Program for Health Care to Underserved Populations

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PART I – Situation Description

Organization:
The Program for Health Care to Underserved Populations (PHCUP) is a network of five health clinics throughout the Pittsburgh area. More specifically, the mission of this organization is to provide basic, primary care at no cost to segments of the population who lack adequate health care. The administrative offices are located on the ninth floor of Montefiore Hospital on Fifth Avenue in Oakland. The underserved populations targeted by PHCUP primarily consist of teen and adult homeless as well as uninsured individuals. PHCUP has a dual purpose of making health care services accessible to these people and educating them about health care opportunities and options.

The five clinics throughout Pittsburgh provide the health services to the targeted populations and are strategically situated in such community centers as the Salvation Army Detox in the South Side and the Harbor Light Rehab Center in the North Side. Other sites include Birmingham (the largest clinic), the Women's Center, and one small site on Smallman Street in the Strip District. The clinics mostly consist of one doctor, two medical students who assist the doctor, a nursing students, pharmacy students, and a pharmacist. The doctors, pharmacists, and medical students are all volunteers. There is also a representative from the Oakland office who oversees the operations. There were 810 visits by both new and repeat patients to the Birmingham clinic in the year 2000.

Facilities:
The physical layout of the Oakland office consists of two adjacent rooms. This office space is provided by UPMC Montefiore hospital. The program administrator works in a small office and the secretary, Americorps members, and clinic coordinator work in the larger room. The room is configured so that each worker has their own medium size desk and computer. The room is somewhat crowded, but well lighted and similar to a typical office environment. All data management and program coordination are done here.

Using the Birmingham clinic as an example, the clinics consist of one small room. The room has a registration desk where the patrons sign in and give vital information. Two cubicles abutting the wall provide some privacy so a medical student or nurse can ask questions about a patient's medical history and determine the chief complaint. Two examination tables are available for use by the doctor. There is a cloth curtain that can conceal these tables during an examination. Against one wall is a large cabinet of basic drugs and medicines that are distributed to those in need. Approximately 2/3 of the medications is donated while many over-the-counter medications are bought with the organization's funds.

Program:
As mentioned before, PHCUP offers one primary program focused on providing a free health service and raising awareness through the five clinics. More specifically, the program provides not just diagnosis, but preventative checkups, pharmaceutical care and immunizations as well.

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When the clinics are not equipped to handle certain cases, the patient is referred to outside the organization and given advice on their eligibility for state health care. The Birmingham clinic is open 3 days per week. These clinic services are usually communicated to the community through word of mouth, brochures, and other charity organizations with larger marketing budgets. There is minimal technology used to assist anyone at the actual clinics. All use of technology is done at the Oakland administrative office for the purpose of information analysis.

Technology's current role in this program is to manage and structure the data generated from the clinics using a database. The database resides on a zip drive and all data is entered on a per visit basis. The database keeps track of all current and returning patients, the number of visits, their vital information, the outcome of the visits (diagnosis, etc.), and any referrals mode. Additionally, the database harvests this data into meaningful forms and charts that provide statistical pictures about the organization. After one round at the clinics, one of two Americorps members enters information into the database off of a document called "Health Care for the Homeless Encounter" that was completed for each patient who visited that day. All this database work is done at the Oakland office.

Staff:

The structure of the organization consists of a program director, program administrator, clinic coordinator, secretary, and two Americorps members, both volunteer and full-time salaried, who coordinate and organize the five clinics. The Americorps workers are in charge of transferring data from the form filled out at the clinic to the database in the Oakland office. One Americorps worker is assigned to use the computer for creating word documents as well as accessing the Montefiore network for email and other communication purposes. Every member of the staff has a desktop and has some literacy in using standard applications like Word and Outlook. Nobody has a formal education in information systems or computer science. The organization used to have somebody with database knowledge. She is the author of the current database. The staff is receptive to new ideas concerning the technology and willing to learn new concepts concerning the database and network.

