A PATIENT MANAGEMENT APPLICATION FOR THE CIVIL COMMITMENT UNIT FOR SEXUAL OFFENDERS

by

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ABSTRACT

The development of a database application for the Civil Commitment Unit for Sexual Offenders will eliminate data redundancy, reduce data entry time, and provide better decision making tools than are currently available.

The purpose of this document is to describe in detail the development process and goals of a patient management application for the Civil Commitment Unit for Sexual Offenders. This project was undertaken at the University of Iowa as an undergraduate honors project and utilizes currently owned equipment and software licenses and thus is provided at no cost to the State of Iowa.

The application manages virtually all aspects of patient care for the Civil Commitment Unit for Sexual Offenders. This should result in more efficient provision of patient care. Additionally, the development process provides valuable experience for all phases of software development including specifications, development, implementation and testing, and software maintenance.

The project is implemented as a relational database in Microsoft Access with a user interface designed in Visual Basic. The database is designed with the relational model to eliminate data redundancy and the interface is designed with the end user in mind so even the most inexperienced user can accomplish data entry and retrieval as easily as possible.

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SECTION 1: INTRODUCTION

The Civil Commitment Unit for Sexual Offenders (CCUSO) was started in 1999 after State of Iowa statute 229A was passed, providing for the civil commitment of Sexually Violent Predators (SVPs) after completion of their prison terms. The purpose of CCUSO is to provide psychological and mental health treatment to committed individuals to prepare them for an eventual successful re-integration into society. [4] The therapists at CCUSO conform to state and nationwide standards for psychological testing and treatment. During the program, a wide variety of records are kept with no coordinated data storage and management application from which the therapists can draw statistics or use to communicate with other therapists or security staff. In order to facilitate effective case management and security, a robust database system is needed as an improvement over the current system of record keeping.

The remainder of this document provides a detailed description of the Patient Management Application (PMA) designed for CCUSO as well as detailed description and background information on the CCUSO program, and information on the previous and current state of electronic and paper records.

SECTION 2: MOTIVATION

Currently there is a large movement in the Department of Human Services (DHS) to streamline processes and improve current methods of conducting business. As with any business, this effort is difficult without an "information at your fingertips" type of application. A well-designed database for CCUSO is a large improvement over the current methods of managing patient case files and allows quick responses to upper management requests for information used to make business decisions.

Several problems with the current case file management system have been identified. The current system would benefit from a centralized patient record repository and communications platform in which all pertinent records are kept and from which statistics and reports may be generated. While currently in a state of transition from the old system to the PMA, the PMA assists therapists in making treatment decisions based on a patient's progress. Additionally it should improve communication between treatment and security staffs by using a common interface where information can be retrieved and stored while eliminating the data redundancy issues. Further, it will improve staff efficiency, freeing staff to concentrate on their primary job functions rather than repetitious data entry.

SECTION 3: PROJECT SUMMARY

There were several goals accomplished in this project. The first was to improve CCUSO record keeping and communication by developing an integrated database and user application. The developed system provides staff with a management tool that captures previously unavailable statistics and automates several inefficient processes. While any transition to a new record keeping system is difficult, after all staff become accustomed to the changes, the PMA should demonstrate significant savings in staff time, which directly translates to better services for the patients. The second goal was to provide experience in application development and planning throughout all stages of the project life cycle from initial discovery through implementation, testing, and maintenance. This was accomplished under general supervision of Dr. Ramon Lawrence and will continue into the maintenance phase in the future as the PMA is implemented.

The CCUSO unit is currently transitioning to the new system and will continue to do so with the help of the author of this paper over the summer of 2004. As with any software project there have been obstacles to overcome however it is estimated that most problems will have been resolved by August or September 2004.

SECTION 4: BACKGROUND

<u>CCUSO Background</u>

At the beginning of project development, the CCUSO program was housed at the Iowa Medical and Classification Center (IMCC) at Oakdale, Iowa across the highway from the University of Iowa's research campus at Oakdale. However, in October 2003 the program was relocated to the Mental Health Institute at Cherokee, Iowa approximately 300 miles away from the previous location. The program currently has a patient population of between 30 and 40 patients who have been civilly committed for an unlimited amount of time in order to complete an approved treatment program before being allowed to re-integrate into society. The civil commitment process, while similar to how someone might be committed to a mental health institute, is unique in that it applies only to a limited population of sexual offenders, which meet the following criteria:

- The candidate must be nearing completion of a criminal sentence for a "sexually motivated" offense.

- The candidate must meet the criteria established by statute for a "sexually violent predator," including determination that the individual has a "mental abnormality" or "personality disorder" that makes it "more likely than not" to engage in future acts of a sexually violent nature.

- The candidate must be referred for commitment by a Multidisciplinary Team, the Prosecutor's Review Committee, and be determined by a professional evaluator to be a high-risk for re-offending.

- The candidate must be found to be a "sexually violent predator" by a civil court. [3]

The patient then has an opportunity to complete treatment at his own pace. The basic treatment program consists of a patient's successful grasp of "12 universal treatment goals" which is then measured by progress through five phases during treatment. ([1], pg. 6) Day-to-day behavior is measured by five different behavior levels, which are not necessarily based on a patient's particular phase. For example, a patient may be on phase three which is a relatively advanced phase, but act out with inappropriate behavior and be dropped to a behavior level of one.

A patient's progress through the phases is calculated by his ability to pass several tests including a polygraph (lie detector), plethysmograph, and Abel screening, which measure truthful disclosure, sexual arousal, and sexual interest respectively. The patient's primary therapist and the security staff review a patient every 90 days. Additionally the program director, Attorney General's office and a civil court judge review each patient annually. The phases are not particularly tied to exact promotion dates as they depend on an individual patient's progress. The one definite rule is that phase two, known as the core phase, has a minimum time period of one year. ([1], pg.10)

A patient's progress up and down the behavior levels is another matter. The behavior levels are generally based on behavior reports generated by the security staff as patients act inappropriately. These behavior reports are based on infractions of rules outlined in the CCUSO_Patient Handbook. [2] Once a patient has been promoted or demoted a level, he is eligible for review again within a specific period of time. ([2], pg.12 – 13)

The patients are able to reach their treatment goals and complete the program by participation in several psycho-educational classes on topics such as relapse prevention,

victim empathy, and cognitive skills. They also participate in group therapy and individual treatment sessions that are all recorded and used to evaluate a patient's progress. ([1], pg. 9)

Virtually all of these processes have multiple forms associated with them and a lot of paperwork is generated by hand or by using a simple word processor. Very little of it is generated automatically without human calculations or data entry which has become a time consuming process. A complete list of reports kept by CCUSO that were addressed by this project can be found in Appendix B.

System Background

When CCUSO was initially set up, there were plans to hire professional programmers to create a database to maintain all aspects of patient records and case management. However, due to circumstances beyond management control, the contract was never completed. A haphazard system of record keeping was put in place as an interim measure and while still in use, is currently under transition to the PMA. The current state of data collection is an unorganized set of text documents and spreadsheets spread over four shared drives on two different servers. One of the servers is located on a separate subnet of the Department of Human Services (DHS) Enterprise Network. Each patient has their own set of flat files and case notes that are quickly growing to an unmanageable level due to the growing patient population. There is a significant lack of communication and computer literacy among the staff, which leads to the undesirable state of data redundancy and an inordinate number of hours being spent on data entry and

retrieval. There are several examples, which demonstrate this current state of CCUSO data, a few of which are detailed here.

One of the worst examples of data redundancy is the entry of clinical notes and progress notes for each patient (Appendix A). After each session of group therapy, the primary therapist must enter a note on each participant in the group. This is often the same note. Each patient has his own Microsoft Word file in which progress notes are stored. Therefore, if 15 patients participate in a group, the therapist must open each file individually and copy and paste the note into each file. This is an extremely time-consuming process considering that each therapist usually conducts two group sessions per day along with numerous individual sessions. The same situation applies to progress notes, which are entered by security staff.

At the end of each month all progress and clinical notes are archived which involves opening each Microsoft Word file, saving the previous month's notes to another folder, and then cleaning out the previous month's notes in preparation for the current month. If the current population is 35, this means that 70 files must be opened, saved to a different network share, and old notes deleted. The newly archived notes are then printed on paper to be filed in each patient's permanent paper record.

Another example that highlights the lack of communication in the current processes is the processing of behavior reports (Appendix A) written by security staff. Once a patient commits an infraction, the security staff involved enters the appropriate information in a Microsoft Word document and manually assigns a case number. The report is then stored on one share on the file server and a supervisor is notified that a report has been written. The manual assignment of case numbers leads to an inconsistent

numbering system and file naming conventions. This makes retrieval of specific reports difficult, as each file that doesn't have the proper name must be opened to find the one being searched for when the report is ready to be reviewed. Also, two staff reporting on the same incident may end up assigning two separate case numbers, which further complicates things for the investigating supervisor.

Once the supervisor has had a chance to review the report, it is saved on a separate network share and the patient has the opportunity to appeal the report to the security director who has seven days to respond to the appeal. There was no automated system that notifies a supervisor or the appellate authority that a report is ready for processing or review. Information is passed strictly on paper and by word of mouth. This leads to report appeals not being completed on time, which in turn opens the unit to a lawsuit, by the patient in question.

Other reports which are currently calculated by hand are quarterly review dates (Appendix A) for each patient, patient's age range grouped in ten year increments, patient daily status sheet, and review dates for patient behavior levels. This is tedious work that consumes countless staff hours generating reports that could be done much more quickly if they were stored in a central location.

