

Center for Hearing & Deaf Services, Inc.

Student Consultant, Karen Lee

Community Partner, Tom Bellucci

PART I: THE CONSULTING SITUATION

About the Organization

ORGANIZATION

The Center for Hearing and Deaf Services, Inc (HDS) is a non-profit organization serving the Greater Pittsburgh Region since 1921. It is located at 1945 Fifth Avenue, Pittsburgh, PA in downtown Pittsburgh. With a diverse group of over 20 staff and volunteers, HDS provides a wide range of services for people who are deaf or hard of hearing.

HDS's mission statement is:

To provide a diverse and affordable program of quality diagnostic, rehabilitative and supportive services designed to address problems experienced by children and adult who are deaf, hard of hearing and/or speech impaired and serve as an information and referral source for this population and the general public.

The organization is funded in a variety of ways. HDS receives funding from the United Way, various program service fees and donations from the public through the fundraising events.

FACILITIES

HDS occupies two floors and a basement of a three-storey building. The facility consists of office spaces, sound proof booths, a self-instructional lab, a life skills training lab, an assistive device retail store and two conference rooms. There is a reception area where visitors are greeted. Programs and activities are held at the conference rooms.

PROGRAMS

HDS offers five primary programs: Interpreting Service Program, Deaf Youth Program, Life Skills Training, Assistive Device Center and Hearing Rehabilitation. The purpose of these programs is to address problems experienced by the deaf persons that will not only assist them with social and communication skills, but also help them with personal growth.

- **Interpreting Service Program (ISP):** ISP provides sign language interpreters to the deaf and hard of hearing population in Western Pennsylvania. Interpreting services are available 24 hours a day, 7 days a week. A self-instructional lab was established in HDS to assist interpreters and sign language students to improve their skills. It consists of seven individualized learning stations for the use with CD-ROMS and video tapes on American Sign Language.
- **Deaf Youth Program (DYP):** DYP conducts a variety of weekend recreational and cultural activities for the deaf and hard of hearing youth. It attempts to break down communication barriers by offering American Sign Language Classes to families and friends of them. The DYP also offers occasional educational workshops and solicits ideas and feedback by hosting annual open meetings with a DYP advisory committee.

- **Life Skills Training (LST):** LST assists persons who are deaf and mentally retarded and/or mentally ill by providing instruction in daily living skills and hosting social experiences that foster their independence. Primary areas of instruction are communication skills development, mobility training, personal safety training, personal hygiene and grooming, utilization of community resources, social skills development, interpersonal issues, prevocational training and sexual awareness.
- **Assistive Device Center (ADC):** ADC offers an extensive inventory of assistive signaling and listening devices for individuals who are deaf or hard of hearing. It is an important resource for individuals as well as professionals serving the needs of people who are deaf or hard of hearing, hospitals, nursing homes, theaters, educational facilities, places of employment, and many others.
- **Hearing Rehabilitation (HR):** HR offers a wide range of services - hearing screening, tympanometry, audiological evaluation, hearing aid evaluations and hearing aid fittings.

STAFF

HDS has a board of directors to oversee operations. For day to day operations, the administration duty falls onto the Executive Director, Tom Bellucci. Each of the service programs is managed by a Director and several staff members. Sharon Hughes-Morris is the Director of Assistive Device Center and she manages the inventory and helps the clients with selecting the product which suits their needs. Currently, there are around 20 staffs in HDS and they serve around 3000 clients all over the Greater Pittsburgh Region in a year.

Each staff member is equipped with a personal computer that is connected to the Internet. These computers are used for word processing, managing finances, compiling databases, emailing, and other office related processes.

There is no computer training available for the staff members. Everyone comes in with his/her computer skills and learns to use the specific software as needed. Training has not been provided since nobody has requested for it in the past.

TECHNICAL ENVIRONMENT

HDS has around 30 personal computers and each of them is installed with Microsoft Windows and Office 2000. All of the computers are connected to the network through DSL and are connected to 3 network printers. Out of the 30 computers, around 5 of them are used as learning stations for the clients. Sign language learning software is installed in these computers for use in training classes.

TECHNOLOGY MANAGEMENT

HDS has no formal technology management process in place. As the Executive Director, Tom Bellucci handles the management of technology in the organization. The former computer-consultant, Marc D. Holmes used to work in HDS as a part-time consultant. However, he changed his career goal and is now pursuing the interpreting service job. He now handles the computer problems at most once a week. He does Norton virus updates regularly and backup once every one or two weeks on all the systems.

TECHNOLOGY PLANNING

HDS does not have a technology plan. There is no one who manages the handling of computers. However, Tom Bellucci holds the unofficial role of the planner and budget manager when dealing with technology. Currently, they are looking for creating a Video Relay Service technology plan which will allow them to

use their in-house computer network to use sign language to communicate among staff and ultimately with clients via the internet.

INTERNAL & EXTERNAL COMMUNICATIONS

The organization has a website, located at <http://www.hdscenter.org>. The site is maintained by the computer consultant, Marc D. Holmes, and has the purpose of supporting HDS's mission by informing the public of the organization and their programs.

Each staff is equipped with a computer that is connected to the internet. The staff members are also provided with an email account through their internet provider. Internal communication is done mainly via email and sometimes by telephone. Everyone has access to the central server and able to share files within it. The central server is located within the organization and is maintained by Marc.

INFORMATION MANAGEMENT

The organization collects and stores the information about the clients who participates in the programs. The secretary will first help the client to register by filling out a form on paper. These forms are then processed and the information are collected and compiled into the corresponding database depending on the service program he/ she is participating in. Each program has its own list of clients and there is no centralized list for all the clients in HDS. For the donors' information, they are kept in Excel spreadsheets and are stored in the central server.

CONSULTING TASKS

PROJECT 1: WORKING WITH THE COMMUNITY PARTNER TO DEVELOP THE EARLY STAGE OF THE VIDEO RELAY SERVICE TECHNOLOGY PLAN

DESCRIPTION

HDS has a long history of providing sign language interpreters to the deaf and hard of hearing population in Western Pennsylvania. Improving the quality of Interpreting Service has been an ongoing priority for the service program staff. Currently, appointment is needed for scheduling Interpreting Service. Although many of the interpreters carry pagers or cell phones that allow them to be contacted at any time of the day or night, and requests that involve emergency situations are handled immediately, the minimal delay still involve the traveling time of interpreters to the hospital. This delay could be crucial for deaf client in crisis.

There are two main reasons for being necessary to have interpreters to do translation between doctors and deaf clients:

- Doctors and deaf clients could not communicate through writing as most of the deaf clients could not understand written English. They are only trained to communicate through sign language.
- Due to the same reason, doctors and clients could not communicate by using any voice recognition software.

Most of the hospitals do not have employees who can communicate using sign language. In order to shorten the delay caused by traveling time of interpreters, the CP was planning to utilize the computer network for communication between the interpreters and the deaf clients in the hospitals. Video relay

calls would be placed over a broadband Internet connection through a personal computer equipped with a Web camera and video conferencing software such as NetMeeting. When there is a need for an interpreter, the hospital will contact the interpreter by phone call or through the Internet. The deaf client will then be able to communicate with an interpreter through the web camera, who then contacts the doctor via a standard phone line and relays the conversation between the two parties.

The CP was currently applying for grant from Cisco for a new router which would support video exchange with better performance. He was also applying for grant from United Way for subsidizing the new server, cables, cameras, software, etc which would be required for the video relay setup.

HOW THE PROBLEM SUPPORTS THE MISSION

Due to the delayed delivery of Interpreting Service, the delay in handling the illness of the deaf client might cause extra health problems. The extra time and effort required of the interpreters to travel to the hospitals detracted them from their mission-critical work.

WORK TASK

The consulting task was to work with the Executive Director to develop the early stage of the video relay service technology plan.

APPROACH

- Created a work plan draft and revised it from time to time with the CP.
- Researched into video conferencing software which involved low frame drop rate. This was important for relaying sign language as every single sign was crucial for a conversation between the doctor and the deaf client.
- Researched into network requirement for supporting simultaneous smooth video conferencing with different hospitals.
- Researched into equipments portability which enabled more convenient use of the relay service in the hospitals.
- Researched into different ways for the hospitals to call in to request for interpreters.
- Documented the sources and methods of the research.
- Discussed with CP the feasibility of the approaches.
- Found out from the CP what resources and network connections HDS already had.
- Compared different approach for their cost and configuration and chose the most cost-effective approach with the CP.
- Found out what resources would be needed and HDS did not already have.
- Wrote a budget plan with the CP.
- Combined all the components into a technology plan.

IMPACTS ON ORGANIZATION:

- *Organization:* The effectiveness and professionalism of HDS would be improved. The deaf or hard of hearing clients would be better served.
- *Programs:* The Interpreting Service Program would be more efficient and effective after the technology plan is carried out. This would free up preparation time and allow more time to be spent on the actual mission-critical services.
- *Staff:* The CP would have good understanding of the technology plan and would be able to adjust or even rewrite the technology plan in the future after the consultant leaves. The Interpreters would not have to travel to the hospitals to perform their work after the technology plan is carried out. They could work in the office or even at home. This would save them much more time for other work especially if the interpreter is handicapped.

- *Technical Environment:* The organization might have to purchase laptops, web cameras, video conferencing software, etc, depending on the final technology plan.
- *Technology Management:* The CP would demonstrate understanding of basic configuration and usage about the video relay system by documenting the information and articulating it to the interpreters. This would increase sustainability of the project. The organization would need to employ another contractor to maintain the video relay system.
- *Internal & External Communications:* The organization could update its website to spread the information about this new service to the public.
- *Information Management:* The organization would have to store the information of the list of participating hospitals into the database for quick reference when any of them calls in to request for interpreting service.

PROJECT 2: STRENGTHENING TECHNOLOGY SKILLS ON POINT-OF-SALES SOFTWARE

DESCRIPTION

There is no computer training available for the staff members. Everyone comes in with his/ her computer skills and learns to use the specific software as needed. Training had not been provided since nobody had requested for it in the past. For the Assistive Device Center, they had been using the software which was written by the previous computer consultant who came in before Marc D. Holmes to help with inventory control and sales management. However, by the time the consultant left the organization, problems still existed with the software. Since no documentation was available and Marc was not trained to fix or further develop that software, they purchased a commercial copy of point-of-sales software, Regit (See Appendix G). Currently, Sharon and Dale are responsible for the Assistive Device Center and only Sharon had been using the software Regit. With no technical background and no training to use the new software, Sharon lost the opportunity to fully utilize Regit.

- She was unaware of features in Regit that would help her to solve some urgently needed problems.
- She was unaware of features in Regit that would help her to produce some reports much more efficiently.
- Even if she knew of a feature that would be useful, she did not know how to use it or did not feel comfortable enough to try it as she was afraid that the whole database would be messed up.
- Since Marc had diverted his career to interpreting service, he would come in at most once a week. She was not able to fix the technical problems by herself and so a lot of problems were pending.
- When a problem was fixed, Marc did not use to explain to her how the problem was solved so that she could handle it by herself if the same problem existed again.

