Development of a Database Program and Networking System For Seven Hills Neighborhood Houses

By

Matthew Edward Morrison

Submitted to
the Faculty of the Information Engineering Technology Program
in Partial Fulfillment of the Requirements for
the Degree of Bachelor of Science
in Information Engineering Technology

University of Cincinnati
College of Applied Science

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Matthew Morrison — Matthew Edward Morrison — 3/14/03 — Date

Prof. Mark Stockman, Faculty Advisor — 3/14/03 — Date

James F. Sullivan — James F. Sullivan, Department Head — 3/17/03 — Date

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Abstract

Seven Hills Neighborhood Houses would like to facilitate the networking of computers at each of the four branches. They believe a computer networking system will enhance their communications and enable them to share pertinent information common to all branches. It will also help to share ideas around service improvements and/or service innovations.

The Seven Hills Neighborhood Houses would also like to establish a comprehensive database to store and access client information. The database will hold the clients' personal information and the services they have received. This will enable the staff to use information technology to improve the efficiency, accuracy, and timelessness of the various reports and documents they are required to keep.

Development of a Database Program and Networking System For Seven Hills Neighborhood Houses

1 Statement of the Problem

1.1 Definition of the Need

Seven Hills Neighborhood Houses is a non-profit United Way Funded-Agency. Their purpose is to increase the resources available to their constituents, who have historically had few alternatives. Their goal is to provide those services that are most needed and best delivered from a community-based agency. The rational is to build partnerships with residents, private/public organizations and businesses to enhance resources to ensure maximum opportunities for individuals, families and community growth. The organization consists of an Administrative Office and three satellite branches located within Greater Cincinnati. The Administration Office located on 1809 Freeman Avenue delegates the business and financial side of the organization. The Findlay Street Neighborhood House is located on 901 Findlay Street. The West End Branch offers a variety of programs including: Emergency Assistance, Computer Training, Parenting Classes and Victims of Crime Counseling. The East End Branch residing on 3806 Eastern Avenue in the East End offers assistance and counseling services. The Valley Branch on 1100 Lindy Street in Lincoln Heights offers activities such as: Computer Training, Building Blocks After School Program, Neighborhood Planning and Counseling. Simply put by their mission statement "Building Communities One Family At A Time".

Currently they do not have the capability to correspond and share information other than primitive means such as phone, fax or mail. The sharing of information occurs at a monthly managers' meeting and/or through the agency's informal network. A

majority of their 25 computers are inefficient and require hardware and software upgrades. Reports and client tracking are manual and prone to human error. The process is tedious and time consuming.

2 Description of the Solution

A wide area network will connect the branches and allow instant access to client information stored in a central database. A user-friendly application will provide a computer-based means of updating and requesting data from the database. The front end will generate instant reports pulling data directly from the database. The network and database will increase communication and improve efficiency.

2.1 Project Design

I plan to use three areas within the Information Engineering Technology program to complete the project. The front end is a Visual Basic application compiled in the form of an executable program located on client computers. The application will access the data stored in the Microsoft SQL database through an open database connection. The branch offices are networked together creating four distinct local area networks. Workgroups were created at each location to help users find objects such as printers and shared folders within that group. Once Seven Hills contacts the Internet Service provider the routers will then allow the user immediate access to the database from any location using the server's static IP address. Below I have listed in detail the specific areas and how they are used in my project.

2.1.1 Microsoft SQL 2000 Enterprise Edition

Microsoft SQL Server 2000 is the market leader and database of choice for this project. SQL Server is the fastest growing relational database with 45 percent revenue

growth—over three times faster than the overall relational database market. SQL Server is the most popular relational database on Microsoft Windows, with 38 percent market share (Gartner, June 2001). Figure1 provides a breakdown of the relational database market share.

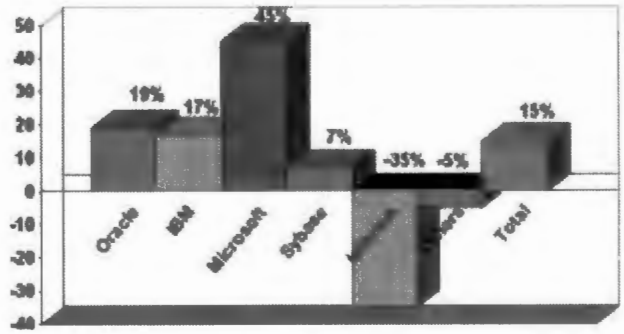


Figure 1. Database Market Composition

SQL Server 2000 on Windows 2000 provides the best performance on the SAP R/3 Sales and Distribution Standard Benchmark on any platform, supporting 26,000 concurrent sales and distribution users—34 percent more than Sun/Oracle. Performance, scalability, and reliability are essential to the organization. Microsoft SQL Server 2000 will provide a reliable and highly scalable database for Seven Hills. SQL Server 2000 takes advantage of symmetrical multiprocessor (SMP) systems. SQL Server Enterprise Edition can use up to 32 processors and 64 GB of RAM. Effective table structures, relationships, and database normalization will optimize database performance. The database is created so that it shows a many to many relationship to efficiently hold and retrieve client information (refer to Appendix A). The database will consist of the following tables: Client Table, Emergency Contact, Client Details and nine Activity Tables. The client's social security number is a unique value therefore will be the primary key. The executable application provides an open database connection to the server. The

server is set up with a static IP address allowing access from the various branches via the Internet and the open database connection. Security for the server will rely on router level security to prevent hackers from gaining access to the data. The server is located on the first floor at the Administrative Office. A disaster plan was created to document backing up the database and restoring the data. A digital copy of the disaster plan resides on the server and a paper copy is stored at the Administrative Office.

2.1.2 Networking

Networking will play a vital role in the project. The four branches collectively will create a wide area network allowing instant access to the server from any location. The computers are set up in distinguishing workgroups. Some of the workstations are inefficient requiring hardware and software upgrades. A majority of the workstations will receive a new Network Interface Card replacing 10MB cards with NETGEAR 10/100 PCI Adapters, allowing faster data exchange rates. The East End, Findlay Street, and Valley Branch will require installing a GIGAFAST 4-Port Router at each location to access the Internet. The Findlay Street Branch requires a NETGEAR 8 Port Hub to accommodate the number of computers. The East End, Findlay Street, and Valley Branch will receive CAT-5e cable drops connecting each computer to the Hub/Router.

2.1.3 Programming

Microsoft Visual Basic 6.0 development system is the most productive tool for creating fast business solutions for the Microsoft Windows operating system and the Web. With its rapid application development (RAD) environment, developers can quickly create and deploy super-fast client/server applications using familiar Visual Basic

programming techniques. A Visual Basic 6.0 application will serve as the front end of the database. Users will have a series of forms: View/Modify Client Information, Add New Client, Client Activities and Metrics. There are validations on several fields within the forms to protect the integrity of the data. During run time the sub routines are coded to identify and report any errors. An open database connection will connect the Visual Basic 6.0 front end to the Microsoft SQL 2000 database. The ADO Data Control will allow the user to move through the records in the recordset. The Metric menu retrieves data from the database and displays the data in Microsoft Excel using a pivot table.

2.2 User Profile

The intended users for the database and application will be at two levels of IT literacy. The distinct levels are Data Entry and Management. Proper documentation and training is key in the success of the deployment of the executable application and maintenance of the database.

