Project Report

Slide Linker

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TIEVA31 – Principles of Programming Graphical User Interfaces, project work, 5cu

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Introduction

The application makes it possible to create “presentations” where an individual slide can be linked to any other slide. The traversal between slides will happen through selecting an option from a variety of options. Each option has a predefined endpoint, a link to another slide, where the user will be directed to after choosing the option.

This allows a non-linear traversal of the presentation, where the path traversed by the user is defined by the decisions the user makes.

For this reason, the application could be used to create flexible inquiries, decision-based role-playing “games”, teaching material, or any other type of content where flexible decision-focused approach is required.

Functionality

The application has the following main functionality:

- Operations to do to the manipulated data:
    - Updating textual and numerical information, for example, changing the heading of the slide
    - Modify the position, size and rotation angle of the slide image
    - Modify slides’ options
    - Modify individual slides in the project
    - Sort and filter the project’s slides in the main editing view
- Undo and redo:
    - Available in the slide editing view
- Settings, where the interface parameters can be adjusted:
    - Light/dark mode
    - Changing the language (Finnish/English)
    - Changing the primary and secondary colors of the interface
    - Changing the font used in the application
    - Changing the font size used in the application
- Keyboard shortcuts, keyboard navigation:
    - TAB-key to switch active element in the interface
    - ENTER-key to activate the active element (if possible)
    - In the slide editing view:
        - Ctrl+Z to undo, Ctrl+Y to redo, Ctrl+S to save, Ctrl+D to delete, Ctrl+C to cancel
- A structural component:
    - Slides table in the main editing view, showcasing the project slides

In addition, it has the following features:

- Loading a file:
    - The user can load project files and image files
- Internationalization:
    - Two languages (Finnish/English) to choose for the interface
- Drag and drop:
    - The user can drag-n-drop an image to the image field in the slide editing view

Unfortunately, due to the limitations of client-side JavaScript, creating, saving and deleting files has not been implemented.
To properly implement these features, I would have had to create an actual backend for the application. Because this would have taken me a lot of time to implement, and because server-side development has not been covered in this course, I decided not to include an actual backend to this version of the application.

Awkwardly, this is why some of the buttons in the interface don't do anything.

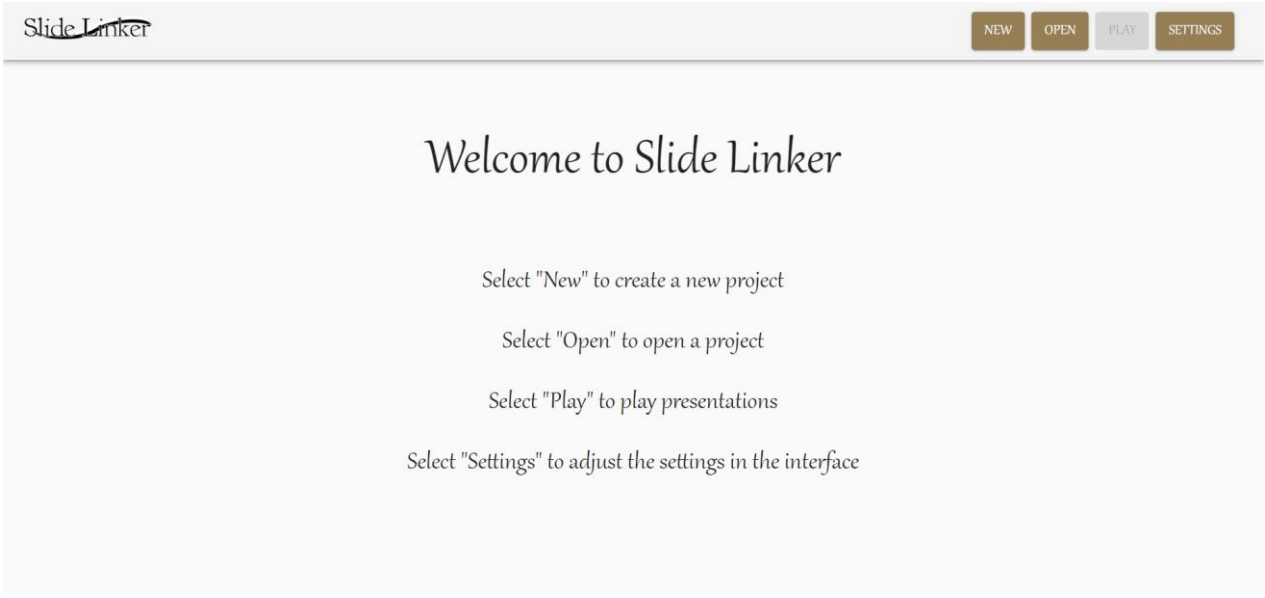
User Interface

The user interface consists of four views:

- The welcome view
- The main editing view
- The slide editing view
- The presentation view

The Welcome View

The welcome view is the view shown to the user when the user first enters the application site.