HOW THE PROBLEM SUPPORTS THE MISSION

Due to the delayed delivery of retail service, it affected the effectiveness and professionalism of HDS. The extra time and effort required of Sharon to figure out how to make use of the software detracts her from her mission-critical work.

WORK TASK

The consulting task was to help Sharon raise her efficiency by helping her better utilize technology to complete her tasks and help Dale get familiar with the software Regit so that she could share the inventory and sales management work with Sharon.

APPROACH

- Created a checklist of tasks that Sharon had problems figuring out how she could use the features to accomplish the tasks.
- Had Sharon demonstrated in Regit how she usually dealt with that list of tasks.
- Student consultant would demonstrate to Sharon how she could utilize the features more efficiently to accomplish those tasks.
- Sharon would produce steps-to-steps quick reference sheets for herself as demonstration going on.
- Sharon would try to accomplish the tasks using the features that the student consultant demonstrated to her.
- The quick reference sheets would be compiled into a “Regit Quick Reference Manual” that would be kept on file at HDS.
- Student consultant would demonstrate to both of them the functionalities that would allow completion of daily tasks as well as the list of tasks that Sharon had problems with.
- Demonstrated to them how they could find out functionality of a feature or search for features that would fit their needs.
- Provided a documentation of the software to them to ensure sustainability.
- Their skill levels would be re-evaluated at the end to see if improvements had been made.
- More training might be needed depending on the results of re-evaluation.

IMPACTS ON ORGANIZATION

- *Organization:* The effectiveness and professionalism of HDS would be improved. The deaf or hard of hearing clients would be better served.
- *Programs:* The effectiveness and efficiency of the Assistive Device Center would be raised. This frees up preparation time and allows more time to be spent on the actual services.
- *Staff:* Sharon would be able to work more efficiently and would feel more comfortable handling problems by herself than before. Dale would be able to share the inventory and sales management work with Sharon.
- *Technology Management:* The learning from this training as well as the basic functionalities of the software would be documented and kept in file for reference for other staff or future use.
- *Information Management:* Client info for the Assistive Device Center could be retrieved more efficiently from Regit.

PART II: OUTCOMES AND RECOMMENDATIONS

OUTCOMES ANALYSIS

PROJECT 1: WORKING WITH THE COMMUNITY PARTNER TO DEVELOP THE EARLY STAGE OF THE VIDEO RELAY SERVICE TECHNOLOGY PLAN

The CP and the consultant conducted a great deal of research to develop the video relay service technology plan and establish a list of equipment that would ideally be purchased for setting up the service. The research (See Appendix A) involved the following:

- Collected and analyzed information from the Internet about the existing video relay service and the equipment that they use. For instance, ATT relay service suggests clients using web-cams

with CCD sensor and personal computer with minimum requirements of Pentium III – 500 MHz with a 16-MB video card.

- Found out the minimum frame rate requirement for carrying out sign language video relay from research done by others on the Internet, for example, a research done on sign language video conferencing stated that minimum frame rate of 15fps is needed although 30fps is ideal. And also found out software and devices which support this minimum requirement, for example, NetMeeting, Logitech QuickCam Pro 4000, CIP-4500 Vizufon video phone, etc.
- Explored different approaches for setting up the service. For example, using laptops installed with web-cams, using cameras that connects to the TV, using video phone that connects over the Internet, etc.
- Found out the price of re-wiring the offices with CAT5E/6 cables.
- Compared the price of setting up the service using different approaches and equipments from different manufacturers.

The CP and the consultant reviewed the pricing of equipments that needed to be purchased and compiled it into a budget plan. All components were then combined into the technology plan.

RESULTS/OUTCOMES

- A documentation of the research and findings were compiled for future reference (See Appendix A).
- The recommended technology plan (See Appendix B) and equipment list (See Appendix D) were created together by both the CP and the consultant and were available as a separate documents.
- In the original project scope, computers equipped with web-cameras were planned to be used for the communication. However, research done over the Internet revealed that a new kind of video phone could be used to satisfy the same purpose. The video-phone approach was picked because it was less costly than computers equipped with web-cameras and video phones were more portable, which made it easier to be used in the hospital.
- The technology plan detailed about how the video relay service could be setup and the corresponding recommended equipments needed. For instance, the service would be setup in the way that interpreters and the deaf person would communicate using sign language over video phones. It also detailed about what training should be provided to the staff on using the video phones.
- The budget plan (See Appendix C) detailed about the expense breakdown for setting up the service, for example, buying 10 video phones would cost \$5500 in total. This could serve as a guideline for getting grant from the donors.
- The equipment list documented the various items such as video phones, routers, new Internet service that are recommended along with detailed specifications for such equipment and recommended brands to consider. For example, 10 video phones would be purchased and it was recommended that CIP-4500 Vizufon or D-Link DVC-2000 i2eye video phone would be used.

There was no technology plan before the consulting partnership. The development of the video relay service technology plan allowed the CP to experience the process of technology plan compilation with the help of consultant. During the creation of technology plan, the CP and the consultant worked together to develop the plan and to select the specifications as well as the manufacturers recommended for the various equipment and peripherals. The CP had asked questions and provided insights with regards to how future video relay equipment would ideally be configured and deployed. For instance, during the discussion about whether video phones would fit the use of video relay service, the CP asked questions

about whether the video phone could be used to communicate with clients who use web-cam on the other end. The process of developing the specifications and equipment list involved a great deal of research using the Internet and allowed the CP to become further accustomed to the technology solutions that are available in the marketplace.

EVIDENCE OF EXPANDED CAPACITY

As a result of having achieved these outcomes, the technology plan and the equipment list could be used as a guideline for the implementation of the video relay services. With the services rolling out, the interpreters would not have to travel to the hospitals to perform their work. They could work in the office or even at home. This would save them much more time for other mission-critical work especially if the interpreter is handicapped. With the experience that the CP gained in creating this video relay technology plan, he would be more capable of creating other kinds of technology plans more effectively and efficiently in the future even without help of the consultant. This gave the organization a better chance to utilize technology to improve their services provided and the deaf or hard of hearing clients would be better served. The effectiveness and professionalism of HDS were undoubtedly improved.

EVIDENCE OF SUSTAINABILITY

Since the CP developed the technology plan with the consultants, he has a very good understanding of the plan and would be able to adjust or even rewrite the plan if needed in the future after the consultant left. The documentation about the research findings would help increase the sustainability as the CP could refer to it if he needs to adjust or rewrite the plan. In order for the video relay service to be sustainable, the organization would as well need to employ another contractor to maintain the video relay system. The foreseeable risk is when the plan turns out to be infeasible in future due to unprecedented organizational changes in budget, the plan may not be implemented.

NEW VISION OF HOW TECHNOLOGY SUPPORTS THE MISSION

The development of video relay service technology plan has allowed the CP to see the feasibility of the idea, which gives him the insight of developing video relay network within the organization as well. This would allow the hard of hearing staff to communicate with other staff within the organization through the video relay service. With the help of this new technology, the staff would be able to communicate much more efficiently and in turn freeing up more time for other mission-critical work.

PROJECT 2: STRENGTHENING TECHNOLOGY SKILLS ON POINT-OF-SALES SOFTWARE

The Assistive Device Center had a working copy of point-of-sales database, Regit. It had been used to manage the inventory and sales of the retail store. Due to the lack of technical background and training, Sharon lost the opportunity to fully utilize Regit. By demonstrating to Sharon and Dale how to complete daily tasks using the software, both of them gained the skills and knowledge necessary for inventory control and sales management, as well as exploring unknown functionalities and handling new tasks.

RESULTS/OUTCOMES

In Regit, both Sharon and Dale now know how to and did the following:

- Performed basic Regit functions such as entering or changing product information, client information, generating end of month or year sales report, extracting invoice of a particular transaction, extracting all invoices of a customer, etc.
- Performed specific tasks that Sharon did not feel comfortable handling before such as looking up an invoice that was archived, looking up a product by product code or by description,

- finding out the total number of items sold per year, finding out the total number of business or individual customers using queries, etc.
- Explored unknown functionalities by searching for the inquired function in the help section of Regit. For instance, Sharon was not sure about the functionality of “Sort Code” in the “Customer Table”, she looked it up in the help section by herself and suggested that it could be utilized to identify the customers as “business” or “individual”.
 - Handled new tasks by looking through the index of help section for relevant functionalities that could be used to perform the tasks. For instance, Sharon wanted to create a new report and she looked through the index of help section and found that “designing reports” would explain the necessary steps for creating a new report. She was able to follow the steps in the help section to complete the new task.
 - Made use of the “Regit Quick Reference” (See Appendix E) and the “Regit Manual” (See Appendix F). On forgetting how to perform certain task, both of them would pull up the manuals from the shared drive and follow the step by step instructions to complete the task.

Both Sharon and Dale accomplished all of the above on their own, after the consultant had conducted a demo to them.

Before the consulting partnership, Sharon was the only one who operated the Regit database for the Assistive Device Center. Without technical training and simple documentation, she faced difficulty managing the inventory and sales using the software. For example, in order to find out the total number of “business” and “individual” customers for the current month, she used to count them one by one manually. Now, Dale is able to share the inventory and sales work with Sharon and both of them are able to fully utilize the software for managing the Assistive Device Center and look for ways to perform new tasks if needed.

EVIDENCE OF EXPANDED CAPACITY

As a result of having achieved these outcomes, Sharon and Dale were able to perform the inventory control and sales management much more efficiently. With the increased efficiency, the deaf and hard of hearing clients were better served. For instance, they are now able to extract the invoice that is already archived, which they were not able to, allowing the clients to get a proof for hearing device warranty even if they have lost their old receipts. They could now spend less time on the sales management as well. As an example, they are now able to get the total number of “business” or “individual” customers report instantly versus the need to count the number manually before. This freed up preparation time and allowed more time to be spent on mission-critical work. The effectiveness and professionalism of HDS were undoubtedly improved.

EVIDENCE OF SUSTAINABILITY

By giving the control of the mouse over to them, they had hands-on experience working with Regit. They should only get better at using the software if they keep working with it. In order to ensure the sustainability of the Regit software, a “Regit manual” and documentation had been created depicting the steps that a person would go through in order to perform various tasks. The only risk is that if they may encounter bugs of the software or mess up the database and nobody in the organization knows how to fix it, they may leave the database aside or turn to use another point-of-sales software.

NEW VISION OF HOW TECHNOLOGY SUPPORTS THE MISSION

The skills strengthening task has exposed Sharon and Dale to the use of query. This gives them the insight of creating a lot more new reports that would help the analysis of sales of the device center, which would

have been difficult to be created without the use of queries. With a more comprehensive analysis of the sales, they would be able to better serve the need of the clients.

RECOMMENDATIONS

RECOMMENDATION 1: HIRING A TECHNICAL CONSULTANT

The former computer-consultant, Marc D. Holmes used to work in HDS as a part-time consultant. However, he changed his career goal and is now pursuing the interpreting service job. Since he comes in and handles the computer problems at most once a week, a lot of computer related problems could not be addressed immediately. The delay of handling the problems often lead to suspension of work tasks or completion of work in an inefficient way. As an example, the network printer right next to the Assistive Device Center did not get fixed for a long time as it was put in a lower priority than other problems. Sharon had to print the invoice to a printer further away from the store and this would increase the waiting time of the clients. The lowering of service quality had decreased the professionalism of HDS. Besides, the waste of staff time also increases the cost.

