



CNIT 392 Final Project Report
Adopt-A-Roadway
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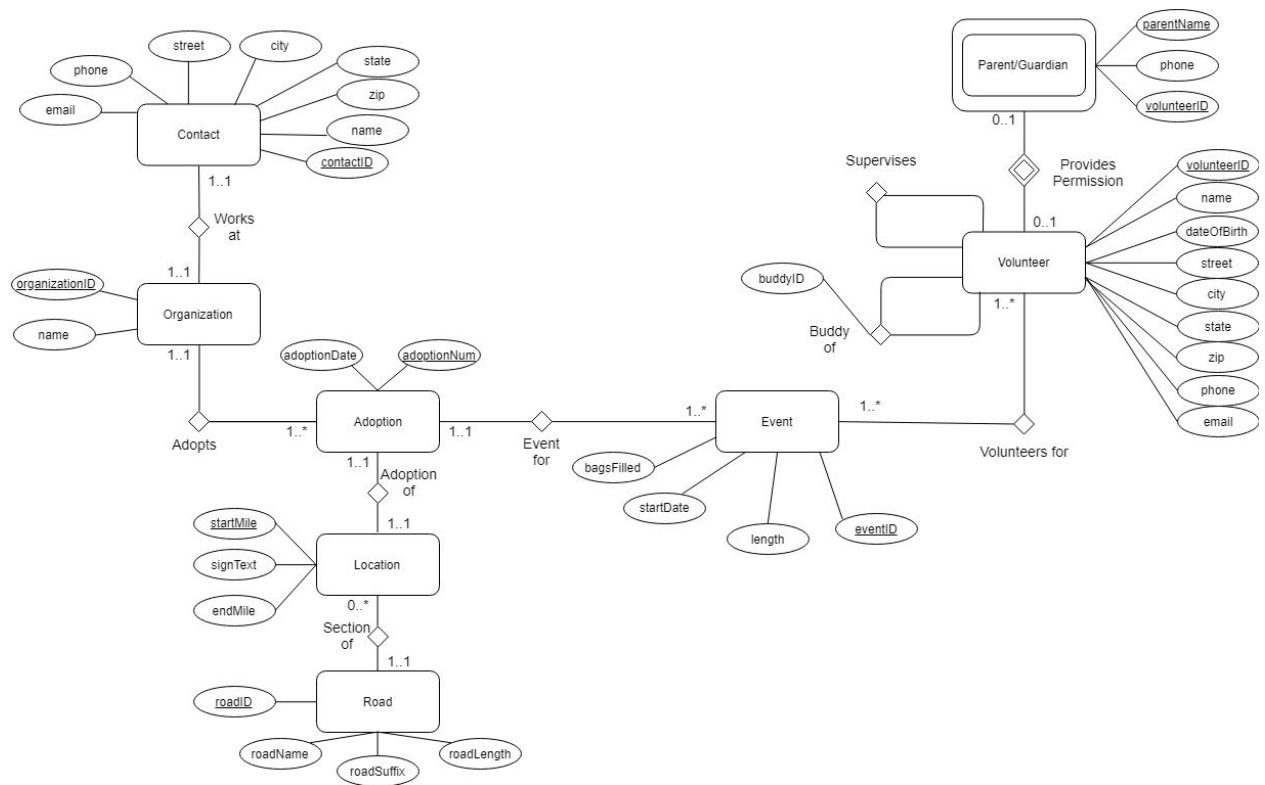
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Tasks Performed

