Data Management Plan of DDBJ Datasets using Shiny-SurrealDB: a study case

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第27回オープンバイオ研究会

2023-03-11

Overview

Introduction

At DDBJ we deal with a number of databases which occasionally requires new platforms for an easy access, store and integrate a particular dataset.

Having in mind that lose data is a historical problem in scientific research, and even when data is not lost, in some cases precious research time is lost when trying to find or understand what the it means.

Therefore, we understand that implementation of a data management plan should be aimed, so less time finding, understanding, reusing and/or sharing data would be spent by researchers. As well as, reliable procedures should be implemented in order to deal with private data.

Why SurrealDB?

Speed and data interaction are fundamental issues in nowadays web applications, particularly with data that have different formats. Since SurrealDB promotes fast searches, even within large datasets and allows data interconnection in a schemaless format, in both relational and graph formats, it was selected for the purpose of our project.

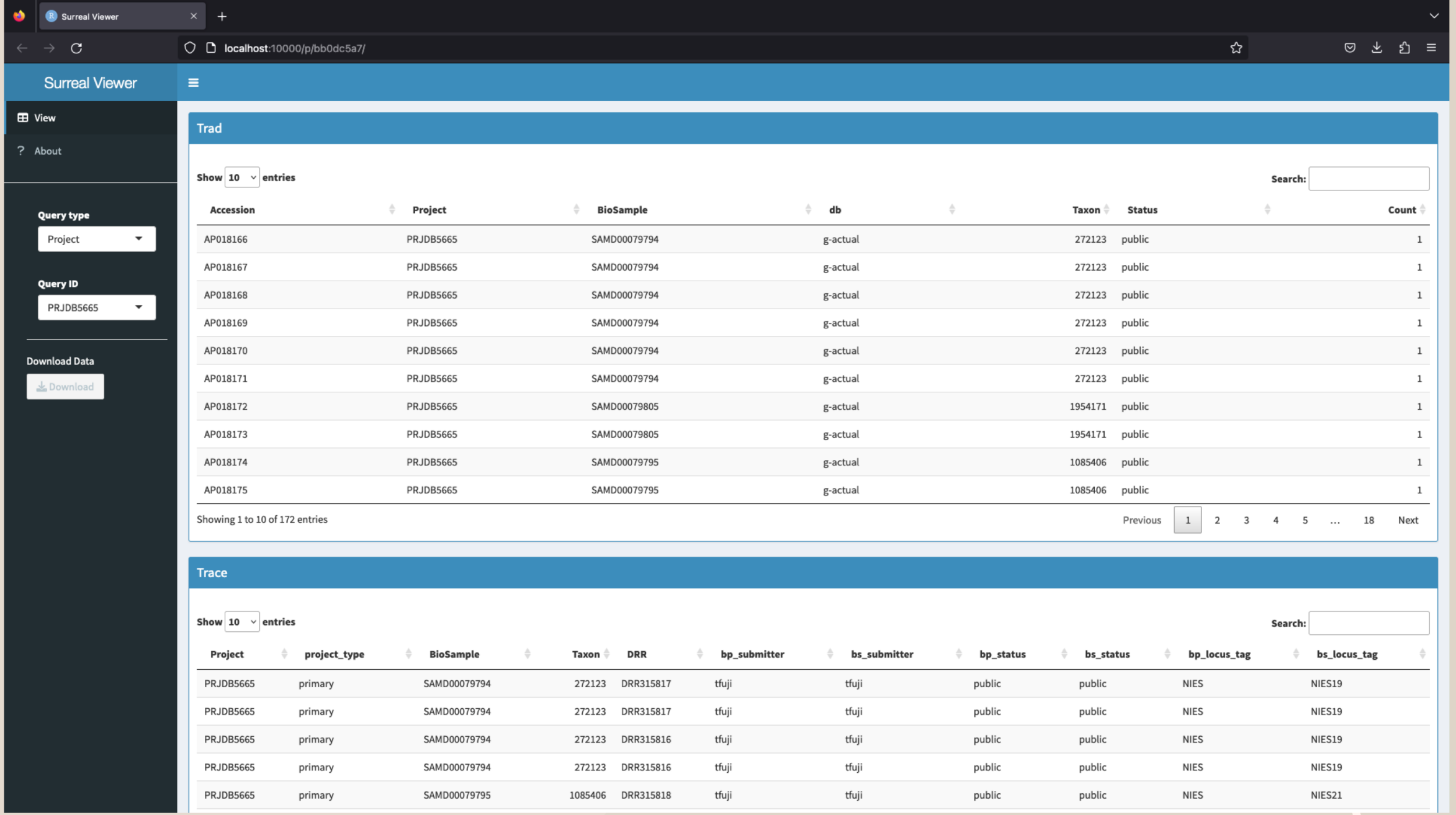
Data Management Guidelines

Documentation	How To	Record the most important information, in README files, codebooks, notebooks, such as GitHub.
Consistency	Where	Organize folders, subfolders and filenames in a logical structure, such as by project and/or date.
Version	When	Keeping distinct copies, for example keep original files and the clean final version, in a classification system such as Git.
Security	Who can/ Who shouldn't	(a) Establish security controls for accession of confidential data. (b) Security breach, such as SQL injection attacks, Malware, etc.
Constraints	Which	Identify best tools based on evaluation of accessibility, speed, vulnerabilities and limitations.
Back-up	Why	Automated and with regular frequency, daily or weekly. Also, perform periodical confirmation that backups are working properly.

Database security: Issues to consider

- Encrypt confidential data, such as masking and tokenization should be considered.
- Access to database should be restricted to the minimum level.
- Web applications that access the database should comply with best practices security guidelines.
- Monitoring log activity and automated detection of suspicious activities.