2.2.1 Data Entry

Data entry employees are responsible for entering new client information, modifying client information and selecting client activities. Several of the data fields are dropdowns eliminating user error. Within the code, key fields are validated and a message box will warn the user if he/she has violated the parameters. The dropdowns and validation sequence are established to maintain the highest level of data integrity. Basic understanding of Microsoft Word and Microsoft Excel are the highest level of IT knowledge.

2.2.2 Management

One key role of management is to analyze client statistics. The Metric menu retrieves data from the database and displays the data in Microsoft Excel by means of a pivot table. After the user enters specific criteria the front end will then execute the SQL statement behind the scenes retrieving the necessary data. The View/Modify Client Information page will allow management to scroll the recordset of existing clients using an ADO Control. The management team is responsible for backing up the Microsoft SQL database. The management team also has the authority to delete records on the database.

2.3 Design Protocols

The primary means of sharing information prior to the local area network and database consisted of a fax machine and telephone. Communication and data sharing between the satellite offices and the Administrative Office were limited and slow. The design protocols detail the individual branches.

2.3.1 East End Branch Protocol

My analysis led to a full computer upgrade and a local area network combined to enhance communication and enable them to share pertinent information. Figure 2 lists the expenses.

Product	Quantity	Price	Sub Total
T-5e 10/100 Base-T Patch Cable – 100 Feet	4	$18.00	$72.00
GIGAFAST 4-Port Router	1	$69.99	$69.99
64MB EDO DIMM	6	$12.00	$72.00
Seagate 4.3 GB Hard Drive	2	$39.00	$78.00
Seagate 4.3 GB Hard Drive	1	$19.99	$19.99
NETGEAR 10/100 PCI Adapter	3	$11.00	$33.00
Microsoft Windows 2000 Professional Upgrade	4	$219.00	$876.00

Microsoft Office 2000 Professional	4	$399.99	$1,599.96
The Complete Reference Word 2000	1	$4.99	$4.99
Note: $19.99 Seagate 4.3 GB Hard Drive purchased from eBay			
		Total	**$2,825.93**

Figure 2. East End Branch Budget

Windows 2000 Professional is the Windows operating system of choice for business desktop and laptop systems. It is used to run software applications, connect to Internet, access files, printers, and network resources. A workgroup was created to help users find objects such as printers and shared folders within that group. By sharing folders and printers the East End branch will increase communication and in turn streamline processes and become more efficient.

The East End branch received a Microsoft Windows upgrade. The operating system went from Microsoft Windows 95 to Microsoft Windows 2000 Professional with Service Pack 2. Windows 2000 will provide a secure operating system and allow the computers in the branch to share folders and files. The Hard Drives and RAM needed an upgrade to meet the minimum requirements for Windows 2000. New Hard Drives and RAM were installed in 3 of the 4 computers. The network cards were also upgraded in 3 of the 4 computers to speed up data communication. The East End branch also received a Microsoft Office upgrade. The office package went from Microsoft Office 97 to Microsoft Office 2000 Premium. Figure 3 lists the East End software/hardware upgrades.

Computer 1
Gateway P5-100

		Computer 1 After Upgrade	
Operating System	Microsoft Windows 95	Operating System	Microsoft Windows 2000 Professional with Service Pack 2
Office Package	Microsoft Office 97	Office Package	Microsoft Office 2000 Premium
Hard Drive	1 GB	Hard Drive	Seagate 4.3 GB Hard Drive
Random Access Memory	16 MB	Random Access Memory	128 MB
Network Interface Card	Allied Telesyn AT-1510 Plug & Play Ethernet Adapter	Network Interface Card	NETGEAR 10/100 PCI Adapter

Computer 2
Gateway E-1400

		Computer 2 After Upgrade	
Operating System	Microsoft Windows 98 Second Edition	Operating System	Microsoft Windows 2000 Professional with Service Pack 2
Office Package	Microsoft Office 2000	Office Package	Microsoft Office 2000 Premium

Computer 3
Gateway P5-100

		Computer 3 After Upgrade	
Operating System	Microsoft Windows 95	Operating System	Microsoft Windows 2000 Professional with Service Pack 2
Office Package	Microsoft Office 97	Office Package	Microsoft Office 2000 Premium
Hard Drive	1 GB	Hard Drive	Seagate 4.3 GB Hard Drive
Random Access Memory	16 MB	Random Access Memory	128 MB
Network Interface Card	Allied Telesyn AT-1510 Plug & Play Ethernet Adapter	Network Interface Card	NETGEAR 10/100 PCI Adapter

Computer 4
Gateway P5-100

		Computer 4 After Upgrade	
Operating System	Microsoft Windows 95	Operating System	Microsoft Windows 2000 Professional with Service Pack 2
Office Package	Microsoft Office 97	Office Package	Microsoft Office 2000 Premium
Hard Drive	1 GB	Hard Drive	Seagate 4.3 GB Hard Drive
Random Access Memory	16 MB	Random Access Memory	128 MB
Network Interface Card	Allied Telesyn AT-1510 Plug & Play Ethernet Adapter	Network Interface Card	NETGEAR 10/100 PCI Adapter

Figure 3. East End Computer Specs

The computers are networked using a star topology. A GIGAFAST 4-Port Router was installed and each of the four computers were then connected to the router. Not only can the GIGAFAST 4-Port Router serve as a 4-port switch for creating the 10/100Mbps network, it also has IP Sharing and network security features, making it the most complete router solution available. Serving as an advanced firewall, the GIGAFAST 4-Port Router prevents hackers from entering the private network. The WAN port may be connected to the incoming Cable/DSL/Ethernet signal with up to 253 client computers connected directly or through other hubs and switches to the 4 10/100Mbps ports on the GIGAFAST 4-Port Router. The GIGAFAST 4-Port Router will then assign IP addresses using its built-in DHCP server, allowing client computers to receive TCP/IP settings directly from the router. Then through one of the client computers, the GIGAFAST 4-Port Router is configured so that all the client computers will be able to share the Internet connection. The front-end application is coded with an open database connection to allow users to gain access to the server via the Internet. Figure 4 illustrates the network topology for the East End Branch.

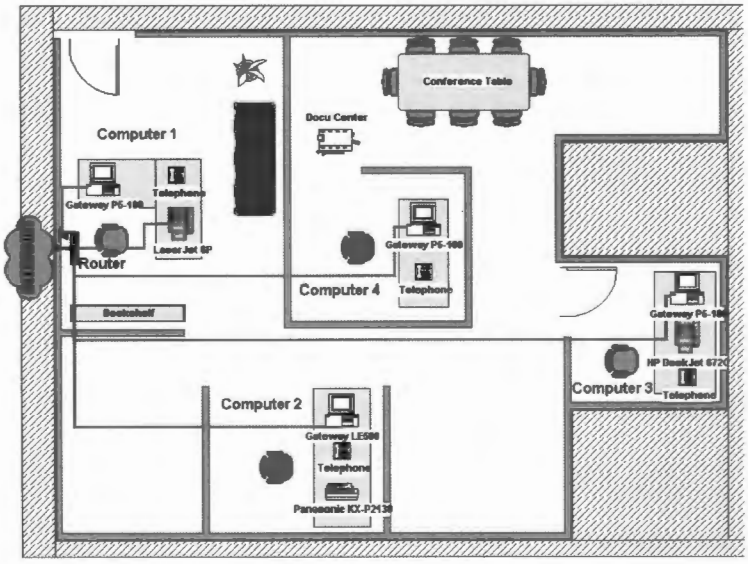


Figure 4. East End Branch Network Topology

2.3.2 Findlay Street Branch Protocol

My investigation led to a partial computer upgrade and a local area network. The local area network will develop communication and enable them to share related information. Figure 5 lists the expenses.

