

S2 Supplemental Document: Expanded description of the tool functions and analysis

Researcher-centered workflow

Data management plan (DMP) template content is carefully designed to fit plant sciences as much as possible. Templates were tested by users at an early stage and have gone through tens of iterations. Each suggestion or advice was carefully considered. Until now, the DataPLAN covers genomics, transcriptomics, proteomics, metabolomics, phenotyping and modeling data.

The same user input can be used to create three detailed DMPs, one short proposal and one practical guide, by several mouse clicks. The three DMPs also include issue warnings to help users avoid potential legal or regulatory violations. The DataPLAN will be continuously updated to align with the new laws and regulations.

To enable collaboration between different users, the answers can be shared online and integrated into a link. DataPLAN can automatically load the answers. While reloading the answers, the input of the answer will be reloaded into the input field, so that the revision will be much easier for the user.

Error proofing and warnings

Error proofing helps to improve user friendliness. Each answer is checked for completeness. If the answer is the same as the *placeholder* or empty, the progress bar will not proceed. If the user submits an unfinished answer, there will be another guide before the final download or copying to help the user walk through all unanswered questions. When all questions are answered, the potential warning will be triggered in the next step to help users clarify the legal and regulatory concerns related to the targeted research object.

Exception handling and security

DataPLAN software might also encounter bugs or issues caused by design flaws or

undefined usages. As a hosted static web page, the user can refresh the page to bypass bugs or errors. The no-backend design means that DataPLAN is highly secure and stable. All information provided by the user will not be stored on the server, which means that the information security is guaranteed.

Convenient features

Reminders with customizable date and name can be downloaded and imported to Outlook and Google calendars. The input given by the users is stored in the browser's local storage. The answers can also be exported and further shared with other people. If the exported answers are uploaded to a directly accessible URL, then the DMP can be reached by using a single URL. The exported answers can be compared to the current answers while importing from the downloaded JSON file.

Customizable templates for users

The templates used for DataPLAN can be created using a text editor or document processor such as Word, Google Docs, Notepad, or the DataPLAN itself. DataPlant can also export all the raw data files of the templates for user-defined templates. Users only need to learn the mechanisms of the *placeholders* and macros, but do not need to learn programming to make user-defined templates. The placeholders and macros are:

1. Text input or text field:

The *placeholders* are in Perl default variable style, starting with `$_`, followed by a keyword. The text input simply replaces the *placeholder* described in the html element, plus adding commas or dots.

2. Checkboxes:

The selection box options are used to keep or remove text between *#if* + *placeholders* such as `$_PLACEHOLDER` and *#endif* plus the same *placeholder* as the previous. Conditional brackets can also be constituted with *#if* and *#endif*.

After creating a user-defined template, the user can directly submit the text to the DataPLAN and get the finished document immediately.