Here some advice is given to the user about how to use the application.

The "New"-button's features have not been implemented.

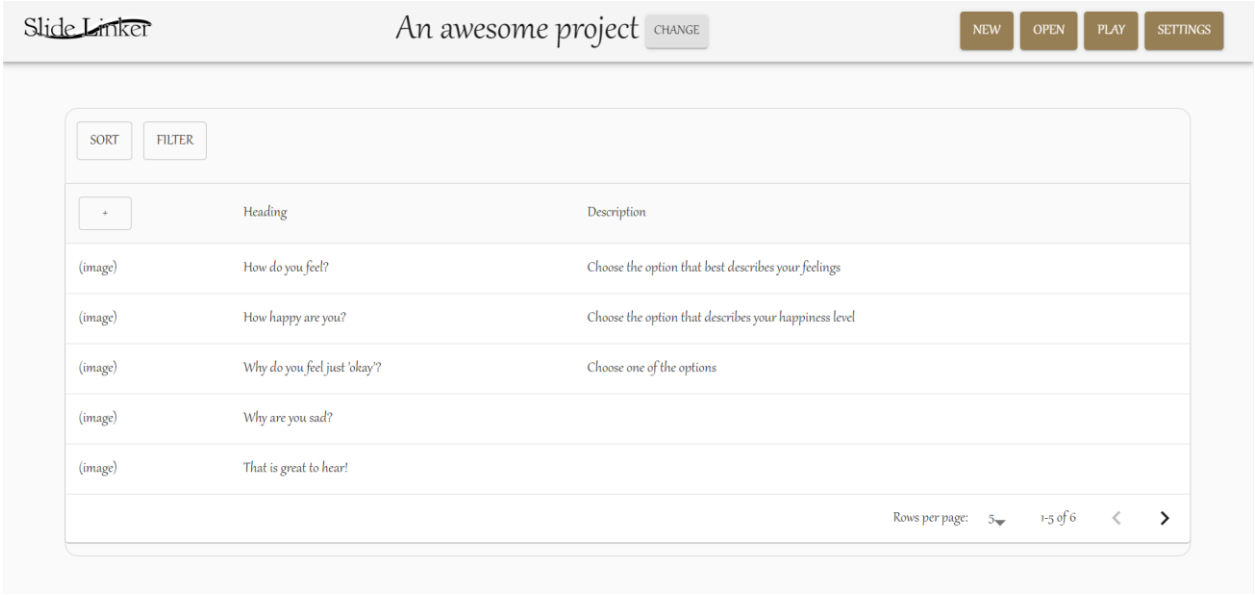
The "Open"-button opens a file explorer, where the user can choose a project file. Provided default project files are called "An awesome project.json" and "Hello project.json", and they exist in the /src/save_files folder. Once a project file has been selected, the application reads the file, and activates the main editing view.

In the welcome view the "Play"-button is disabled because no project has been opened yet.

The “Settings”-button opens a menu, where the user interface settings can be adjusted. The settings menu has been documented in more detail later in the document.

The Main Editing View

The main editing view is where an overview of the open project can be examined.



“New”-button functionality has not been implemented in this version.

“Open”-button lets the user to change the open project.

“Play”-button opens the project in the presentation view.

“Settings”-button opens a menu, where the user interface settings can be adjusted. The settings menu has been documented in more detail later in the document.

