Danny Argudo, Emily Castanza, Lucas Franco, Mila Manzano, Devan Nieradka

Professor DeGood and Professor Michels

CSC315&BUS/MGT385 – Collaborative Project

10 March 2023

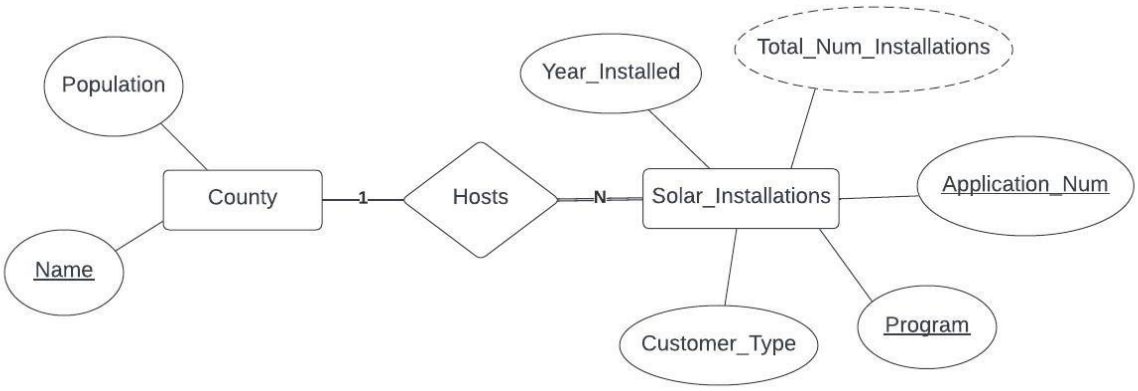
Relational databases help organize and structure the similarities and, by effect, the differences of data and information. Usually in the form of a table or chart, the parameters set for the data in this database are predetermined based on their relationships with one another. Each piece of information is arranged in a column and then an identifier in each row. These databases, however, still follow certain rules. For example, a rule can state that multiple rows are not allowed as it could cause unnecessary errors. Relational databases are effective when you need to display information in a secure and consistent way ("What Is a Relational Database?").

Organizing the data in this manner allows for easier understanding of how to read it and how to compare it to other necessary information within the database. It also allows for an easier way for the individual making the database to construct it. This is a more simple way to demonstrate data in a concise and effective way for the viewer. Because of its simplicity compared to other types of databases, it ensures the integrity of the data and makes it easier to keep it accurate and secure (Pedamkar).

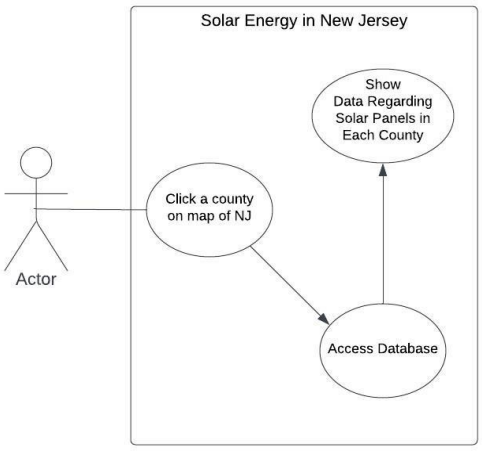
The elements of our diagram are designed to make our database extremely user friendly. Within two clicks, any user will be able to easily see solar data relevant to the specific area or region they are interested in gathering information on. Whether you are looking to gather solar data for your local county to build public support for new solar projects, or you are just looking to familiarize yourself with New Jersey's solar infrastructure – our database will be extremely useful for our users.

The reason for our database design is simple; to provide users with a view of the current state of solar energy in the state of New Jersey with an interactive map. There were various directions that our group was deciding to take with the database. After discussion, we agreed that a map of the state that breaks down solar energy data by county would be the best way to translate data. We will also be using a color scale that will reflect the current state of solar energy across the state. Those regions that have the most solar energy in relation to population and area, will be highlighted with a darker color (i.e. red or orange). Meanwhile areas that have a low number of solar grids/panels will be highlighted with lighter colors (i.e. pale or white shades). As our users click through the database and look at the differences in solar energy usage across the state, they will be able to pinpoint opportunities for improvement across the state. Similar to our sustainability project proposal, we hope that gathering and analyzing data on solar energy use can help identify areas for improvement, build public support, inform policy decisions, and encourage investment in this important area. By using data to propose positive change, we can help New Jersey move towards a more sustainable and environmentally-friendly future.