Product	Quantity	Price	Sub Total
CAT-5e 10/100 Base-T Patch Cable – 100 Feet	5	$18.00	$90.00
CAT-5e 10/100 Base-T Patch Cable – 50 Feet	3	$15.00	$45.00
CAT-5e 10/100 Base-T Patch Cable – 25 Feet	1	$9.00	$9.00
CAT-5e 10/100 Base-T Patch Cable - 7 Feet	1	$3.00	$3.00
GIGAFAST 4-Port Router	1	$69.99	$69.99
NETGEAR 8 Port Hub	1	$33.00	$33.00
NETGEAR 10/100 PCI Adapter	8	$11.00	$88.00
Microsoft Windows 2000 Professional Upgrade	3	$219.00	$657.00
Microsoft Office 2000 Premium	3	$399.99	$1,199.97
Microsoft Windows 98 Second Edition	1	$84.99	$84.99
Microsoft Office 97 Professional Edition	3	$259.00	$777.00
64MB PC100	4	$10.00	$40.00
		Total	**$3,096.95**

Figure 5. Findlay Street Branch Budget

A workgroup was created to help users locate objects such as printers and shared folders inside that group. By sharing folders and printers the Findlay Street branch will boost communication and in turn modernize processes and become more efficient.

The network cards were upgraded in all nine computers to speed up data communication. NETGEAR FA310 TX network cards were installed in all nine computers. The NETGEAR FA310TX is an auto-sensing, 100BASE-TX Fast Ethernet

PCI adapter. It will operate with either 10 Mbps 10BASE-T or 100 Mbps 100BASE-TX hubs or switches. Figure 6 lists the Findlay software/hardware upgrades.

Computer 1
ACER

		Computer 1 After Upgrade	
Operating System	Microsoft Windows 98	Operating System	Windows 98 Second Edition
Office Package	Microsoft Office 97	Office Package	Microsoft Office 2000 Premium
Network Interface Card	Motorola Modem SURFR Internal 28.8 Plug & Play	Network Interface Card	NETGEAR 10/100 PCI Adapter

Computer 2
Gateway P5-100

		Computer 2 After Upgrade	
Office Package	Microsoft Office 5.0	Office Package	Microsoft Office 97 Professional
Network Interface Card	Intel 82559 Plug & Play Ethernet Adapter	Network Interface Card	NETGEAR 10/100 PCI Adapter

Computer 3
Gateway 400

		Computer 3 After Upgrade	
Operating System	Microsoft Windows 98	Operating System	Microsoft Windows 2000 Professional with Service Pack 2
Office Package	Microsoft Office 2000	Office Package	Microsoft Office 2000 Premium
Random Access Memory	64 MB	Random Access Memory	128 MB
Network Interface Card	US Robotics 56K Voice Win	Network Interface Card	NETGEAR 10/100 PCI Adapter

Computer 4
Gateway P5-100

		Computer 4 After Upgrade	
Office Package	Microsoft Office 5.0	Office Package	Microsoft Office 97 Professional
Network Interface Card	Allied Telesyn AT-1510 Plug & Play Ethernet Adapter	Network Interface Card	NETGEAR 10/100 PCI Adapter

Computer 5
Gateway P5-100

		Computer 5 After Upgrade	
Network Interface Card	Allied Telesyn AT-1510 Plug & Play Ethernet Adapter	Network Interface Card	NETGEAR 10/100 PCI Adapter

Computer 6
Gateway P5-100

		Computer 6 After Upgrade	
Operating System	Microsoft Windows 95	Operating System	Windows 98 Second Edition
Office Package	Microsoft Office 6.0	Office Package	Microsoft Office 97 Professional
Network Interface Card	Allied Telesyn AT-1510 Plug & Play Ethernet Adapter	Network Interface Card	NETGEAR 10/100 PCI Adapter

Computer 7 **Computer 7 After Upgrade**
Compaq

Operating System	Microsoft Windows 95	Operating System	Microsoft Windows 2000 Professional with Service Pack 2
Office Package	Microsoft Office 97	Office Package	Microsoft Office 2000 Premium
Random Access Memory	32 MB	Random Access Memory	128 MB

Computer 8 **Computer 8 After Upgrade**
IBM Aptiva

Operating System	Microsoft Windows 98	Operating System	Microsoft Windows 2000 Professional with Service Pack 2
Office Package	Microsoft Office 97	Office Package	Microsoft Office 2000 Premium
Random Access Memory	96 MB	Random Access Memory	160 MB
Network Interface Card	LT Win Modem	Network Interface Card	NETGEAR 10/100 PCI Adapter

Computer 9 **Computer 9 After Upgrade**
Gateway P5-100

Network Interface Card	Standard 1200 Bps Modem	Network Interface Card	NETGEAR 10/100 PCI Adapter

Figure 6. Findlay Street Computer Specs

The computers are networked using a star topology. A NETGEAR FE108 8-Port Hub was installed and seven of the nine computers were then connected. The NETGEAR FE108 8-Port Hub provides fast information exchange, resource sharing, and client or peer-to-peer communication using simple Category 5 unshielded twisted pair (UTP) wiring. The hub was then wired to the GIGAFAST 4-Port Router and the remaining two computers were then connected to the router. Not only can the GIGAFAST 4-Port Router serve as a 4-port switch for creating the 10/100Mbps network, it also has IP Sharing and network security features, making it the most complete router solution available. Serving as an advanced firewall, the GIGAFAST 4-Port Router prevents hackers from entering the private network. The WAN port may be connected to the incoming Cable/DSL/Ethernet signal with up to 253 client computers connected directly or through other hubs and switches to the 4 10/100Mbps ports on the GIGAFAST 4-Port Router.

The GIGAFAST 4-Port Router will then assign IP addresses using its built-in DHCP server, allowing client computers to receive TCP/IP settings directly from the router. Then through one of the client computers, the GIGAFAST 4-Port Router is configured so that all the client computers will be able to share the Internet connection. The front-end application is coded with an open database connection to allow users to gain access to the server via the Internet. Figure 7 illustrates the network topology for the Findlay Street Branch.