The old data storage and networking system was housed on two separate servers. The main file server was located off campus at the Mental Health Institute in Independence, Iowa. This server stored the majority of documents on three separate network shares named svp_asst$, svp_ark$, and ccusso_pss$. It had a storage capacity of 20 GB and held 12.1 GB of data. Another small file and print server was located onsite at the CCUSO unit and stored an additional 1.5 GB of data in a suprvsr$ share used

primarily by the supervisors for administrative purposes such as level review information and patient personal effects inventory.

A variety of personal computers (PCs) were used to access the network with the baseline system containing an Intel 433 MHz Celeron processor with 128 MB of RAM and running either Windows 95 or Windows 98. These computers as well as the onsite server were on their own internal Local Area Network (LAN) that is subnet of the much larger DHS Enterprise Wide Area Network (WAN). The current number of users of the CCUSO network is approximately 40 but this is scheduled to expand to a total of 57 full-time employees by the end of 2004.

SECTION 5: SYSTEM DESCRIPTION

<u>Development Process</u>

This project was developed as a software engineering project and while there was definite overlap of phases, some adherence to a project timeline was attempted in accordance with good software engineering practices. This project was completed in several different phases from June 2003 to May 2004 and although some slips occurred in during different phases of the timeline, the overall project was eventually completed within a few weeks of the final deadlines.

Phase one included project proposal and discovery, which was an in-depth exploration of CCUSO business rules. These rules then were translated into project requirements and specifications. This was accomplished through this author's own extensive knowledge of CCUSO procedures, personal interviews conducted with both management and line staff, and review of CCUSO internal documentation. During this phase CCUSO management was be encouraged to look at current business practices and take this opportunity to revise them rather than just try to translate the current paper system directly into a database environment.

Some guidelines were established in the project proposal as to what the application would and would not provide due to time constraints of the project and perhaps some unrealistic expectations by the end-users of the application.

Phase two of the project was the database design. The database was designed using a relational model. The design was done independently of any particular software package and the Entity-Relationship diagrams and normalization of tables was

completed during this phase. This provided a strong foundation for development during the third phase and was completed in late October that was the first departure from the assigned timeline completion date of September 30, 2003.

Phase three of the project consisted of implementation of the database design in Microsoft Access as well as coding of the application in Microsoft Visual Basic 6.0. This phase took most of the fall semester and a good majority of the spring semester from October 2003 – April 2004. This was an overlap of the testing phase of the project during which time various builds were done and installed onsite at the CCUSO unit at Cherokee, IA for evaluation and testing. While a close working relationship was attempted with the CCUSO management staff as well as periodic project update reports to ensure that the project remained on track, the large distance between the development site and the deployment site proved to be a large obstacle to development.

Phase four began with end-user testing of the application to ensure that all agreed upon specifications had been implemented. Because of careful planning and coordination during the development phase, bugs were recorded and fixed during this final phase using and informal reporting process. Unfortunately during this phase, all staff members were not able to attend at least one training session so training was received from other staff who had been introduced to the system rather than the developer.

One test system with test data was set up in order to allow staff to practice entering and retrieving data, generating required reports, and adjust to the idea of using new procedures. This allowed staff to feel free to explore the application at their own pace and not worry about contaminating the data in the real database depending on their

own levels of expertise. Also, because all data entered into the test system was not confidential, login restrictions were removed to allow all staff access to all parts of the application so that those staff that desired could explore and gain an understanding of the PMA in its entirety. It should be noted that the actual application has login procedures designed to limit access to certain parts of the PMA based on the role of particular staff members. During the initial testing, groups were developed with generic logins to control access to the database information. At the time of writing, final decisions as to exactly which particular staff members would have access to which information had not been confirmed by CCUSO management. As noted previously, phase 4 had some significant overlap with phase three and led into the maintenance phase of development.

The maintenance phase of the project is still ongoing and debugging and testing of the PMA is expected to last at least through May 2004. More information on this is included in the future work portion of this document.

<u>Architecture Overview</u>

The new CCUSO program management application consists of a relational database designed independently of any particular Database Management System (DBMS) to prevent any particular platform specific issues from interfering with the design process. The relational database design was implemented with Microsoft Access and a graphical user interface designed in Microsoft Visual Basic 6.0 is used to access the data.

The database itself resides on a Dell dual processor server with a 70 GB storage capacity that was specifically purchased for the CCUSO unit to replace old equipment.

This is a significant increase in storage and computing capacity and eliminates the old two server storage system that was used previously. The Visual Basic application is installed on individual personal computers (PCs) with the baseline system being a Gateway P-III with 128MB of RAM and running either Microsoft Windows 2000 or XP. Prior to application deployment, all desktop operating systems were upgraded to a standard Windows 2000 installation with Microsoft Office 2000 or a factory-installed Windows XP configuration with Microsoft Office 2000.

The data on the server is accessed from the PMA interface using Standard Query Language (SQL) [6] statements in the Visual Basic code which are passed through the built-in Active-X Data Objects (ADO) in Visual Basic and the standard Microsoft Data Access Components (MDAC) that are an integral part of the windows operating system.
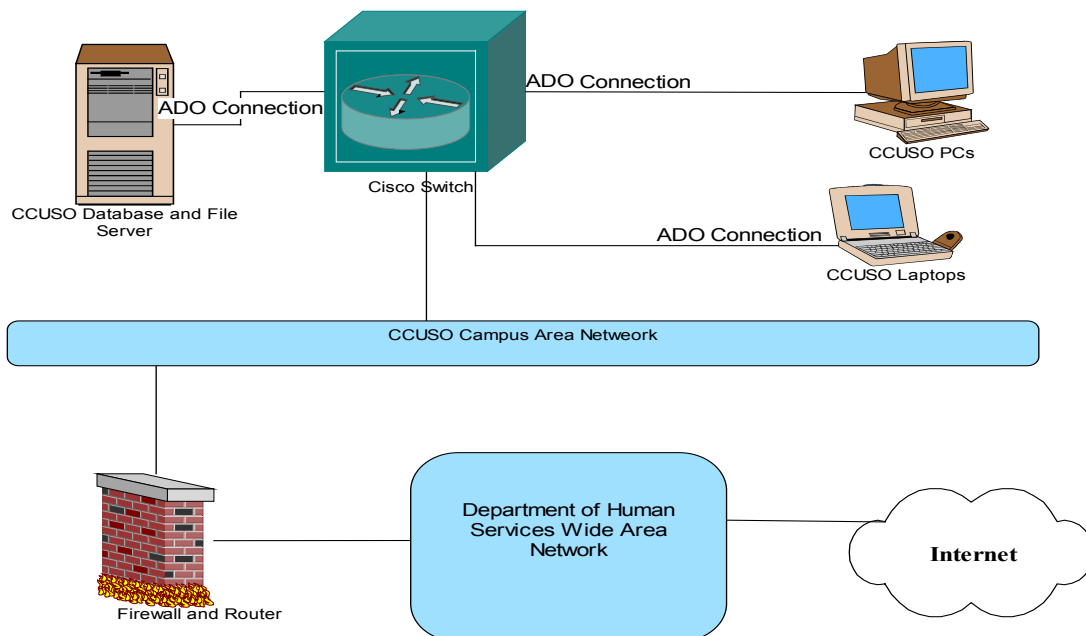

Figure 1: CCUSO Basic Network Diagram

The reason that this particular architecture was selected was conformity to current DHS standards and an attempt to develop with assets currently owned by CCUSO without additional expenditures. CCUSO currently holds licenses for Microsoft Office 2000 for all PC's currently owned. Additionally licenses for Visual Basic 6.0 were already owned prior to application development. All new computer purchases were part of the change in locations rather than being purchased specifically to run the PMA and thus were not considered an expense related to development. The application also needed to run on current PC equipment so the choice to use older software was not necessarily detrimental to the project. Ideally, the PMA would be ported to run on Microsoft SQL Server 7.0 on the new server purchased for the CCUSO unit with a Visual Basic or web-based front-end. However, at the time of writing, while there are servers that run Microsoft SQL Server at the Cherokee, Mental Health Institute, a license has not been acquired specifically for the CCUSO unit. Also, there are currently bureaucratic issues internal to the Department of Human Services, which in the future may preclude individual institutions from running their own SQL servers. For this reason, porting of the project to Microsoft SQL has been assigned to future work.

<u>Database Design</u>

The database for CCUSO was designed using the relational database model. [6] Due to political issues internal to DHS, it was determined by the information technology administrator at the Cherokee Mental Health Institute that proper final implementation and maintainability on Microsoft SQL Server 7.0 could not be achieved due to

Department of Data Management constraints. Therefore the final project database implementation will remain in Microsoft Access.

The CCUSO database consists of XX tables and has been optimized to reduce data redundancy. All relationships between entities have been reduced to one-to-many relationships by using entity-relationship (ER) diagrams to visualize relationships between various tables and intermediate entities.

Central to the database and ER diagram are the patient and employee entities. These two entities relate in some way to all other entities in the table and have the following attributes. As these two entities are central to the database design, the attributes are listed here. For a complete listing of all entities, attributes, and data types of each attribute please see Appendix C.