ER Diagram



Use Case Diagram



Textual Use Case

Use Case: Click a county on map of NJ
Primary actor: Normal User
Goal in context: Allow user to click on a county on the map and view information
Preconditions: N/A
Scenario:

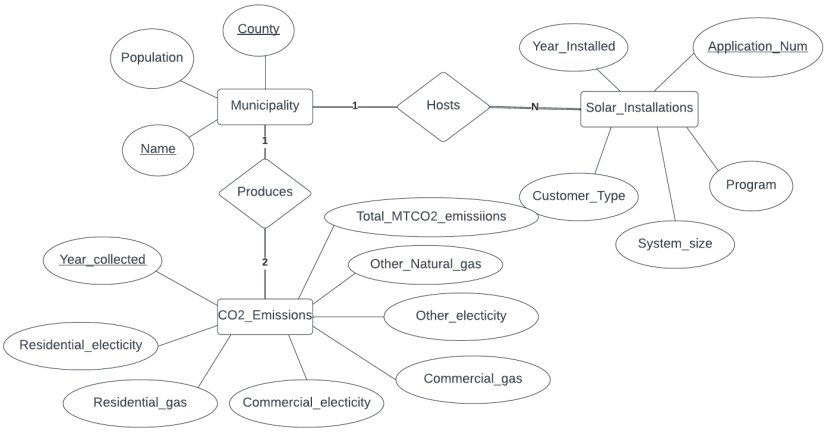
1. User goes to website
2. User selects specific year
3. User views map of county in varying colors
4. User hovers over a county and selects one
5. System provides user with information on the county in regards to solar panels in the area

Works Cited

Pedamkar, Priya. "Relational Database Advantages: 8 Advantages of Relational Database." EDUCBA, 4 Mar. 2021, https://www.educba.com/relational-database-advantages/.

"What Is a Relational Database?" Oracle, https://www.oracle.com/database/what-is-a-relational-database/.

5/1/23



Municipality

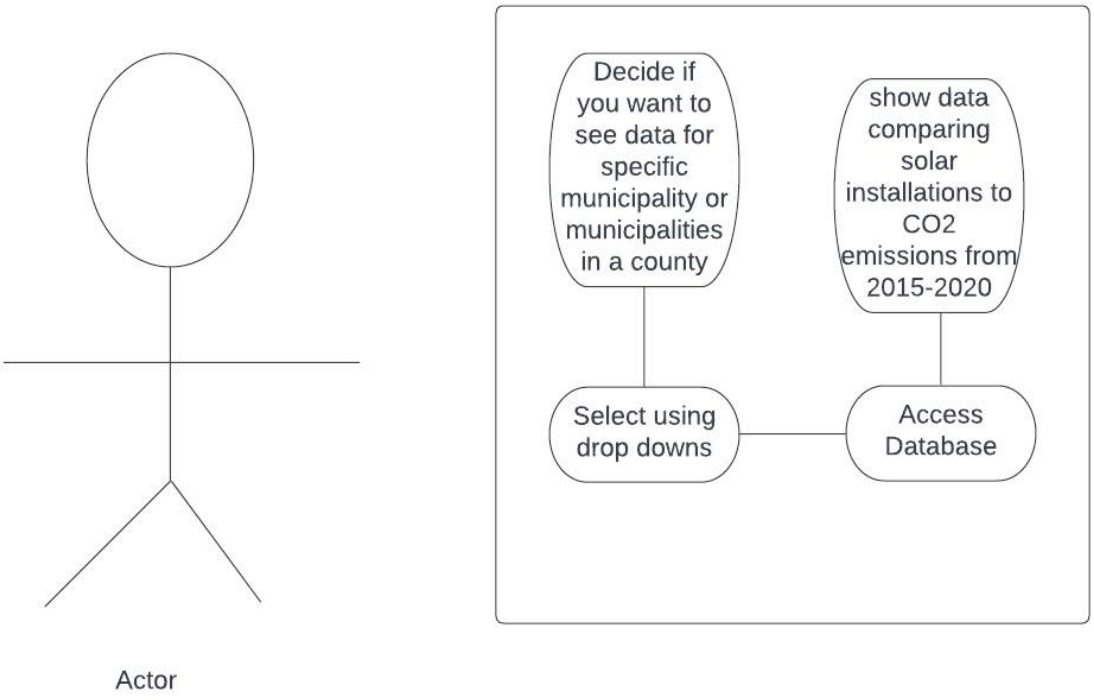
Name	County	Population

Solar Installations

Application_Num	Program	Customer_Type	Year_Installed	System_size	CName	MName

CO2 Emissions

Year_collected	Residential_electricity	Residential_gas	Commercial_gas	Commercial_electricity	Other_Natural_gas	Other_electricity	Total_MTC02_emissions	MName	CName



Textual Use Case

Use Case:	Select a county or municipality with drop downs.
Primary actor:	Normal User
Goal in context:	Allow user to see comparing data
Preconditions:	N/A

Scenario:

1. User goes to website
2. User selects municipalities or counties
3. User views data side by side from 2015 and 2020