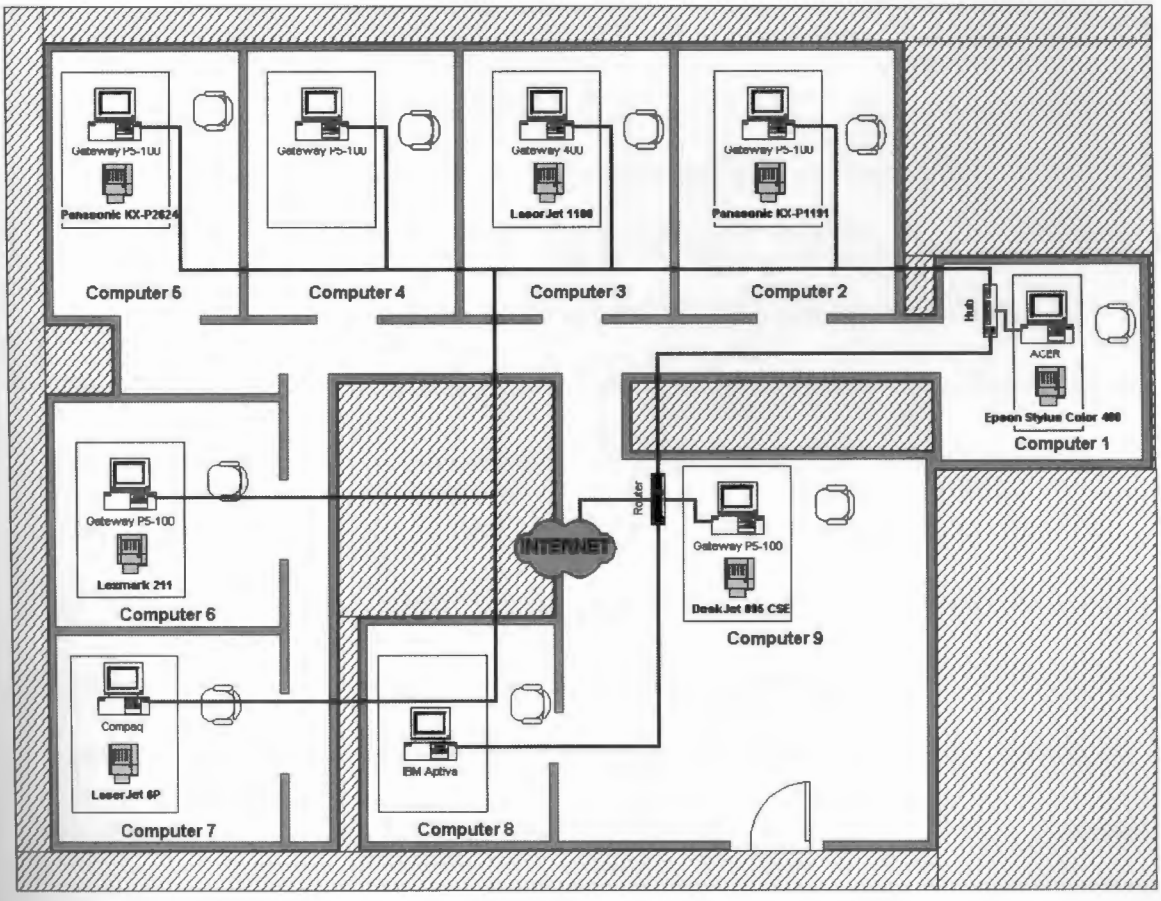


Figure 7. Findlay Street Branch Network Topology

2.3.3 Administrative Office Protocols

The Administrative Office currently has voice and data boxes installed in each of the individual rooms. The computers are fully networked and sharing a network printer. Figure 8 lists the expenses for installing the server.

Product	Quantity	Price	Sub Total
NETGEAR FE108 8-Port Hub	1	$33.00	$33.00
CAT-5e 10/100 Base-T Patch Cable – 25 Feet	2	$9.00	$18.00
OmniView 2-Port KVM Switch	1	$89.99	$89.99
OmniView Cable Kit	2	$14.99	$29.98
		Total	**$170.97**

Figure 8. Administrative Branch Budget

The four computers are running Windows 2000 with Service Pack 1 and Microsoft Office XP. A NETGEAR 8 Port Hub was installed on the first floor alloying an extra port for the server to connect to the network. To cut expenses an OmniView 2-Port KVM Switch was installed. The OmniView 2-Port KVM Switch is the ideal solution for system administrators, computer technicians and power users for hassle-free control over multiple computers without the additional expense of duplicate keyboards, monitors and mice. The Administrative Office has a complete LAN and is Internet ready. Contacting Cincinnati Bell will be the next step for the Administrative Office. Cincinnati Bell will install a DSL connection to the LAN. A high-speed connection will keep the server connected allowing the branches access. Figure 9 lists the expenses for assembling the server.

Product	Quantity	Price	Sub Total
CHIEFTEC Server Chasis Model DX-01BD-420W	1	$70.00	$70.00
Gigabyte GA-8IEXP motherboard	1	$133.00	$133.00
IBM 40GB 7200 RPM Hard Drive	1	$70.75	$70.75
Micron Technology 512MB DDR PC2100 266MHz	1	$97.00	$97.00
Generic CD-RW	1	$40.00	$40.00
Generic Floppy	1	$15.00	$15.00
Windows 2000 Advanced Server (25 client)	1	$3,749.99	$3,749.99
Microsoft SQL 2000 Enterprise Edition	1	$10,939.99	$10,939.99
Microsoft Visual Basic 6.0 Enterprise Edition	1	$1,429.99	$1,429.99
Microsoft Office 2000 Premium	1	$399.99	$399.99
Microsoft Baseline Security Analyzer	1	Free-service	
		Total	**$16,945.71**

Figure 9. Server Budget

2.3.4 Valley Branch Design Protocols

My examination led to a Network Interface Card upgrade and a local area network. The local area network consists of computers located inside the Valley Branch and dedicated to the staff of Seven Hills. The computers are networked using a star topology. The star topology consists of a central hub from which cable segments radiate to each computer on the network. To cut overhead expenses the computers will connect to the NETGEAR 8 Port-Hub by way of Category 5 cable and the hub will then tie to a router in the client computer lab. The computers will temporarily share the same bandwidth Figure 10 lists the expenses.

Product	Quantity	Price	Sub Total
NETGEAR 8 Port Hub	1	$33.00	$33.00
NETGEAR 10/100 PCI Adapter	5	$11.00	$55.00
		Total	**$88.00**

Figure 10. Valley Branch Budget

The five computers had a 10 MB Allied Telesyn AT-1510 Plug & Play Ethernet Adapter. NETGEAR 10/100 PCI Adapters were installed in each of the computers allowing a faster data transfer. The NETGEAR FA310TX is an auto-sensing, 100BASE-TX Fast Ethernet PCI adapter. It will operate with either 10 Mbps 10BASE-T or 100 Mbps 100BASE-TX hubs or switches. Figure 11 lists the Valley Branch software/hardware upgrades.