Patient	Employee
PT_ID	
PT_LNAME	
PT_FNAME	
PT_INITIAL	EMP_PK
PT_SSN	EMP_LNAME
PT_DOB	EMP_FNAME
PT_ADMIT_DATE	EMP_INITIAL
PT_LEVEL	EMP_SSN
PT_PHASE	EMP_HIRE_DATE
PT_ETHNICITY	EMP_SENIORITY_DATE
PT_WEIGHT	EMP_POSITION_NUM
PT_HEIGHT	TITLE_CODE
PT_WARD	
PT_ROOM	
PT_BED	

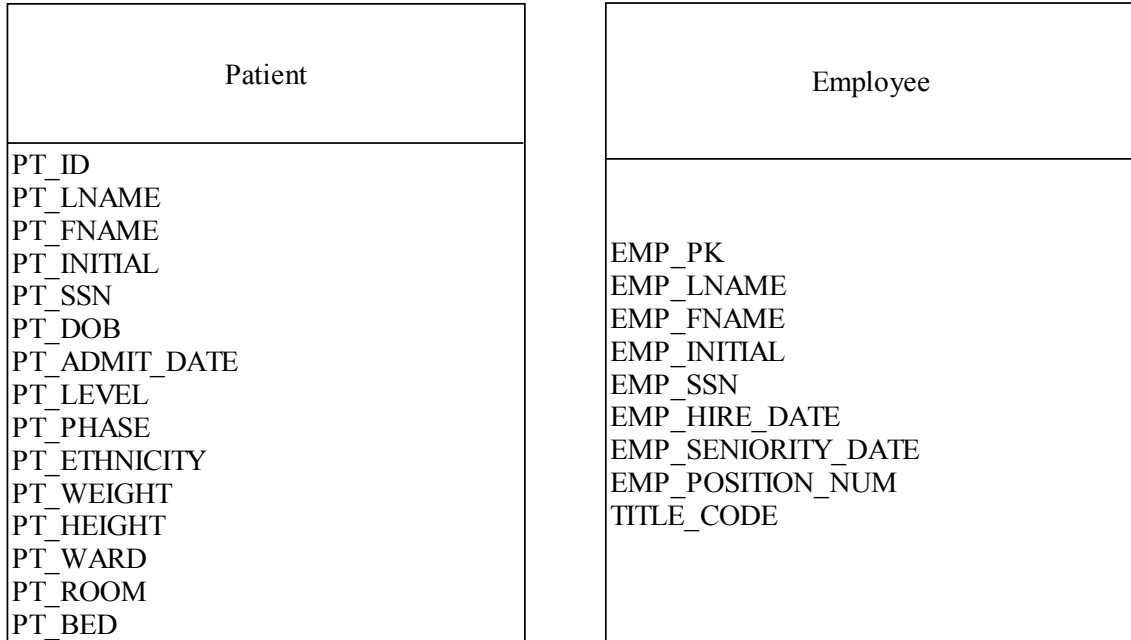**Figure 2: CCUSO Patient and Staff Entities**

Due to the many relationships in this database that connect to both the patient and employee entities, the ER diagram has been broken into three sections for readability.

The patient and employee entities are the same in each section of the diagram. All relationships are one-to-many unless otherwise noted. The ER diagram may be visualized as follows:
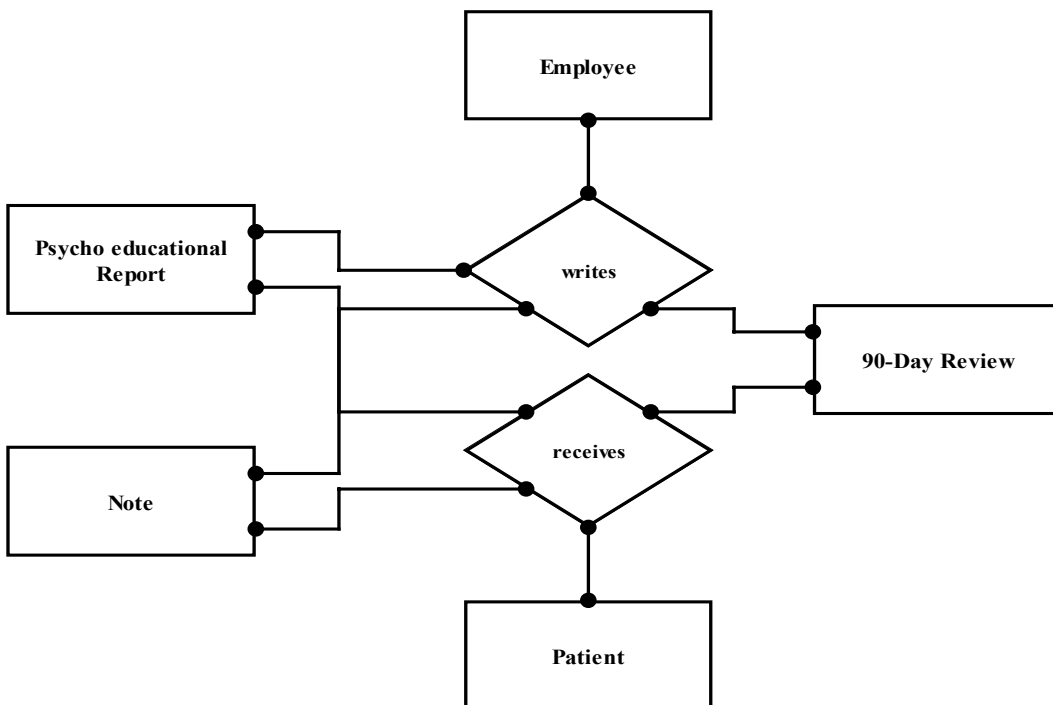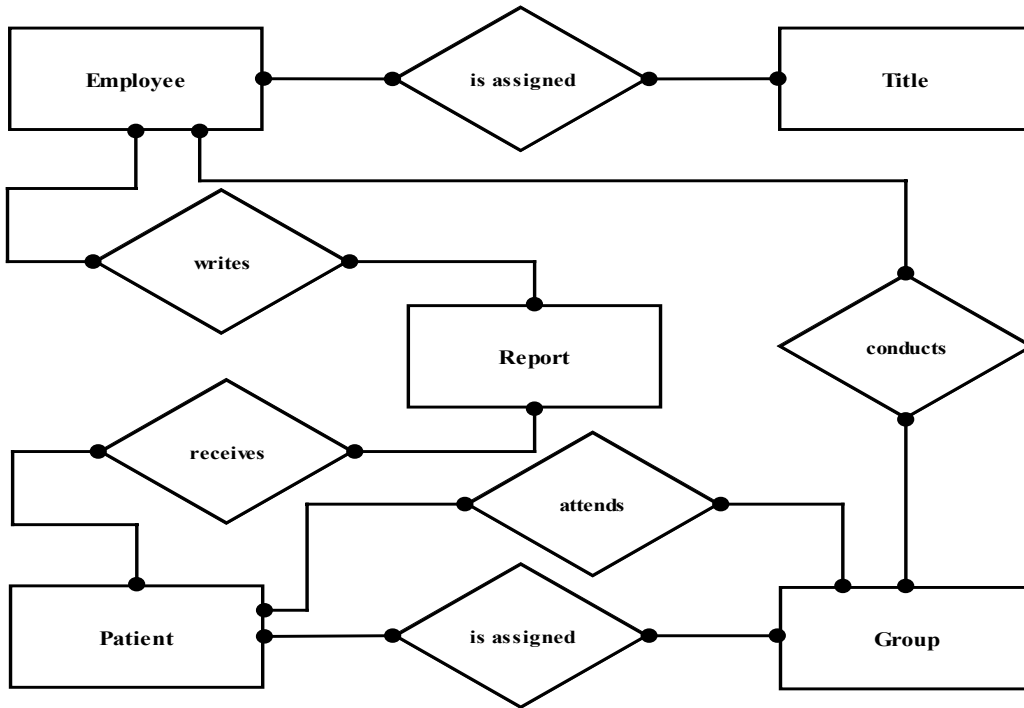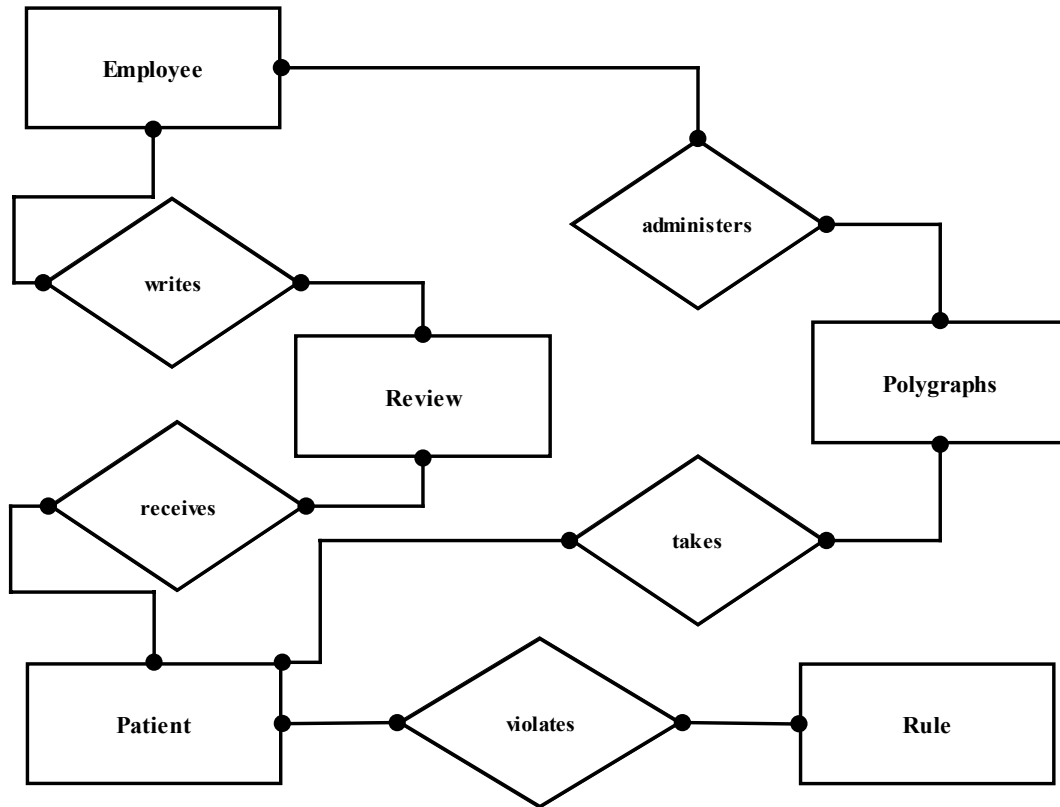
Figure 3: ER Diagrams

The majority of other entities in the database are involved in maintaining data for specific data reports that have been consolidated or replaced as listed in Appendix A or new reports that are available because of information included in the database as listed in Appendix B.