Therefore, it is recommended that HDS hires a technical consultant. With the new hire, computer or network problems could be addressed immediately, HDS's website could be maintained and updated in a regular basis and technically related workshops could be provided to the staff more easily if needed. This would undoubtedly increase the efficiency of the staff and in turn delivering a higher quality of service to the clients.

The technical consultant should be expected to spend:

- 20% of the time on regular support, maintenance and administration of the computers as well as future additions of supporting software such as Microsoft Windows, Microsoft Office, Microsoft Outlook Express, installation of hardware, supporting the personal computer's wired network connections and keeping track of customer support phones numbers and e-mail address, in case anything breaks down.
- 25% of the time on managing and administering the network, including support of firewall, email system, hub, router and network printer.
- 20% of the time on maintaining and administering various database systems, including assisting other staff on database setup, report extraction, etc when they encounter problems.
- 10% of the time on maintaining the website, including making any needed updates to the HDS website and further developing the website to incorporate any graphics enhancement and value expanding features.
- 10% of the time on providing workshops to staff on new software as well as making suggestions to the CP about purchases or upgrades of software or equipment.
- 15% of the time on supporting the implementation of Video Relay Service and internal Instant Messaging (if the next recommendation is adopted).

The technical consultant should have the following background and skills:

- Must have 3+ years of computing experience in a Microsoft Windows environment and possibly 1+ year of desktop support experience. Must be proficient in Microsoft Word, Excel, PowerPoint and Outlook Express. Experienced in web and network development as well as general software or hardware troubleshooting. Skill in SQL, HTML, JavaScript and Flash is a plus.
- Must be friendly, considerate, highly reliable and able to work independently.

- Although computer-related college education is preferred, any candidate with a High School diploma with the above skill set is qualified for this position.

Provided are two plausible options that will provide HDS with a satisfactory level of support to achieve increased efficiency:

- **Full-time Consultant:** With enough budgets, it is highly recommended that a full-time consultant is hired. Comparing to a part-time technical consultant, this would further shorten the delay a computer problem is fixed and in turn increase the efficiency of the consultant. Since part-time consultant usually work for the organization for only a short period of time, say one semester, full-time consultant would have a better understanding of the organization's technological situation as well as the ongoing projects, which in turn enables him to make better technological decisions. Besides, with the full-time requirement, candidates with higher qualification could be hired more easily.
- **Part-time High School/College Student:** Contrasted to full-time role, a part-time student mature and capable enough to support the IT concerns of HDS might be more cost effective. This role could be for varying intervals of working hours. Students also are willing to work for lower wages than full-time consultant, as there are other benefits, which entice their talent. High school students are commonly seeking community service as this is a nice perk on college applications. College students are always seeking working experience, and so a lower wage than that of a professional would still recruit their talent. However, since it would take some time for a new hire to fully understand the ongoing projects and the organization's technological situation, it would be costly if the part-time consultant could only stayed in the organization for a short period and has to switch to another consultant very often.

RESOURCES

The following are resources on the web that are useful in an attempt to hire a technical consultant:

Website	Description
http://www.studentaffairs.cmu.edu/career/campus_employment/supervisor_pages/formsoff.html	Carnegie Mellon University Career Center: This website provides guidelines and all the information necessary for student employment in Carnegie Mellon University.
http://www-2.cs.cmu.edu/~mjs/	Assistant Dean for Computer Science: If you intend to find a Computer Science student from CMU, contact Mark Stehlik, Assistant Dean for Undergraduate Education. He often forwards labor-requests from organizations in Pittsburgh to Computer Science students. His contact information can be found on his homepage
http://careers.pghtech.org/admin1/	Pittsburgh Technology Council: This site provides a good way to recruit talent. Job postings are often forwarded to students by career center or department assistant to students in the related fields.
http://www.microsoft.com/smallbusiness/issues/management/recruiting_staffing/6_tips_for_hiring_a_technology_pro.msp#x	Tips for hiring a technical consultant: This website gives some invaluable advices and list of things to note when hiring a technical consultant.
http://www-2.cs.cmu.edu/~colleen/HR/	Carnegie Mellon University's information for

	hiring a technical staff: This site provides samples of job description that could be useful when creating a job posting.
--	--

RECOMMENDATION 2: UTILIZING INSTANT MESSENGER FOR INTERNAL COMMUNICATIONS

Currently, HDS is utilizing email, phone and teletypewriter (TTY) for internal communications. In this new era, more and more business people are choosing text-based Instant Messenger over phone calls and emails. Instant Messenger has the advantage of providing immediacy and efficiency in getting real-time information from partners and colleagues. If people were to send message over email, they would not know if the end users were going to receive it now or later on. Instant Messenger allows brief communication that is more timely than email, but it does not require full attention like a phone call. Besides, today's email is full of spam, there is a good chance that your email would get deleted unintentionally together with other spam. Instant Messenger could also be used as a tool for finding out if a colleague is at his or her desk, available for an in-person or telephone call, just like peeking into someone's office. The use of Instant Messenger could increase the efficiency of the staff and save both time and cost of the organization. This frees up time and allows more time to be spent on mission-critical work.

It is recommended that MSN Messenger (See Appendix H) to be used as it does not only provide messaging and file transfer function like other messengers, it also has the features of whiteboard and application sharing, which allows staff to collaborate and exchange ideas more easily. In addition, it is free for download and use.

A rough list of tasks to be done:

- Download and install MSN Messenger in every computer (<http://messenger.msn.com/>).
- Register and assign unique usernames to every staff.
- Test the messenger and accounts out to make sure that they work properly.
- Have the technical consultant hold a training session for all staff, showing them how to utilize the messenger for daily communication, including signing on/off, adding/editing/deleting contacts, managing contact list by creating user groups, backing up contact list regularly, identify different online status (online/busy/on the phone/away/out for lunch/offline) and saving conversation if needed.
- Have the technical consultant be aware of the danger of communicating confidential or personal information over the messenger. This is because the message is relayed through a server en route to your contact. If anyone is on the connection and can see that traffic, they could see your confidential or personal information. It is better to send such information through an encrypted email, or not at all.
- Since Instant Messenger file attachments carrying viruses penetrate firewalls more easily than email attachments, it is suggested that the technical consultant learn more about the quality of the organization's firewall protection in order to decide whether or not to restrict file transfer through Instant Messenger.
- Check the MSN Messenger web page (<http://messenger.msn.com/>) regularly for version updates and bug fixed.

RESOURCES

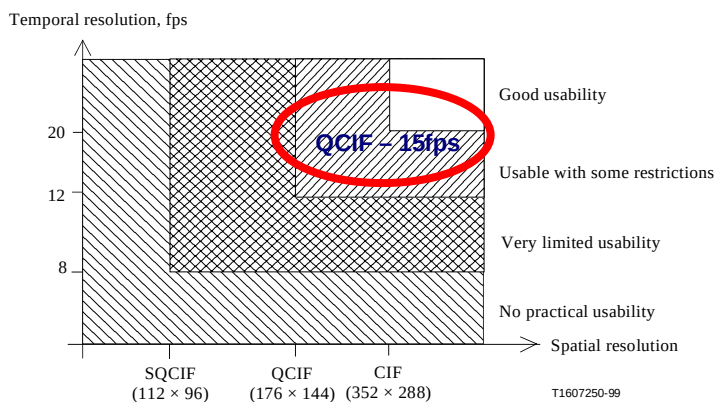
The following are resources on the web that are useful in an attempt to utilize Instant Messenger for internal communications:

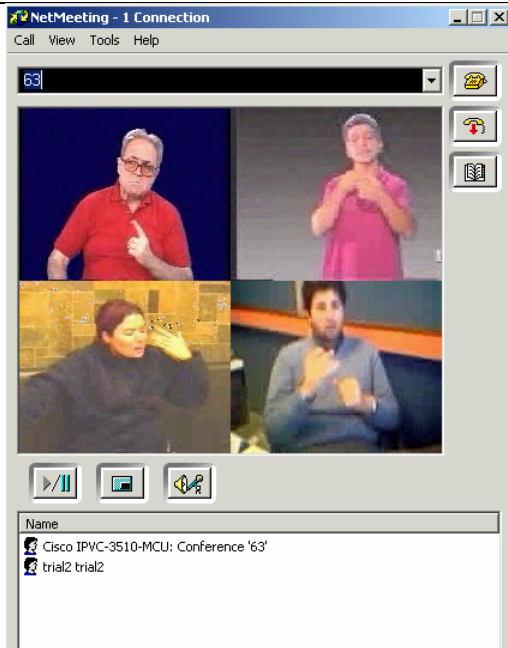
Website	Description
http://messenger.msn.com/	MSN Messenger website: This site provides download, documentations and support for MSN Messenger.
http://msgplus.mybboard.com/forumdisplay.php?fid=10	Technical forum for MSN Messenger: It provides a great way for the organization to ask for technical advice regarding MSN Messenger if nobody in the organization knows how to solve the problem.
http://pub37.bravenet.com/forum/3109949091	Another technical forum for MSN Messenger
http://www.google.com	Google: Keep up to date with instant messenger product by going to search engine such as Google or your preferred site and search for the keywords 'instant messenger' and/or similar words.
http://reviews.cnet.com/	Reviews from CNET: Read reviews about using Instant Messenger in CNET by searching for the keywords 'IM' and/or similar words. This would give an idea about how Instant Messaging is viewed and used in the current world.

About the Consultant

Karen Lee is a senior majoring in Electrical and Computer Engineering and double majoring in Computer Science at Carnegie Mellon University. After graduating from Carnegie Mellon University, Karen hopes to enter the industry and further her software development and consulting skills, while gathering real world experience. After which, she plans on obtaining an MBA.