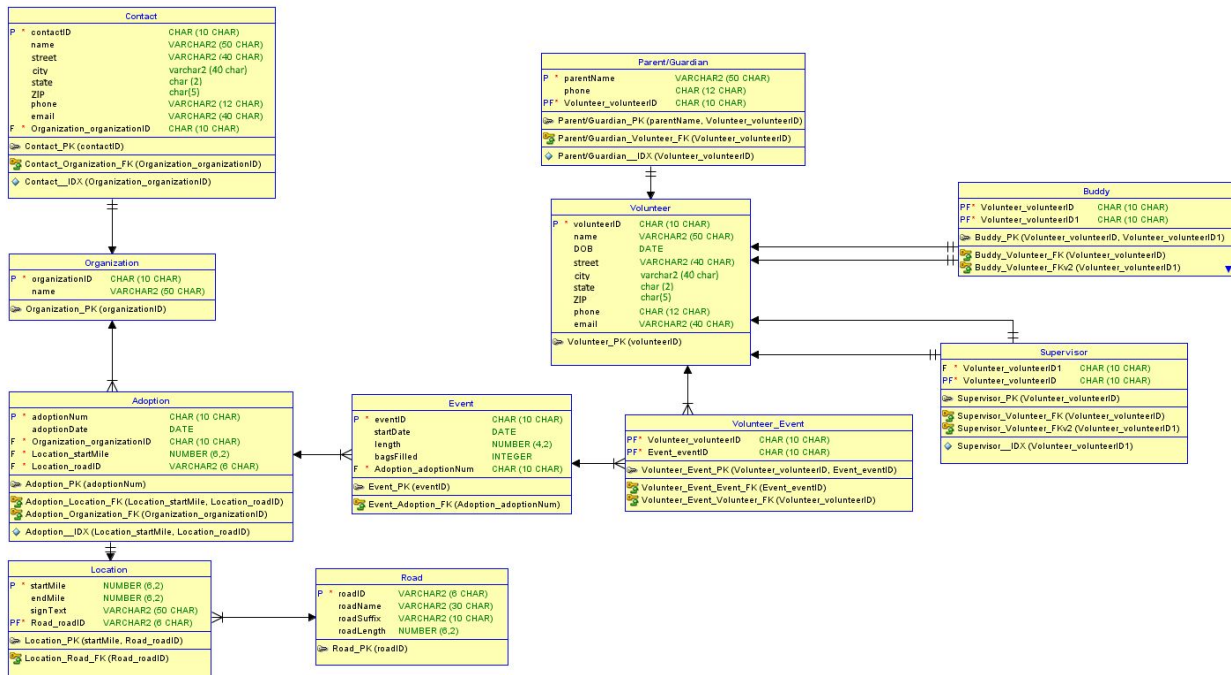
Tasks	Project Reporter	Project Liaison	Project Manager	Milestone 1	Milestone 2	Milestone 3	Business Rules
Group Members							
Andrew Oppenheimer			X	X	X	X	X
David Burgos		X			X	X	X
Mason Griggs	X				X	X	X
Jeremy Pan	X			X	X	X	X

Conceptual Design	Logical Design	Physical Design	Design Implementation	Sample Data	Sample Queries	Poster	Report
X	X	X	X	X	X	X	
X	X			X	X	X	
				X		X	X
X				X		X	X

Logical Model



Physical Model



Entities Explained

Contact(contactID, name, street, city, state, zip, phone, email, *organizationID*): 2NF

- The person who is responsible in handling the communications for the roadway

Organization(organizationID, name): 3NF

- The name of the organization that is adopting the roadway

Adoption(adoptionNum, adoptionDate, *organizationID*, *startMile*, *roadID*)

- The specific instance of roadway adoption by an organization

Location(roadID, startMile, endMile, signText): 3NF

- The area of the road that is being adopted

Road(roadID, roadName, roadSuffix, roadLength): 3NF

- The road that is up for adoption

Event(eventID, startDate, length, bagsFilled, *adoptionNum*): 3NF

- The specific date set by the organization to clean up the road

Volunteer(volunteerID, name, phone, email, DOB, street, city, state, zip): 2NF

- A person who is part of the organization that is volunteering to help maintain their part of the road

Volunteer_Buddy(volunteerID, *buddyID*): 3NF

- Each volunteer must have another volunteer as a buddy to work near the road

Volunteer_Supervisor(volunteerID, *supervisorID*): 3NF

- Each volunteer must have another volunteer as a supervisor when volunteering at an event

Volunteer_Event(volunteerID, eventID): 3NF

- The specific event and volunteer associated with the event

Parent/Guardian(parentName, volunteerID, phone): 3NF

- For volunteers under 16 they must have a parent or guardian on record that agrees to let them volunteer

How to run the code

Open up Oracle SQL Developer.

