

Data Set Explorer with Voting

Overview: The Data Set Explorer with Voting program saves data sets. A data set includes the source and target items along with the answer set which are the links between the source and target items. The program will allow importing new data sets, exporting data sets, and voting on links in the data sets. Other tasks might include cloning a data set, viewing the history of a data set, and reviewing a data set. The program will provide a visual representation of the answer set between the source and target items in the data set and allow the user to see which items in the data set are or are not linked. The user will be able to vote on if they agree with the existing links and the user can also recommend adding or removing a link between source and target items. The initial use case for the program uses a data set of requirements (source) and specifications (target) with the links between the two.

The program will have a menu that allows the user to select their task. Available tasks and subtasks include:

- Import a new data set
- Export a data set
- Browse, comment, and/or vote on a data set
 - Browse
 - Add a comment on a link
 - Add a comment on the data set
 - Vote on a link
 - Recommend to remove a link
 - Recommend to add a link
 - View comments
 - View history
 - Identify items with no link
 - Request to become an owner of a data set
- Clone a data set
- Administer a data set
 - Publish a new version
 - Make the data set public (release)
 - Make the data set private
 - Add a link
 - Remove a link
- Administer users
 - Grant access to a user
 - Revoke access from a user

Task Overview

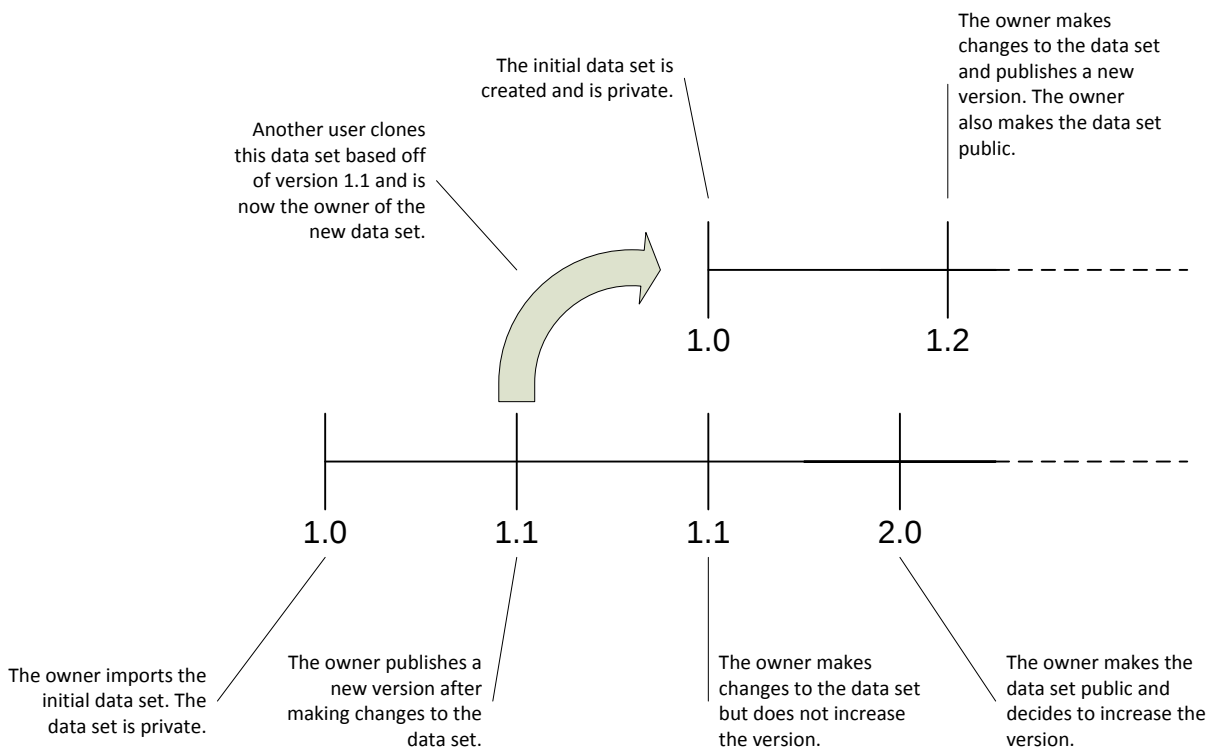
Task Name	Description
Import a new data set	Allows importing a new data set. The data set must be in zip file. The zip file must have a specified structure. There will be a top folder which contains 2 subfolders. One of the subfolders contains the source items and one contains the target items. Within the top folder, there will be a .txt file containing the answer set.
Export a data set	Allows exporting an existing data set which has a published version. Exports the data set to a zip file with the same format as the import zip file (see above). Options could include exporting with or without gray links.
Browse	Allows the user to look through the data set in order to view items.
Add a comment on a link	Allows the user to add a comment to a link. All comments are visible to all users.
Add a comment on the data set	Allows the user to add a comment to the data set. All comments are visible to all users.
Vote on a link	Allows a user to vote on an existing link in a public data set. Voting choices are: Link (black) Not a link (white) Possible link (gray) Based on the data set, gray links can be disabled as a voting choice by the owner.
Recommend to remove a link	Allows for recommending to the administrator that an existing link should be removed between a specific source and target item. An explanation can be entered to discuss why the user thinks the existing link should be removed.
Recommend to add a link	Allows for recommending to the administrator that a link should be added between a specific source and target item. An explanation can be entered to discuss why the user thinks a link should be added and the type of link (gray or black).
View comments	All users can view comments on all public data sets. Displays a list of all comments associated with the data set.
View history	Allows reviewing the history of the data set which could include: the version of the data set, the data set creation date, the user that uploaded the data set, the dates when the data set was exported or cloned and accompanying users, a list of the recommendations and the actions taken on each one, etc.
Identify items with no link	Displays a list of source and target items in the data set which have no link.
Request to become an	Allows a user to send a request to the owner of the data set asking to make them an owner.