RESEARCH FOR VIDEO RELAY SERVICES

Source	Description
http://www.microsoft.com/technet/prodtechnol/netmtng/evaluate/enableac.mspix	MICROSOFT NETMEETING AND THE ROLE OF INTERNET CONFERENCING FOR DEAF AND HARD-OF-HEARING USERS
http://www.microsoft.com/technet/prodtechnol/netmtng/reskit/netmtg2/chpt10.mspix#top http://www.zmk.uni-fruiburg.de/InternetService/Netmeeting/default.htm	NETMEETING RESOURCE KIT
 Microsoft PowerPoint Presentation	STATISTICAL ANALYSIS OF SIGN LANGUAGE: Exchange of bandwidth demanding qualitative video information - minimum video bit rate of 384 kbs and <i>frames per second are at least 15 reported although 30 is ideal.</i> Sign Language VideoConference Requirements Official application profile document of ITU  S. Kouremenos NCSR Demokritos 4

																											
http://support.microsoft.com/default.aspx?scid=kb;EN-US;Q186867	MAXIMUM FPS OF NETMEETING FOR EACH PROCESSOR: Maximum FPS of NetMeeting 2.1 Service Pack 1 for Each Processor Use the following table to determine the maximum fps of NetMeeting 2.1 Service Pack 1 for each processor. You can send video in three different formats by using the Send Image Size option: Large - common interchange format (CIF) Medium - quarter common interchange format (QCIF) Small - sub quarter common interchange format (SQCIF) The actual fps may be less for your connection based on the hardware, bandwidth, and the programs that are running on each computer: <table><thead><tr><th>Processor</th><th>Video format</th><th>FPS</th></tr></thead><tbody><tr><td rowspan="3">486</td><td>SQCIF</td><td>7</td></tr><tr><td>QCIF</td><td>7</td></tr><tr><td>CIF</td><td>3</td></tr><tr><td rowspan="3">Pentium</td><td>SQIF</td><td>15</td></tr><tr><td>QCIF</td><td>15</td></tr><tr><td>CIF</td><td>7</td></tr><tr><td>Pentium Pro</td><td>SQCIF</td><td>30</td></tr><tr><td>-or-</td><td>QCIF</td><td>30</td></tr><tr><td>Pentium II</td><td>CIF</td><td>15</td></tr></tbody></table>	Processor	Video format	FPS	486	SQCIF	7	QCIF	7	CIF	3	Pentium	SQIF	15	QCIF	15	CIF	7	Pentium Pro	SQCIF	30	-or-	QCIF	30	Pentium II	CIF	15
Processor	Video format	FPS																									
486	SQCIF	7																									
	QCIF	7																									
	CIF	3																									
Pentium	SQIF	15																									
	QCIF	15																									
	CIF	7																									
Pentium Pro	SQCIF	30																									
-or-	QCIF	30																									
Pentium II	CIF	15																									
http://www.consumer.att.com/relay/video/requirements.html	AT&T VIDEO RELAY CALL REQUIREMENTS: Personal Computer (PC) For optimum performance, it is suggested that your PC meet these minimum requirements: <i>Pentium III - 500 MHz with a 16-MB video card (16K color) and 128 MB RAM (256 MB RAM recommended).</i> The computer must have a USB or other connection port for your web-cam. Web-cams																										

	Web-cams must be equipped with a <i>CCD sensor</i>—a “Charge Coupled Device” that creates superior image resolution through an electronic pixelation process. CCD sensors are usually listed under the technical specifications on the box. Suggested Cameras: <i>IBM Net Camera, Logitech Quickcam Pro 3000 or 4000, and Intel Pro PC Camera CS430/CS431.</i> <u>High-Speed Internet Connection</u> An Internet connection with a <i>minimum of 128Kbps</i> of upload and download speed is needed to use AT&T Video Relay Service. The higher the upload speed and download speed, the better the service will perform. Any of the following will work well: <i>Cable:</i> This is an Internet connection that runs through a cable TV line without interfering with cable TV service. Offered by many local cable TV companies, cable can provide up to 10 to 20 Mbps of data transmission downstream and 300 Kbps upstream (speed depends on network traffic). <i>DSL:</i> This is a “Digital Subscriber Line” that runs through a phone line without interfering with phone service. There are several types of DSL service available. Most are provided by telephone companies and permit a minimum of 128 Kbps upload and download speed. <i>T1, T2, or T3 lines:</i> These are high-speed network links that are usually available only in the workplace, not residentially. The “T” refers to the speed of the data transmittal, not the medium of the network. T1 lines transmit data at 1.5 Mbps. T2 lines bundle four T1 lines together and transmit data at 6Mbps. T3 lines are faster still, transmitting data at 45 Mbps.						
Xirlink IBM USB Net Camera: http://www.amazon.com/exec/obidos/tg/detail/-/B000056SM2/ref=ed_a_td/104-1080701-1244747?v=glance&s=electronics&vi=tech-data Logitech QuickCam Pro 4000: http://shopper.cnet.com/Logitech_QuickCam_Pro_4000/4014-6502_9-20276742.html?rvwtp=4505-6502_9-20276742-2&tag=nav&ci	WEB CAM PRICE & SPEC COMPARISON: <table><tr><th></th><th>Cost</th><th>Spec</th></tr><tr><td> Xirlink IBM USB Net Camera </td><td>\$39.98</td><td> The latest member of the IBM Camera line provides both still and video image capture with vivid color and full 640x480 VGA resolution. Maximizing user convenience, the camera provides users with fast plug- and-play USB installation and use on Windows 98, 2000, Millennium, and XP enabled systems. The new, enhanced 3-D graphical user interface complements the user's ability to capture top-quality still images and high (up to 30 <i>fps</i>) frame rate video. This camera is perfect for web streaming video, web casting, sending video email, videoconferencing or capturing still images for a Web site. The IBM Net Camera includes a comprehensive </td></tr></table>		Cost	Spec	Xirlink IBM USB Net Camera 	\$39.98	The latest member of the IBM Camera line provides both still and video image capture with vivid color and full 640x480 VGA resolution. Maximizing user convenience, the camera provides users with fast plug- and-play USB installation and use on Windows 98, 2000, Millennium, and XP enabled systems. The new, enhanced 3-D graphical user interface complements the user's ability to capture top-quality still images and high (up to 30 <i>fps</i>) frame rate video. This camera is perfect for web streaming video, web casting, sending video email, videoconferencing or capturing still images for a Web site. The IBM Net Camera includes a comprehensive
	Cost	Spec					
Xirlink IBM USB Net Camera 	\$39.98	The latest member of the IBM Camera line provides both still and video image capture with vivid color and full 640x480 VGA resolution. Maximizing user convenience, the camera provides users with fast plug- and-play USB installation and use on Windows 98, 2000, Millennium, and XP enabled systems. The new, enhanced 3-D graphical user interface complements the user's ability to capture top-quality still images and high (up to 30 <i>fps</i>) frame rate video. This camera is perfect for web streaming video, web casting, sending video email, videoconferencing or capturing still images for a Web site. The IBM Net Camera includes a comprehensive					

p=1&orderby=90 http://www.tigerdirect.com/applications/searchtools/item-details.asp?EdpNo=415465&Sku=L23-6156&SRCCODE=CNETFEED&CMP=OTC-CNETFEED Intel Pro PC Camera CS430 Webcam: http://www2.shopping.com/xPO-Intel_CS430~CLT-HSNLF			software bundle, to complement the camera and maximize the experience.
	Logitech QuickCam Pro 4000 	\$58-99	Video capture: Up to 640 x 480 pixels (VGA CCD) Still image capture: Up to 1280 x 960 pixels, 1.3 megapixels Frame rate: Up to <i>30 frames per second</i> (with recommended system) Included Software: - FREE Logitech® IM Video Companion™ - Live video-enabled Yahoo! Messenger - One-click video e-mail software - Video broadcasting software - Web album creator software - Web camera software - Motion detection software - Animation software
	Intel Pro PC Camera CS430 Webcam 	\$79.99 - 88.88	Image sensor: <i>Progressive-scan CCD</i> Lens: 3 glass and 1 plastic elements Focus range: 10 centimeters to infinity Field of view: 50 degrees Still image-capture resolution: 640 x 480 (VGA) Still image-capture format: JPG, BMP, FPX Video-capture resolution: 640 x 480 (VGA) captured; 320 x 240 (VGA) displayed Video-capture format: YUV12 Video file format: AVI, IVS Frame rate: <i>30 frames per second at 160 x 120; 15 frames per second at 640 x 480</i> Number of colors: 16.8 million (24 bits) Audio compression: Intel Indeo Audio, G.273

			Controls: Focus, snapshot Compatibility: Desktop or notebook PC, TWAIN-compliant devices System requirements: 166 MHz Pentium processor with MMX, Celeron, or faster; Windows 98, 98 SE, or Me; 32 MB RAM; USB port; 800 x 600, 16-bit display; 150 MB hard disk space; 4x CD-ROM drive; Microsoft Internet Explorer 4.0 or higher, or Netscape Communicator 4.0 or higher; Internet service provider; 28.8 Kbps or faster modem; Windows-compatible sound card with speakers and microphone Software included: Intel Scene Recorder, Intel Snapshot, Intel Audio Recorder, Intel Email Postcard, Intel Gallery, Intel TWAIN driver, Intel Quick Video Email, Intel Home Page Builder, Intel Audio Snapshot, Intel Movie Builder, Microsoft Windows NetMeeting or videophone software, Reality Fusions PC Camera Games, bonus CD-ROM Interface: USB Power: Supplied by USB port Dimensions: 4.0 by 2.75 by 1.0 inches Warranty, parts: 1-year limited warranty Warranty, labor: 1-year limited warranty
http://www-132.ibm.com/webapp/wcs/stores/servlet/CategoryDisplay?categoryId=2072541&storeId=1&catalogId=-840&langId=-1	PORTABLE LAPTOPS PRICE & SPEC COMPARISON:		