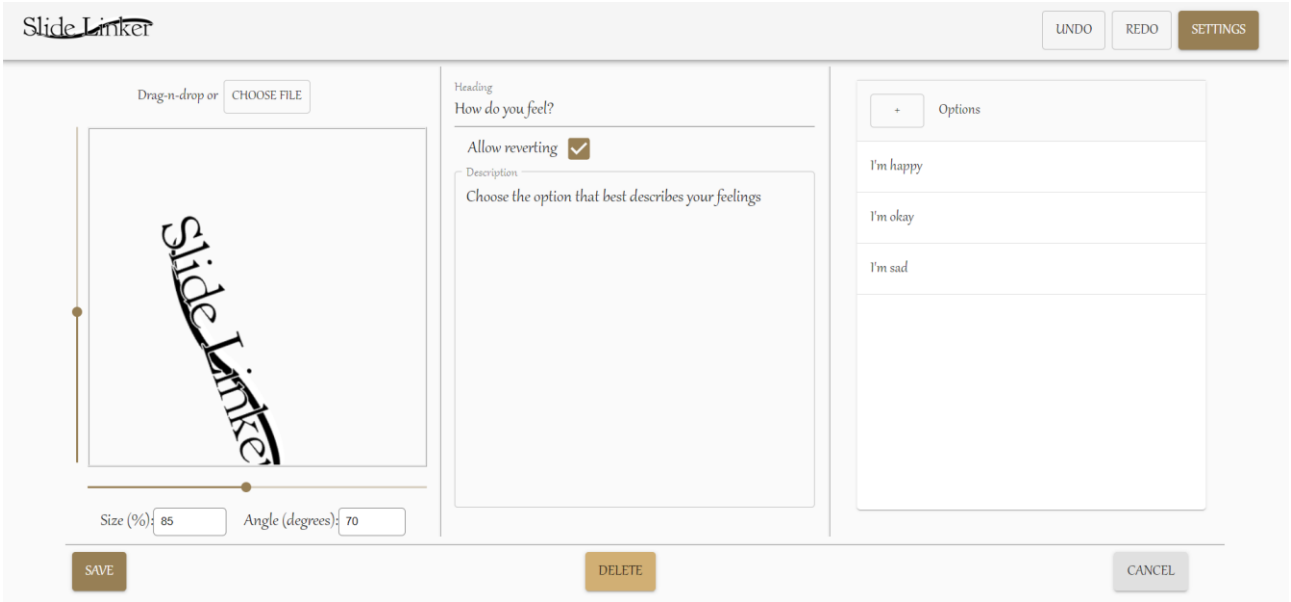
At the middle of the application’s top bar, the project title is displayed.
Next to the project title is a “Change”-button (functionality not implemented).

Under the top bar there is a table showing the project slides. The slides table has been documented in more detail later in the document.

Choosing an individual slide from the slides table opens the slide editing view, where the user can edit the chosen slide.

The Slide Editing View

The slide editing view consists of all the settings available for an individual slide. To get here, a slide has to be chosen in the main editing view.



In the top bar there are buttons for “Undo”- and “Redo”-operations. Making changes to slide’s settings adds the performed operations to the editing history, which can be traversed using these buttons. Also, keyboard shortcuts have been added to this functionality (Ctrl+Z for Undo, Ctrl+Y for Redo).

“Settings”-button opens a menu, where the user interface settings can be adjusted. The settings menu has been documented in more detail later in the document.

The center area is divided into three parts:

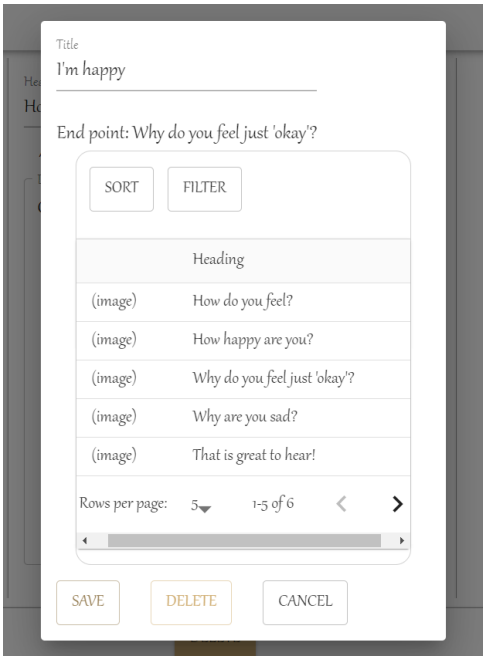
- The image editing area (left side)
- The info editing area (center)
- The options editing area (right side)

In the *image editing area*, the slide image is shown. To add or change the image, the user can either drag-n-drop an image to the area or click the “Choose file”-button to manually choose the image file from their computer.
The vertical slider determines the vertical position of the image. The horizontal slider determines the horizontal position of the image.
The “Size”- input field is used to change the image size.
The “Angle” -input field is used to set the rotation angle of the image.

In the *info editing area* the user can change the main information (heading, reverting, description) related to the slide.
At the top the user can change the heading of the slide.

