

INFO 2300: Milestone 3

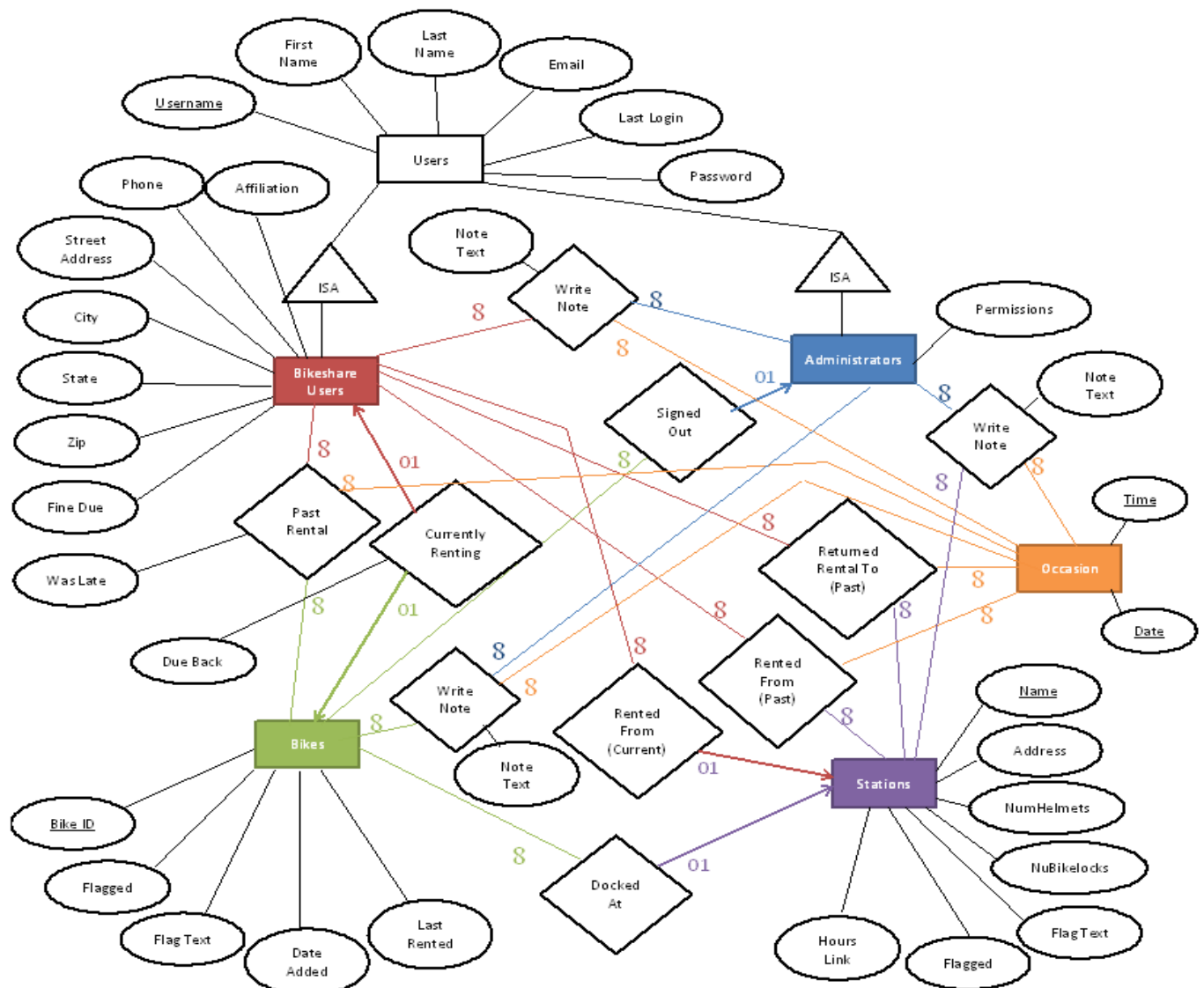
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Database Design

Updated ER Diagram

As in the previous milestone, primary keys are underlined, "01" indicates "zero or one," and the sideways infinity sign indicates "many."