	Featured models: <table><tr><th>Economy</th><th>Value</th><th>Performance</th></tr><tr><td>IBM Web Price \$1,499.00*</td><td>IBM Web Price \$1,629.00*</td><td>IBM Web Price \$1,899.00*</td></tr><tr><td>Customize & buy</td><td>Customize & buy</td><td>Customize & buy</td></tr><tr><td>Availability: In stock**</td><td>Availability: In stock**</td><td>Availability: In stock**</td></tr><tr><td>Processor^[1]: Intel® Pentium® M Processor 1.50GHz</td><td>Processor^[1]: Intel® Pentium® M Processor 1.50GHz</td><td>Processor^[1]: Intel® Pentium® M Processor 735 1.70GHz</td></tr><tr><td>Operating System^[12]: Microsoft Windows XP Professional</td><td>Operating System^[12]: Microsoft Windows XP Professional</td><td>Operating System^[12]: Microsoft Windows XP Professional</td></tr><tr><td>Memory^[8]: 256 MB</td><td>Memory^[8]: 256 MB</td><td>Memory^[8]: 512 MB</td></tr><tr><td>Hard Drive^[4]: 30 GB</td><td>Hard Drive^[4]: 40 GB</td><td>Hard Drive^[4]: 40 GB</td></tr><tr><td>Wireless^[10]: Intel PRO/Wireless 2200BG</td><td>Wireless^[10]: Intel PRO/Wireless 2200BG</td><td>Wireless^[10]: Intel PRO/Wireless 2200BG</td></tr><tr><td>Weights (lbs)^[2]: 4.5-4.5</td><td>Weights (lbs)^[2]: 5.7-5.7</td><td>Weights (lbs)^[2]: 5.7-5.7</td></tr><tr><td>Security Subsystem: IBM Embedded Security Subsystem 2.0</td><td>Security Subsystem: IBM Embedded Security Subsystem 2.0</td><td>Security Subsystem: IBM Embedded Security Subsystem 2.0</td></tr><tr><td>Graphics: 32MB ATI Mobility RADEON 7500</td><td>Graphics: 32MB ATI Mobility RADEON 7500</td><td>Graphics: 32MB ATI Mobility RADEON 7500</td></tr><tr><td>Display Size: 14.1"</td><td>Display Size: 15.0"</td><td>Display Size: 15.0"</td></tr><tr><td>Optical: DVD-ROM</td><td>Optical: CD-RW/DVD-ROM Combo</td><td>Optical: CD-RW/DVD-ROM Combo</td></tr><tr><td>More Details ThinkPad T42 (IBM Think Express Program) 2378DTU</td><td>More Details ThinkPad T42 (IBM Think Express Program) 2378DWU</td><td>More Details ThinkPad T42 (IBM Think Express Program) 2378FZU</td></tr></table>	Economy	Value	Performance	IBM Web Price \$1,499.00*	IBM Web Price \$1,629.00*	IBM Web Price \$1,899.00*	Customize & buy	Customize & buy	Customize & buy	Availability: In stock**	Availability: In stock**	Availability: In stock**	Processor ^[1] : Intel® Pentium® M Processor 1.50GHz	Processor ^[1] : Intel® Pentium® M Processor 1.50GHz	Processor ^[1] : Intel® Pentium® M Processor 735 1.70GHz	Operating System ^[12] : Microsoft Windows XP Professional	Operating System ^[12] : Microsoft Windows XP Professional	Operating System ^[12] : Microsoft Windows XP Professional	Memory ^[8] : 256 MB	Memory ^[8] : 256 MB	Memory ^[8] : 512 MB	Hard Drive ^[4] : 30 GB	Hard Drive ^[4] : 40 GB	Hard Drive ^[4] : 40 GB	Wireless ^[10] : Intel PRO/Wireless 2200BG	Wireless ^[10] : Intel PRO/Wireless 2200BG	Wireless ^[10] : Intel PRO/Wireless 2200BG	Weights (lbs) ^[2] : 4.5-4.5	Weights (lbs) ^[2] : 5.7-5.7	Weights (lbs) ^[2] : 5.7-5.7	Security Subsystem: IBM Embedded Security Subsystem 2.0	Security Subsystem: IBM Embedded Security Subsystem 2.0	Security Subsystem: IBM Embedded Security Subsystem 2.0	Graphics: 32MB ATI Mobility RADEON 7500	Graphics: 32MB ATI Mobility RADEON 7500	Graphics: 32MB ATI Mobility RADEON 7500	Display Size: 14.1"	Display Size: 15.0"	Display Size: 15.0"	Optical: DVD-ROM	Optical: CD-RW/DVD-ROM Combo	Optical: CD-RW/DVD-ROM Combo	More Details ThinkPad T42 (IBM Think Express Program) 2378DTU	More Details ThinkPad T42 (IBM Think Express Program) 2378DWU	More Details ThinkPad T42 (IBM Think Express Program) 2378FZU	
Economy	Value	Performance																																													
IBM Web Price \$1,499.00*	IBM Web Price \$1,629.00*	IBM Web Price \$1,899.00*																																													
Customize & buy	Customize & buy	Customize & buy																																													
Availability: In stock**	Availability: In stock**	Availability: In stock**																																													
Processor ^[1] : Intel® Pentium® M Processor 1.50GHz	Processor ^[1] : Intel® Pentium® M Processor 1.50GHz	Processor ^[1] : Intel® Pentium® M Processor 735 1.70GHz																																													
Operating System ^[12] : Microsoft Windows XP Professional	Operating System ^[12] : Microsoft Windows XP Professional	Operating System ^[12] : Microsoft Windows XP Professional																																													
Memory ^[8] : 256 MB	Memory ^[8] : 256 MB	Memory ^[8] : 512 MB																																													
Hard Drive ^[4] : 30 GB	Hard Drive ^[4] : 40 GB	Hard Drive ^[4] : 40 GB																																													
Wireless ^[10] : Intel PRO/Wireless 2200BG	Wireless ^[10] : Intel PRO/Wireless 2200BG	Wireless ^[10] : Intel PRO/Wireless 2200BG																																													
Weights (lbs) ^[2] : 4.5-4.5	Weights (lbs) ^[2] : 5.7-5.7	Weights (lbs) ^[2] : 5.7-5.7																																													
Security Subsystem: IBM Embedded Security Subsystem 2.0	Security Subsystem: IBM Embedded Security Subsystem 2.0	Security Subsystem: IBM Embedded Security Subsystem 2.0																																													
Graphics: 32MB ATI Mobility RADEON 7500	Graphics: 32MB ATI Mobility RADEON 7500	Graphics: 32MB ATI Mobility RADEON 7500																																													
Display Size: 14.1"	Display Size: 15.0"	Display Size: 15.0"																																													
Optical: DVD-ROM	Optical: CD-RW/DVD-ROM Combo	Optical: CD-RW/DVD-ROM Combo																																													
More Details ThinkPad T42 (IBM Think Express Program) 2378DTU	More Details ThinkPad T42 (IBM Think Express Program) 2378DWU	More Details ThinkPad T42 (IBM Think Express Program) 2378FZU																																													
http://www.dlink.com/products/?model=DVC-2000#	D-LINK DVC-2000 i2EYE™ INTERNET VIDEO PHONE:																																														

Broadband VideoPhone

DVC-2000

*Be there real time...
Anytime*



Product Features:

Comes with its own *built-in screen*

No PC is required to use i2eye

Up to 30 frames per second for smooth video

Product Description:

The D-Link DVC-2000 i2eye™ Internet Video Phone introduces the world of video conferencing over the Internet, to bring you and your family, friends and colleagues together. Since the DVC-2000 i2eye Video Phone is a stand-alone device, you do not need a computer to video conference over the Internet.

The previously complicated process of conducting a video conference is simplified with the DVC-2000 Video Phone. With the DVC-2000, plugged into a standard Ethernet network connected to your broadband Internet connection, you are ready to conduct real-time video conferencing.

Using advanced video compression technology, the DVC-2000 Video Phone maximizes the image and audio quality within the available bandwidth. The DVC-2000 can send and receive video at up to a full 30 frames per second. It is an ideal solution for consumers and small businesses with high-speed Internet access.

Easy to use set-up wizards guide you step-by-step through the set-up of the DVC-2000 Video Phone. You can be up and working in minutes. With the DVC-2000 it is easy to make changes to personalize your video conferencing display.

The DVC-2000 Video Phone comes with its own *built-in screen*. The product operates as a completely stand-alone video phone. *It also features audio/video out connections so that you can connect it to a TV.*

Be there real-time, anytime. You won't miss a moment with your friends, family and colleagues with the i2eye DVC-2000 Video Phone.

[http://www.itave.com/
IP-Video-Phone.html](http://www.itave.com/IP-Video-Phone.html)

<http://www.cnstec.com>

THE CIP-4500 VIZUFON VIDEO PHONE:

[/e-html/](#)



Price: \$549.99

Overview:

The CIP-4500 Vizufon video phone uses broadband connection to transfer both video and sound. The main benefit is, it provides unlimited telephony services - *local and long distance 100% free*. This is useful if you are a frequent user of long distance services overseas or cross continent. The system is great for businesses, and also for personal home use to call your friends and family.

Key Features & Functions:

- Broadband Internet video phone *using high speed Internet connection*
- Includes your own static SIP phone number (Only 6 digits)
- Contact list shows name, number and picture for easy identification
- Normal telephone functions - redial, hold, mute, transfer, and speaker phone
- Privacy mode - Temporally block the outgoing video images to the other
- Internet access function - access the Internet using a built-in web browser
- E-mail service - Send and receive e-mails using users' own e-mail accounts
- Can be used with regular phone lines, but we do not recommend this because phone bill will be charged.
- IP Video phone *can be used as a sign language interface*, remote surveillance, remote medical examination, and so on. Other usages
- Send and receive SMS (Short Message Service)
- Support wireless IR keyboard
- Personal Information Management System (Phonebook, Call log, etc)
- Support dynamic IP (LAN, DSL, ADSL and Cable Modem)
- Support international standards, H.323
- Technical Specifications
- About the manufacturer - C&S Technology
- How does VOIP work?
- Please contact us if you have any product questions: support@itave.com

Toll free phone number: 1-888-640-0200

	<u>System Protocol:</u> ITU-T Recommendation : H.323v2 IETF Recommendation : SIP(RFC 2543,3261) - Optionally Selectable <u>Video:</u> ITU-T Recommendation : H.263 CIF Resolution : 352 X 288 pixels QCIF Resolution : 176 X 144 pixels Maximum Frame Rate (QCIF) : 30 fps <u>Audio:</u> ITU-T Recommendation : G.723.1, G.711 Frequency response : 50Hz~3.4KHz Full Duplex Line Echo Cancellation <u>Camera:</u> Illumination (min) : 1.0 lux(20IRE), F.2.0 Horizontal field of view (max) : 50 Vertical field of view (max) : 39 Auto exposure and white balance <u>Display Device:</u> Active Matrix TFT LCD Size : 4 inches Dot pitch (mm) : 0.171 (W) X 0.264 (H) Resolution : 480 X 234 pixels <u>Network:</u> LAN : 10/100 Based-T (2 RJ-45 jack) ADSL, Cable Interface PSTN : RJ-11 jack <u>Internet Protocol:</u> TCP/IP, UDP, ICMP, DHCP, NTP, TELNET <u>Supplementary Service:</u> ITU-T Recommendation : H-450 : Call Transfer, Forwarding, Hold, etc. <u>Voice Encryption:</u> ITU-T Recommendation : H-235 : Security framework used to provide authentication, encryption and integrity to H.323 system <u>Remote Upgrade and Configuration:</u> Remote Upgrade : The latest version of S/W will be downloaded from remote server using TFTP. Automatic and manual download are supported. Remote Configuration : System information can be configured from remote site through embedded web server. <u>Electrical:</u> Operation Voltage : +5V, +12V, -5V, -12V DC Power consumption (max.) : 17W Power Supply (AC Adaptor) : 110~240 AC compatible
--	---

	<u>Dimension & Weight:</u> 205mm X 212mm X 82mm (W X D X H) 1.25kg(2.75 lbs) <u>E-mail:</u> Send and receive E-mail Send and receive SMS POP3, SMTP <u>Web Browser:</u> With a built-in cHTML Browser, search web sites and contents <u>GUI:</u> User friendly Graphic User Interface <u>External A/V Port:</u> Allow users to connect Vizufon CIP-4500 to external camera or TV <u>Notes:</u> Can be used to communicate with computers using web-cams through Pulver (downloaded from Pulver.com) account (using user id, work like MSN messenger) Each phone has both phone jack and Ethernet jack, could be used as a normal phone as well as an Internet phone (both lines can be used as the same time). Does not have the multiple phone line features as in office phones. Each phone has forwarding features which allow one phone to act as a server and forward the incoming phone calls to the rest of the phones. There would be discount rate if buy 10 at a time (\$449.99 each) (call 604-629-0799 to order with discount rate) Technical Support phone no.: 604-629-0799
http://www.consumer.att.com/relay/video/faqs.html	WHY IS VRS FREE FOR ME TO USE? In an effort to encourage relay providers to offer VRS, the Federal Communications Commission (FCC) has agreed to temporarily reimburse providers for all interstate and intrastate VRS calls from the Interstate Telecommunications Relay Services Fund which is administered by the National Exchange Carrier Association (NECA). However, in order to be eligible for reimbursement, the VRS provider must meet minimum requirements mandated by the FCC.
http://www.fcc.gov/cgb/dro/4regs.html	MINIMUM REQUIREMENTS FOR TRS
http://www.deafweb.org/signlang.htm#video	EXISTING VRS:

relay	• AT&T Relay Service Site has a nice graphic showing how video relay works. • Communication Access Center for the Deaf and Hard of Hearing This is a free video relay service. • Sorenson VRS Sorenson VRS is a free service that allows anyone to conduct video relay calls through a certified ASL interpreter. Site has some nice tutorial videos to learn how to use its services. High call volume users are eligible a free videophone appliance that sits on top of a TV and enables two-way video converencing via a high speed Internet connection. • Sprint Relay Service No TTY is needed...just your computer. No long distance charges. Site also has video ASL instructions. Permits video relay calls in English, Spanish and French.
-----------------------	---

VIDEO RELAY SERVICE TECHNOLOGY PLAN

BACKGROUND

HDS has a long history of providing sign language interpreters to the deaf and hard of hearing population in Western Pennsylvania. Improving the quality of Interpreting Service has been an ongoing priority for the service program staff. Currently, appointment is needed for scheduling Interpreting Service. Although many of the interpreters carry pagers or cell phones that allow them to be contacted at any time of the day or night, and requests that involve emergency situations are handled immediately, the minimal delay still involve the traveling time of interpreters to the hospital. This delay could be crucial for deaf client in crisis.