owner of a data set	
Cloning a data set	Allows creating a copy of an existing data set based on a published version of the data set. The new data set stands alone and starts at the initial version. Once a data set is cloned, the history will indicate the data set which it was cloned from but all ties to the parent data set are cut. Meaning changes to the parent or clone do not impact the other.
Publish a new version	Allows an administrator or owner to create a new version of the data set.
Make the data set public (release)	Allows an administrator or owner to make the data set public. When the data set is public all users in the system, not just administrators or owners of the data set, are able to view the data set. The administrator/owner is given the option of creating a new version of the data set at this time but it is not required.
Make the data set private	Allows an administrator or owner to change the public data set back to private. When the data set is private only administrators/owners of the data set are able to view the data set.
Add a link	Allows an administrator or owner to approve or deny a user's recommendation to add a link. The administrator/owner can add an explanation of why the link was approved or denied which is kept in the history of the data set.
Remove a link	Allows an administrator or owner to approve or deny a user's recommendation to add a link. The administrator or owner can add an explanation of why the link was approved or denied which is kept in the history of the data set.
Grant access to a user	Allows a user to grant access to a new user.
Revoke access from a user	Allows an administrator to revoke the access of any user in the system.

Versioning Overview

The version of the data set is used to capture a point in time of the data set. This allows the user to know what links made up the data set at that time. Someone using the system may be using a certain version of the data set for their experiments and they need to be able to come back to the system and retrieve the same data as before. Or if the user gets a different version of the data set they will know which links have changed. Only administrators or owners can create a new version of the data set. The administrator/owner can add or remove one or many links and then decide to create a new version of the data set. The administrator/owner has the option to make changes but not create a new version at that time. Users can only export published versions of a data set meaning the export does not take into account any recommendations which have been made since the last version was created. Users will have the ability to add a comment on the data set if they need the administrator/owner to take action on a data set (such as add or remove links) and then create a new version. The initial version of a data set when it is imported will be 1.0. When the administrator/owner creates a new version, they have two

choices: 1) increment the version to the next major version (i.e., 2.0) or 2) increase the version to the next minor version (i.e., 1.1).