Under heading edit, there is a check box for allowing/disallowing reverting to earlier slides.
The “Description”-field is used to edit the description of the slide.

In the *options editing area* the user can view and edit the options related to the slide (saving the changes has not been implemented).



The “+”-button functionality has not been implemented.
The user can edit an individual option’s settings by clicking the option. This opens a dialog where the user can change the title of the option, and the end point of the option.

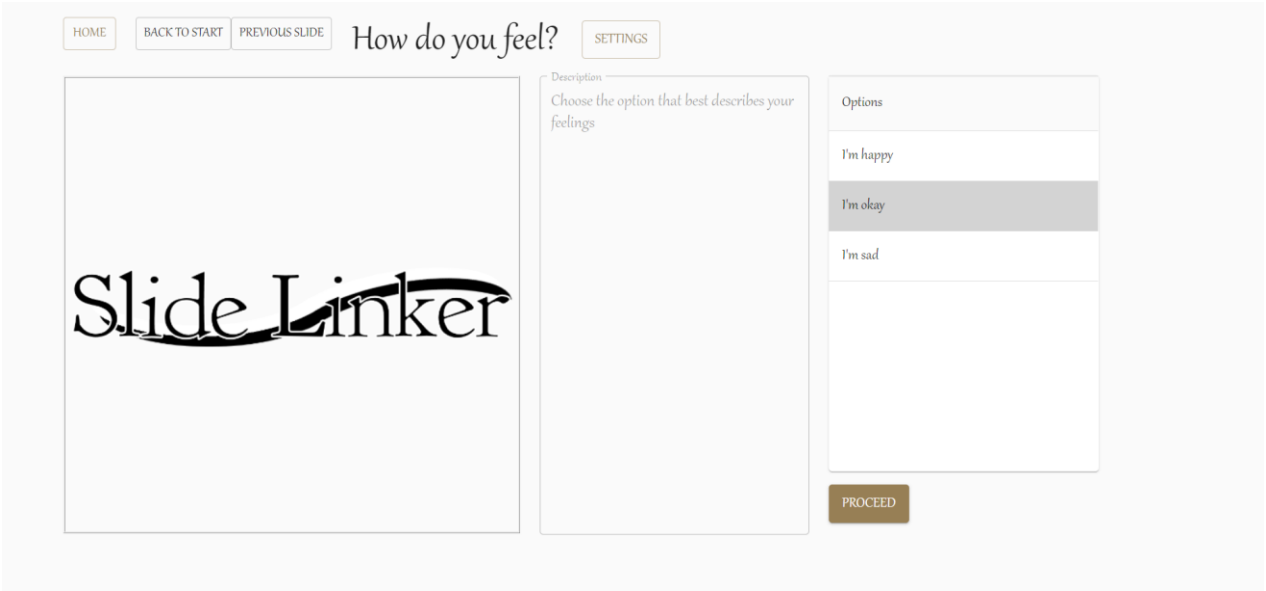
The end point can be changed by selecting a slide from a slides table (the slides table has been documented in more detail later in the document).

Saving the changes or deleting the option has not been implemented.
“Cancel”-button cancels all the changes made to the option and closes the dialog.

At the bottom area of the slide editing view, there are three buttons: The “Save”-button (functionality not implemented), the “Delete”-button (functionality not implemented), and the “Cancel”-button, which is used to discard any changes and to return to the main editing view.
For these features, keyboard shortcuts have been implemented (Ctrl+S for Save, Ctrl+D for Delete, Ctrl+C for Cancel).

The Presentation View

The presentation view offers the presentation of the project. This view is where the actual project can be used and tested.



“Home”-button lets the user to return to the main editing view.

“Back to start”-button can be used to get back to the start of the presentation. Only accessible if “Allow reverting”-option is checked in the slide settings.

“Previous slide”-button lets the user to return to the previous slide. Only accessible if “Allow reverting”-option is checked in the slide settings.

In the middle of the top there is an area for displaying the title of the slide.

“Settings”-button opens a menu, where the user interface settings can be adjusted. The settings menu has been documented in more detail later in the document.

“Description”-field displays the description defined for the slide.

The image area displays the image defined for the slide (defined image manipulation settings are also implemented to the image).

