Final Project – Week 7

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**Project Database Proposal – Approach Details**

- Develop SQL programming skills by taking advantage of the hands on training for each weekly lessons and lectures.

- Accumulate knowledge on how to implement the third normal form method to structure the database in a logical manner.

- Gather XYZ Trucking’s requirements for the use of this new database system.

- Design a diagram that conveys the database system’s logical structure and relationships between each table based on gathered requirements.

- Identify primary keys and foreign keys to structure the attributes’ and tables’ relation.

- Implement SQL code to construct the database according to system diagram.

- Create comments for the code to understand the code’s function and what part each section follows according to the system diagram.

- Once the database system is constructed, test system for bugs to ensure that a faulty database is not being deployed for production use.

**Project Database Proposal – Obstacles**

- Run into coding errors, which will be mitigated by utilizing the course textbooks or the internet to search for the applicable SQL statements.

- Accidentally delete or ruin the database/table structure and information. Creating copies of the database will mitigate the impact of potential mistakes.

- As the database gets bigger, the code will increase in size as well. Which will add to losing track of what each section of code is doing. Adding comment lines will reduce the confusion of why certain code was implemented.

- Possible difficulty in understanding the material for database design or SQL programming. After searching through the reading materials and credible websites, seeking help from the instructor or a tutor can be a good option to provide clarity on the subject.

- Database system may not function properly when given to the client for production. A rigorous testing phase will be implemented to ensure all the query, inserting data, and/or deleting data functions are working properly.

- Not understanding the project or certain parts of the project. Utilize the final project discussion to ask questions about the project. If the context is right, send an email to the instructor.

**Week 2**

**What do you plan to do next?**

In the project so far, the three tables for XYZ Trucking have been constructed. These tables contain information on driver demographics, truck information, and truck maintenance. Items that are required in the future, will be adding more tables to support information for trailer information, haul record, and haul manifest. In addition, look up tables will need to be added to specific data values throughout the project. Another goal for this project is to learn more about the SQL language to develop well rounded scripts for adding more tables and applying test data for the database. Overall, there is plenty to add to this database project.

**Obstacles**

There are several obstacles to overcome in this XYZ Trucking database project. One major obstacle is ensuring that this database meets XYZ Trucking’s requirements and business logic. The next obstacle will be developing the database in the third normal form standard. This will require carefully analyzing the dependencies of the primary key and structuring the database in a logical manner. Last major obstacle is testing the database and correcting any coding errors. Prior to giving the database over to the client, it should be delivered as the best product possible. Which means conducting a quality analysis that checks for logical errors in the code or for missing parts to the database structure. With these obstacles in mind, learning more about SQL and developing databases will help reduce the probability of being burdened by them.

**ERD Diagram**

**Graphical user interface, table

Description automatically generated**

**Week 3**

**What do you plan to do next?**

On week three, the trailer information, haul record, and haul manifest tables were added to the XYZ Trucking database. In addition, data has been added to the tables. This leaves developing look up tables to reference specific data throughout the database. Another part that needs to be worked on is the business logic portion of XYZ Trucking to ensure the database meets the operational standards. Which, the last part that needs to be done, is testing the database. Testing the system thoroughly will help guide the developers in correcting errors and provide the client with a polished database to work with.

**Obstacles**

An obstacle that can occur is finding out the database does not meet the clients business logic. Such an event would cause a restructuring of the database or possibly start over from scratch. As a result, redeveloping the database would waste time and money for ACME Software, INC. Another obstacle to consider is maintaining the code to be readable by other developers. This would include code comments, a standard layout of code, and applying best practices for implementing code. If the code is hard to read, future developers may become overwhelmed with trying to fix or enhance XYZ Trucking’s database.

**ERD Diagram**

**A screenshot of a computer

Description automatically generated with medium confidence**

**Week 5**

**What Changed?**

On week 5, the XYZ Trucking database has been updated with lookup tables. This required a database restructuring. To conduct this restructuring, it needed scripting to execute the removal of data, altering the tables, reseeding the primary keys for each table, and reinserting the updated data back into the tables. In addition, creating lookup tables with new data to insert. Another change that was done, was updating the queries to reflect the needs of the client. Major update to the scripts were adding the “Where” clauses to allow certain dates and ID numbers to be selected by the user. Which are helpful when XYZ Trucking needs to run a report for their business.

**Obstacles**

The major obstacle faced in the changes of the database was how to restructure it with lookup tables. First step was to backup the database in case anything went wrong with the code. Then came removing the data from the database and altering the tables to change the data type and to delete the constraints. Next step was to create the lookup tables for the trailer type, cargo type, maintenance type, and maintenance code data. Last step was to insert the data back into the tables with updated data to the scripts. This was a bit challenging as it involved a lot of moving parts, which allowed for a lot of room for errors to occur.

**What’s Next?**

This project is pretty close to being finished, which will require a couple things to be done. One major thing that needs to be done next is converting the three queries into a stored procedure. Also, adding another query of my choosing will need to be constructed as well. These queries will be used by the user to generate reports for their business activities. The last thing that is required, is going over the project by testing the functionality of the database and making improvements prior to delivering the final product. Implementing these last parts will provide XYZ Trucking a well rounded database for their business operations.

**Week 6**

**What Changed?**

This week has some significant changes to the XYZ Trucking database. One major change is converting the reports, delete statements, and insert statements into stored procedures. The second change was updating the tables in the ERD Diagram to reflect int datatypes for the lookup tables. Third change was fixing the code to select both haul record and haul manifest table columns in the haul inventory script. Making these changes helped complete the database for week six of Relational DB Design and SQL.

**Week 7**

**How was the System Tested?**

The database for XYZ Trucking was tested in a few ways. When initially creating the insert and delete scripts, executing the scripts with some basic data to ensure the correct results were coming up. After deleting some of the data, running the reseed table script was important for getting the ID numbers to reset so the data that gets reinserted matches with other tables. When the scripts were converted to stored procedures, using the “EXEC” command with the needed data ensured that the code is working. Doing so helped me spot a few typos in my scripts. Another test conducted, was ensuring that the query reports produced the expected results. This required carefully analyzing the right statements and variables to develop the logic for these scripts. After several executions of each report, fine-tuning the scripts allowed for the correct results to display in the messages tab. The final testing was ensuring that when it came to certain data types, the script only took that specific input and no other data type. Which all the scripts took in the expected datatype. Overall, the database has passed the testing phase.

**After Action Report**

During the XYZ Trucking database development, a plethora of knowledge was accumulated in the process. First major step is learning how to create tables and insert data into the tables. Then developing scripts to delete and update data that is stored in the database was an interesting process. Especially when converting them into stored procedures to allow more flexibility in typing in the inputs for the database actions. The most challenging part of the database are the queries, which was fun to develop the logic for these reports. These queries took a few trials and errors to get to the expected results for the reports. Overall, the learning experience was real rewarding for developing a working database.