Application Interface Design

The PMA interface was designed with the least computer literate users in mind in anticipation that some of the staff at the CCUSO unit may have little or no training in computer use. Care was taken to reduce the amount of information that staff has to know about when, where, and how data is stored. All possible functions of data entry were automated as much as possible during the time frame permitted for development.

The PMA main screen is designed using the SSTab control from Visual Basic, which acts as a container for the rest of the controls on the main screen. There are six tabs on the main screen, which depict the five basic categories of the PMA. These categories are security, therapy, reports, patient administration, and employee administration. Command buttons on these separate tabs then lead to data entry screens or reports for each separate subsection of the application.
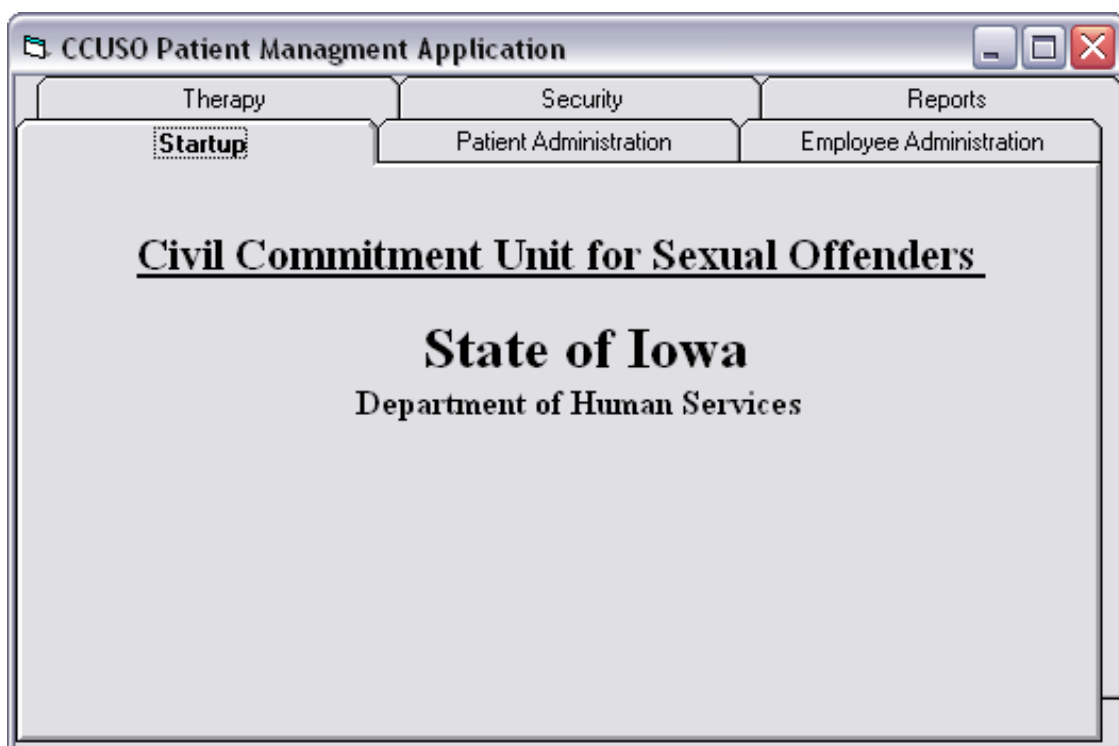

Figure 4: Application Main Screen with Tabbed Interface

Each of the categories is reached by simply clicking on the appropriate tab. On each tab are command buttons that lead to sub-categories and input screens.

The main focus of the PMA is the tracking of patient information from the time they enter treatment until the time they are discharged. This begins with a basic entry

screen with all pertinent information entered at the time a patient comes to the CCUSO

unit. Additionally, this information must be easy to quickly update and obtain current

data on each patient. This is done through the original patient information screen and the

update patient information screen that keeps track of everything from a patient's primary

therapist and behavior level to what medications they are on and what room and bed they

sleep in.

The initial patient input screen and the patient update screen show virtually

identical information on a patient. However, because there are some information that

should not be updated or changed in the database, certain information on the patient

update screen is made unavailable during normal operations to prevent inadvertent

changes being made to critical data. For example, the patient number should never

change as this is used as the primary key for the patient in the database. Likewise other

information such as birthdates and admission dates should not be changed since these are

used to calculate statistics from the database such as age and length of stay for individual

and group reports. Only the information that updates frequently is available in enabled

text boxes on the patient update screen.

Figure 5: Patient Intake Screen

Under the patient administration section are command buttons, which lead to data entry screens dealing with various aspects of maintaining patient files. The majority of these input screens represent what was previously maintained in separate Excel spreadsheets or Word files for each individual patient. For example, the input screens for behavior logs, polygraph logs, criminal history, disclosure log, and general comments were all separate Excel spreadsheets for individual patients. These screens alone consolidate approximately 200 separate spreadsheets.

Each of these data entry screens consist of dropdown combo boxes from which the patient's name is selected. The date is entered through the use of a date-time picker control, which contains a dropdown calendar from which the date of a specific event may be selected. This control is available only with service pack 4 and above for Visual Basic 6.0. The specific advantages of using this control are that code to format a date entered into a text box may eliminated and the date is already in a form compatible with the Microsoft Access database. The other controls on these forms include a textbox into which the incident of record is typed and may or may not include a dropdown combo box for the author of the information depending on which type of information is being recorded. Shown below is the input for behavior log entries to demonstrate the general form of these screens. As the forms for each of these data entry screens have generally identical data entry text boxes.
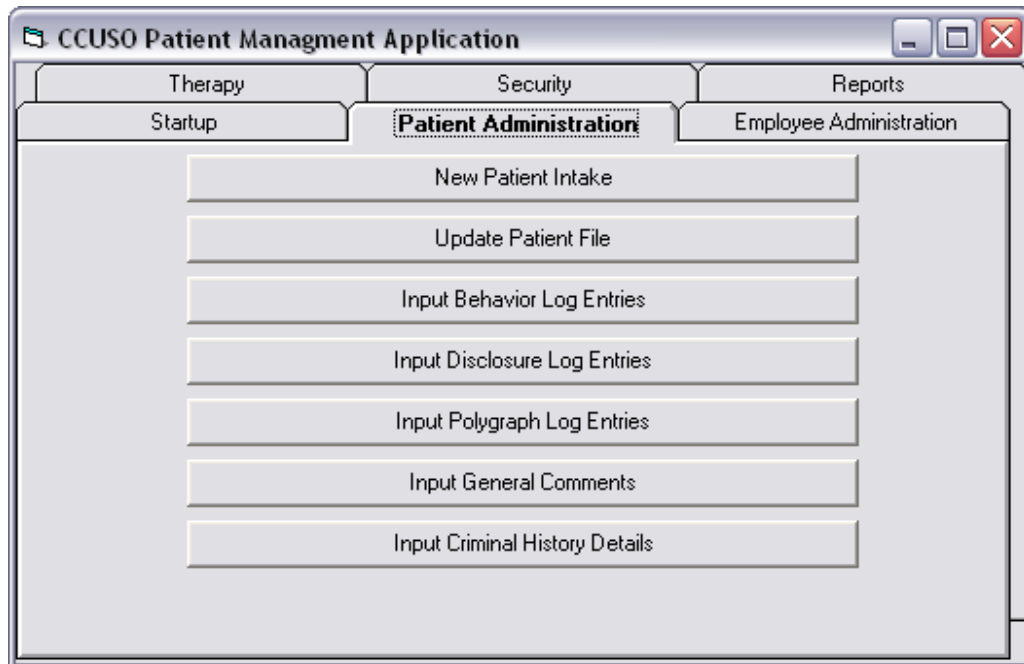
Figure 6: Patient Administration Screen

Figure 7: Example of Basic Data Entry Screen Demonstrating Dropdown Boxes for Patient and Staff Name Selection

Figure 8: Example of Basic Data Entry Screen Demonstrating the Date-Time Picker Control

Once all of the data has been typed or selected in the boxes on the screen; the information is then entered into the database by clicking on the command button at the bottom of the screen.

The next category of the PMA is the staff administration section, which is similar to the patient administration section. Although not as much information is kept on staff members, there is still sufficient information stored in the database that would allow future development or add on components to create a staff scheduling application from the PMA. This was specified in the original project proposal and will be discussed further in the future work section.

There are only three screens in the staff administration section. A data entry screen is used to input initial staff hiring information such as hire date, seniority date, and social security number etc. An update screen is used to modify information on staff members and, similar to the patient update screen, has certain information disabled so that critical information cannot be changed by accident. The third screen in this section is

the staff titles screen. This is used to create three letter codes for staff titles to reduce the size of information stored over time in the database. For example, the clinical director has a code of CDR and the treatment program supervisors have the code of TPS. This closely follows the abbreviations already used in the CCUSO program for specific job titles and this screen is merely a vehicle to input these codes into the database.