Technical Environment:
The technical environment at PHCUP's central administrative office is typical for any organization of its size. Hardware consists of four Pentiums between 75 and 135 megahertz, a printer, standard network wiring, and an external zip drive that reads the database. Each computer has a copy of Windows 95 or 98 installed and common Microsoft applications such as Word, Access, Excel, Outlook, and Explorer to perform administrative procedures. All computers are connected to the Internet through Montefiore's ISP and are networked together to allow for basic file sharing with read/write access. The small cluster forms a work group named Americorps within the domain of the Montefiore Hospital Intranet and they have access to the rest of Montefiore network via their computers. All workstations have standard computer peripherals like a mouse and keyboard.

Technology Management:
Mary Herbert and Dr. Bui are the primary people involved in the technology management. Together they assess the current information needs of the organization in terms of what additional information from the clinic database can be useful to the organization. Dr. Bui oversees the organization and also provides feedback about the technological issues. Additionally, Mary judges how closely the database is reflecting the makeup of the organization and whether there is

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a need for revising its design. For instance, she proposed upgrading the database to include all five clinics instead of only the largest one. These changes will make the statistical reports more accurate. She is in position to make such assessments since she fully understands the clinical makeup of the organization. She is the spokesperson of the group when addressing technical issues and difficulties. In addition to Mary, a Montefiore information systems employee answers requests from PHCUP about obtaining new equipment and maintaining the technological environment.

PART II – Analysis of Problems and Opportunities

1. Information not stored for four out of five databases

PHCUP depends on clinic information to make administrative decisions such as reordering of supplies, staffing procedures, maintaining medical records, and aggregate analysis of program impacts. Funding opportunities are often impacted by efficient outcomes of data and presentation. Therefore the organization must be able to accurately represent number of patients seen and situations surrounding treatment and case management.

As mentioned in the situation description, there are five clinics administered from the central office. The current problem is that the database only stores data on the largest clinic. Information on the other four sites is not stored. Maintaining information for one clinic causes PHCUP to underestimate their actual impact. Additionally, without this valuable information, PHCUP is unable to gauge how to allocate their limited resources between the five clinics.

A solution was proposed to extend the currently existing database to include all five sites. This would involve alterations to the database schema, forms, and reports. All work can be done with Microsoft Access since it already exists on all computers.

2. Limited Data Analysis

PHCUP performs detailed aggregate analysis on the data to detect trends and monitor clinic usage. However, the organization needs to extrapolate other kinds of information, like the distinct number of patients to visit a clinic in one month. Currently, this cannot be done.

The second problem is the limited data analysis done on the database. The database can only produce statistics from reports and queries written by its original creator who is no longer with the organization. PHCUP has the technology in Access and queries to create new tools for data analysis as well as an understanding of what information is valuable, but the staff lacks the technical expertise in creating new queries and reports. This problem affects the mission since PHCUP has countless situations where specific metrics are needed to better serve their clients. However, they cannot extrapolate this data unless queries were written with the original database.

A solution was proposed combining instruction with implementation. The partnership would involve immediate progress by creating queries that satisfied current information needs. Additionally, instruction would be provided so the staff could create their own queries in the future to satisfy new information needs.

3. Database Connectivity

The only formal information flow between clinics and office is the medical sheets that record details of a certain patient visit as well as the diagnosis, immunizations, treatment, or prevention.

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The information on the sheets is then entered into the database at the office. This is a one-way information flow.

The third problem is that no connectivity exists between office and clinics. The database offers fast and comprehensive data on all patients. Currently, neither doctors nor volunteers at the clinic are able to view the database at the site.   Solving this problem will enhance PHCUP's ability to access patient information. The organization can now better serve their clients on the spot and may even assist the doctor in diagnosis with a detailed medical history.

A solution was proposed involving a cheap laptop which stores a copy of the database. The laptop could be carried to each clinic. Since clinics never operate concurrently, no two staff members will need the database at once.

PART III – Analysis of Problems and Opportunities

Problem: Information not stored for four out of five databases

Outcomes/Evidence of Increased Capacity:
First, a new field was created in the office visits table to store the site where each office visit entry took place. A site location can now be linked to each office visit. This solution allows the organization to collect both aggregate data as well as individual information for each of the five clinics. The forms have been updated with a prompt to choose the clinic. The staff has been informed of the change and is meticulous about entering the site each time. Second, following these changes, some unexpected glitches arose in the queries and reports not accounted for in the scope of work. These queries and reports were adjusted appropriately. Third, new queries were written that allow a user extrapolate new information on individual sites. Lastly, the reports were adjusted to display the site breakdown for the patient encounters. Evidence of increased capacity is shown through the new information available to the staff whether they want print monthly reports for grants or run a simple query to find the average age of patients at a particular clinic.