Study Case: Surreal Viewer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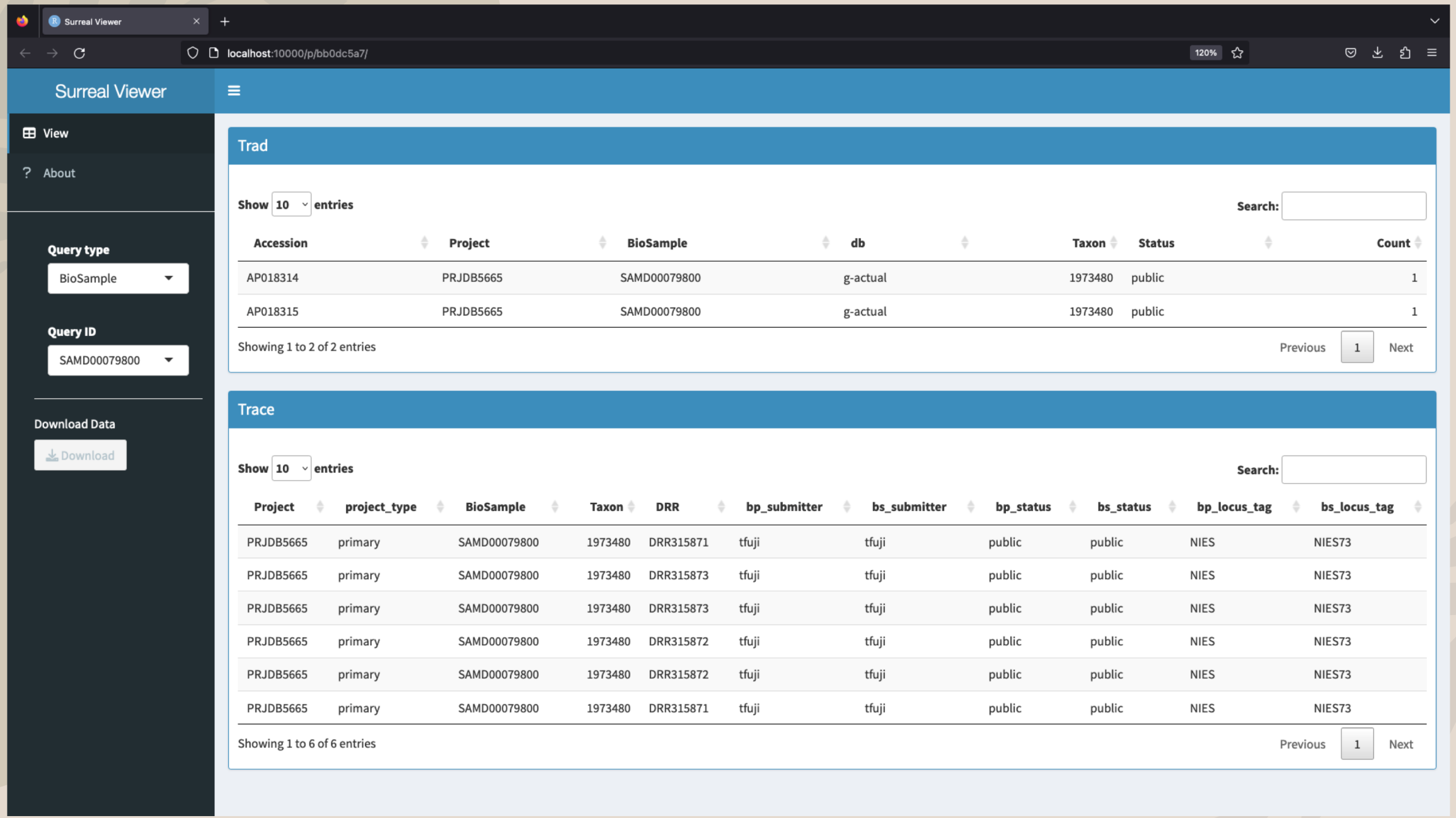
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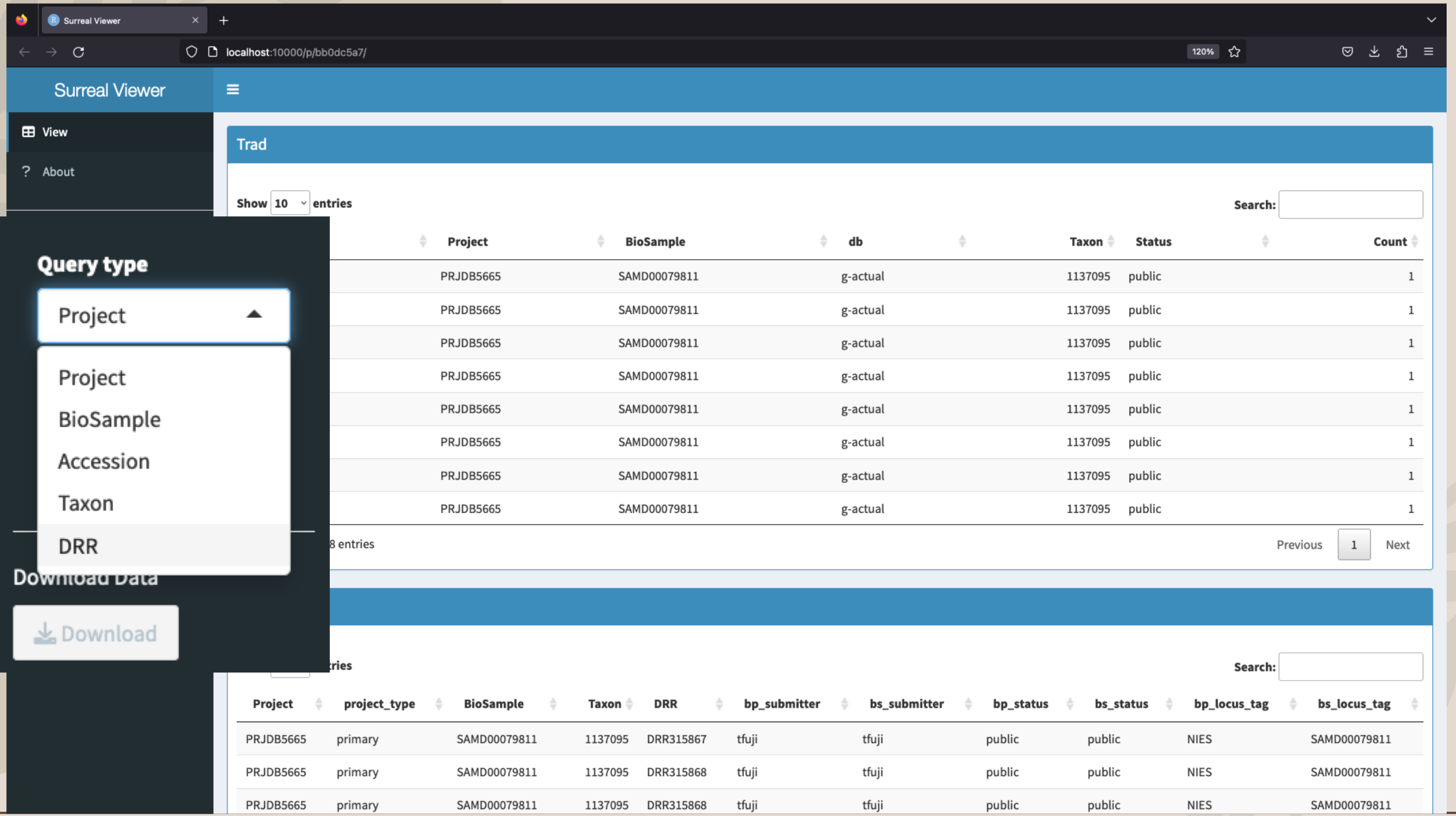
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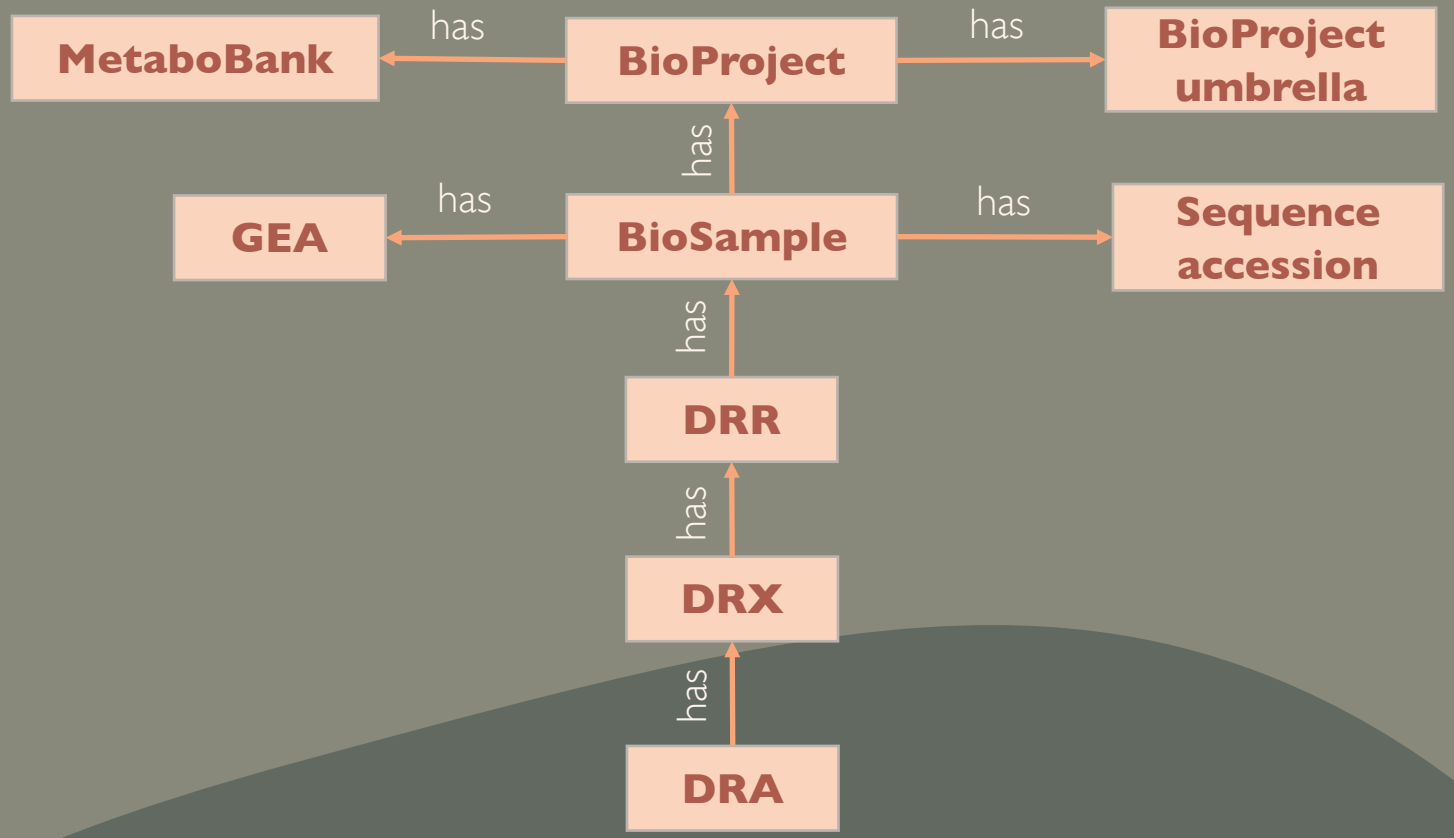
SurrealDB Data Integration



Summary

In order to have a efficient data management there are some important steps to follow, such as:

- Good documentation of the procedures used to manage and store data;
- Establish rules for directory, sub-directories and filenames, which should be easily understandable;
- Versioning all updates in a structured manner such as used in GitHub;
- Secure confidential data as well as being aware of security breaches;
- Identify strengths and weakness of the tools that have being used in the system;
- Automate a periodic backup to secure data.

References

1. Briney KA, Coates H, Goben A (2020) Foundational Practices of Research Data Management. Research Ideas and Outcomes 6: e56508.
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3. Database management - https://www.smartsheet.com/database-management.

ありがとうございます

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