The third category of the PMA is the area dealing with security. This is an important section because by law, the CCUSO unit is required to be housed in a secure facility. This section provides standard reporting input forms and an easy way to consolidate different staff entries pertaining to the same incident or occurrence. A data entry screen is also used to input notes made on each ward known as behavior observation logs. This has replaced the "progress note" entries that were specified in the original proposal. This consolidates an additional large spreadsheet that was kept on each ward separately and allows for easier searching by patient name rather than hunting through three or four days worth of entries to find observations entered on a single patient.

The incident report screen is simply an input screen to use when creating an incident report. Incident reports are used for any event not specifically covered by one of the other occurrences on which staff members are required to provide documentation. The advantage to including this in the PMA is the creation of concise entries that can be formatted in a standard fashion. Previously incident reports and well as behavior reports were formatted differently depending on the staff member writing the report. This was mostly due to a poorly designed form in Microsoft Word that tended to change over time. The incident report screen has spaces for case number, a dropdown list from which to

choose the author's name, standard date and time selection boxes, and a large textbox in which to enter the details of the incident.

Figure 9: Example of Incident Report Screen

The behavior report in this section is central to the behavior modification program at CCUSO and of particular interest are the problems, which have plagued the writing of these reports since the unit began. Many times several staff members are required to report on the same incident. This has lead to reports which, although dealing with the same case, may in fact have different case numbers and are delivered to the supervisors on several different sheets of paper at different times creating confusion when cases are reviewed.

This problem was tackled by making two separate data entry screens for behavior reports. The first of these is a screen is utilized in creating the initial behavior report. On the left side of the screen, a list of minor, major, and felony violations as listed in the

patient handbook are displayed in a listbox. [2] This allows staff to simply click on the checkbox next to the item or items in the list being reported on which places a checkmark next to that particular violation. When the command button is clicked to create the report, those violations with checks next to them are entered into the database and connected to a particular report through the use of the primary key of the report being used as a foreign key in the violations table. Using the violations in this manner will improve the writing of behavior reports since it forces staff to tie incidents to particular rule infractions in order to create reports.

Other features of this behavior report origination screen are dropdown lists from which to choose the report author and the patient being reported on. Also found here is automatic generation of case numbers. This is a significant improvement over the old system of case numbering which consisted of the date and patients initials. This contributed to confusion, as each staff member reporting on an incident would type in his or her own case number on separate behavior report forms. A wrong date or patients with duplicate initials created problems for the staff reviewing reports as they tried to piece together all documents belonging to the same incident. On the new behavior report screen, after the patient is selected, a case number is automatically generated based on that patient's number and initials. This eliminates human error and provides a unique identification number for each case, which may be used to identify all separate reports on a single incident.

Standard date-time picker controls are also part of this screen so that times and dates are entered into the database in a standard format. This eliminates the previous

practice of using different time and date formats depending on which staff member was

doing the reporting.

Figure 10: Behavior Report Origination Screen

Once this initial report has been created, the staff member authoring the report can

either close this screen or go directly to enter the details of the report. This second data

entry screen solves the problem of having many different staff reporting on the same

incident with different case numbers. The list of available reports is displayed in a

dropdown list from which the desired report is selected. The rest of the information

pertaining to the report is then automatically queried from the database and the patient's

name, incident time and date, and incident location is automatically populated from this

query. A list of the violations being reported on is displayed in a listbox on the left side of

the screen as a reference. The staff member then enters their information on the incident

into the textbox.

After all staff have reported on a certain incident, the case is reviewed by a supervisor who places a checkmark in a checkbox. This Boolean value is updated in the database after which a particular report is no longer listed on the behavior report details screen. Having details entered in this fashion on the same case number will alleviate the issue of having several different versions of a report on separate pieces of paper as all staff input will be displayed with the same case number on the same sheet of paper when printed.

The fourth tab on the main screen leads to the therapy section of the PMA. This category is where the treatment notes and reviews of patients are entered into the database by the unit therapists. This area also helps to eliminate many individually stored Microsoft Word documents. By utilizing the 90-day review forms 160 individually stored documents per year are eliminated and the clinical note form lead to better note writing by the therapists due an improved interface than that used previously and eliminates and additional 40 Microsoft Word documents. Entry of the clinical notes into the database also eliminates many hours spent each month archiving the notes. Elimination of the archiving procedure saves approximately five to six hours each month and eliminates 480 archived Microsoft Word files stored each year.

The 90-day review forms here are similar to those used in the security section for the behavior reports in that one form is used to initiate a 90-day review and another form is used to enter the details and complete the 90-day review. Once a review has been initiated on the 90-day review setup screen, it then appears in a dropdown list on the 90-day review details screen. The 90-day review setup screen displays dropdown lists from which the patient being reviewed, the reviewer, and the date may be selected. Also a

textbox appears into which the sequence number of the review may be entered. This is necessary only for the transition to using the PMA from the current system. After one 90-day review has been completed, the computer may calculate the sequence numbers and the manual entry of these numbers dispensed with.

The 90-day review details screen displays all information pertinent to the patients review. This information will also be displayed on the final paper form once the review is printed out for signatures by the primary therapist and the patient. Upon selection from the list of available reports, the patients name, number, months in program, reviewer, and treatment phase are automatically filled in to ensure that the correct 90-day review has been selected. The patients are rated on 12 treatment goals with a brief text entry on how the patient performed during that quarter and a separate text entry on how the patient is able to improve their score for each particular goal.

Each of the 12 goals upon which the patient is being rated is selected from a dropdown list as well as the score assigned to that category. Once the text has been entered for a particular goal, these steps are repeated until all 12 goals have been assessed. Once a review is complete, the review complete check box in the upper right corner is checked and the Boolean value is updated in the database. Following this update, that particular review is no longer available in the dropdown list.

Figure 11: 90-Day Review Details Screen

Another tool for the clinical staff found in the therapy category is the ability to enter individual and group notes pertaining to an individual's treatment progress. The form for entering a note on a single individual is reached by clicking on a command button on the screen and is nearly identical to those forms covered previously for entering information pertaining to an individual patient. The form for entering group and individual notes is a different case altogether.

The group and individual note form is used to document group therapy sessions which are the primary form of treatment at the CCUSO unit. Since a therapist is required to document each patient's participation in a group, the previous system involved opening up an individual Microsoft Word for each patient. Due to time constraints, the note in each patients file was often just a duplicate of one note, which was copied and pasted between Word files. This was not only time consuming but led to poor

documentation procedures. The PMA addresses this issue by using a single form on which notes may be entered for all patients, which participated in a particular group as well as a general note pertaining to the group therapy session as a whole. When the form is activated, a particular group, therapy session, and group therapist are selected from two dropdown lists. Selecting all patients listed in a certain group and creating a set of labels and textboxes that correspond to each patient then dynamically creates the rest of the form. The therapist may then enter notes individually for each patient. Upon clicking the command button at the top of the form, all notes are entered simultaneously into the database. This is estimated to initially save approximately six to eight hours of data entry time per week with an additional benefit realized later as better documentation aids in more effective treatment decisions.

Figure 12: Group and Individual Note Entry Screen for Treatment Groups

One deviation from the standard look and feel for the PMA was selected for this form. The command button was placed near the top of the form instead of at the bottom. While this may slightly interrupt the natural flow of data entry, placing the command button at the bottom of the form would have required extra programming to dynamically place it on the form each time a different group is selected, as there is no set size for each group. Placing it in this position allows the labels with patient names and the text boxes for text entry to be dynamically replicated and placed on the form at runtime without regard to the placement of the command button. While initially this may present a small learning curve for the therapists entering notes, it should not prove to be an insurmountable task.

SECTION 6: RESULTS AND USAGE

At the time of writing, the PMA is still in a transitional phase at the CCUSO unit. Basic data entry has begun and the small amount of feedback received has been generally favorable. It is anticipated that at least two more versions will have to be developed and installed before the transition will be fully complete.

SECTION 7: CONCLUSION

Due to the nature of patients in the CCUSO program, rigid rule sets, extensive psychological testing, and complete documentation in all case files is necessary to both protect the state and assist patients in fully completing their treatment program. However, all of this collected information is underutilized and in some cases pointless if it cannot be easily searched or statistical comparisons made between patients. The final result of the program management application should in the end alleviate many of these problems and save numerous man-hours of time spent by psychologists and security staff wading through separate files.

Many valuable lessons were learned during the development of this project. Learning to overcome a distance barrier of nearly 300 miles between developer and customer was especially challenging. Also, adherence to original specifications is important to avoid "scope creep" as the customer wants to add more and more features to the application.

Overall this project was a moderate success although some work was not accomplished within the timeline established.

SECTION 8: FUTURE WORK

As with most software development projects, there are always items and bugs left over after initial delivery. This begins the maintenance phase of an application. One thing that would be extremely helpful to the client is integration of the login/authentication procedures with the standard Microsoft Network procedures already in place on the network. This way, once the Windows domain has authenticated a user there is no additional need to have a separate login and password to access the PMA. Additional reports should be developed as well as refinement of current reports to more fully utilize all available stored information to provide good statistics when making decisions about the program. Ideally as mentioned before, this application would be converted to run on Microsoft SQL server in the future with a web-based interface. These items will be considered and possibly developed as a volunteer project in the future.

REFERENCES

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APPENDIX A: EXAMPLE REPORT DOCUMENTS

It should be noted that due to the confidential and controversial nature of the

CCUSO program, all identifying information pertaining to both staff and patients has

been deleted, changed or replaced with generic non-descriptive labels.