Areas for Improvement:
One area where there is not evidence of increased capacity is in the presentation of data on individual clinics. There are no current reports that can provide an organized analysis of the demographics or insurance information for an individual clinic (although a user can currently obtain such information in aggregate form for all five clinics). Queries exist for individual data analysis. The staff has no means of efficiently translating the data into a presentable format.

Sustainability
This solution is sustainable since, as PHCUP grows, new sites are easy to add. Mary has been taught how to add additional allowable choices to the site field. If a new clinic is added to PHCUP's program, she can simply add a new value to the combo box. One risk is that if the staff fails to enter the site too often, then the site data will be skewed with the "unknown" value that clumps together data from different clinics. This situation would create the old problem. I have instructed Mary to ensure that a site is entered for each office visit.

Problem: Limited Data Analysis

Outcomes/Evidence of Increased Capacity:

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The solution chosen for this problem was to have the consultant write queries with some limited instruction to the staff. First, Mary and I carefully outlined the information need of the organization and examined which queries currently exist and which need to be written. Second, the consultant wrote the queries while each one was explained in detail to Mary. The CP understands how to use the design view as well as how to write simple queries in SQL. More specifically, queries now exist that count the number of distinct patients that visited PHCUP's operations within a certain time interval and the number of patients new and returning. Also, many queries were written to extrapolate data concerning insurance status. For instance, a user can enter the name of an insurance company and see a complete list of patients who used that insurance and the number of visits they used it. Third, aside from the instruction given to Mary, a few members of the staff took an Access course on how to write queries.

There is concrete evidence of increased technical capacity. The organization now has the ability to view statistics on patients and insurance companies. They have already used this information in assessing how many people are uninsured and how often a patient in PHCUP's program reuses the services. This information will provide insight on the impact and areas of improvement. Mary's technical understanding has increased as evidenced by her use of the design feature in Access to write complex queries and the use of SQL to write quick simple queries in my absence. She has successfully written queries without any of my assistance.

Areas for Improvement:
One area where there is not evidence of increased capacity is in the staff's (excluding Mary) understanding of both the concept and use of queries. Despite the limited instruction, the staff does not understand how to use the design view to create queries in Access nor do they understand key fundamental query concepts such as cross-joins or conditional clauses.

Sustainability
The progress made is sustainable IF Mary, who currently has the knowledge of queries, stays with the organization. When a new information need arises, the CP understands how to write simple SQL as well as use the Access design view to create the new query. Evidence of this sustainability is shown how the CP has already created new queries independent of any consultant assistance. As mentioned above, however, one major risk is that the CP might leave the organization. Currently, as indicated in the unfulfilled outcome section, nobody else has an understanding to create queries. The old problem will resurface and they will not have the technical capacity to create queries to satisfy information needs.

PART IV – Recommendations

The following recommendations are guidelines to address unfulfilled opportunities.

Recommendation #1
With so much new data generated from the five clinics, PHCUP should have an automated method of transforming the raw data into presentable reports. This can be accomplished by creating a report that prompts the user for a clinic name and time interval. Using these parameters, a report is created with data on the individual clinic similar to the report that displays aggregate data for all five clinics. The report will provide insurance, demographic, and diagnosis data specific to the clinic entered. Mary has the technical understanding to perform this task

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based upon our work with reports during my tenure. The outcomes from this approach are the following:

- Data in presentable report format will permit PHCUP to submit information on individual clinics to outside parties like the clinic itself or funders. Currently, the only improvement in the reports is the accurate number of office visits. Some parties might want more detailed information.
- Data retrieval is much faster and efficient than running separate insurance, demographic, and diagnosis queries and copying the information by hand or through a cut and paste function. Such improvement makes PHCUP's operations more efficient.
- If certain data in the database was ever made public through a medium such as the web, the reports could be made available for viewing while the queries could be made inaccessible. This would allow somebody to view information about a clinic, without actually viewing the contents of the database. This possibility has been crafted into the next recommendation.