Computer 1
Gateway P5-100

Network Interface Card	Allied Telesyn AT-1510 Plug & Play Ethernet Adapter

Computer 1 After Upgrade

Network Interface Card	NETGEAR 10/100 PCI Adapter

Computer 2
Gateway P5-100

Network Interface Card	Allied Telesyn AT-1510 Plug & Play Ethernet Adapter

Computer 2 After Upgrade

Network Interface Card	NETGEAR 10/100 PCI Adapter

Computer 3
Gateway P5-100

Network Interface Card	Allied Telesyn AT-1510 Plug & Play Ethernet Adapter

Computer 3 After Upgrade

Network Interface Card	NETGEAR 10/100 PCI Adapter

Computer 4
Gateway P5-100

Network Interface Card	Allied Telesyn AT-1510 Plug & Play Ethernet Adapter

Computer 4 After Upgrade

Network Interface Card	NETGEAR 10/100 PCI Adapter

Computer 5
Gateway P5-100

Network Interface Card	Allied Telesyn AT-1510 Plug & Play Ethernet Adapter

Computer 5 After Upgrade

Network Interface Card	NETGEAR 10/100 PCI Adapter

Figure 11. Valley Branch Computer Specs

A NETGEAR FE108 8-Port Hub was installed and the computers were then connected. The NETGEAR FE108 8-Port Hub provides fast information exchange, resource sharing, and client or peer-to-peer communication using simple Category 5 unshielded twisted pair (UTP) wiring. The hub was then wired to the router located in the client computer lab. Serving as an advanced firewall, the router prevents hackers from entering the private network. The front-end application is coded with an open database connection to allow users to gain access to the server via the Internet. Figure 12 illustrates the network topology for the Valley Branch.

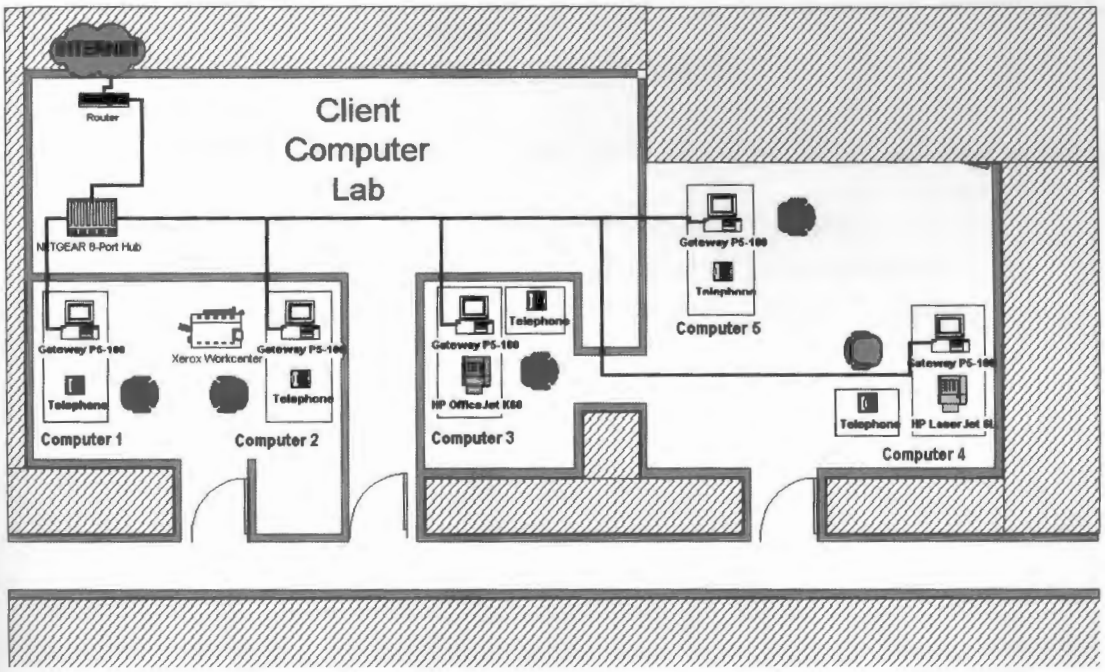


Figure 12. Valley Branch Network Topology

3 Deliverables

1. Develop a Wide Area Network consisting of the following offices:
    - Administrative Office
    - Findlay Street Neighborhood House
    - East End Branch
    - Valley Branch

2. Administrative Office Deliverables
    2.1 Peripherals
        - 1 - NETGEAR FE108 8-Port Hub
        - 1 - OmniView 2-Port KVM Switch
    2.2 Cable Drops
        - 2 – CAT-5e 10/100 Base-T Patch Cable – 25 Feet
    2.3 Functionality of the Administrative Office
        - Accommodate the server

3. Findlay Street Neighborhood House Deliverables
    3.1 Hardware
        - 4 - 64MB PC100
        - 8 - NETGEAR FA310TX 10/100 PCI
    3.2 Software
        - 3 - Microsoft Windows 2000 Professional Upgrade with Service Pack 2
        - 3 - Microsoft Office 2000 Premium Upgrade
        - 1 - Microsoft Windows 98 Second Edition Upgrade
        - 3 - Microsoft Office 97 Professional Edition Upgrade
    3.3 Peripherals
        - 1 - GIGAFAST 4-Port Router
        - 1 - NETGEAR FE108 8-Port Hub
    3.4 Cable Drops
        - 5 - CAT-5e 10/100 Base-T Patch Cable - 100 Feet
        - 3 - CAT-5e 10/100 Base-T Patch Cable - 50 Feet
        - 1 - CAT-5e 10/100 Base-T Patch Cable - 25 Feet
        - 1 - CAT-5e 10/100 Base-T Patch Cable - 7 Feet
    3.5 Functionality of the Findlay Street Neighborhood House
        - Establish a workgroup for the computers
        - Create a local area network so that once the Internet service is provided the Findlay Street Neighborhood House can access the server via the Internet

4. East End Branch
    4.1 Hardware
        - 6 - 64MB EDO DIMM
        - 3 - NETGEAR FA310TX 10/100 PCI
        - 3 - Seagate 4.3 GB Hard Drive
    4.2 Software
        - 4 - Microsoft Windows 2000 Professional Upgrade with Service Pack 2
        - 4 - Microsoft Office 2000 Professional Upgrade
    4.3 Peripherals
        - 1 - GIGAFAST 4-Port Router
    4.4 Cable Drops
        - 4 - CAT-5e 10/100 Base-T Patch Cable - 100 Feet
    4.5 Functionality of the East End Branch
        - Establish a workgroup for the computers
        - Create a local area network so that once the Internet service is provided the East End Branch can access the server via the Internet

5. Valley Branch Deliverables
    5.1 Hardware
        - 5 - NETGEAR FA310TX 10/100 PCI
    5.2 Peripherals
        - 1 - NETGEAR 8 Port Hub
    5.3 Functionality of the Valley Branch
        - Establish a workgroup for the computers
        - Create a local area network so that once the Internet service is provided the Valley Branch can access the server via the Internet

6. Server Deliverables (assemble the server using the following hardware/software)
    6.1 Hardware
        - CHIEFTEC Server Model DX-01BD-420W
        - Gigabyte GA-8IEXP Motherboard
        - IBM 40GB 7200 RPM Hard Drive
        - Micron Technology 512MB DDR PC2100 266MHz
        - Sony CD-RW
        - Generic Floppy
    6.2 Software
        - Windows 2000 Advanced Server (25 client)
        - Microsoft SQL 2000 Enterprise Edition
        - Microsoft Office 2000 Premium
        - Microsoft Baseline Security Analyzer
        - Microsoft Visual Basic 6.0

6.3 Functionality of the Server

- Reliable source to store data
- Highly scalable database
- Effective table structures and relationships
- Database normalization to optimize database performance
- Obtain static IP so that branch offices can access the server via the Internet

6.4 Database Tables

- Client Table
- Emergency Contact
- Client Details
- 9 Activity Tables

7. Microsoft Visual Basic 6.0 Front End

7.1 Functionality of the Front End

- Provide a means to enter New Client Information via open database connection to the server
- Provide a means to View Client Information via open database connection to the server
- Provide a means to Modify Client Information via open database connection to the server
- Provide a means to enter Client Activities via open database connection to the server
- Provide a means to view Client Statistics and print reports