Date/Time	Clinical Notes
7-7-03 Assertiveness Training	Handed out an Assertiveness Training Quiz and had the men work on the answers. We then read the Group Rules and Expectations and had a good discussion regarding them. Following that, we began to discuss the first two questions. Therapist 4
7-8-03 Personal Victimization	Went over the focus during this quarter in PV. Resentment lists, resentment letters and forgiveness being the primary objectives. Also, established rapport with new caseload, i.e., DG, JB and AH. Therapist 1
7-8-03 Small Group	Xxxx X shared some personal history up until he finished his 3rd tour of duty in Southeast Asia. I identified emotional points of his history, i.e., aunt Xxxxxx, leaving parents in CA, abusive father and friend KIA in Nam. Will pick up. Also discussed uniqueness and purpose of small group. Therapist 1
7-9-03 Relapse Prevention	TG, DT and RG were congratulated on completing Blue Book and moving to Brown Book. I gave them their brown books. Spent the group time going over the new patient handbook. Received feedback and some grumbling. Issues to be addressed are clothing-many patients have only a few pair of underwear. Supervisor 1 said he would try to get some resolution; wage issues. I discussed this with the Program Director. Emphasis was placed on advancing in the phases of the program. Also pointed out new policies when we arrive to Cherokee. Therapist 1
7-9-03 Small Group	Continued discussion of the patient handbook. Therapist 1
7-10-03 Victim Empathy	Discussed process for this group. The major goals being for patients to identify with their victim, demonstrate insight into the feelings of their victims and express meaningful remorse for their offenses. The expectation is that patients will write out victim sheets, amends letters and letters "through the victim's eyes". We will have the patients share victim sheets, discuss the similarities/differences between the specific victim and the offender, while this is going on I will get with another patient to rehearse role-playing the part of the victim. We will then conduct the role-play and get feedback from the perpetrator and the rest of the group. This is a format that is recommended in the Handbook for Sexual Abuser Treatment. We will see how this goes. I went over this with the patients. Especially the fact that this may bring out strong emotions and that is ok, but they will have to find appropriate ways to express their feelings in group, i.e., crying, anger without attacking, respecting others in the group, etc. Therapist 1
7-10-03 Small Group	JB shared his personal story (life history) with the group. This was done to establish rapport and gain some insight about Xxxxx. He did a fine job. He became emotional at several points related to his close relationship with his sexually abused sister, a crush he had on his 5th grade teacher, keeping family secrets and family shame. He finished today at age 14. Group gave him very good feedback. Therpist 1
07-11-03 Disclosure Group	Group was cancelled this a.m. due to conflict of scheduling with H.S. Therpist 2

Figure 13: Clinical Notes. This document contains the same entries multiple times for multiple patients leading to large amounts of redundant data. Typically seven or eight pages like the one above are generated for each patient every month.

CCUSO BEHAVIOR REPORT

Patient: Xxxx Xxxxx   Case No.:011007xxx
Date of Infraction: 10/07/01   Time: 5:19
PM
Location of Infraction: IMCC Dining Hall
Person(s) Involved/Witnesses: Security Staff 1, Security Staff 2, Security Staff 3, Patient
Xxxxx Xxxxxx, Patient Xxxxx Xxxxxx, Patient Xxxxx Xxxxxx, Patient Xxxxx Xxxxxx.
Brief Description of Infraction: Patients Xxxxx Xxxxxx Xxxxx Xxxxxx, Xxxxx
Xxxxxx, and Xxxxx Xxxxxx sat with each other during lunch on 10/07/01. Patients
Xxxxx Xxxxxx and Xxxxx Xxxxxx are on diets. It is the general practice on the CCUSO
unit to have patients on diets sit together away from non-diet patients to ensure that the
diets are complied with. Patient's Xxxxx and Xxxxx were directed not to sit together by
Security Staff 3 at lunch on 10/06/01.

Staff Reporting Infraction: Security Staff 1   Date: 10/07/01
Staff Signature: _____   Date:
INVESTIGATION DISPOSITION
Investigation Deadline: 10/14/01
Investigator: Supervisor 1   Completion Date:
10/07/01
                              Signature

Summary of Findings:
Xxxx stated that he had heard what Security Staff 3 told him about the seating
arrangements, but said that he gets a special diet plate (gets a shake with his meal) We
informed him that we wanted him to sit at the tables with the rest of the patients and this
would be a warning. He stated he would like to be at the table with Xxxxx to help him
eat and carry his tray. He was informed we would review the situation at a later date to
determine whether this is working or change the seating. Xxxxx agreed to comply.
Appeal Wanted: Appeal
Waived:
Patient Signature:

CC: Program Director
        Clinical Director
TPS copy

**Figure 14: Behavior Report. This report has the potential to be updated by three
sets of people including the author, reviewing supervisor, and security director if
appealed. Also noted here is the lack of rule citations typical of report-writing
inconsistencies.**

Last	First	CCUSO #	DOC #	Admit Date	1st Qtr Review	2nd Qtr Review	3rd Qtr Review	Next Annual Review	Therapist
Xxxxx	Xxxxx	010306	910930	6/9/2003	9/7	12/7	3/6	6/9/2004	Therapist 1
Xxxxx	Xxxxx	010202	0207247	02/01/02	5/2	7/31	10/29	02/01/04	Therapist 1
Xxxxx	Xxxxx	010109	0800935	09/05/01	12/4	3/4	6/2	09/05/03	Therapist 2
Xxxxx	Xxxxx	010204	1012754	04/29/02	7/28	10/27	1/25	04/29/04	Therapist 1
Xxxxx	Xxxxx	020305	1020700	05/23/03	8/21	11/20	2/18	05/23/04	Therapist 3
Xxxxx	Xxxxx	010207	0902006	07/19/02	10/17	1/15	4/15	07/19/03	Therapist 2
Xxxxx	Xxxxx	020205	0803580	05/21/02	8/19	11/18	2/16	05/21/04	Therapist 2
Xxxxx	Xxxxx	039910	0802832	10/25/99	1/23	4/23	7/22	10/25/03	Therapist 2
Xxxxx	Xxxxx	010102	1053124	02/02/01	5/3	8/1	10/30	02/02/04	Therapist 3
Xxxxx	Xxxxx	020211	1012633	11/27/02	2/25	5/26	8/24	11/27/03	Therapist 2
Xxxxx	Xxxxx	010305	1122054	05/02/03	7/31	10/30	1/28	05/02/04	Therapist 3
Xxxxx	Xxxxx	020004	0791198	04/17/00	7/17	10/15	1/13	04/17/04	Therapist 2
Xxxxx	Xxxxx	029910	0400074	10/15/99	1/13	4/13	7/12	10/15/03	Therapist 2
Xxxxx	Xxxxx	019910	0808056	10/14/99	1/12	4/12	7/11	10/14/03	Therapist 1
Xxxxx	Xxxxx	020207	0081040	07/22/02	10/20	1/18	4/18	07/22/03	Therapist 2
Xxxxx	Xxxxx	010001	0103408	01/07/00	4/7	7/6	10/4	01/07/04	Therapist 3
Xxxxx	Xxxxx	010205	0803735	05/10/02	8/8	11/7	2/5	05/10/04	Therapist 1
Xxxxx	Xxxxx	020403	0207218	04/30/03	7/29	10/28	1/26	04/30/04	Therapist 3
Xxxxx	Xxxxx	010208	0207151	08/05/02	11/3	2/1	5/2	08/05/03	Therapist 3
Xxxxx	Xxxxx	010101	0805802	01/18/01	4/18	7/17	10/15	01/18/04	Therapist 1
Xxxxx	Xxxxx	010301	0206152	01/20/03	4/20	7/19	10/17	01/20/04	Therapist 2
Xxxxx	Xxxxx	010002	0021558	02/03/00	5/4	8/1	10/30	02/02/04	Therapist 1
Xxxxx	Xxxxx	020107	0017965	07/13/01	10/11	1/9	4/9	07/13/03	Therapist 3
Xxxxx	Xxxxx	030107	0800984	07/23/01	10/21	1/19	4/19	07/23/03	Therapist 2
Xxxxx	Xxxxx	019904	1028710	04/21/99	7/20	10/19	1/17	04/21/04	Therapist 1
Xxxxx	Xxxxx	010010	1092549	10/05/00	1/4	4/3	7/2	10/05/03	Therapist 2
Xxxxx	Xxxxx	020102	0804809	02/06/01	5/7	8/5	11/3	02/06/04	Therapist 1

Due dates for July 03 reviews: Annuals In Italics
7/2 Lastname (3rd)   7/13 Lastname
7/6 Lastname (2nd)   7/19 Lastname
7/11 Lastname (3rd)   7/22 Lastname
7/12 Lastname (3rd)   7/23 Lastname
7/16 Lastname (1st)
7/17 Lastname (1st) Lastname (2nd)
7/19 Lastname (2nd)
7/20 Lastname (1st) Lastname (3rd)
7/22 Lastname (3rd)
7/28 Lastname (1st)
7/29 Lastname (1st)
7/31 Lastname (1st)

Figure 15: Quarterly Review List. This list is manually generated and updated in a Microsoft Excel spreadsheet each month.