One resource to supplement Mary's knowledge is www.databases.about.com/ compute/databases/cs/access/index.htm (click on the "Access Tips" link). This web site is another online reference for Microsoft Access users. The tip link contains some key suggestions for formatting data in a report such as sorting methods and organizing the margins. This will assist Mary in making the data presentable.

Recommendation #2
Provided that the new data is in a presentable and meaningful format as prescribed above, PHCUP should use their aggregate statistics about the organization and clinics as a promotional tool to attract benefactors. This could be accomplished by creating a simple web page hosted on a free ISP with links to the new Access reports. The effects of this approach would be the following:

- Aggregate information is now public on the World Wide Web. Sister programs from across the nation can compare data and swap ideas with PHCUP.
- PHCUP can use their web page for promotional purposes.
- One large risk is the potential security issues that might arise by making data public via the Web. The patients are ensured by PHCUP that their vital statistics and patient records are strictly confidential. Even if the public has access only to aggregate statistics, there is a risk that the patients might feel a violation of their privacy and believe that their personal information is still at risk. This would make them uncomfortable and reluctant to participate in the clinics.

One resource especially useful for creating a web site would be www.trfn.clpgh.org. This is an ISP offering free Internet service. TRFN offers free web hosting for local nonprofit organizations and government agencies, including training, support, and email. This service is not as comprehensive as a typical ISP, but the cost savings outweigh any minor benefits.

Recommendation #3
Encourage Mary to teach the staff her understanding of the concept and creation of queries, employing the same apprentice/mentor relationship used throughout the partnership. During our partnership, one of the outcomes was that Mary expanded her understanding of cross-joins and conditional clauses and developed solid knowledge about the use of the design view in Access.

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This technical knowledge should be passed to her coworkers. Each time Mary creates a new query, she should demonstrate and explains the logic, technique, and implementation involved with creating the query. The expected affects from implementing this approach are the following:

- The solution implemented during the twelve-week partnership will become totally sustainable and the increased technical capacity no longer applies to one person.
- A universal understanding will allow Mary to delegate some query work to her assistants. This will allow her to focus on other things related to her job.
- Understanding the capabilities of queries will permit the staff, who works closer with the data than the Mary, to identify certain information deficiencies that can be resolved with queries. They can then bring this to the attention of Mary.

There are several resources to supplement Mary's instruction. One relevant web site is www.access-programmers.co.uk (click on discussion form link and then on the Queries link). This web site provides online Microsoft Access reference and tutorials free of charge. This resource is especially useful for people who need specific questions answered about certain aspects of Access. There is a discussion forum specific to queries where Mary or other staff members can submit a question and receive a professional answer. It is impossible to teach every detail to account for every case. The forum allows for specific syntactical questions in exceptional cases. Another good reference is a book titled SQL For Dummies. This is a book especially geared towards those who have never used SQL before. I do not recommend that every staff member read this book, rather they should use it for reference and consult the index for specific questions about syntax. Some topics of interest would be cross-joins or conditional clauses. This resource is useful since it gives SQL knowledge in a clear, concise, easy-to-understand manner.

Recommendation #4
This recommendation focuses upon providing a low-cost, effective solution to solving the problem of no database connectivity. I suggest that PHCUP buy a relatively cheap laptop that is easy to transport. The laptop must be equipped with a hard drive no less than 100 megabytes, Microsoft Access, and Microsoft Windows. This expenditure should fall within the organization's budget constraints. The laptop, with the most current copy of the database, would "travel" to each clinic with a member of the staff. This would put the database at the fingertips of the staff and doctors. Since no two clinics ever operate concurrently, the laptop will never be demanded in more than one place at any given moment.

- A connected database will eliminate the need for a paper medium to be transported from all the clinics to the administrative office. Less paper work means less work for the staff.
- A doctor at the clinic can now access valuable information about a given patients medical history, past medications, and other vital information. Before, PHCUP was going through redundant data entry where all demographic, diagnosis and referral information was recorded at each patient visit, transported to the main Oakland offices and then entered in the database.
- These effects are sustainable. No matter how large PHCUP grows or how many sites are added, all data entry/modification is performed in a centralized place (the database). Therefore, little will be needed in terms of information management when new sites are added
- A fixed cost for equipment must be paid. There is no variable cost.

