the partnership. In addition to many of the computers, the DSL modem had not yet been installed. This is a necessary first step for their programs to begin, and to get use out of their purchased technology.
- Local Area Network not set up – in order to allow more than one visitor to access the Internet simultaneously, a LAN would have to be installed. This would allow the many computers in the

Center to all have access to email and other Internet resources, in addition to file sharing. This makes the DSL connection much more useful.

- No web presence for BTC Center – a web presence is useful for gaining visibility from funding agencies, community residents, and similar local programs. Having a web presence would allow an easy venue to publish work of students in BTC's classes.

Consulting Focus

The partnership focused on alleviating each of these issues listed above.

Hardware was set up and installed during the first phase of the consulting partnership, while Mrs. Jenkins and I were developing a scope of work for the remainder of the partnership. This allowed for a good jumping off point to do work more relevant to their mission. An independent contractor installed operating system software on the server, and set up wiring to most of the computer systems. Mrs. Jenkins and I set up user logins for BTC staff and guests on the Windows XP machines, and installed software necessary for classes.

During the main phase of the consulting partnership, work focused on setting up and maintaining the LAN. The network server was configured to share Internet connectivity throughout the network, and provide email services for all systems. Network maintenance tasks were discussed and demonstrated. Great consideration was given to sustainability of this work, to ensure the network would continue to be available to the BTC Center after the partnership was completed.

Once the network was able to provide Internet, email, and file sharing services to the LAN, work focused on developing a BTC web presence. The layout of the Internet and the nature of HTML were explained, and prototype web sites were explored. Once desired content was discovered, work focused on obtaining a web host, and finally culminated in developing a web page.

Rationale and Expected Outcomes

The BTC Center required its computer hardware to be operational in order to accomplish its mission. Additionally, in order to allow more than one visitor to use Internet resources, a LAN had to be present. File sharing also had to be available to allow classes to share data. A web presence is also critical to allowing public awareness of a technological resource such as the BTC Center.

The outcomes expected from this work were:

- All of the BTC Center's computers are operational
- Mrs. Jenkins is able to do her work from the BTC Center
- Internet and email services are available to all systems
- Files may be shared throughout the building
- Technology classes may begin
- Computer resources would be provided to the public
- The BTC Center would have a published Internet page

Part II: Outcomes and Recommendations

Task 1: Set up computer hardware:

Results

Mrs. Jenkins and I worked to set up all of the BTC Center's hardware. We first focused on setting up the new computer systems. Once a rack for the server was purchased and had arrived, an independent contractor installed the server, while Mrs. Jenkins and I worked to get the other systems powered up. I demonstrated how to set up user accounts and set account privileges in Windows XP, and Mrs. Jenkins and I each set up user accounts for two of the new systems.

We then worked to set up the printers. One printer was connected directly to the hub, and the other two were connected to individual network computers. To ensure that this work could be sustained, the process was explained and performed together at first. Later, Mrs. Jenkins installed her own printer on one of the systems.

Mrs. Jenkins also independently installed the scanner to one of the older PC's.

The fact that Mrs. Jenkins was capable of setting up PC's on her own, and later actually downloaded drivers, installed them, and set up a new piece of hardware indicate the sustainability of the work done.

Outcomes

- All of the BTC Center's computers are operational
- Mrs. Jenkins is able to type her papers at the Center as opposed to going home to work on documents
- Multiple technology classes have started
- All printers and the scanner are functional
- Mrs. Jenkins set up three PC's on her own
- Mrs. Jenkins installed a scanner on a PC

Recommendations

One recommendation to make the computer hardware more useful is to homogenize the operating systems to Windows XP / 2000. The BTC Center currently has 10 systems that students may use, which are all networked to one another and to printer resources. Four of these systems are loaded with Windows XP, which is a 2000 based operating system. This provides added security features that are necessary to a shared computer. However, the other systems have old Windows 9x operating systems. This software does not support multiple "guest" logins, and as of now all students have full access to all information on the system, and may make administrative changes while using the systems. By installing Windows 2000 or XP on all systems, the network will become more homogenous, and each system will allow only "guest" privileges to students.

Without having the different operating systems, differences in computer setup would be eliminated. Additionally, software would be guaranteed compliant across all systems, as opposed to having to consider two separate operating systems when making software investments.