APPENDIX B: COMPLETE LIST OF DOCUMENTS
AND REPORTS

Report	Current Format	Number	Frequency Generated	Current Location
Clinical Notes	Microsoft Word	1/Patient	1/Month	svp_asst$
Progress Notes	Microsoft Word	1/Patient	1/Month	ccusso_pss$
Psychoeducational Report	Microsoft Word	1/Patient	1/Quarter	svp_asst$
Behavior Log	Microsoft Excel	1/Patient	As needed	ccusso_pss$
Level Review Dates	Microsoft Excel	1/Unit	Continuously Updated	suprvsr$
Polygraph Log	Microsoft Excel	1/Unit	Weekly	svp_asst$
Disclosure Log	Microsoft Excel	1/Unit	Weekly	svp_asst$
90-Day Review Dates	Microsoft Excel	1/Unit	Monthly	svp_asst$
Behavior Report	Microsoft Word	Individual	As needed	ccusso_pss$ and svp_asst$
90-Day Review	Microsoft Word	1/Patient	1/Quarter	svp_asst$
Patient Status Sheet	Microsoft Word	1/Unit	Daily	ccusso_pss$
PPG Assessment Log	Microsoft Word	1/Unit	Monthly	svp_asst$
Criminal History	Microsoft Word	1/Patient	Once	ccusso_pss$
Patient Personal Effects Inventory	Microsoft Word	1/Patient	As needed	suprvsr$
Archived Clinical and Progress Notes	Microsoft Word	1/Patient	Monthly	svp_ark$

APPENDIX C: DATABASE TABLES AND
ATTRUBUTES

The tables of the PMA can each be visualized as the following entities. Effort has

been made to make the names of the attributes as self-documenting as possible. However

a description of each attribute has been provided along with the data types of each of the

attribute.

tbl90DAYREVIEW			
Name	Data Type	Size	Description
REV_PK	AutoNumber	Long Integer	Primary Key for 90 day review table
REV_DATE	Date/Time	Short Date	Date 90 Day review is set up
REV_MONTHS_IN_PROGRAM	Number	Long Integer	Number of months patient has been in CCUSO
REV_SEQUENCE_NUM	Number	Single	Sequential number assigned to reviews
PT_ID	Text	6 chars	Patient primary key used as foreign key here
EMP_PK	Number	Long Integer	Staff primary key used as foreign key here
REV_COMPLETE	Yes/No	Boolean	Boolean used to determine whether report has been completed

tbl90REVDETAIL			
Name	Data Type	Size	Description
DET_PK	AutoNumber	Long Integer	Primary Key for 90 day review details table
DET_TYPE	Number	Long Integer	One of the 12 areas a patient is evaluated on
DET_SCORE	Number	Integer	Score given for each one of the 12 areas
DET_EVAL_TEXT	Memo	N/A	Comments justifying why a patient received the score they did
DET_EVAL_TXPLAN	Memo	N/A	Text outlining a plan for the patient to improve their score on a particular area
REV_PK	Number	Long Integer	Primary key for the 90 day review used as foreign key here

tbl90REVTYPES			
Name	Data Type	Size	Description
REV_TYPE_PK	AutoNumber	Long Integer	Primary Key for 90 day review types table
REV_TYPE	Text	20 Chars	Long Name for each of the 12 review type areas

tblBEHAVIORLOG			
Name	Data Type	Size	Description
BHL_PK	AutoNumber	Long Integer	Primary Key for behavior log table
BHL_DATE	Date/Time	Short Date	Date behavior occurred
BHL_TYPE	Text	50 Chars	1 of 4 predesignated behavior types
BHL_TEXT	Text	255 Chars	Text describing behavior
PT_ID	Text	6 Chars	Patient primary key used as foreign key here

tblBEHAVIORREPORT			
Name	Data Type	Size	Description
BHR_PK	AutoNumber	Long Integer	Primary Key for behavior report table
BHR_CASENUM	Text	12 Chars	Case number generated by vb code
BHR_DATE	Date/Time	Short Date	Date incident occurred
BHR_LOCATION	Text	50 Chars	Location incident occurred
BHR_TIME	Date/Time	Medium Time	Time incident occurred
BHR_ENTRY_COMPLETE	Yes/No	Yes/No	Boolean used to determine whether all staff have entered their report on a single incident
BHR_REPORT_DONE	Yes/No	Yes/No	Boolean used to determine whether report has been reviewed
PT_ID	Text	Text	Patient primary key used as foreign key here

tblBHVRINVESTIGATIONS			
Name	Data Type	Size	Description
INV_PK	AutoNumber	Long Integer	Primary Key for 90 day review areas/types table
BHR_INVEST_TEXT	Memo	N/A	One word description of each of the 12 areas a patient is evaluated on
EMP_PK_INVESTIGATOR	Number	Long Integer	Staff primary key used as foreign key here
BHR_PK	Number	Long Integer	Behavior Report primary key used as foreign key here

tblBHVRREPORTDETAIL			
Name	Data Type	Size	Description
BRPT_DET_PK	AutoNumber	Long Integer	Primary Key behavior report details table
BRPT_DETAIL_TEXT	Memo	N/A	Text describing incident entered by staff involved
EMP_PK	Number	Long Integer	Staff primary key used as foreign key here
BHR_PK	Number	Long Integer	Behavior Report primary key used as foreign key here

tblCLASSGROUPNOTE			
Name	Data Type	Size	Description
CLAS_NUM	AutoNumber	Long Integer	Primary Key class group note/clinical note table
CLAS_NOTE_TEXT	Memo	N/A	Text covering group therapy session
CLAS_DATE	Number	Short Date	Date group was conducted
SES_NUM	Number	Long Integer	Session primary key used as foreign key here

tblCLASSINDIVIDUALNOTE			
Name	Data Type	Size	Description
CNOTE_NUM	AutoNumber	Long Integer	Primary Key individual note table
CNOTE_TEXT	Memo	N/A	Text entered about individual patient treatment
CLAS_NUM	Number	Long Integer	Group note primary key used as foreign key here
PT_ID	Text	6 Chars	Patient primary key used as foreign key here

tblCOMMENTS			
Name	Data Type	Size	Description
COMMENT_PK	AutoNumber	Long Integer	Primary Key comments table
COMMENT_DATE	Date	Short Date	Date comment is entered
COMMENT_TEXT	Memo	N/A	Text for general comments covering patients
EMP_PK_AUTHOR	Number	Long Integer	Staff primary key used as foreign key here
PT_ID	Text	6	Patient primary key used as foreign key here

tblCRIMINALHISTORY			
Name	Data Type	Size	Description
CH_PK	AutoNumber	Long Integer	Primary Key criminal history table
CH_DATE	Date/Time	Short Date	Date criminal incident occurred
CH_INCIDENT	Text	255 Chars	Text describing criminal incident
CH_STATE	Text	2 Chars	Two letter state abbreviation where incident occurred
CH_DISPOSITION	Text	50 Chars	Conviction outcome and sentencing
PT_ID	Text	6	Patient primary key used as foreign key here

tblDISCLOSURELOG			
Name	Data Type	Size	Description
DCL_PK	AutoNumber	Long Integer	Primary Key disclosure log table
DCL_DATE	Date/Time	Short Date	Date disclosure was made
DCL_TYPE	Text	50 Chars	Type of disclosure, i.e. rule violation
DCL_TEXT	Text	255 Chars	Text describing violation
PT_ID	Text	6 Chars	Patient primary key used as foreign key here

tblEMPLOYEES			
Name	Data Type	Size	Description
EMP_PK	AutoNumber	Long Integer	Primary Key employee information table
EMP_LNAME	Text	50 Chars	Employee last name
EMP_FNAME	Text	50 Chars	Employee first name
EMP_INITIAL	Text	1 Chars	Employee middle initial
EMP_SSN	Text	9 Chars	Employee social security number
EMP_HIRE_DATE	Date/Time	Short Date	Date employee was hired
EMP_SENIORITY_DATE	Date/Time	Short Date	Date employee was first hired by the state/used for promotion purposes
EMP_POSITION_NUM	Text	25 Chars	State position/payroll number
TITLE_CODE	Text	3 Chars	3 letter code used to describe employees position

tblGROUPS			
Name	Data Type	Size	Description
GRP_PK	Text	2 Chars	Primary Key groups table/A,B….ZZ
PT_ID	Text	6 Chars	Patient primary key used as foreign key here

tblINCIDENTREPORT			
Name	Data Type	Size	Description
INC_PK	AutoNumber	Long Integer	Primary Key employee information table
INC_CASENUM	Text	8 Chars	Case Number for incident report/nonunique
INC_DATE	Text	Short Date	Date incident occurred
INC_TIME	Text	Medium Time	Time incident occurred
INC_LOCATION	Text	50 Chars	Location incident occurred
INC_TEXT	Memo	N/A	Text describing incident
EMP_PK	Number	Long Integer	Staff primary key used as foreign key here

tblOBSERVATIONLOG			
Name	Data Type	Size	Description
OBS_PK	AutoNumber	Long Integer	Primary Key for observation table
OBS_DATE	Date/Time	Short Date	Date actions were observed
OBS_TEXT	Memo	N/A	Text describing observations of patients
EMP_PK_AUTHOR	Number	Long Integer	Staff primary key used as foreign key here
PT_ID	Text	50	Patient primary key used as foreign key here

tblPATIENTS			
Name	Data Type	Size	Description
PT_ID	Text	6 Chars	Primary key for patient table
PT_LNAME	Text	50 Chars	Patient last name
PT_FNAME	Text	50 Chars	Patient first name
PT_INITIAL	Text	1 Chars	Patient middle initial
PT_SSN	Text	9 Chars	Patient social security number
PT_DOB	Date/Time	Short Date	Patient date of birth
PT_ADMIT_DATE	Date/Time	Short Date	Date patient was admitted to CCUSO
PT_LEVEL	Number	Integer	Current behavior level
PT_PHASE	Number	Integer	Current treatment phase
PT_ETHNICITY	Text	50 Chars	Patient ethnic background
PT_WEIGHT	Number	Integer	Current patient weight
PT_HEIGHT	Number	Integer	Patient height
PT_WARD	Text	2 Chars	Ward patient currently resides on
PT_ROOM	Text	50 Chars	Room occupied by patient
PT_BED	Text	1 Char	Bed A-F occupied by patient
EMP_PK	Number	Long Integer	Staff primary key used as foreign key here/Patients primary therapist

