CSC431

Download of Public-facing Data

Software Requirements Specification

Team #3

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Version History

Version	Date	Author(s)	Change Comments
2	May 6, 2018	Jerry Bonnell and Gururaj Shriram	Final Draft
1	March 5, 2018	Jerry Bonnell, Gururaj Shriram, Re Chang	First Draft

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1 System Requirements

1.1 Functional Requirements

1.1.1 Download of Public-facing Data

Table 1: Download of Public-facing Data

Title	Download of Public-facing Data
Description	Users can choose an output format for queried data and download it locally to their machine.
Source Scenario	FR1
Priority	Mandatory: 0
Precondition(s)	List of layers consisting of cadastral, multimedia, and workshop data is passed to the server. Output format is given: one of `GeoJSON`, esri `shapefile`, `kml`, or `CSV`
Postcondition(s)	Data is packaged into a zip file and sent back to the browser for a local download.
Use Case Diagram	Figure 1

1.2 Non-Functional Requirements

1.2.1 Minimum Simultaneous Downloads

Table 2: Minimum Simultaneous Downloads

Title	Minimum Simultaneous Downloads
Description	The download server must handle up to 3 simultaneous download requests.
Source Scenario	NFR1
Priority	High: 1
Applicable FR(s)	FR1

2 System Constraints

2.1 Tool Constraints

2.1.1 Web Application Framework Constraint

References:

- `https://nodejs.org`
- `https://expressjs.com/`

Table 3: Web Application Framework Constraint

Title	Web Application Framework Constraint
Description	We will be using Express/Node.js as the framework for the backend. This will allow for greater ease of deployment on the server-side.
Priority	Mandatory: 0

Table 4: geojson2 Conversion Package

Title	geojson2 Conversion Package
Description	We will be using geojson2 which is a geojson exporting utility belt that can convert a geojson object into several other formats. This package uses the ogr2ogr node package to perform the conversions.
Priority	Mandatory: 0

Table 5: Archiver Packaging Tool

Title	Archiver Packaging Tool
Description	We will use the Archiver node module in order to package all of the requested files into a zip or tar file.
Priority	High: 2

2.2 Language Constraints

2.2.1 Backend REST Framework

Table 6: Backend REST Framework

Title	Backend REST Framework
Description	Because we are using the Express framework, Javascript is a requirement. Therefore, the backend will be written in Javascript.
Priority	Mandatory: 0

2.3 Platform Constraints

2.3.1 Web Service Platform

Table 7: Web Service Platform

Title	Web Service Platform
Description	Express/Node.js is, fortunately, platform independent. Further, a platform constraint has not been set by the client for this team.
Priority	Lowest: 5

2.4 Hardware Constraints

As we are using Amazon EC2 for deployment, our hardware constraints are set by the free-tier package Amazon provides.

References:

- `https://aws.amazon.com/ec2/`

2.4.1 Storage Constraints

Table 8: Storage Constraints

Title	Storage Constraints
Description	Our storage constraint is set by Amazon EC2. However, storage constraints are of minimal priority for this team as there will be nothing stored on disk.
Priority	Lowest: 5

2.4.2 Computation Constraints

Table 9: Computation Constraints

Title	Computation Constraints
Description	Our computation constraint is also set by Amazon EC2. Its free-tier service is ample for this team as our service primarily converts and packages data.
Priority	Low: 4

2.5 Network Constraints

2.5.1 Access Database

Table 10: Access Database

Title	Access Database
Description	Our service must be able to query a PostGRES database over the network in order to fetch geospatial and multimedia data.
Priority	Mandatory: 0

2.5.2 Download Response

Table 11: Download Response

Title	Download Response
Description	Our service must be able to package and send back data to the browser over HTTP protocol for local download.
Priority	Mandatory: 0