These systems do not currently meet the RAM requirements of Windows 2000 / XP. RAM is currently very inexpensive – on Pricewatch (www.pricewatch.com), 128 meg RAM chips are available starting at \$16. This in combination with the 64 meg of RAM that these older systems currently have will provide enough for newer Windows software.

Once the RAM was purchased and installed, the systems would be ready for newer operating system software.

Additionally, the Center currently owns a copy of Windows 2000 Server, which includes 5 free client licenses. Currently, none of these licenses are in use, so once the systems are upgraded, five of them could install the software without any additional cost. Packs of 5 more licenses for Windows 2000 may be purchased at CompuMentor (www.compumentor.org) for \$25.

Windows XP is also available through CompuMentor for \$55, and each additional license is \$25. The home page for any Microsoft product, including Windows 98, 2000, and XP, may be found at www.microsoft.com.

Task 2: Set up LAN

Results

Mrs. Jenkins and I both installed network protocols on client systems, set up email access, and enabled each system to receive access to the Internet through the DSL line running into the server. The server has been configured to act as a host for one of the printers, which is connected to the network through its Ethernet port. All other printers were added to the network as shared resources as well. Shared folders have been created on each client computer and on the server for file sharing.

The BTC Center's Internet provider did not support the email software of some of the clients on the network, and as a result the systems were not able to contact the ISP's email server. The BTC Center's in-house server was configured to act as a mail server, routing emails on to the ISP. This has fixed issues with sending email from within the network.

Mrs. Jenkins has been able to add a printer to the network since our work. This is an indication of the sustainability of our efforts.

I have also written several documents outlining maintenance tasks that Mrs. Jenkins and I had performed in setting up the LAN. Email setup, server configuration, and client computer settings are all described in detail to aid in sustainability.

Outcomes

- The BTC Center is open to the public, and visitors may use Internet resources from any of the computers on the LAN
- Printer resources are shared among all computers
- Files can be shared among all computers
- Mrs. Jenkins can send emails from any system in the Center, eliminating the need to work from home
- Mrs. Jenkins was able to set up 4 PC's and add them to the network herself
- Mrs. Jenkins was able to install a printer and share it through the network

Recommendations

One recommendation to increase reliability of network resources, and potentially save time and headaches, is to purchase a software package such as Norton Ghost. Norton Ghost is capable of taking a disk image of an entire hard drive and copying it to either a removable media device or a network drive. Since the BTC server has over 60 gigabytes of free hard drive space, an image of a Windows 98 and Windows XP machine could be saved to the server. In the event of a crash, this software could be used to

restore the hard drive to its original condition. This is useful for shared resource computers, where a user error may cause some data loss.

The Norton Ghost home page is located at <http://www.symantec.com/sabu/ghost/>. Symantec currently publishes this software, so this web site should be a good place to go to find product information. The current release is Norton Ghost 2002, and is available through the Symantec web site for \$69.95. A guide for use of Norton Ghost is available at http://ghost.radified.com/ghost_1.htm, and is available in PDF format for easy printout.

Roxio's GoBack (www.goback.com) is a similar software package, however it does not provide the option for network backups, and is more of a single computer solution.

Task 3: Develop Web Presence for BTC Center

Results

Once the BTC Center's network met their needs, Mrs. Jenkins and I browsed the Internet looking at a few sample web pages. HTML code was explained, and the correlation between the source code and the appearance of the page was discussed. Web development software was purchased, and a page is currently underway.

Mrs. Jenkins has been able to incorporate digital camera images, scanned pictures, and other brochures she has generated into the web page in development. A web host has been selected, and service is being purchased.

All web development has been by BTC staff, so the page may continue to develop once the partnership has completed.

Outcomes

- Mrs. Jenkins is familiar with Internet topology
- Mrs. Jenkins knows the correlation between HTML source code and a web page
- Mrs. Jenkins is able to use digital cameras, scanners, and other technologies to make an attractive web page
- A web host has been selected, and concepts such as database hosting, domain names, and servers are understood

Recommendations

I recommend that the BTC Center construct an online enrollment database for BTC classes, and tie it into the BTC Center web page. This will make the web site more valuable, and a service like this will make the BTC Center a better provider for the youth.

This will help to sustain the work that we have done through the semester by motivating updates to the web page. Also, this will encourage other staff members and instructors to learn how to operate the database, and, in turn, the web site.

This will provide increased capacity. Parents will be able to know if their children have been attending classes by going to the BTC Center web site. Logging student attendance and payments for classes will be easier and more accurate. Additionally, individuals funding the organization may log on and see popularity of BTC available classes.