4 Development Timeline

Senior Design I		
Feasibility Study	01/07/02 Thru	03/04/02
Interviews	01/08/02 Thru	01/15/02
Research	01/08/02 Thru	03/01/02
Area of Inquiry	01/28	
Report	02/11/02 Thru	03/04/02
Rough Draft	02/09/02 Thru	02/14/02
First Draft	02/14/02 Thru	02/19/02
Final Draft	02/19/02 Thru	03/04/02
Presentation	02/19/02 Thru	03/04/02
Slide Preparation	02/19/02 Thru	03/01/02
Final Presentation	03/04	
Senior Design II	**06/20/02 Thru**	**08/19/02**
Develop DB Prototype	06/20/02 Thru	06/20/02
DB Table Design	06/20/02 Thru	08/15/02
Develop Flow Charts	08/08/02 Thru	08/15/02
Testing	06/20/02 Thru	08/15/02
Front End		
Design VB GUI	06/20/02 Thru	08/15/02
Develop Network	06/20/02 Thru	08/17/02
East End Branch		
Software & Hardware Upgrade	06/17/02 Thru	06/28/02
Findlay Street Branch		
Software & Hardware Upgrade	07/01/02 Thru	07/12/02
Valley Branch	07/10/02 Thru	07/19/02
Administrative Branch	07/22/02 Thru	08/02/02
Report	06/20/02 Thru	08/19/02
Rough Draft	06/20/02 Thru	07/27/02
First Draft	07/25/02 Thru	08/08/02
Final Draft	08/12/02 Thru	08/19/02
Presentation	06/20/02 Thru	08/29/02
Check Prototype	06/20/02 Thru	08/15/02
Slide Preparation	08/12/02 Thru	08/19/02
Final Presentation	8/19	
Senior Design III	**01/03/03 Thru**	**03/18/03**
Design Working Product	01/03/03 Thru	03/17/03
Final Product Testing	01/03/03 Thru	03/17/03
User Beta Testing	02/14/03 Thru	03/13/03
Debug Final Product	02/14/03 Thru	03/13/03
Develop User Documentation	01/18/03 Thru	02/14/03
Final Presentation	03/18	

5 Proof of Design

After executing the application the user is introduced to the Seven Hills Neighborhood Houses database by a Splash Screen. The Splash screen is on a three second timer. When the three seconds expire the Splash screen unloads and the Main Page appears. The users have the option of clicking on the Splash Screen to by-pass the timer and unload the screen. Figure 13 is a screen shot of the Splash Screen.

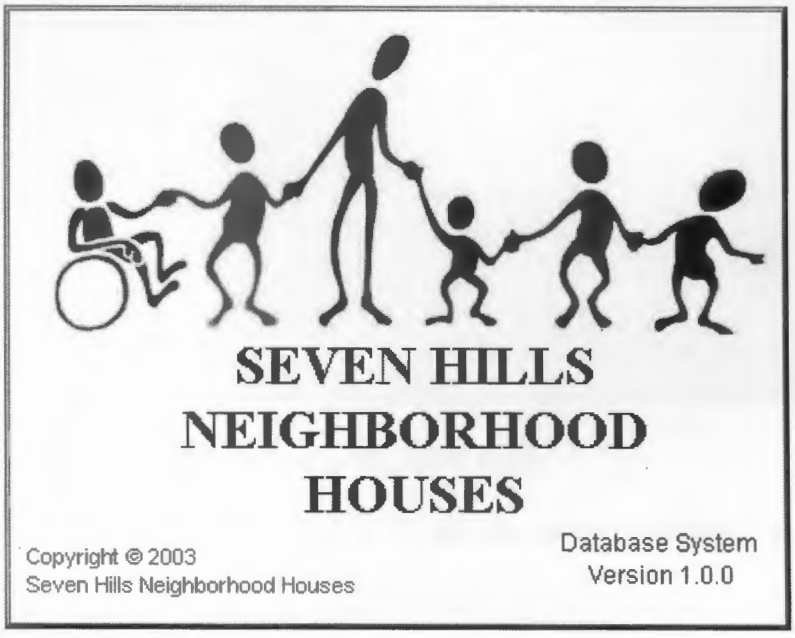


Figure 13. Splash Screen

The Main Page proceeds the Splash Screen and allows the user to select from four main choices: View / Modify Client Information, Add New Client, Client Activities and Metrics. The choices will navigate the user to the corresponding page. The Help Menu contains a sub menu that contains technical information concerning the front and back end of the application. The File Menu contains a secondary menu to allow the user to exit the application. The user is prompt with a message box confirming the exit. The message box contains two choices: yes or no. If the user select yes the application will save and exit the program. The alternative selection will unload and return to the application

without the saving. Figure 14 is a screen shot of the Main Page.

Figure 14. Main Page

The New Client and View / Modify Client Information is divided into three sub sections: Client Information, Demographics and Emergency Contact. The Social Security number is formatted so that the user must enter eleven characters, nine numbers and two dashes. The user may not enter any character values. There are three fields that are required to continue: Social Security Number, First Name and Last Name. If the user tries to update the database without filling in a required field a message box will prompt the user to fill in the appropriate required field. If the user completes the required fields and clicks the Update button a message box will appear prompting the user to save. If the user clicks Yes a message box will confirm the save, update the database and refresh the page. If the user selects No the applications returns to the page without saving. The Home button will return the user to the Main Page. The Help Menu contains a sub menu that

contains technical information concerning the front and back end of the application.

Figure 15 is a screen shot of the View/Modify Client Information Page.

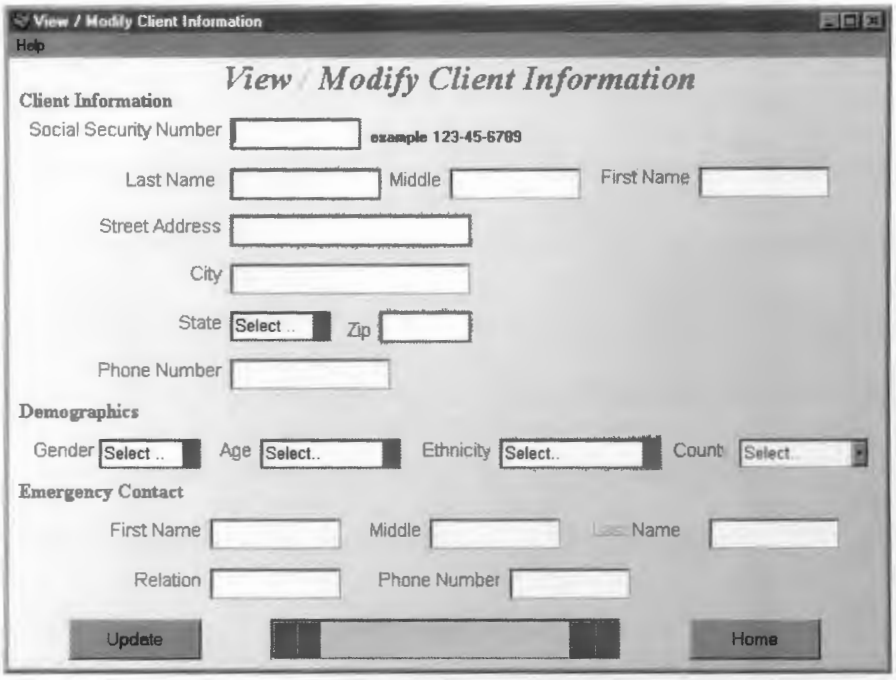


Figure 15. View / Modify Client Information Page

Figure 16 is a screen shot of the New Client Information Page.