Changes from Milestone 2

After further discussion with our client, we have changed a few of the attributes based on a reassessment of the information they need to store, added a few new relationships (UserNotes, BikeNotes, StationNotes) to extend the admin functionality, and removed the Hours entity to facilitate a lower level of maintenance (station hours change frequently since they are associated with campus libraries and so it is better to just have a link to that location's hours). The Duration entity was also removed since the same information can be described using the Occasion entity.

Database Schema

The different tables involved in our database are described below. Primary keys are underlined. Some tables have additional constraints listed as well. All tables have been implemented on our 2300 MySQL (phpMyAdmin) database (the group username is brbss).

BikeshareUsers(*varchar: email, varchar: password, varchar: fname, varchar: lname, varchar: address, varchar: city, varchar: state, varchar: zip, varchar: phone, double: fines_due, datetime: last_login, varchar: affiliation*)

- Contains information about the people who use the bikeshare program.
- Phone number can be null if the user does not have a phone.
- No other fields can be null.
- The default value of fines_due is 0.

Administrators(*varchar: username, varchar: password, varchar: email, varchar: fname, varchar: lname, int: permissionslvl, datetime: last_login*)

- Contains information on Big Red Bikes team members with administrative privileges.
- No fields can be null.

Bikes(*int: bikeid, date: date_added, datetime: last_rented, varchar: current_station, boolean: flagged, text: flag_descript*)

- Contains information about the bicycles.
- current_station is a foreign key that references Stations. On delete it restricts. On update it cascades.
- current_station can be null if the bike is not currently docked at a station.
- flag_descript can be null if there is no current reason to flag the bike as unavailable.
- last_rented can be null if the bike has not yet been rented.
- No other fields can be null.
- The default value of last_rented is null.
- The default value of flagged is false.
- The default value of flag_descript is null.

Stations(*varchar: name, varchar: address, int: num_helmets, int: num_bikelocks, boolean: flagged, text: flag_descript, varchar: hours_link*)

- Contains information about the stations where bikes can be docked.
- flag_descript can be null if there is no current reason to flag the station as unavailable.
- No other fields may be null.
- The default value for num_helmets and num_bikelocks is 0.
- The default value for flagged is false.

- The default value for `flagged_descript` is null.

CurrentRentals(*varchar: username, int: bikeid, varchar: admin, varchar: rented_from, datetime: time_rented, varchar: due_back*)

- Keeps track of the bikes currently rented out to bikeshare users.
- A particular user can only rent one bike at time.
- A particular bike can only be rented by one user at a time.
- `username` is a foreign key that refers to `BikeshareUsers`. On delete it restricts and on update it cascades.
- `bikeid` is a foreign key that refers to `Bikes`. On delete it restricts and on update it cascades.
- `admin` is a foreign key that refers to `Administrators`. On delete it restricts and on update it cascades.
- `rented_from` is a foreign key that refers to `Stations`. On delete it restricts and on update it cascades.
- No fields can be null.
- The default value for `due_back` is “Due back 30 minutes before closing.” It is a message that gives a user information on their particular rental timeframe.

PastRentals(*int: rentalid, varchar: username, int: bikeid, varchar: rented_from, datetime: time_rented, varchar: returned_to, datetime: time_returned, boolean: was_late*)

- `username` is a foreign key that references `BikeshareUsers`. On delete and on update it cascades.
- No fields can be null.
- Note that `bikeid`, `rented_from`, and `returned_to` do not reference a foreign keys. This is because we want to be able to maintain which bikes a user rented and what station they rented them from/returned them to in the past even if those bike or stations are no longer in use (i.e. deleted from the database). In this case the foreign key constraint would be too constrictive, and so this information is retained in regular fields.

UserNotes(*int: noteid, varchar: username, varchar: admin, text: note_text, datetime: timestamp*)

- `username` is a foreign key that references `BikeshareUsers`. On delete and on update it cascades.
- No field may be null.
- Note that the `admin` field will denote the administrator who originally left the note but is not a foreign key in this case because we want to keep the current `UserNotes` even if that administrator has been removed, and so a foreign key constraint would be too constrictive. The same principle holds for `BikeNotes` and `StationNotes` below.