Role Overview

Privilege Level	Role	Description / Privileges
Highest (the user has the capabilities in this role and all lower roles)	Administrator	-can change any data set to be public or private -can add other users as owners to any data set -can vote on any data set -can comment on any data set -can see voting summary information for any data set -can download a published version of any data set -can create a new version of any data set -can make recommendations to add or remove a link on any data set -can accept or reject recommendations to add/remove links on any data set -can make decisions on links after voting has occurred on any data set -can revoke the access of any user in the system
High	Owner	-can change a data set they own to be public or private -can add other users as owners to data sets which they own

		-can vote on any public data set and private data sets for which they are the owner -can comment on any public data set and private data sets for which they are the owner -can see voting summary information for any public data set and private data sets for which they are the owner -can download a published version of any public data set and private data sets for which they are the owner -can create a new version of any public data set and private data sets for which they are the owner -can make recommendations to add or remove a link on private data sets for which they are the owner -can accept or reject recommendations to add/remove links on data sets they own -can make decisions on links after voting has occurred on data sets they own
Lowest	User	-can create a new user -can upload and create a new data set becoming the owner of that data set -can vote on any public data set -can comment on any public data set -can see voting summary information for any public data set -can download a published version of any public data set -can clone a published version of any public data set -can make recommendations to add or remove a link on any public data set -can request to become an owner of a public data set

User Interface Overview

The main screen for exploring the data set will look like the following mock-up:

File Edit View Help

Data Set Explorer

- CM1
 - Source Items
 - SRS5.1.1.1
 - SRS5.1.1.2
 - SRS5.1.1.3
 - SRS5.1.1.4
 - SRS5.1.1.5
 - SRS5.1.1.6
 - SRS5.1.1.7
 - SRS5.1.1.8
 - SRS5.1.1.9
 - SRS5.1.1.10**
 - Target Items
 - DPUSDS4.0.1
 - DPUSDS4.0.2
 - DPUSDS4.0.3
 - DPUSDS4.0.4
 - DPUSDS4.0.5
 - DPUSDS4.0.6
 - DPUSDS4.4.1.1

Detail

Source: SRS5.1.1.10

The DPU-BOOT CSC shall include a DRAM BIT consisting of two write/read/compare tests. The first test shall write the address of each memory location to that location. The second test shall write the complement of each memory location to that location.

Links

Target: DPUSDS4.4.1.1

Startup Sequence The DPU FSW is booted using PROM-resident bootstrap software. The bootstrap software performs a basic set of built-in tests, then copies the DPU FSW from EEPROM to DRAM and executes it. In flight, there are two methods which can trigger the DPU FSW to boot:* power-on (cold boot), or*

Target: DPUSDS5.1.0.2

initial boot sequence the initial boot sequence, identified as Boot Sequence 1. This processing takes place when the Bootstrap executes from Programmable Read-Only Memory (PROM). Boot Sequence 1 is composed primarily of 4 steps as follows.First, in this sequence, EEPROM is updated. Then, CPU BIT and a portion of DRAM BIT is performed. Next, DRAM is cleared. Lastly, Boot Sequence 2 is copied to DRAM and executed. During this sequence, the rest of DRAM is tested if skipBit is not set. Load parameters are put into registers r13, r14, r15 and r16. DRAM is cleared up to memSize. Lastly, either the DPU-RTOS or the Bootstrap Monitor is loaded and executed according to the load parameters.

Target: DPUSDS5.1.2.3

DRAM BIT Part of the memory is tested in Boot Sequence 1, and part of the memory is tested during Boot Sequence 2. During Boot Sequence 1, ? KB of DRAM is tested before the Bootstrap is copied to this area. During Boot Sequence 2, the remaining memory is tested in ? KB blocks. The DRAM BIT first writes the address of each word in a block to that word in the block. Then the test flushes the cache and reads back the entire block. If a single-bit error occurs on the read-back, the location is read again. If another single-bit error occurs, the test assumes a hard error and marks the whole block bad. If a multiple-bit error occurs, the whole block is marked bad. If the value read back does not match the address, the whole block is marked bad. This same process is repeated with the one's complement of the address. The Bootstrap stores the results of the DRAM BIT in EEPROM as a series of x consecutive y-bit words. Each bit in a result word represents the result of testing a ? KB block of DRAM. These bits are mapped to DRAM by proceeding from least-significant bit (LSb) to most-significant bit (MSb) as the addresses of the memory blocks increase. A set