There are two main reasons for being necessary to have interpreters to do translation between doctors and deaf clients:

- Doctors and deaf clients could not communicate through writing as most of the deaf clients could not understand verbal/written English. They are only trained to communicate through sign language.
- Due to the same reason, doctors and clients could not communicate by using any voice recognition software.

Most of the hospitals do not have employees who can communicate using sign language. In order to shorten the delay caused by traveling time of interpreters, HDS is planning to utilize the computer network for communication between the interpreters and the deaf clients in the hospitals. Video relay calls are placed over a broadband Internet connection through a video phone. When there is a need for an interpreter, the hospital will contact the interpreter using the video phone. The deaf client will then be able to communicate with an interpreter through video phone, who then contacts the doctor via the same phone and relays the conversation between the two parties.

SETUP

- Install the dual wall outlets which handle both phone and internet connections. (Kessler Communication)
- Upgrade Internet connection wiring to Cat5E/6 (Kessler Communication)
- Upgrade Internet service to T1 (Expedient)
- Upgrade router to Cisco 7000 Series
- Setup the 10 CIP-4500 Vizufon video phones so that one of them would be used as a central server for forwarding calls to the other 9 phones. (<http://www.itave.com/IP-Video-Phone.html>)
- Hospital would call the interpreters using the Pulver account number for HDS through the video phone.
- Calls reached HDS would be forwarded to individual interpreters' video phones.
- Clients using computers with web cam could also call into HDS's video phone using the Pulver account (<http://www.Pulver.com>)

Appendix C

VIDEO RELAY SERVICE BUDGET PLAN

ONE TIME COST

Items	Cost for each item	Total cost
10 CIP-4500 video phones	\$450	\$4500
33 dual wall outlets (Kessler Communication)	\$197	\$6501
Upgrading Internet connection wiring (Kessler Communication)	\$500	\$500
Total		\$11501

MONTHLY COST

New T1 Internet Service (Expedient)	\$700	\$700
-------------------------------------	-------	-------

GRANT RECEIVED

Funding	Amount
United Way Maurice Falk Fund	\$20,950
Cisco	7000 series Cisco router

VIDEO RELAY SERVICE EQUIPMENT LIST

Items	Specifications
CIP-4500 Vizufon video phones	 <u>Overview:</u> The CIP-4500 Vizufon video phone uses broadband connection to transfer both video and sound. The main benefit is, it provides unlimited telephony services - <i>local and long distance 100% free</i>. This is useful if you are a frequent user of long distance services overseas or cross continent. The system is great for businesses, and also for personal home use to call your friends and family. <u>Key Features & Functions:</u> • Broadband Internet video phone <i>using high speed Internet connection</i> • Includes your own static SIP phone number (Only 6 digits) • Contact list shows name, number and picture for easy identification • Normal telephone functions - redial, hold, mute, transfer, and speaker phone • Privacy mode - Temporally block the outgoing video images to the other • Internet access function - access the Internet using a built-in web browser • E-mail service - Send and receive e-mails using users' own e-mail accounts • Can be used with regular phone lines, but we do not recommend this because phone bill will be charged. • IP Video phone <i>can be used as a sign language interface</i>, remote surveillance, remote medical examination, and so on. <u>Other usages</u> • Send and receive SMS (Short Message Service) • Support wireless IR keyboard • Personal Information Management System (Phonebook, Call log, etc) • Support dynamic IP (LAN, DSL, ADSL and Cable Modem) • Support international standards, H.323 • <u>Technical Specifications</u> • <u>About the manufacturer - C&S Technology</u> • How does <u>VOIP</u> work? • Please contact us if you have any product questions: support@itave.com Toll free phone number: 1-888-640-0200

	<u>System Protocol:</u> ITU-T Recommendation : H.323v2 IETF Recommendation : SIP(RFC 2543,3261) - Optionally Selectable <u>Video:</u> ITU-T Recommendation : H.263 CIF Resolution : 352 X 288 pixels QCIF Resolution : 176 X 144 pixels Maximum Frame Rate (QCIF) : 30 <i>fps</i> <u>Audio:</u> ITU-T Recommendation : G.723.1, G.711 Frequency response : 50Hz~3.4KHz Full Duplex Line Echo Cancellation <u>Camera:</u> Illumination (min) : 1.0 lux(20IRE), F.2.0 Horizontal field of view (max) : 50 Vertical field of view (max) : 39 Auto exposure and white balance <u>Display Device:</u> Active Matrix TFT LCD Size : 4 inches Dot pitch (mm) : 0.171 (W) X 0.264 (H) Resolution : 480 X 234 pixels <u>Network:</u> LAN : 10/100 Based-T (2 RJ-45 jack) ADSL, Cable Interface PSTN : RJ-11 jack <u>Internet Protocol:</u> TCP/IP, UDP, ICMP, DHCP, NTP, TELNET <u>Supplementary Service:</u> ITU-T Recommendation : H-450 : Call Transfer, Forwarding, Hold, etc. <u>Voice Encryption:</u> ITU-T Recommendation : H-235 : Security framework used to provide authentication, encryption and integrity to H.323 system <u>Remote Upgrade and Configuration:</u> Remote Upgrade : The latest version of S/W will be downloaded from remote server using TFTP. Automatic and manual download are supported. Remote Configuration : System information can be configured from remote site through embedded web server. <u>Electrical:</u> Operation Voltage : +5V, +12V, -5V, -12V DC Power consumption (max.) : 17W Power Supply (AC Adaptor) : 110~240 AC compatible <u>Dimension & Weight:</u> 205mm X 212mm X 82mm (W X D X H)
--	--

	1.25kg(2.75 lbs) <u>E-mail:</u> Send and receive E-mail Send and receive SMS POP3, SMTP <u>Web Browser:</u> With a built-in cHTML Browser, search web sites and contents <u>GUI:</u> User friendly Graphic User Interface <u>External A/V Port:</u> <i>Allow users to connect Vizufon CIP-4500 to external camera or TV</i> <u>Notes:</u> Can be used to communicate with computers using web-cams through Pulver (downloaded from Pulver.com) account (using user id, work like MSN messenger) Each phone has both phone jack and Ethernet jack, could be used as a normal phone as well as an Internet phone (both lines can be used as the same time). Does not have the multiple phone line features as in office phones. Each phone has forwarding features which allow one phone to act as a server and forward the incoming phone calls to the rest of the phones. There would be discount rate if buy 10 at a time (\$449.99 each) (call 604-629-0799 to order with discount rate) Technical Support phone no.: 604-629-0799	
Cisco 7000 Series Router	Description	Specifications
	High-speed backplane	533-Mbps CxBus, 5 interface processor slots, 1 RP slot, and 1 SP (or SSP) slot
	Dimensions (H x W x D)	19.25 x 17.5 x 25.1" (48.90 x 44.45 x 63.75 cm) Chassis depth including power cord is 28" (71.12 cm)
	Weight	Chassis only: 76 lb (34.47 kg) Chassis fully configured with 1 RP and 1 SP (or 1 SSP), 5 interface processors, and 2 power supplies: 145 lb (65.76 kg)
	Power supply	700 watts (W) maximum (for AC-input and DC-input power supplies)
	Power dissipation	626W, maximum configuration 530W typical with maximum configuration
	Heat dissipation	1200W (4100 British thermal units [Btus]/hr) with AC-input 300W (1024 Btus/hr) with DC-input

	Input voltage	100 to 240 volts alternating current (VAC) wide input with power factor corrector (PFC)
	Frequency	50 to 60 Hz autoranging
	AC-input ratings	12A maximum @ 100 VAC, 6A maximum @ 240 VAC, chassis fully configured
	DC-input ratings	-40 volts DC (VDC) minimum -48 VDC nominal -72 VDC maximum
	Airflow	140 cubic feet per minute (cfm) through the system blower
	Operating temperature	32 to 104° F (0 to 40° C)
	Nonoperating temperature	-4 to 149° F (-20 to 65° C)
	Humidity	10 to 90%, noncondensing
	Agency approvals	Safety: UL 1950, CSA 22.2-950, EN60950, EN41003, AUSTEL TS001, AS/NZS 3260 EMI: FCC Class A, EN55022 Class B, VCCI Class 2
	User Guide: http://www.cisco.com/en/US/products/hw/routers/ps332/products_user_guide_book09186a008007e301.html	
Expedient T1 Internet Service	Expedient offers traditional Sonet-based T1, DS3 and OC3 Internet connectivity over a connection that is dedicated to your organization. As a private, leased line technology delivered via point-to-point or frame-relay, the speed of your connection is not compromised by other users serviced by the same Central Office or POP, or in the same vicinity. Starting with a 1.5 Megabit T1 connection, you can increase your bandwidth capacity as your business grows up to full 155 Megabit OC3 service. To learn more, please email us or call 877-570-7827, toll-free. We'll expedite our reply. Expedient T1, DS3, or OC3 Internet connectivity. Simple. Fast. Expedient. Expedient Advantages: ▪ Dedicated connectivity ▪ Competitive pricing ▪ Rapid installation ▪ 24/7 technical support ▪ Exceptional reliability	

REGIT QUICK REFERENCE MANUAL

I. TO VIEW ALL INVOICES

- Open *Regit Point-of-Sale Office*
- Click on *File*
- Choose *Open Data Base Table*
- Choose *Transaction Log*

II. TO VIEW ALL CUSTOMERS

- Open *Regit Point-of-Sale Office*
- Click on *File*
- Choose *Open Data Base Table*
- Choose *Customer*

III. ITEMS SOLD PER YEAR

- Open *Regit Point-of-Sale Office*
- Click on *File*
- Choose *Open Data Base Table*
- Choose *Product 1*
- Click on *Query*
- Choose *Load Query*
- Double click *Month Sales By Item Rpt*

IV. BUSINESS VS INDIVIDUAL FOR CURRENT MONTH

- Open *Regit Point-of-Sale Office*
- Click on *File*
- Choose *Open Data Base Table*
- Choose *Customer*
- Click on *Query*
- Choose *Build Query*
- Clear everything in the *Select Box*
- Copy and paste the following to the *Select Box*:

SELECT distinct (select count([Sort Code]) from [Customer] where [Sort Code]='B' and datediff('m', [Last Date], date())=0) as Business, (select count([Sort Code]) from [Customer] where [Sort Code]='I' and datediff('m', [Last Date], date())=0) as Individual FROM [Customer]

- Click *OK*

V. LOOK UP A PRODUCT BY DESCRIPTION

- Open *POS Cash Register*
- Click on *Enter/Scan Product Code*
- Click on *LookUp by Product Description*
- Enter the product description
- It will bring up all the products with the matching description in *alphabetical order*.

