

Teaching Case

The Recovery Care and Treatment Center: A Database Design and Development Case

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ABSTRACT

The advantages of active learning methodologies have been suggested and empirically shown by a number of IS educators. Case studies are one such teaching technique that offers students the ability to think analytically, apply material learned, and solve a real-world problem. This paper presents a case study designed to be used in a database design and development course. The case is about the Recovery Care and Treatment Center System, a real-world organization with names changed. The case is challenging, presents a real-world exercise, and allows students to apply a number of the skills they discuss and learn in class. The case provides sufficient information to be demanding and thought-provoking, but not so much that the case becomes overwhelming in terms of its challenges. The project may be structured as a group or individual project. Additionally, the structure of assigned work from the case can be an overall project, multiple deliverables, or even singular assignments if aspects of the database are separated. Suggested deliverables include relational schema, normalized relational schema, design of entity-relationship diagrams, data dictionary, SQL queries, forms and reports, and other system documentations.

Keywords: Teaching Case, Database Design, Team Project, Pedagogy

1. CASE INFORMATION

1.1 Case Background

Established in 1979, the RCTC is an addiction treatment and recovery agency located in a Midwestern state in the USA. The mission of the organization is to help individuals recover from alcohol and drug addictions through effective treatment, quality education, and support from the community. The RCTC offers many programs to help individuals begin the “road to recovery” from education to an intensive outpatient service. By working with the community, the goal of the RCTC is to return the patient back to society as a productive and helpful individual.

The RCTC has grown considerably over the years and currently treats approximately 800 patients per year. The primary services of the RCTC focus on substance abuse treatment (i.e., drugs and alcohol abuse), with special service programs for driving under the influence (DUI) offenders. In this state, an individual who is caught driving under the influence of drugs or alcohol can receive a sentence that includes one or more (usually more) of the following: jail time, punitive fines, suspended license, DUI probation, DUI schools, and other punishments. The RCTC primarily is

involved with DUI probation cases where offenders are treated at the facility, attend a DUI school, and/or are required to complete community service hours.

During a DUI probation period, the courts may order compulsory drug and alcohol treatment or may require attendance in a DUI School. Both of these measures are used for education and to deter offenders from committing another DUI crime in the future. During DUI probation, the completion of these types of programs can lead to a reduction in penalties for a DUI offense. With that being said, these DUI probation options are considered a privilege and are often not available for repeat offenders.

Criminal DUI probation periods are different depending on the state law and circumstances involved in the DUI offense. In some states the DUI probation period can range from three months to a full year. In more serious DUI offense cases (e.g., if the blood alcohol content is higher, a DUI resulted in a death, DUI while having a suspended license from a previous DUI), the probation period can span several years after a DUI conviction. If a person commits any criminal offense during a DUI probation period, the punishment for that offense can be increased considerably. This violation of DUI probation can lead to jail time, fines,

and/or an extension of the DUI probation. If DUI probation is part of an individual's DUI sentence, it is important for the offender to understand all of the terms and specifics of what that DUI probation entails. In the large majority of cases, the offender is designated a probation officer who will maintain correspondence with and ensure that the offender is in compliance with the DUI probation terms. Some of these DUI probation terms include motor vehicle restrictions, treatment and school requirements, and other DUI probation provisions.

The RCTC receives a list of DUI offenders, who they prefer to call "clients," from references through one of the two court systems, adult or juvenile, of the local county. Individuals who are 18 years or younger will be flagged as juveniles, and it is worth noting that the penalties are more severe when offenders are juveniles as opposed to adults. Once referred by the court, a legal guardian of each juvenile offender must be notified. The guardian will be fully informed of the juvenile conditions and all service programs that the RCTC has to offer. Once clients sign an initial agreement, they will be assigned to a probation officer. The probation officer is responsible for designing and recommending a program that is appropriate for each individual client. Working together, the court and probation officer for each client decide on a series of community service activities (the "community service case") as part of the overall program, and the court reviews and ultimately has to approve the recommended programs for each client.

1.2 The Current System and Situation

As discussed, each RCTC client receives a program that is designed by the probation officer and is approved by the court and judge. In each client's program, there are a number of hours for community service activities that each client must complete in order to pass the program. These hours, which are traditionally divided up as "assignments" (i.e., a full day "assignment" would be eight hours), can all be served at a single organization, but most often are split up between a number of different organizations.

Regardless of the number of organizations a client is supposed to work for to complete the community service requirement portion of the program, there is a need to track and keep up with the hours for each client. To accomplish this goal, each client is given a work card at the beginning of the probationary period. This work card lists the organizations within the area that the client is expected to work at and the number of hours required. Upon completion of each day's work, the client must present the work card to the director or representative of the organization to receive credit toward the program. At the end of the week, each client must turn in his or her work card to the assigned probation officer.

The probation officer then examines the submitted cards for completion, verifies the information with the organization(s) if necessary, and calculates the running total number of hours of community service completed for each client. Currently, all data processing at RCTC is performed by hand and the information is kept in a log book and paper file folders. This method worked well (or at least was acceptable) in the past when the RCTC worked with fewer clients, organizations, and probation officers. However, as

the RCTC has grown, the manual method of data processing is no longer appropriate and has resulted in a number of errors and inefficiencies. For example, the work card might get lost in the process and the clients do not get credit for their work. Another example is that when RCTC employees receive inquiries about a client, it usually takes them a couple of hours, if not days, to locate the information in response to the inquiry. An additional difficulty is that the RCTC does not have the most up-to-date information available in an easy-to-retrieve format. Another problem relates to the amount of paperwork and the need to frequently reexamine the completed work cards to calculate such items as the number of hours, number of organizations, and how many hours are left to complete the community service portion of the DUI probation program. The current logbook is very old, and RCTC employees have to physically photocopy documents in order to make back ups. Additionally, the current data processing system makes it very difficult for RCTC administrators to complete various reports (e.g., those needed for government reporting) on overall totals for all clients.