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There are many sites on the web that offer information and deals on laptops. For instance, www.techsoup.com is especially geared towards technology in non-profit organizations. They have designated a hardware section that has several deals on used laptops. Another web site is www.pricewatch.com. This site is great for locating good prices for laptops through price comparisons on computer equipment. Click on the appropriate hardware link to find laptops of a suitable price.

Part V - Benchmarks to Address

Upon reviewing PHCUP's current technology capacity in reference to the "Technology Management Benchmarks", it was found that most of the benchmarks are currently satisfied. However, the following benchmarks are believed to be relevant to PHCUP, but are not currently addressed.

Minimum technology competency requirements are defined for every organization staff position. Staff members receive appropriate technology training that allows them to achieve these minimum technology levels.

Why address this benchmark?
Perhaps the greatest threat to PHCUP is not the lack of technology, but the lack of training used for the purpose of developing consistent technical knowledge among all employees. The sustainability of most outcomes is jeopardized by the fact that only one member of the organization truly understands the technical basis behind the improvements and there is absolutely no reference that can be consulted should improvements need to be made in the future. If Mary were to leave the organization, the progress made during this period would be lost.

How to address this benchmark?
A solution to achieve this benchmark was proposed in recommendation #3. Although the recommendation narrows its focus on training the staff for query creation, the same approach can be duplicated across all aspects of technology in order to achieve a universal understanding of the technological environment.

The organization maintains a web site on the Internet that is part of its overall communication strategy and regularly updates it.

Why address this benchmark?
PHCUP addresses a problem that is universal and not specific to Pittsburgh or the United States. Lack of adequate health care is a global issue and, as a result, there are countless charity organizations in almost every region of the world working to create effective programs to combat this problem. Given their similar situations, strategies, and mission, it would greatly benefit PHCUP to network information and ideas with other sister organizations. Through communication, PHCUP can maybe obtain ideas for promoting their organization. In addition, the web site can be used as a marketing method to locate more patients and potential contributors not in the Pittsburgh area.

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How to address this benchmark?
Developing a web site accessible to other organizations and joining a web ring of organizations with the similar mission will help network PHCUP with the rest of the non-profit health care community. Also, careful correspondence should be maintained with the organizations to develop an information flow of ideas between the community sites. A solution for attaining this benchmark can be found in recommendation #2.

Organization has a mechanism through which it keeps current on "best practice" use of technology in the nonprofit sector and incorporates this knowledge into the technology planning process.

Recommendation:
Aside from communicating with other health related non-profit organizations, PHCUP should network with the local Pittsburgh non-profit community in order to share knowledge about technology use. Several technical problems addressed during the partnership were not specific to the type of organization. For instance, operating, maintaining, and extending a database is a common problem for any non-profit group that needs to compile large amounts of data in an organized fashion. By seeing how other organizations solved certain technologies, PHCUP can gain insight by witnessing how different technical solution have worked under different circumstances. Communication between groups could be done in person or through email. Learning from somebody's experience is much more efficient than trying to carve out a solution from scratch. By establishing partnerships, these organizations can mutually benefit by sharing information between each other. The following are local non-profit organizations that also use Access databases in the Pittsburgh area:

- East End Neighborhood Employment, 412-241-2811, Pittsburgh, PA
- Hill House Association – Senior Services, 412-553-5631, Pittsburgh, PA

Additionally, there are several on-line communities on the web that link together non-profits for the purpose of information exchange, especially information pertaining to technology. www.nonprofits.org, is a site where non-profits can congregate in cyberspace and seek answers for commonly asked questions. Several of the questions in the FAQ relate to technology issues and even provide examples of good technology plans that PHCUP can use as a model. The unique feature about this web site is that it recognizes the budget constraints of most non-profits and, as a result, provides guidelines to gauge the cost-effectiveness of certain approaches. However, one drawback is that the site is global and does not link PHCUP with local non-profit organizations. For a comprehensive list of all non-profit organizations in the Pittsburgh area, Mary should consult http://trfn.clpgh.org/organizations/all.shtml. This site lists, in alphabetical order, all local non-profits and offers contacts information and links to their web sites. This resource is excellent for finding similarly situated organizations in the Pittsburgh area.

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