The Data Repository App has been developed for the purpose of storing data and retrieving it later via searches. It has a browser-based UI that users can use to upload two dimensional data (i.e. rows and columns) in the form of Excel spreadsheets or comma-separated-value (CSV) files. The ingested data is stored in a MongoDB database. The raw uploaded files are stored on the server’s file system. The app provides a mechanism for searching for data rows using user specified criteria, as well as the ability to download the originally uploaded files.

When the user uploads data to the system, he also fills out fields specifying the data category (required), the submission date (required), the submitter (required), the project, the charge code, and comments. These, too, can be part of the search criteria. He can also include in the upload files he considers “attachments” (also retrievable later). The data category is selected from a drop down list and is data driven.

Data categories are added to the system in one of two ways. The first is to add it to the comma separated setting in the application’s configuration file called app.defaultSetOfDataCategories. When the application starts up it assures these categories exist in the system. The other way to is to call a REST service for adding them (explained in the admin documentation).

The app’s configuration files are contained in resources directory.

The app is designed in a tiered manner.

|  |  |  |
| --- | --- | --- |
| **Architectural Layers** | **Implementing Technologies** | |
| User Interface (UI) | | HTML5, CSS3, Javascript, Angular, Bootstrap |
| REST Services | | Spring REST Boot |
| Business Objects | | Java |
| Data Access Objects | | Java, MongoDB “Java driver” (a Java library) |
| Data storage | | MongoDB, server file system |

**Source Code Organization**

The UI code is contained in src/main/resources/static.

The HTML files are:

index.html

pages/uploadData.html

pages/findData.html

The CSS file unique to the app is:

css/app.css

The javascript unique to the app is:

js/app.js

External javascript and CSS files are contained in:

bower\_components

It is called bower\_components because a tool called Bower was used to pull them (http://bower.io), and it places them there by default. A file called bower.json is the script for pulling them (refer to Bower’s documentation for usage), though they shouldn’t need to be re-pulled because the files in the bower\_components directory have been added to source control. (This is so that the app’s dependencies are assured to always be present.)

The Java code is in src/main/java

The application’s root package is gov.energy.nrel.dataRepositoryApp.

Within it is a class called DataRepositoryApplication. This class is significant in that it initializes the application. One of the things it does is make sure

Within that are the following packages:

app: contains the application,

bo: business objects

dao: data access objects

model:

restEndpoint:

settings:

utilities:

Applicaiton Configuration

**THE DATABASE**

The Data Repository App uses MongoDB as its data store. It was chosen because it lets you store data in an unstructured manner, as JSON documents. This was a benefit because it allowed us to store the uploaded data without knowing ahead of time what the data’s columns would include.

***Installing MongoDB***

Go to <https://www.mongodb.org> and download MongoDB.

Install it.

***Starting MongoDB***

At the time of this development, MongoDB came with two storage engines. One called “WiredTiger” was represented as being more performant. Therefore, I recommend we use it.

To accommodate that, as a one-time setup task, create a directory somewhere on the machine that WiredTiger can use to store data. For instance, c:/mongodb\_wiretiger.

If you specify its use at startup, Mongo will use WiredTiger. For convenience sake, you might create a script to launch Mondo using WiredTiger. Its contents would follow this form:

*mongod.exe -dbpath <path to storage directory> -storageEngine wiredTiger*

Using the directory example above, it would look like this:

*mongod.exe -dbpath c:/mongodb\_wiretiger -storageEngine wiredTiger*

Then, whenever you wanted to start MongoDB, you’d use that script. (Executing the command at a command prompt would work just as well.)

***Stopping MongoDB***

When MongoDB shuts down, it does cleanup tasks. Without these tasks, data will be put in an unstable state and the next time Mongo starts, will begin by doing a (sometime time-consuming) repair operation. You may have to manually kick the repair operation with:

*mongod.exe –repair*

To allow Mongo to shut down gracefully, doing the following:

1. Launch Mongo’s command line tool:

*mongo.exe*

1. Enter the following commands:

*use admin*

*db.shutdownServer()*

**Memory**