BikeNotes(*int: noteid, int: bikeid, varchar: admin, text: note_text, datetime: timestamp*)

- `bikeid` is a foreign key that references `Bikes`. On delete and on update it cascades.
- No field may be null.

StationNotes(*int: noteid, varchar: station, varchar: admin, text: note_text, datetime: timestamp*)

- `station` is a foreign key that references `Stations`. On delete and on update it cascades.
- No field may be null.

PHP Interaction

Listed below are all the PHP files on our server, along with descriptions of what the code should do for each. Some have been implemented, and others remain as commented pseudocode.

Bike Red Bikes Website PHP Interaction

About.php

This page contains information to learn about Big Red Bikes and how they are run. There is a link at the bottom of the page saying “Join Our Team” which links users to the recruitment page.

AccountAdmin.php

When administrators log in, they will be routed to this page, which will display a form to fill out to rent out bikes to users.

AccountUser.php

When users log in, they will be routed to this page. It will display their bike renting history.

Apply.php

This page will contain the application form people who are interested in applying to join the Big Red Bikes team can fill out. This application form is a PHP form we created.

Bikes.php

Displays bike availability information. The locations and times of all stations where big red bikes offers their services will go in this section. There will also be a Google Map integrated application displaying the number of bikes per station.

Contact.php

This is the page users can go to in order to contact Bike Red Bikes. There is a PHP contact form on this page users can fill out.

Donate.php

This page explains how alumni and local businesses can contribute to the program by donating a bike.

Faq.php

This page displays and answers questions frequently asked by current bike share users and/or people interested in registering for the program.

Footer.php

Used to display the site’s footer on each page with links to different pages.

Head.php

Used to display the site’s header on each page.

How.php

Describes how the bikeshare program works.

Index.php

Displays the homepage for the site, with an image/news slider. This page will have an image carousel displaying different Big Red Bikes images.

Login.php

Allows users to login to the bike share system. Contains a PHP form asking for their username and password. Bikeshare users are then given access to their account details and administrators are given access to another part of the site that allows them to view details on users and manage the bikes, their exact level of access determined by their permissions level.

Media.php

Displays news articles related to Big Red Bikes.

Models.php

Displays information on the available bike models.

Nav.php

Used to display the site's main navigation on each page. The current page's name is highlighted.

Recruitment.php

Provides information on how to join the Big Red Bikes team, including all currently available positions and details on how to apply.

Register.php

Allows new bikeshare users to register for the program. Contains a PHP form where users can input their contact information and create a username (their email address) and password.

System.php

Explains the steps involved with renting a bike.

User Testing

Testing Protocol

Please find below a script of Instructions and Tasks for User Testing.

Testing Script

Thank you for participating in our user test! Our goal is to test the navigation of the new Bike Red Bikes website we are designing. Before we get started with the user test, we would like to ask the following questions to get to know your background better:

Background Questions:

- *What major/year are you?*
- *How often do you use a computer?*
- *What websites do you normally visit?*

- *Are you a registered with Big Red Bikes?*

We will now task you with some navigational requests to test the usability of our website. Be sure to remember that this is a test on our website, not on you - so relax and be sure to think out loud while going through each task. The way you answer these questions will help us in improving the website.

Tasks:

- 1) *Register and create a Big Red Bikes account.*
 - *What was your experience with this task? Was it easy or difficult?*
- 2) *Find the steps of how the Bike sharing program works.*
 - *What was your experience with this task? Was it easy or difficult?*
- 3) *Fill out an application to get a position with the Big Red Bikes organization.*
 - *What was your experience with this task? Was it easy or difficult?*
- 4) *Find out how you can donate to Big Red Bikes.*
 - *What was your experience with this task? Was it easy or difficult?*
- 5) *Contact Big Red Bikes.*
 - *What was your experience with this task? Was it easy or difficult?*

You have completed the user test! We now have some questions regarding your overall experience with the website during the user test.