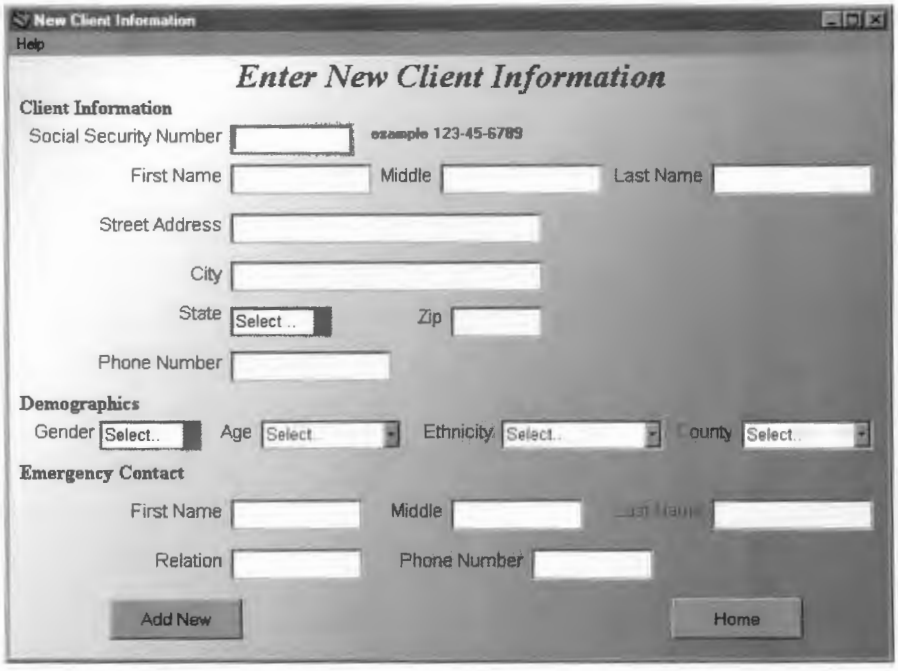


Figure 16. New Client Information Page

The Client Activities page is divided into three sections: Client Information, Services and The Calendar. The user can simply scroll through the recordset until they find the correct client and then update client information. The Client Information is displayed using label boxes so the user is unable to modify the information. The services are arranged in a Tabbed Dialog Control allowing the user to select the correct tab and continue to check the activities. After selecting the activities the user can select the date using the Calendar Control. After selecting the date the Enter button will prompt the user with a message box verifying the save. The Home button will return the user to the Main Page. The Help Menu contains a sub menu that contains technical information concerning the front and back end of the application. Figure 17 is a screen shot of the Client Activities Page.

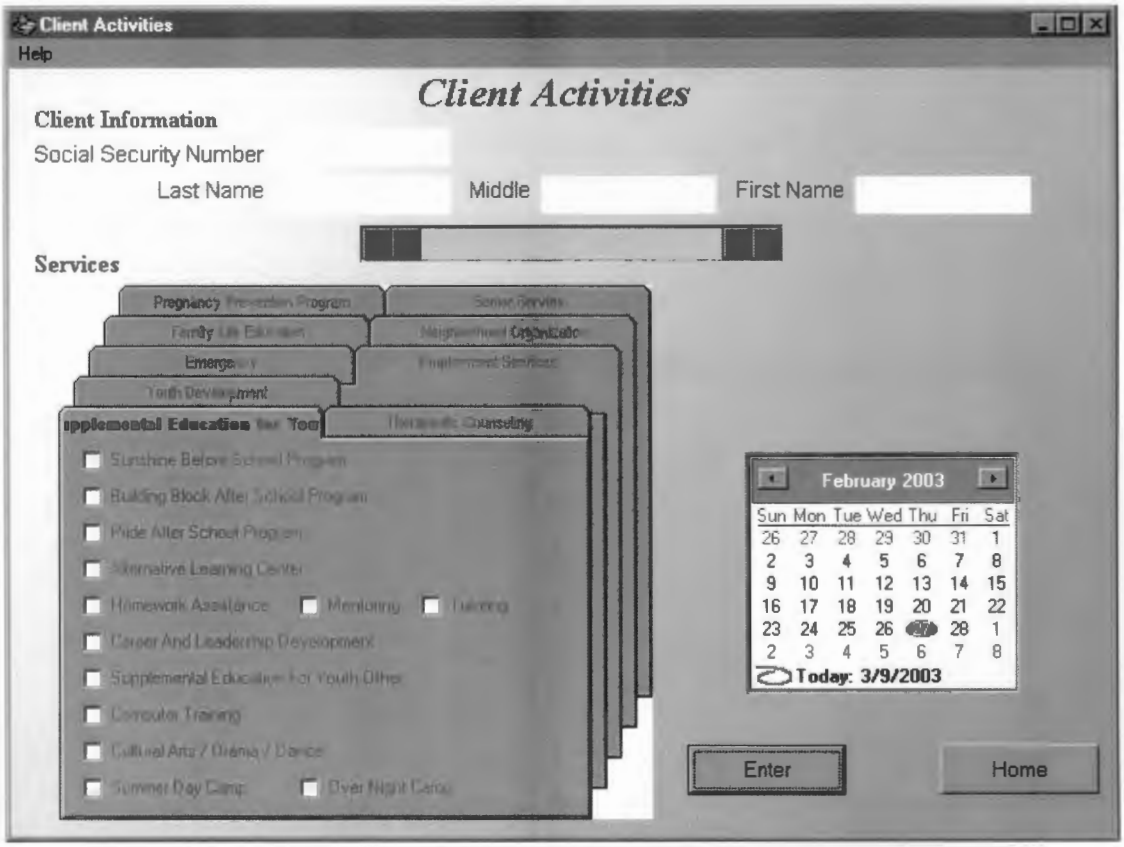


Figure 17. Client Activities Page

The Metrics Page contains two buttons: View Metrics and Home. The View Metrics button will open a Microsoft Excel page retrieve the data from the database and display the data using a Pivot Table. The Home button will return the user to the Main Page. The Help Menu contains a sub menu that contains technical information concerning the front and back end of the application. Figure 18 is a screen shot of the Metrics Page.

Figure 18. Metrics Page

The Pivot Table is an interactive table that enables the user to group and summarize an Excel list into concise, tabular format for easier reporting and analysis. Figure 19 is a screen shot of the Pivot Table.