A first step toward accomplishing this recommendation is to create a local database. This could be hosted on the BTC Center server. Microsoft Access is a good choice due to its ease of use and availability of online tutorials. If Access is not desired, another software package to consider would be SQL.

This local database could be used to aid current work. Creating a table that logs student names and classes signed up and paid for, and creating a table for class attendance would assist in logging activity at the BTC Center.

Knowledge in how to update the database could be conveyed to other staff members so that they could log their attendance in the database.

Next, the database could be uploaded to the web host. A page could be developed letting visitors see class attendance. If the BTC Center wishes to pursue this stage of the recommendation, security will be a big issue, and careful consideration must be given to sensitive information (payments, children's names and information without permission, etc). As a potential resolution, a member log-in area could be made which would allow individual families to see what classes they have signed their children up for, and whether or not they have paid.

The BTC Center will only have to use existing hardware to enable this recommendation. The in-house server already has the ability to host the database, and the web provider selected provides free database storage and access.

Information on MS Access or SQL Server may be found at Microsoft's web site: www.microsoft.com. Access product information may be found at <http://www.microsoft.com/catalog/display.asp?subid=22&site=10864&x=42&y=5>, and SQL Server 2000 information may be found at: <http://www.microsoft.com/sql/>. Microsoft Access 2002 is available in the Office XP Professional software bundle, which is available at www.compumentor.org for \$60. Microsoft SQL Server 2000 would have to be purchased from Microsoft. SQL Server 2000 Standard is available for \$1,489, and includes 5 client access licences.

Microsoft help pages, in addition to web resources, could help instruct how to create the database.

- <http://www.rowden.net/learn/guides/access/> -- a "beginner's guide" to using Microsoft Access, which is probably the best introductory database software to use. It is for a dated version of Access (version 2.0), however all underlying concepts are the same.
- <http://www.csun.edu/itr/guides/access/2000/beg.html> -- This is another "beginner's guide" for Access 2000, and walks the user all the way through making tables and entering data.

The Frontpage software that the BTC Center has purchased can be used to tie the database into their web site. This is detailed in the Frontpage guides, and is also covered at Microsoft's MSDN site:

<http://msdn.microsoft.com>

Finally, further partnerships with CMU could provide the BTC Center with the expertise to build a database and link it to their web page.

Additional Recommendations

Recommendation 1: Create a Technology Plan

As technology becomes a critical piece of non-profit organizations, a technology plan has become a vital aspect of a thriving work environment. Being able to forecast changing technical needs and relevant technological advances can help a non-profit use future technology to expand capacity. Many Internet resources are available which detail how to construct a technology plan. Here are a few key sites:

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| http://techsoup.com | http://www.nonprofits.org/ |
| http://www.nctp.com | http://casa.darkstar.org/npotech/ |
| http://www.isf.com/services/article1.htm | http://www.genie.org |
| http://www.coyotecom.com/database/techbuy.html | http://www.helping.org/nonprofit/ |
| http://www.infolink.org/process.htm | http://www.philanthropy.com/ |
| http://www.lincproject.org/toolkit/strategies/index.htm | http://www.nonprofit-tech.org |
| http://www.progressivetech.org/Resources/index.htm | http://www.americconnects.net |

It is important to note that, if a Technology Plan is to be useful, it cannot be written and then sit on a hard drive without any future consideration. The use of a technology plan does not come from its first draft, but rather continually assessing and updating it with regard to current needs. Successful technology planning means never having to feel inundated with new technologies.

Recommendation 2: Set up more concrete Technology Management

Having a defined plan for technology management becomes more necessary as more hardware becomes available. Particularly when looking into generating a technology plan, coming up with a means of managing the technology will be necessary. So far, Mrs. Jenkins has taken an active role in managing the technology. This may be further defined, or other staff may be added to help her in managing future purchases and upgrades.

Recommendation 3: Purchase one or more web cameras

I recommend that the BTC Center purchase one or more web cameras for use in classes. These cameras may allow students to incorporate their own pictures or videos that they take in the Center into their projects, and allow for video conferencing.

Current courses teach students to create their own interactive storybooks and collages of clipart images and pictures they find on the web. By being able to incorporate their own images, these types of exercises could be expanded, and the children would have greater opportunities to exercise their creativity. Pictures and videos also are an excellent addition to a web site, and can be used to show the students having fun while taking classes there.