Data Set Properties

Name	CM1
Description	CM1/Baselines in Requirements
Revision	2 of 2
Source Items	235
Target Items	220
Links	162

The Data Set Explorer and Data Set Properties panes are fixed. The Detail pane is fixed and is a tab-view pane so multiple tabs can be opened in this pane. The list of source and target items is listed in a tree view in the upper left hand Data Set Explorer pane. If a list of the links is required in the tree view, this can also be added. The data set summary information is listed in the lower left hand Data Set Properties pane. When the user selects an item in the tree view by double clicking, the links for the item are displayed in the right hand Detail pane in a new tab. In this example, the user has selected source item SRS5.5.5.10 and the linked items to this source are displayed. The user can scroll through the list of linked items in order to see all of the items. The user can then double click on a link in the Detail pane in order to open that specific link in a separate tab. When a specific link is opened, the voting information is displayed:

Data Set Navigator

File Edit View Help

Data Set Explorer

CM1

Source items

SRSS5.1.1.1

SRSS5.1.1.2

SRSS5.1.1.3

SRSS5.1.1.4

SRSS5.1.1.5

SRSS5.1.1.6

SRSS5.1.1.7

SRSS5.1.1.8

SRSS5.1.1.9

SRSS5.1.1.10

Target Items

DPUSDS4.0.1

DPUSDS4.0.2

DPUSDS4.0.3

DPUSDS4.0.4

DPUSDS4.0.5

DPUSDS4.0.6

DPUSDS4.4.1.1

Detail | Link |

Source: SRS5.1.1.10

The DPU-BOOT CSC shall include a DRAM BIT consisting of two write/read/compare tests. The first test shall write the address of each memory location to that location. The second test shall write the complement of each memory location to that location.

Link

Target: DPUSDS4.4.1.1

Startup Sequence

The DPU FSW is booted using PROM-resident bootstrap software. The bootstrap software performs a basic set of built-in tests, then copies the DPU FSW from EEPROM to DRAM and executes it. In flight, there are two methods which can trigger the DPU FSW to boot:* power-on (cold boot), or*

Link type: Link (black)

Vote:

☒ Link (black)

☐ Not a link (white)

☐ Possible link (gray)

Vote

Other actions:

Recommend to remove this link

Voting Summary:

Link (black)87.5% (14)

Not a link (white)0% (0)

Possible link (gray)12.5% (2)

Total number of votes:16

Number of recommendations to add this link:0

Number of recommendations to remove this link:0

Data Set Properties

Name	CM1
Description	CM1/Baselines in Requirements
Revision	2 of 2
Source Items	235
Target Items	220
Links	162

This view of the specific link allows the user to see the current link they have selected. The type of link is also displayed based on the current top vote (options include: Link (black), Not a link (white), Possible link (gray)). The user can vote on this link by selecting the appropriate radio button and then selecting the Vote button. The user also has the option to select the Recommend to remove this link button. The voting summary is shown at the bottom and this can be configured to only be visible to administrative users if necessary.

Terminology

Term	Definition
Data set	One entire set of data which consists of the source list, target list, and an answer set.
Answer set	The list of all items in the source and the corresponding link(s) in the target. Some source items may have no links in the target list. Some target items may have no links back to the source list.
Source list	The starting list of items, such as requirements. For every source list, there is one corresponding target list.
Target list	The ending list of items, such as design elements. For every target list, there is one corresponding source list.
Link	One item in the answer set list which is the connection between the source item and target item.

Assumptions

- The tool will be a Windows application. It is considered future work to convert the Windows application to a web-based application if needed.
- The source and target items will remain static once they are imported.
- There can be multiple answer sets per the corresponding source and target items.

Questions

- Is there a use case for having multiple answer sets per data set? It seems like if you want multiple answer sets this would just be a different/newer version of the same data set. Otherwise any voting or commenting would have to be done on potentially multiple answer sets (so there would be rework on the user's part).
- Are you sure you want the user to be able to change the version? It seems like the version would start initially at 1.0 then it would be incremented when the data set is published, when links are added or removed, when the data set is made private, and when the data set is exported.