2.6 Deployment Constraints

2.6.1 AWS EC2 Deployment

Table 12: AWS EC2 Deployment

Title	AWS EC2 Deployment
Description	The web service will be deployed on Amazon EC2. Amazon provides a free-tier service for 12 months that will last the duration of the semester.
Priority	Medium: 3

2.7 Transition & Support Constraints

2.7.1 Transitionary Requirements

Table 13: Transitionary Requirements

Title	Transitionary Requirements
Description	Once the user selects the needed data elements and desired file format, our service must download the data and package it in a convenient manner for the user.
Priority	Mandatory: 0

2.7.2 Continued Maintenance

Table 14: End of Life

Title	End of Life
Description	This service is a term project for the course CSC431. As such, this service will no longer be maintained after the final grading period, and a new team is required to ensure continued development.
Priority	Lowest: 5

2.8 Budget & Schedule Constraints

2.8.1 Time Constraints

Table 15: Time Constraints

Title	Time Constraints
Description	The service must be designed and developed before the end of the semester: May 7, 2018. A working prototype must be released before this date.
Priority	Mandatory: 0

2.8.2 Budget Constraints

Table 16: Budget Constraints

Title	Budget Constraints
Description	No funds have been made available by the client. Therefore, this project has no budget.
Priority	Lowest: 5

2.9 Miscellaneous Constraints

2.9.1 Performance Constraints

Table 17: Performance Constraints

Title	Performance Constraints
Description	The speed and quality of the service is directly dependent on the reliability of the Search results and the access database's schema.
Priority	Low: 4