There are many options to consider when looking into digital imaging. Digital cameras are great solutions to allow still images (or, in the case of more expensive cameras, short video) to be captured independent of a computer. These have a significant cost over a “web cam” (which is only able to operate when plugged into a PC), but may be used to roam about and take pictures away from a PC.

At pricewatch’s website (www.pricewatch.com) web cams are available for purchase, and start at \$10. One of the more popular web cams is Logitech’s “QuickCam”, which has information available at www.quickcam.com.

At pricewatch, it is important to know that the hardware purchased is not necessarily packaged for retail sale, and may or may not include bundled software, cables, and manuals. As a result, purchase options through other retailers may be investigated. At C-Net’s web site (www.cnet.com), a search for “quick

cam” will result in a list of manufactures that will sell boxed web cameras. Logitech’s Quick Cam USB starts at only \$38. Additionally, C-Net is a great resource to use because it provides reviews for most major hardware, and customer feedback. These can all be important to determining what functionality is desired in a camera.

Digital cameras are available from all major camera manufactures, including Kodak (www.kodak.com), Olympus (www.olympus.com), and others. Since purchasing a digital camera requires knowledge of terms like “megapixel resolution”, a resource page would be of great benefit. The digital camera store (<http://www.digital-camerastore.com/>) is a great resource both for learning about digital cameras in general, but getting specific reviews. Additionally, digital cameras info (<http://www.digital-cameras-info.com/>) is a great resource to learn about digital cameras and obtain reviews of particular cameras.

It is important to note that if a camera for each PC is too costly, the file sharing capabilities of the LAN may be used to share only a few cameras.

Recommendation 4: Purchase a MIDI keyboard:

Along the same lines as a digital imaging, purchasing a MIDI keyboard would provide more creative uses of technology. Since students are already creating multimedia productions through the interactive storybook classes, adding the capability to generate their own music would further expand the creative opportunities for students. Additionally, students would be able to use instructional software to develop musical skills without incurring the expertise of a music instructor. This would greatly enhance the education of the students, and further balance their educational opportunities at BTC.

Through the LAN, all students could utilize one keyboard. By sending their compositions to the server, they would be able to access them from any system in the building.

An organization called Street Level Media has started a similar program in the Chicago area, whose web site may be found at <http://streetlevel.iit.edu>. Their work focuses on using multimedia projects as a creative outlet for urban youth. Additionally, the web site for the Challenge 2000 Multimedia Project (<http://pblmm.k12.ca.us/>) is a great resource to set up such a program.

Yamaha is a company reputed for their music hardware, and focus on using their hardware with PC’s to expand educational opportunities. The Yamaha EZ-20 (which is designed to be used for educational purposes, with features such as LED lights on each key to show which keys ought to be pressed, and a large bundle of educational software) is available at musician’s buy (www.musiciansbuy.com) for \$229, including educational software, cables, and headphones. All product information may be investigated at www.yamaha.com.

About the Consultant:

My name is Nathan Ide, and I am a senior, double majoring in Mechanical Engineering and Computer Science. Starting this August, I will begin full time employment at Microsoft. I greatly enjoyed the experience being able to work with Louise at the BTC Center, and am anxious to see the work they are able to accomplish in the future!

Detailed specifications of Hardware available to BTC Center

Computers:

- 6 Pentium II PC's with 233 MHz processors, and 64 megabytes of RAM. Each has a CD-ROM drive and network card. Each is loaded with Windows 98
- 4 Pentium 4 PC's with 128 megabytes of RAM. Each has Windows XP loaded. Each has a CD-ROM drive and a network card.
- One Pentium 3 1 GHz server. The server features a SCSI RAID hard disk array, and has two network cards – one gigabit Ethernet adaptor, and another 10/100 Ethernet adaptor

Printers:

- HP LaserJet 4050: a typical office laser printer, which is capable of 1200x1200 resolution at 17 pages per minute
- HP LaserJet 2200: 1200X1200 resolution laser printer, capable of 19 pages per minute, as well as more advanced features (double sided printing, network connectivity directly to a LAN hub)
- HP DeskJet 1220c: a color inkjet printer, capable of up to 2400X1200 resolution, and 11 PPM (for black and white documents)

Other Devices:

- HP 6390 scanner, with ADT attachment: High resolution scanner with automatic document feeder. The scanner supports parallel, USB, and SCSI interface methods. The scanner is interfaced through a SCSI card on the back of the machine, and allows automatic feeding through the ADT unit on top.