VI. LOOK UP A PRODUCT BY PRODUCT CODE

- Open *POS Cash Register*
- Click on *Enter/Scan Product Code*
- Click on *LookUp by Product Code*
- Enter the exact product code
- It will bring up all the products *ordered by product code* with the product that you look for highlighted.

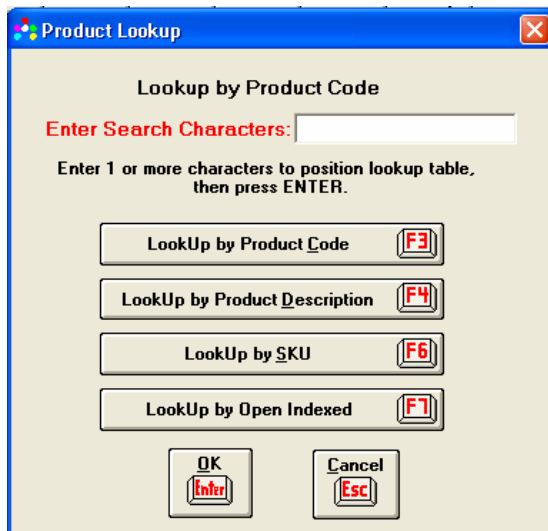
VII. LOOK UP AN INVOICE (INCLUDING THOSE ARCHIVED)

- Open *POS Cash Register*
- Click on *ReCall*
- Click on *View Or Reprint A Past Sales Receipt*
- Enter the exact transaction #

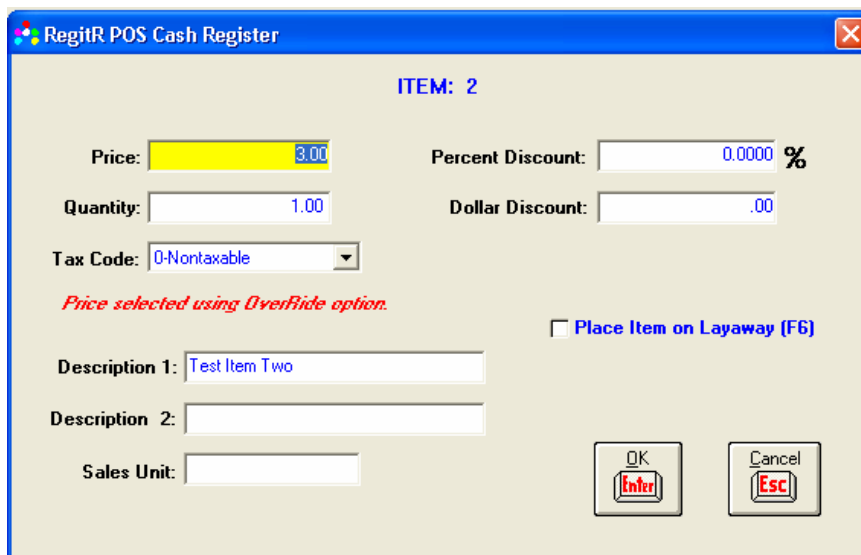
REGIT MANUAL

I. TO MAKE A TRANSACTION

- Open *POS Cash Register*
- Click on *Lookup*
- Enter the corresponding Product info to look up the product



- If product info has to be changed for this specific transaction, highlight the product, then click on *Product*, and make the corresponding changes



- Identify the customer by clicking on *Customer*

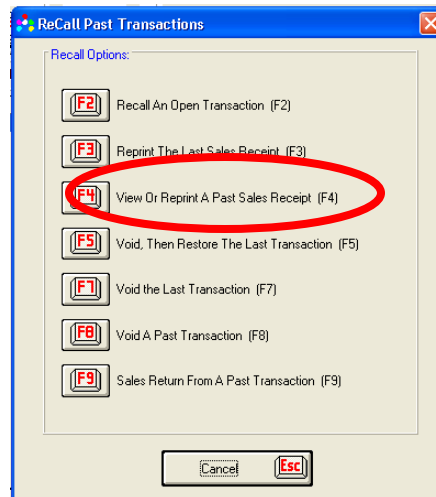
- Enter the corresponding Customer info to look up the customer. If this is a new customer, enter a new customer code and you will be prompted to enter the info for this new customer.

- Click on *Tender*
- Enter the corresponding payment info

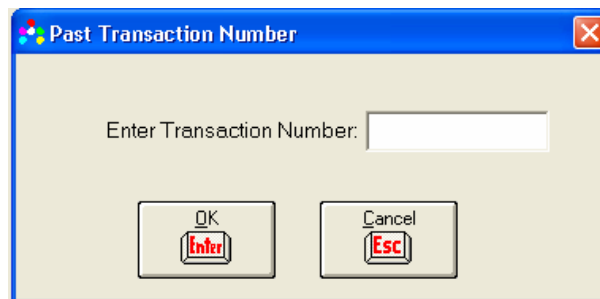
- Click on *Receipt* if receipt is needed to be printed

II. LOOK UP AN INVOICE (INCLUDING THOSE ARCHIVED)

- Open *POS Cash Register*
- Click on *ReCall*
- Click on *View Or Reprint A Past Sales Receipt*

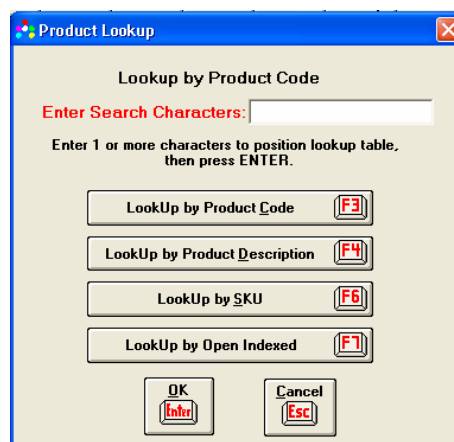


- Enter the exact transaction #



III. TO VIEW THE INVENTORY QUANTITY OF A PRODUCT

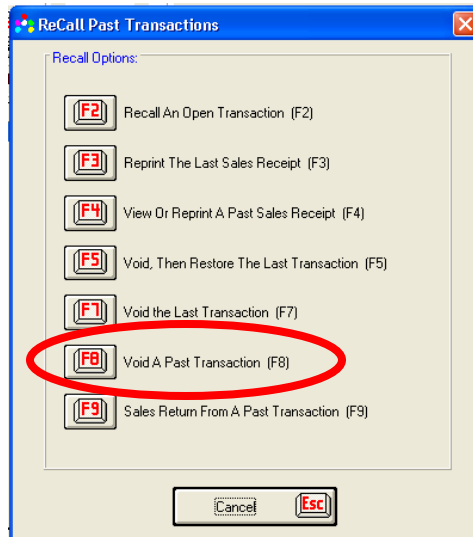
- Open *POS Cash Register*
- Click on *Lookup*
- Enter the corresponding Product info to look up the product



- Click on *View*
- Choose *Inventory Quantity*

IV. TO VOID A TRANSACTION

- Open *POS Cash Register*
- Click on *Recall*
- Choose *Void a Past Transaction*



- Enter the corresponding transaction number

V. TO COMPACT AND REPAIRING DATABASE

- Open *Regit Point-of-Sale Office*
- Click on *File*
- Choose *Compact/Repair Database*

VI. TO CLOSE THE REGISTER AT THE END OF THE DAY

- Open *POS Cash Register*
- Click on *File*
- Choose *Close Register*

VII. TO CLOSE THE REGISTER AT THE END OF THE MONTH/YEAR

- Open *Regit Point-of-Sale Office*
- Click on *Utilities*
- Choose *Close Month/Year*

VIII. TO PRINT SALES REPORT

- Open *Regit Point-of-Sale Office*
- Click on *Reports*
- Choose the corresponding report you desire to print

IX. TO VIEW ALL INVOICES

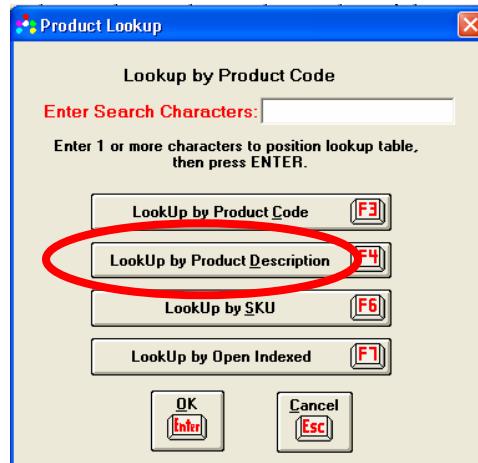
- Open *Regit Point-of-Sale Office*
- Click on *File*
- Choose *Open Data Base Table*
- Choose *Transaction Log*

X. TO VIEW ALL CUSTOMERS

- Open *Regit Point-of-Sale Office*
- Click on *File*
- Choose *Open Data Base Table*
- Choose *Customer*

XI. LOOK UP A PRODUCT BY DESCRIPTION

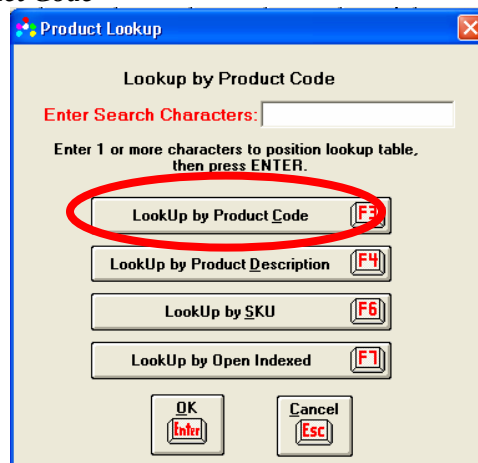
- Open *POS Cash Register*
- Click on *Enter/Scan Product Code*
- Click on *LookUp by Product Description*



- Enter the product description
- It will bring up all the products with the matching description in *alphabetical order*.