Run the Database.ddl file.

Run the datasql file.

Run the queriesql file.

Business Rules

10 Business Rules

1. ADOPTION must last 2 years. (ACTUAL)
2. LOCATION: Roadside area within the County's right of way. Allegheny County will work with prospective adopters to select sites that are safe for volunteers. (ACTUAL)
3. VOLUNTEER: Participants should be 16 years of age or older. (ACTUAL, simplified)
4. EVENT: A minimum of two organized, scheduled events; one in the Spring (March/April), and one in the Fall (September/October). (ACTUAL)
5. SUPERVISOR: An event must have at-least one supervisor. (ACTUAL, simplified)
6. CONTACT: A contact must be associated with an organization. (ACTUAL)
7. LOCATION: Allegheny County will post signs to acknowledge the adoption. (ACTUAL)
8. VOLUNTEER: Volunteers can work on more than one event. (FALSIFIED)
9. EVENT will be marked as completed so that Allegheny County will pick up bagged litter from the roadside after cleanup events. (ACTUAL)
10. VOLUNTEER: Each volunteer must have a "buddy" that they work with for safety. (ACTUAL)

10 More Business Rules

11. VOLUNTEER: Participants can be 14 or 15 years old with parent/guardian permission. (ACTUAL, simplified)
12. VOLUNTEER: A volunteer has one and only one supervisor. (FALSIFIED)
13. ADOPTION: An adoption can be renewed after 2 years. (ACTUAL)
14. SUPERVISOR: A supervisor can supervise many volunteers. (FALSIFIED)
15. PARENT/GUARDIAN: A parent or guardian can provide permission for a volunteer to participate in the cleanup activities. (FALSIFIED)

16. ADOPTION: Every adoption will have the start date of the organization's adoption recorded. (FALSIFIED)
17. LOCATION: Milepost signs will be present at adoption locations. (FALSIFIED)
18. ORGANIZATION: An organization can participate in more than one adoption. (FALSIFIED)
19. LOCATION: A road can be split up into multiple locations. (FALSIFIED)
20. ROAD: A road may not have any locations deemed as safe for cleanup and adoption. (FALSIFIED)

Some screenshots show multiple rules, the rules they show are marked below each screenshot.

ALLEGHENY COUNTY ADOPT-A-ROADWAY PROGRAM

GENERAL PROGRAM INFORMATION

Welcome to the **Allegheny County Adopt-a-Roadway Program**. The purpose of this program is to provide individuals and groups an opportunity to help keep County-maintained roadways trash free. We ask adopters to organize cleanup events at least twice a year. In return, Allegheny County will post recognition signs along the adopted roadway giving you or your group credit for your efforts.

Note: Contact PennDOT's Adopt-A-Highway program for state-maintained roads and the local municipality for municipal roads. To see who owns a road near you, visit [Who Owns My Infrastructure](#).

Adoption Time Length: 2 years.

Length and Location: Roadside area within the County's right of way. Allegheny County will work with prospective adopters to select sites that are safe for volunteers.

Note: Site selections will be reviewed on a case-by-case basis. Restricted visibility, high runoff potential, steep slopes or narrow roadside/roadway shoulders are examples that may cause a road segment to be unacceptable for adoption.

Age Requirements: Participants must be 14 years of age or older to work along County roadways. There must be at least one adult (18 or older) per eight minors (17 and under). Minors must have parental permission.

Note: Age limitations will be reviewed on a case-by-case basis for cleanup events on roads in County Parks.

Events Per Year: A minimum of two organized, scheduled events; one in the Spring (March/April) in conjunction with the Great American Cleanup, and one in the Fall (September/October).

Clean-Up Event Notification: Adopter will notify the Adopt-a-Roadway Coordinator at least two weeks prior to a scheduled event.

Supplies: Allegheny County will provide "Litter Crew Ahead" signs and other equipment as required by Allegheny County. Safety vests, trash bags, and work gloves will be available upon request.

Acknowledgement Signs: Allegheny County will post signs to acknowledge the adoption.