tblPOLYGRAPHS			
Name	Data Type	Size	Description
POLY_NUM	AutoNumber	Long Integer	Primary Key for polygraph table
POLY_DATE	Date/Time	Short Date	Date polygraph was administered
POLY_TYPE	Text	2 Chars	Type of polygraph i.e. general or specific issue
POLY_PASS	Yes/No	Yes/No	Boolean used to determine pass/fail of polygraph
PT_ID	Text	6 Chars	Patient primary key used as foreign key here

tblPOSITIONTITLES			
Name	Data Type	Size	Description
TITLE_CODE	Text	3 Chars	Primary Key for position titles table
TITLE_NAME	Text	100 Chars	Full title description i.e. Treatment Program Supervisor

tblPSYCHEDDETAIL			
Name	Data Type	Size	Description
PED_NUM	AutoNumber	Long Integer	Primary Key for details of psychoeducational report table
PED_RATING	Number	Byte	Rating of class participation 1-5
PED_TEXT	Memo	N/A	Text describing patients group/class participation
SES_NUM	Number	Long Integer	Session primary key used as foreign key here
PER_NUM	Number	Long Integer	Psychoeducational Report primary key used as foreign key here
EMP_PK	Number	Long Integer	Staff primary key used as foreign key here/Group Leader

tblPSYCHOEDUCATIONREPORT			
Name	Data Type	Size	Description
PER_NUM	AutoNumber	Long Integer	Primary Key for psychoeducational report table
PER_START_DATE	Date/Time	Short Date	Date group being reported on began
PER_END_DATE	Date/Time	Short Date	Date group being reported on ended
PER_QTR	Number	Byte	Quarter 1-4 of the calendar year
PER_YEAR	Number	Integer	Calendar year
PT_ID	Text	6 Chars	Patient primary key used as foreign key here

tblRULES			
Name	Data Type	Size	Description
RUL_PK	AutoNumber	Long Integer	Primary Key for rule list table
RUL_NUM	Number	Long Integer	Number given to rule in patient handbook
RUL_TYPE	Text	50 Chars	Type given to rule in patient handbook
RUL_TEXT	Text	50 Chars	Text describing rule in patient handbook

tblRULEVIOLATIONS			
Name	Data Type	Size	Description
BRL_PK	AutoNumber	Long Integer	Primary Key for rules violated table
RUL_PK	Number	Long Integer	Rule List primary key used as foreign key here
BHR_PK	Number	Long Integer	Behavior Report primary key used as foreign key here/links rule violations to specific behavior reports

tblTHERAPYSESSION			
Name	Data Type	Size	Description
SES_NUM	AutoNumber	Long Integer	Primary Key for therapy groups in session table
SES_NAME	Text	50 Chars	Name describing therapy group
SES_TIME_START	Date/Time	Medium Time	Time during the day a group starts according to the master schedule
SES_TIME_STOP	Date/Time	Medium Time	Time during the day a group ends according to the master schedule
SES_GROUPS	Text	2 Chars	Patient groups A,B,….,ZZ attending therapy session
SES_LOCATION	Text	50 Chars	Location group is normally conducted
EMP_PK	Number	Long Integer	Staff primary key used as foreign key here/Group Leader-Therapist

APPENDIX D: VISUAL BASIC APPLICATION
DETAILS

This appendix contains many of the details of how the Visual Basic application is organized and how it accesses the database. The more technical details included in this appendix are things like naming conventions, form design, modules, and database connections.

<u>Naming Conventions</u>

The naming conventions used in the PMA were selected allow for maximum readability by future programmers and make the code as self-documenting as possible. The naming convention selected for this application is as follows:

1.   All variable names shall be declared a specific data type which is enforced by using the 'Option Explicit' declaration at the before any code is written for subroutines or functions in a specific form or module.

2.   All variables, forms, controls, and functions shall be in Hungarian notation so that each name is preceded by 3 lowercase letters designed to give some indication of the name type. For example: form names shall be preceded by frmName and strings are called strSomeString. [9]

3.   Names shall also follow the form 3 lowercase letters followed by any number of words with each word being capitalized to set it apart from previous words since Visual Basic names cannot contain spaces.

Database Connections

The database connection type selected for the PMA is the ActiveX Data Objects (ADO) type of connection instead of the older Remote Data Objects (RDO) connection as it requires less code and seems to have significant advantages over RDO. [8]

All database connections are sent through one central and global ADO connection named goDatabase so that the connection string need only be changed in one spot should the location of the database ever change. This connection code is placed in a "Connection" module, which contains in addition to the connection object, all functions and subroutines that also connect to the database such as functions that handle Standard Query Language (SQL) statements. The object and string used to connect to the database are shown below.

```
Option Explicit

    Global goDatabase As ADODB.Connection   'object to connect to the access database

Sub Main()

    Dim strDBConnect As String
'connection string set to connnect to database
    strDBConnect = "Provider=Microsoft.Jet.OLEDB.4.0;"
    strDBConnect = strDBConnect & "Persist Security Info=False;"
    strDBConnect = strDBConnect & "Data Source=C:\Develop\CCUSO.mdb"
    'strDBConnect = strDBConnect & "Data Source=\\cherr1s212i\ccusodb$\CCUSO.mdb"


    Set goDatabase = New ADODB.Connection
'open database connection
    goDatabase.Open strDBConnect
'load main application form
    Load frmMain
    frmMain.Show vbModal
'close database connection
    goDatabase.Close
'garbage collection for emptying any leftover information in
'the database connection
    Set goDatabase = Nothing
'close application
    Unload frmMain
```

End Sub

<div align="center">Public Functions and Subroutines</div>

Demonstrated here are some of the public functions that are used frequently throughout the PMA and are thus placed in the connection module. Most of these pertain to connecting to the database however some of them do not. Those that do not were simply placed in the connection module because they were public functions but not deemed significant enough to be placed in their own separate module.

There are three SQL subroutines here dealing with the SQL commands SELECT, INSERT, and UPDATE. These and the other functions will be will be listed below.

Subroutines			
Name	Parameters	Return Type	Description
SQLInsert	SQL String	Nothing	Inserts values into the database based on the SQL string passed into it as an argument
SQLUpdate	SQL String	Nothing	Updates values into the database based on the SQL string passed into it as an argument
SQLSelect	SQL String	Recordset	Queries the database based on the SQL string passed into it as an argument and returns a Recordset to the calling function
CenterForm	Form	Nothing	Centers the form being loaded in the center of the users screen
PopPtCombo	Combobox	Combobox	Populates a combo box with a list of all patient names from the database
PopEmpCombo	Combobox	Combobox	Populates a combo box with a list of all staff names from the database

The code for SQLInsert, CenterForm, and PopPtCombo subroutines and functions is shown here as representative examples of coding style for functions and subroutines.

All source code for the PMA will be contained in a separate document.

```
Public Function SQLSelect(sqlString As String) As ADODB.Recordset

   Dim ssResults As ADODB.Recordset

   Set ssResults = New ADODB.Recordset
'query the database with public database object and sqlstring argument
   ssResults.Open sqlString, goDatabase, adOpenForwardOnly, adLockReadOnly
'return a disconnected recordset to calling function
   Set SQLSelect = ssResults
'clear query results
   Set ssResults = Nothing
```

End Function

```
Public Sub CenterForm(roForm As Form)
'ensure forms are centered on users screens regardless of
'screen size by using the system properties of the Screen
'object
    roForm.Top = (Screen.Height - roForm.Height) / 2
    roForm.Left = (Screen.Width - roForm.Width) / 2
End Sub

'populate combo box with patient IDs as well as first and last names
Public Function PopPtCombo(cboPatientList As ComboBox) As ComboBox

    Dim ssResults As ADODB.Recordset
    Dim strSQL As String
    Dim strResult As String

'query patient information table
    strSQL = "select PT_ID, PT_LNAME, PT_FNAME from tblPATIENTS"

'set the selected set equal to the query results
    Set ssResults = SQLSelect(strSQL)

'populate the combo box with concatenated strings of all patients and their
'associated ID numbers
    While Not ssResults.EOF
        cboPatientList.AddItem ssResults("PT_ID") & ":" & Space(2) &
ssResults("PT_FNAME") _
            & Space(1) & ssResults("PT_LNAME"), cboPatientList.ListCount
        ssResults.MoveNext
    Wend

'return the populated combo box to the calling function
    Set PopPtCombo = cboPatientList

'close the selected query connection and do garbage collection on the recordset
    ssResults.Close
    Set ssResults = Nothing

End Function
```

<u>Form Design</u>

Forms in the PMA were designed to take advantage of the current CCUSO

hardware configuration which includes 17" monitors on each workstation. While in past

years graphical user interface screens tended to be somewhat cramped and possibly hard to read the decision was made to take full advantage of the large screen sizes enjoyed on today's computers.

The design decision was also made to keep each form as simple as possible and try to keep one task per form for the most part with at most access to one additional form on each screen. These decisions were made with the computer illiterate user in mind in order to minimize confusion by the end user while using the PMA and make it as easy as possible to figure out with a minimum of instruction.

Many functions on the PMA forms are executed on the Lost_Focus action of text boxes in order to minimize the number of buttons that a user must click and decisions to be made by the user. For example on the behavior report initiation screen, the case number is generated automatically as soon as the Combobox with the patients name loses focus after a patients name is selected.

Additionally, code in each form is declared 'Option Explicit' and follows the naming conventions described above.