Final Wrap Up Questions

- *How was the experience of the actual user test?*
- *Were the questions clear enough? Did you know exactly what we were asking for?*
- *Do you have any recommendations, comments or questions about the website?*

Thanks again for participating in our user test and helping us improve the Big Red Bikes website!

Summary of User Testing

User Backgrounds

User 1: Senior Operations Research Major. Uses a computer daily. Normally visits gmail and Facebook. Has never registered with Big Red Bikes.

User 2: Junior English Major. Uses a computer daily. Frequently visits gmail, Pinterest, and YouTube. Has never registered with Big Red Bikes.

User Task Notes

User 1: Task 1 - not difficult to find, but it would be easier if “Register” stood out more the text blends in too much with the background. Task 2 - very easy to find how the bike sharing program works. Task 3 - It will be easier to test this task once more content is added to the site, but the user was able to easily locate the recruitment page and found it by going to the About Us page and clicking the Recruitment sub navigation link. Task 4 - The user found it extremely easy to find where to donate to Big Red Bikes. Task 5 - The user found it easy to find out how to contact Big Red Bikes. Final Wrap Up - Task 3 was confusing to this user. It initially was find how to join Big Red Bikes, but has been changed to Fill out an application to get a position with

the Big Red Bikes organization to make it more clear of what the task is asking the user to find how to join the organization Big Red Bikes not just to rent a bike. This user also recommended the color scheme changes mentioned below.

User 2: Task 1 - Not difficult to find how to create a Big Red Bikes account, found the register button easily and liked its location in the top corner. Task 2 - Found it very easy to learn more about the bike sharing program and clicked the “How It Works” link in the navigation bar right away. Task 3 - This user scrolled down and found the recruitment link in the footer. Task 4 - The user easily found the donate page via the main navigation bar. Task 5 - The user easily found the contact page via the main navigation bar. Final Wrap Up - This user critiqued the side bar that we had on our website and felt that it made the page too busy. We therefore moved this sub navigation to the top of the page rather than in a side bar.

Summary of Testing

Overall we got great feedback on our website from the two users we tested. Both were able to easily navigate through the website. The only navigation issue we ran into was with User 1 who did not understand what Task 3 was asking initially, but we edited the task to make it more clear for future user testing. We got some helpful feedback in terms of color scheme and overall page layout that we made changes based on.

Action Taken Due to User Testing

Color Scheme Changes

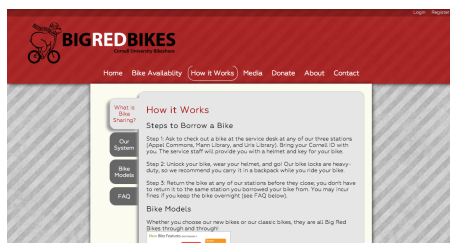
We made several color scheme changes based on user testing to make the website have a more welcoming atmosphere and make the text more visible. Initially our color scheme was just red, white, and black, but we got feedback from our users that some of the text was hard to read. We therefore changed the scheme to still include red but used light hues of grey instead of black to emulate the metal in a bicycle.

Logo Changes

We changed the font color of the logo from dark red to black and white because during our user tests we were told the text was not visible against a red background.

Side Bar Changes

Initially our side bar looked like the image below with side tabs breaking down different sections. During user testing we were told that this type of side bar made the page look too crowded and unprofessional. Therefore we removed the side bar feature and created a second navigation bar under the main navigation bar to break down sections of the site. For example: the How It Works section has pages on: What is Bike Sharing?, Our System, Bike Models, and FAQ.



Future User Testing Protocol

Administrative Users

In the next round of user testing we hope to test the website with a member of the Big Red Bikes executive board and/or an administrative user that rents bikes out to users at their different stations. For administrative users we would like to add an additional task: Task 6: Log into Big Red Bikes as an administrator and fill out form to rent out a bike.

Users

We are also interested in testing actual Big Red Bikes users in the future. For this initial round of user testing both of our users had never used Big Red Bikes before. We would like to add an additional task for a Big Red Bikes user: Task 6: Log into Big Red Bikes as a user and check your bike renting history.