Bagged Litter Pick-Up: Allegheny County will pick up bagged litter from the roadside after cleanup events.

Rules 1, 2, 3, 4, 5, 7, 9, 11, 13

ALLEGHENY COUNTY ADOPT-A-ROADWAY PROGRAM

ATTACHMENT B – SAFETY REQUIREMENTS *(continued)*

BEST SAFETY PRACTICES FOR VOLUNTEER GROUPS PARTICIPATING IN ADOPT-A-ROADWAY CLEANUP EVENTS

THE FOLLOWING ARE ESSENTIAL FOR YOUR AND THE PUBLICS' SAFETY!

- ☐ **LITTER CREW AHEAD SIGNS:** BEFORE YOU START, HAVE ALL ROAD SIGNS BEEN PROPERLY SET UP TO NOTIFY THE PUBLIC?
- ☐ **SIGN IN SHEETS:** EVERYONE MUST SIGN IN AND BE ACCOUNTED FOR, NOT ONLY AT THE START BUT AT THE END OF THE DAY.
- ☐ **BUDDY SYSTEM:** EVERYONE SHOULD WORK WITH A "BUDDY" THEREBY LOOKING OUT FOR ONE ANOTHER. DOES EACH BUDDY GROUP HAVE A CELL PHONE, WITH A NUMBER TO CALL IF SOMEONE IS INJURED?

Rule 10

ALLEGHENY COUNTY ADOPT-A-ROADWAY PROGRAM

PROGRAM GUIDELINES

The Allegheny County Adopt-a-Roadway Program allows non-political organizations, corporations, groups or individuals to participate in maintaining Allegheny County roadways by picking up litter on a specific section of roadway during scheduled cleanup events. You or your civic or volunteer group sign a two-year agreement to pick up litter at least two times a year, and Allegheny County will post signs to recognize the adoption.

Adoption Requirements

Designate a Primary Contact

Whether an individual, organization, or group is requesting an adoption, **one individual, 18 years or older, will serve as the primary contact person.** This person will be responsible for contacting the Adopt-a-Roadway Coordinator, registering the adoption, organizing cleanup events, communicating safety guidelines to participants for the day of the cleanup(s), and reporting cleanup results to Allegheny County. Spring events will also be reported to the Great American Cleanup of Pennsylvania.

Rule 6

Other Documents

Adopt-a-Roadway.pdf

Choice of DBMS:

Oracle SQL Developer
Reasoning:

Several concerns were important in deciding which DBMS was used. Adopt-A-Highway has a relatively structured set of documentation required for adopting organizations to fill out in order to adopt the section of roadway and arrange clean up events. The team considered three management styles to represent the data: RDBMS (Oracle SQL), XML, NoSQL (MongoDB).

SQL Developer offers users the ability to create logical designs that display all the relevant class information and convert it into prepared SQL DDL. The user interface makes it simple to test separate queries and entire scripts to obtain data quickly from a database. SQL Developer also allows for the use of horizontal partitioning if necessary to divide up stored data elements such as adoptions in larger databases. A relational database's inclusion of constraints also helps to ensure that information is properly added to the database, meeting all the requirements.

XML was another consideration, as it presents information in a designed schema style but is still flexible due to not requiring every field. Its flexibility is useful when dealing with other objects found on the roadway, which may not conform to storing a "number" of bags and other event-specific information. NoSQL was an alternative option, specifically MongoDB, due to extreme flexibility with using json to store information, making it easy to store various pieces of information. However, adding constraints would simplify the presentation of the information to make it simple for standard clerks to add it into a text field on the front end and automatically translate to database information in the back end.

The group recognizes that using a relational database to represent the potential information that Adopt-A-Highway may store may not be an optimal solution due to the strict schema style that needs to be pre-defined to use RDBMS, or Oracle SQL in this particular project. However, due to limited amount of time for the project, the lack of familiarity with other implementations, and the addition of certain constraints on pieces of information presented in Adopt-A-Highway's required forms with rigid requirements, the team opted to choose to continue with the RDBMS model over XML and NoSQL representations of the data.