3 Requirements Modeling

3.1 Download Public-Facing Data

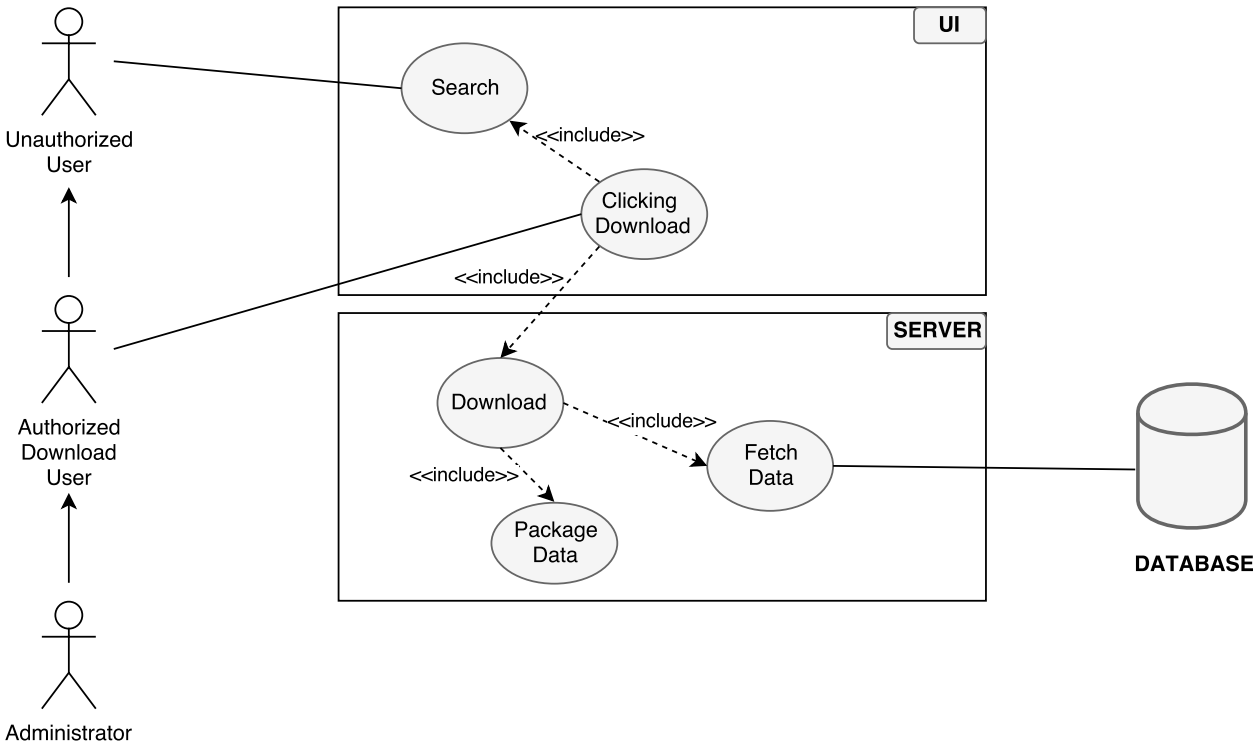
Table 18: FR1 Scenario

Statement of Purpose	The user is interested in downloading useful information in order to quicken the process of obtaining land grants.
Individual	A public (unauthorized), registered (authorized), or administrator user.
Trigger	The user presses a download button.
Precondition(s)	A user search has been completed, filtered for workshop, multimedia, and cadastral data, and may have been subsetted.
Postcondition(s)	A compressed file is downloaded to the user's local machine.
Assumptions	N/A
Steps of Scenario	1. User A observes a list of results from a completed search. 2. User A selects a checkbox for result #3. 3. User A presses the download button. 4. A compressed file of data relevant to result #3 is downloaded locally to User A's machine.

Table 19: Primary Use Case

Name	Download of Public-Facing Data Use Case
Description	This is the primary use case for the flow of the download system.
Actors	The Administrator, Authorized User, and Unauthorized User.
Trigger	This use case is initiated when a user clicks the download button.
Precondition(s)	The user has received Search results, chosen the files to download, and clicked the download button.
Basic Flow	1. The user, regardless of their authentication level, selects files to download from the Search results. 2. The user clicks the download button. 3. For an unauthorized user, the system begins the download process only if the requested data is public. The download of private data requires either an appropriate authentication level or permission from the administrator. 4. For an authorized user: the system begins the download process for the requested data. 5. If the user has permissions to download the requested data, the system fetches the data from the database and packages it. 6. A compressed file of data relevant to the requested data is downloaded locally to the user's machine.
Exceptions	If the user does not have the proper authentication level to download private data, they must request access from an administrator. If there are any errors in the flow, the user may be requested to retry the download.
Postcondition(s)	The user has received a compressed file of their requested data, and any database connections created to download the data are closed.
Special Requirements	Download of data requires either an appropriate authentication level or permission from an administrator. Further, in the initial implementation, only 3 simultaneous download requests are permitted. This use case also assumes that the Search results are accurate and the requested data is stored in the database.