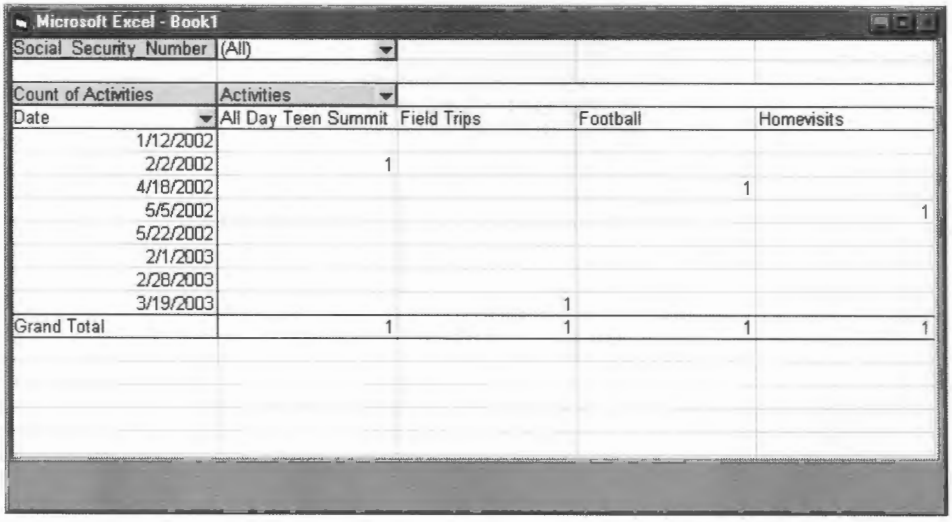
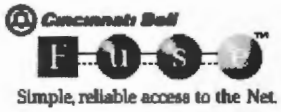


Figure 19. Pivot Table

6 Conclusions and Recommendations



http://www.fuse.net/

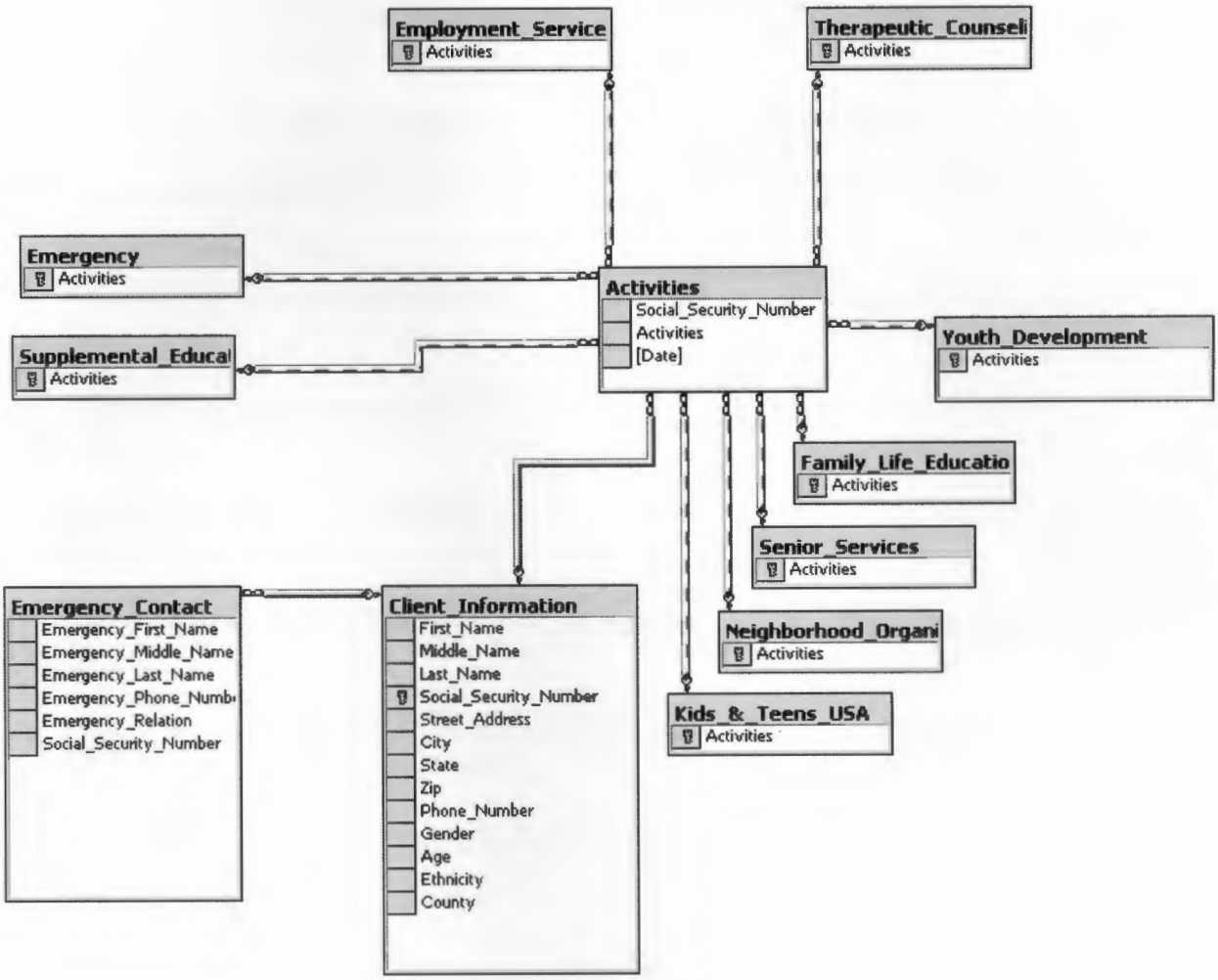
The next step for Seven Hills Neighborhood Houses is to contact Cincinnati Bell and request a high speed Internet connection for the following offices: East End Branch, Findlay Street Branch and Valley Branch. Once the WAN is complete install the front-end application at the client computers at the branch offices allowing instant access to the Server. The branch offices can then View/Modify Client Information, Add New Clients, assign Client Activities and generate Metrics. The Administrative Office holds the document for adding the application to client computers. By enhancing the Internet connection with ZoomTown high-speed Internet access it will eliminate the idle time spent dialing into the Internet, drastically speed up downloading, and let them use the phone when their online. ZoomTown has four flexible service offerings so they can choose the one that best suits Seven Hills. Figure 20 lists the ZoomTown expenses. The LANs are set up with a static sub net mask. I would also recommend a mail server to further increase the efficiency and capability of sharing information.

Standard Pricing
ZoomTown with Fuse

ADSL Option	Speed	Price
ZoomTown With Fuse Internet Access	Up to 768 Kbps download and 384 Kbps upload	**$19.95/mo. for 3 months** Offer expires 3/31/2003! $41.95 per month regular price applies after the third month.
ZoomTown HyperSpeed With Fuse Internet Access	Up to 1.5 Mbps download and 768 Kbps upload	$59.95 per month
ZoomTown Home Office With Fuse Internet Access includes 1 static IP	Up to 768 Kbps download and 384 Kbps upload	$49.95 per month
ZoomTown With Participating ISP	Up to 768 Kbps download and 384 Kbps upload	**$9.95/mo. for 3 months** Offer expires 3/31/2003! $29.95 per month regular price applies after the third month.
ZoomTown HyperSpeed With Participating ISP	Up to 1.5 Mbps download and 768 Kbps upload	$47.95 per month
ZoomTown Home Office With Participating ISP includes 1 static IP	Up to 768 Kbps download and 384 Kbps upload	$43.95 per month

Figure 20. ZoomTown expenses

Appendix A. Relationship Diagram



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