Thus, after discussing the RCTC's predicament with a number of people, the RCTC administration has decided the organization needs a database to help them keep track of their clients, client hours, organizations worked for, duration of DUI probation programs, and other important information. Additionally, there is a need to be able to quickly locate information (e.g., number of clients, client hours assigned, client hours completed) for each probation officer, court, judge, community service case, organization, etc. Finally, the RCTC has reporting requirements for funding and governmental purposes, so it needs to be able to determine how many total organizations are being served, how many total client hours have been worked, how many total client hours were assigned and are remaining, and how many hours have been worked at each of the community service organizations.

Your job is to help RCTC analyze the situation, and then design and construct a working prototype for this database system. As the RCTC employees have various levels of computer proficiency, one of the requirements of the system is an easy to use interface. Prior to contacting you, the RCTC examined the available off-the-shelf software options, but they either lacked the desired functionality or could do more (thus costing more) than the RCTC needed. As a result, the RCTC has set aside a small budget for the completion of this database system project.

2. DESIRED SYSTEM OUTPUTS

RCTC officers would like the new database to be able to generate the reports listed below. The database should also be able to provide answers to the following questions:

2.1 Client Specific Reports and Queries

1. A general report that organizes relevant client's contact information including name, address, phone number, client type (juvenile or adult), and the assigned probation officer.

2. If the client is a juvenile, the database needs to be able to generate information on the school he/she attends as well as guardian information.
3. How many hours an individual client was originally assigned, how many hours have been completed, and how much longer an individual client has to complete his/her community service hours.
4. Which organizations an individual client has worked for and how many hours an individual client has worked for each of the respective organizations.

2.2 Probation Officer Reports and Queries

1. A general report that organizes relevant contact information (name, address, phone number), officer identification number, and officer type.
2. How many clients a probation officer is working with at given time.
3. Information on each community service case, including how many hours were originally assigned, have been completed, and how much longer the probation period is for all clients working with a specific probation officer - with the capability to organize this data by probation officer last name, client type (juvenile or adult), court, and judge.
4. How many organizations and how many hours have been completed at each organization for all clients working with a specific probation officer - with the capability to organize this data by last name, client type (juvenile or adult), court, and judge.

2.3 Judge Level Reports and Queries

1. A general report that organizes relevant contact information (name, phone number) and at which courts the judges work.
2. How many hours were originally assigned, have been completed, and how much longer the probation period is for all clients assigned by a particular judge - with the capability to organize this data by last name, client type (juvenile or adult), probation officer, and community service case.

2.4 Community Service Organization Reports and Queries

1. A general report that organizes relevant contact information (organization name, address, phone number, and organization ID).
2. The total number of clients who have worked for an organization in a given time period – with the capability to organize this data by client, client type (juvenile or adult), court, judge, probation officer, or length of time in the program.
3. The total number of assignments and hours worked for an organization in a given time period – with the capability to organize this data by client, client type (juvenile or adult), court, judge, probation officer, or length of time in the program.

2.5 RCTC-Level Reports and Queries

1. The total number of assignments and hours that all clients have worked for a given organization in a given time period – with the capability to organize this data

by client type (juvenile or adult), court, judge, community service case, and probation officer.

2. The total number of assignments and hours that all clients have worked for all organizations in a given time period.
3. How many clients have graduated from the programs in a given time period – with the capability to organize this data by client last name, client type (juvenile or adult), school if a juvenile, court, judge, and probation officer.
4. In a given time period, how many clients have had problems with their probations and what have been the nature of these problems – with the capability to organize this data by client last name, client type (juvenile or adult), school if a juvenile, court, judge, and probation officer.

3. ADDITIONAL BUSINESS RULES

To keep things simple for purposes of the case, some details were simplified. However, based on the skill level of the class, expectations for assignments, and general challenge level, the instructor may change the business rules as desired. A few examples of such changes are as follows:

1. Instead of assuming that judges do not move over time and only serve one court at a time, an enhanced feature of the system could be the ability to track the history of judge-court assignments. Also, it is possible that a judge may simultaneously serve many courts.
2. DUI offenders are able to either serve two days in jail or perform a minimum of 100 service hours, in addition to the assigned service hours. Thus, there is flexibility for the client in the community service case. Judge, court, and probation officer need to be aware of this potential arrangement.
3. Based on previous criminal history (e.g., crimes against children), clients are only able to work at certain community service organizations or must be supervised closely when performing community service work.
4. A client who has problems (e.g., missing assignments) during the probation period may have his/her hours in the overall community service case increased by a multiple of the number of hours in the assignments missed.
5. Due to staffing and workload issues, as well as turnover in the RCTC, there are times when clients may have new probation officers assigned to their community service cases. As a result, the database may need to have the capability to have multiple probation officers listed for each client, community service case, etc.
6. Clients may switch schools, which could result in the school information needing to be logged and updated for the client and community service case. However, the RCTC would need to be able to keep track of both the new school and the old school.

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