Figure 1: Download Public-Facing Data



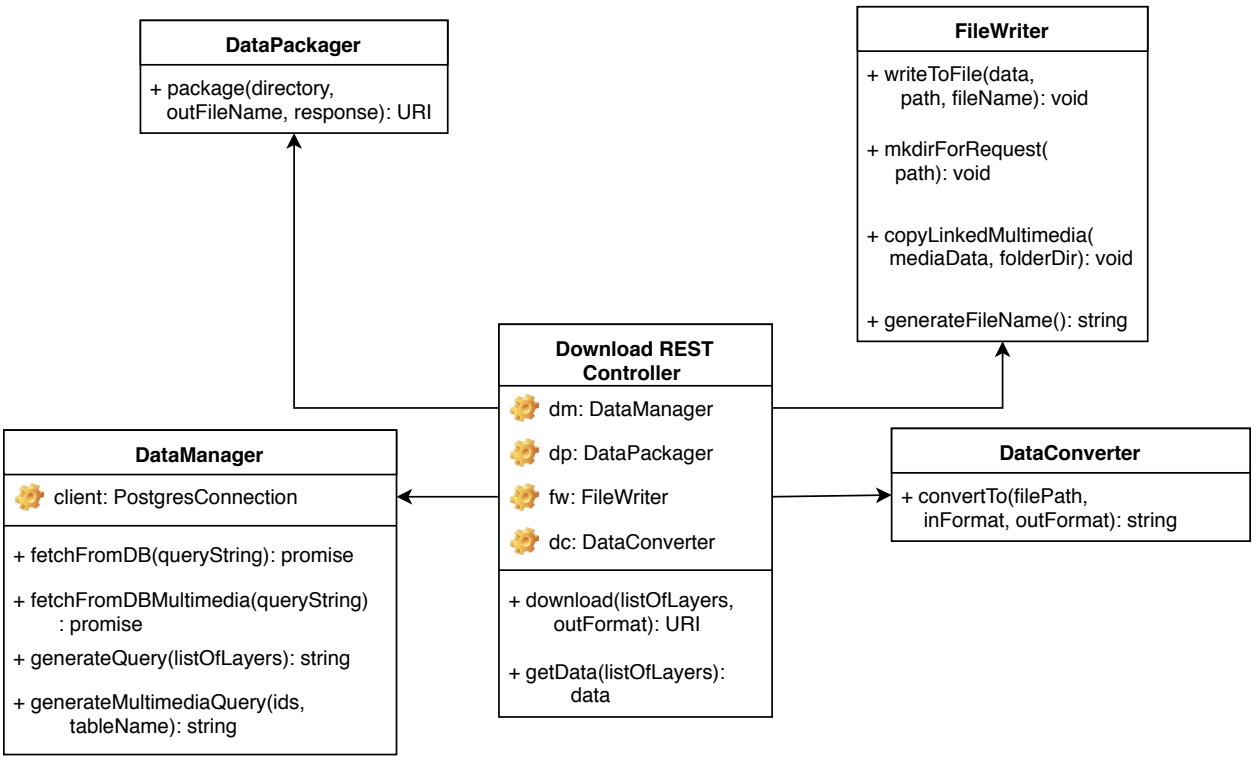
3.2 Minimum Simultaneous Downloads

Table 20: NFR1 Scenario

Statement of Purpose	The system should be able to handle at least three simultaneous download requests.
Individual	A public (unauthorized), registered (authorized), or administrator user.
Trigger	Three or more users select pieces of information to download and press the download button simultaneously.
Precondition(s)	The users' search has been completed, filtered for workshop, multimedia, and cadastral data, and may have been subsetted. The users have selected pieces of information to download.
Postcondition(s)	The pieces of information selected for downloading are compressed and downloaded to the users' local machines.
Assumptions	Each user makes one download request after selecting the necessary pieces of information and pressing the download button on the front end. The minimum requirement is to handle up to three simultaneous download requests. The current iteration of the system can support up to 100 simultaneous download requests.
Steps of Scenario	1. Users A, B, and C observe a list of results from a completed search. 2. Users A, B, and C select pieces of information to download by clicking on checkboxes. 3. Users A, B, and C press the download button simultaneously. 4. The multiple pieces of information relevant to the selected checkboxes are individually compressed and downloaded locally to the machines of Users A, B, and C.

3.3 Class Diagram

Figure 2: Class Diagram



4 Evolutionary Requirements (TBA)

At this moment, there are no evolutionary requirements set for this project.

4.1 Functional Requirements

4.1.1 Placeholder

Table 21: Placeholder

Title	Insert title
Description	A one or two sentence description
Priority	Priority from 0 (highest) - 5 (lowest)
Precondition(s)	What needs to happen before
Postcondition(s)	What happens as a result
Use Case Diagram	Link or number, if present

4.2 Functional Requirements

4.2.1 Placeholder

Table 22: Placeholder

Title	Insert title
Description	A one or two sentence description
Priority	Priority from 0 (highest) - 5 (lowest)
Applicable FR(s)	What functional requirement(s) is this applicable to?