XII. LOOK UP A PRODUCT BY PRODUCT CODE

- Open *POS Cash Register*
- Click on *Enter/Scan Product Code*
- Click on *LookUp by Product Code*

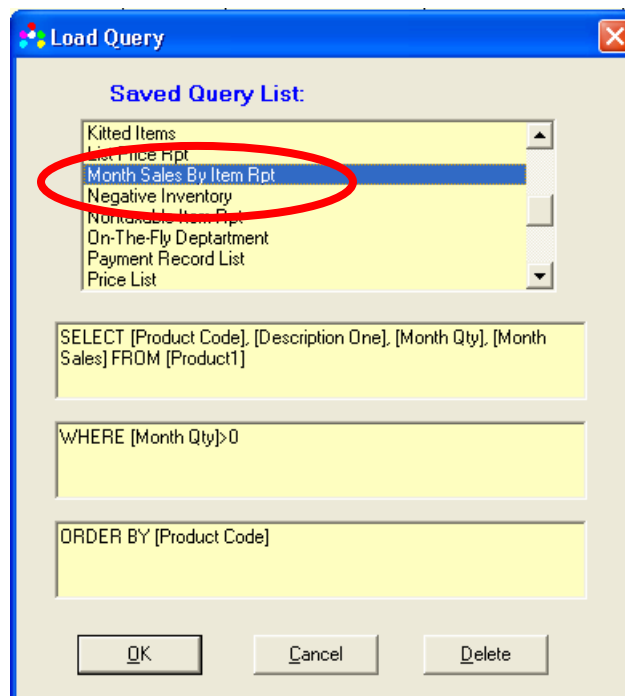


- Enter the exact product code

- It will bring up all the products *ordered by product code* with the product that you look for highlighted.

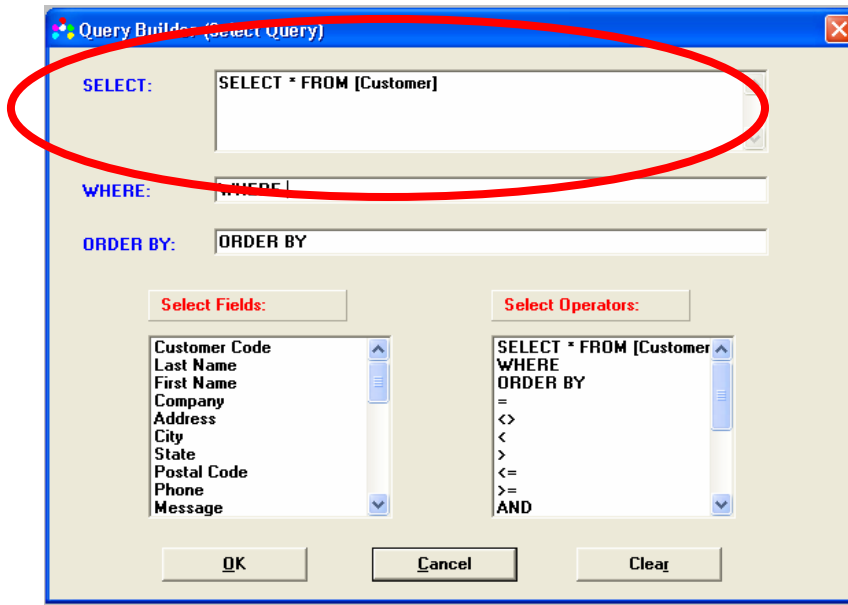
XIII. ITEMS SOLD PER YEAR

- Open *Regit Point-of-Sale Office*
- Click on *File*
- Choose *Open Data Base Table*
- Choose *Product 1*
- Click on *Query*
- Choose *Load Query*
- Double click *Month Sales By Item Rpt*



XIV. BUSINESS VS INDIVIDUAL FOR CURRENT MONTH

- Open *Regit Point-of-Sale Office*
- Click on *File*
- Choose *Open Data Base Table*
- Choose *Customer*
- Click on *Query*
- Choose *Build Query*



- Clear everything in the *Select* Box
- Copy and paste the following to the *Select* Box:

SELECT distinct (select count([Sort Code]) from [Customer] where [Sort Code]='B' and datediff('m', [Last Date], date())=0) as Business, (select count([Sort Code]) from [Customer] where [Sort Code]='T' and datediff('m', [Last Date], date())=0) as Individual FROM [Customer]

- Click OK

XV. TO BUILD A QUERY

- Open *Regit Point-of-Sale Office*
- Click on *File*
- Choose *Open Data Base Table*
- Choose the corresponding table
- Click on *Query*
- Choose *Build Query*

SELECT [list field names or asterisk] FROM [database table name]

• **SELECT * FROM [Product1]**

- returns the entire "Product1" database table.

• **SELECT [Product Code], [Description One], [Inventory Qty] FROM [Product 1] WHERE [Inventory Qty]<0**

- returns just the Product Code, Description One, and Inventory Qty fields from the Product1 database table which have an inventory quantity less than zero.

WHERE is the conditional part of the query. It is generally used with one of the comparison operators: = (equal to), <> (not equal to), < (less than), > (greater than), <= (less than or equal to) or >= (greater than or equal to):

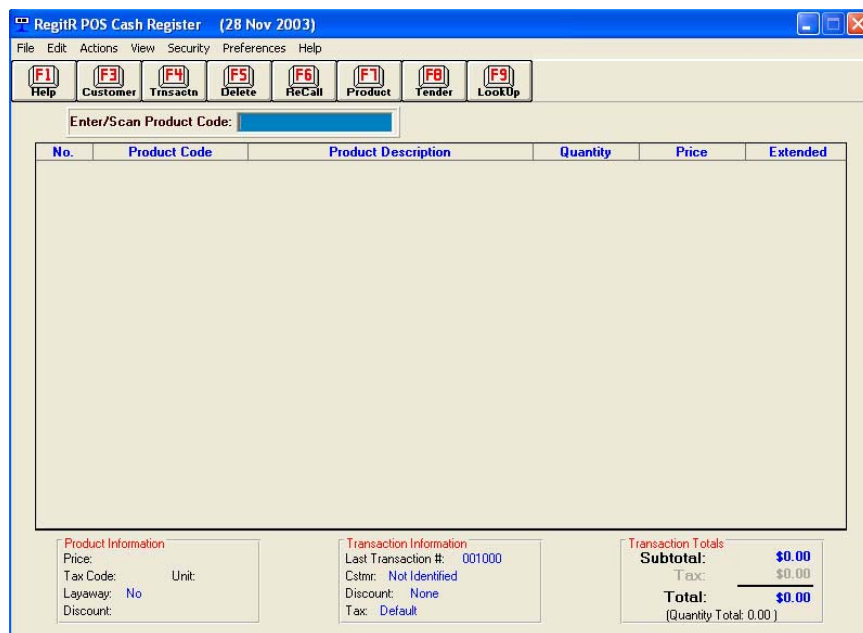
- *SELECT * FROM [Product1] WHERE [Standard Price] > 10*
- Simple select query selecting all records where the Standard Price is greater than 10.
- *SELECT * FROM [Product1] WHERE [Vendor Code] = "ABC Company"*
- Select all records where the vendor is the "ABC Company".
- *SELECT * FROM [Product1] WHERE [Inventory Qty] > 10 AND [Standard Price] > 100*
- Selects all records where the inventory quantity is greater than 10 and the standard price is greater than \$100.
- *SELECT * FROM [Product1] WHERE LEFT([Product Code],2) = "V2"*
- Selects all records from Product1 where the left two characters of the Product Code field equal "V2".
- *SELECT * FROM [Product1] WHERE RIGHT([Product Code],4) = "Inch"*
- Selects all records from Product1 where the last four characters of the Product Code field equal "Inch".
- *SELECT * FROM [Product1] WHERE MID([Product Code],2,3) = "xyz"*
- Selects all records from Product1 where the three characters starting at the second position of the Product Code field are equal to "xyz".
- *SELECT * FROM [Product1] WHERE [Serial Number] = Yes*
- For Yes/No Field (Boolean) quotes are not used around the Yes or No as with a text field.

The ORDER BY clause is to specify the sort order.

- *SELECT * FROM [Product 1] ORDER BY [Description One]*
- Selects all from Product1 and sorts by the Description One field.
- *SELECT * FROM [Product 1] ORDER BY [Description One] DESC*
- Selects all from "Product1" and sorts by the Description One field (descending order).
- *SELECT * FROM [Product1] ORDER BY [Vendor], [Department]*
- A double sort query--first sorted by vendor, then by department.

SCREENSHOTS OF REGIT

REGIT POS CASH REGISTER



RegitR POS Cash Register (28 Nov 2003)

File Edit Actions View Security Preferences Help

F1 Help F3 Customer F4 Transactn F5 Delete F6 ReCall F7 Product F8 Tender F9 LookUp

Enter/Scan Product Code:

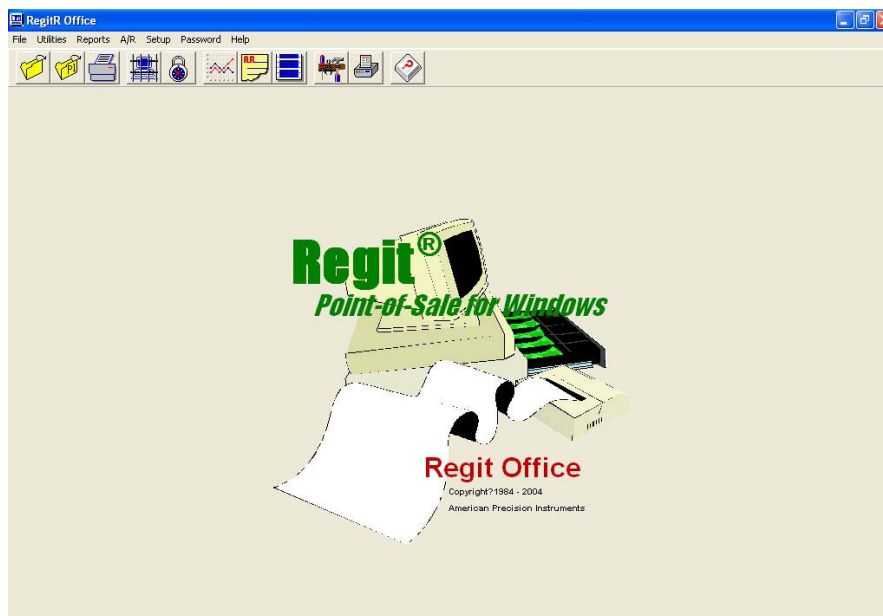
No.	Product Code	Product Description	Quantity	Price	Extended
-----	--------------	---------------------	----------	-------	----------

Product Information
 Price: Tax Code: Unit: Layaway: No Discount:

Transaction Information
 Last Transaction #: 001000
 Cstmr: Not Identified
 Discount: None
 Tax: Default

Transaction Totals
 Subtotal: \$0.00
 Tax: \$0.00
 Total: \$0.00
 (Quantity Total: 0.00)

REGIT OFFICE



SCREENSHOT OF MSN MESSENGER