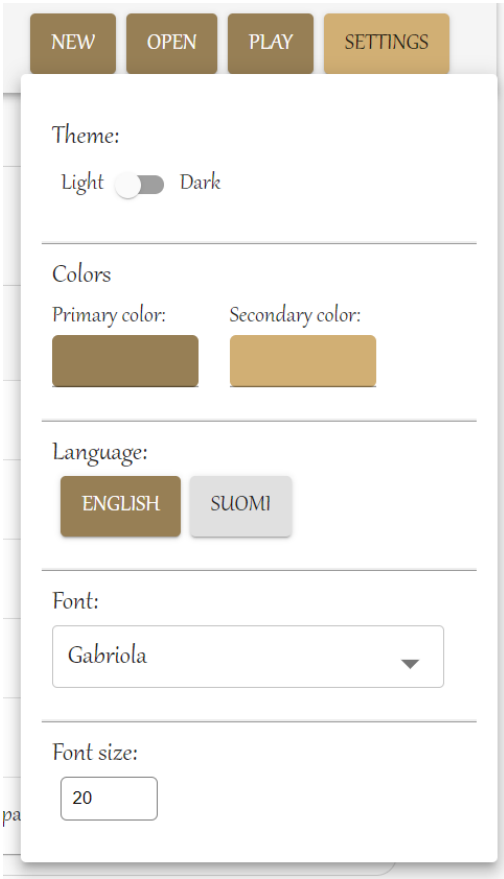
In the “Options”-field the user chooses one option.

“PROCEED”-button is used to confirm the chosen option, and from there, the user gets directed to the slide that was linked to the chosen option.

Complex Components

Here some of the more complex and/or regularly used individual components in the user interface have been documented in more detail.

The Settings Menu



The settings menu is used to adjust the attributes of the user interface. The settings menu can be opened by clicking the “Settings”-button.

In the “Theme”-section the user can change between light and dark themes.

In the “Colors”-section the user can change the primary color and the secondary color of the interface. Choosing the color happens by clicking on the color field and choosing a new color from the color picker.

In the “Language”-section the user can change the language of the user interface. Changing the language works by clicking on the button that has the name of the language.
Currently there are two languages available for the interface: English and Finnish.

In the “Font”-section the user can change the font used in the user interface. Clicking on the font field opens a list of fonts, from where the new font can be chosen by clicking it.

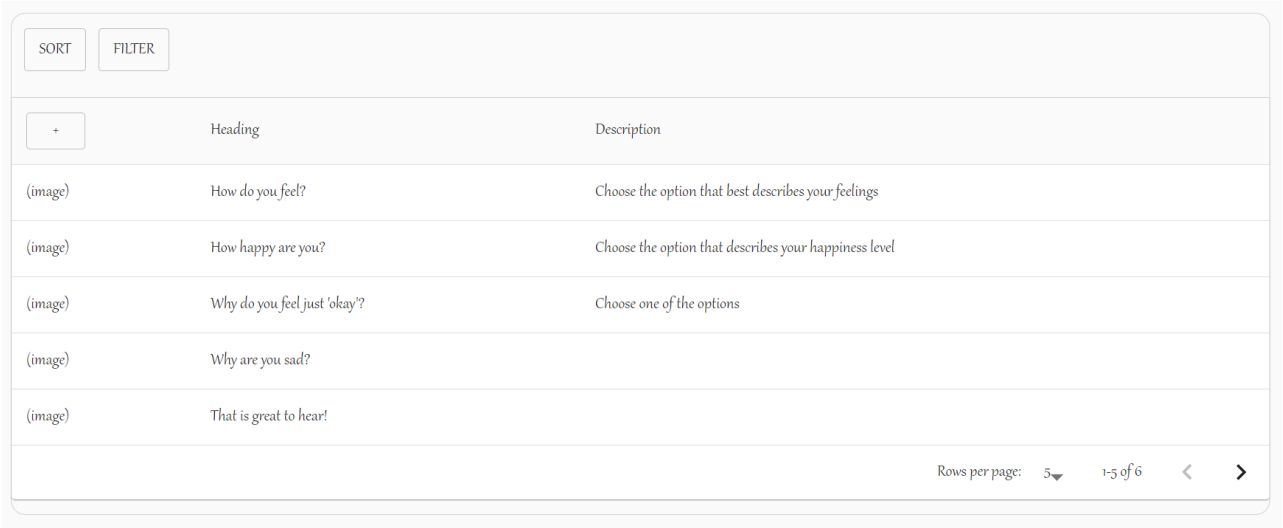
In the “Font size”-section the user can change the font size used in the interface.

The Slides Table

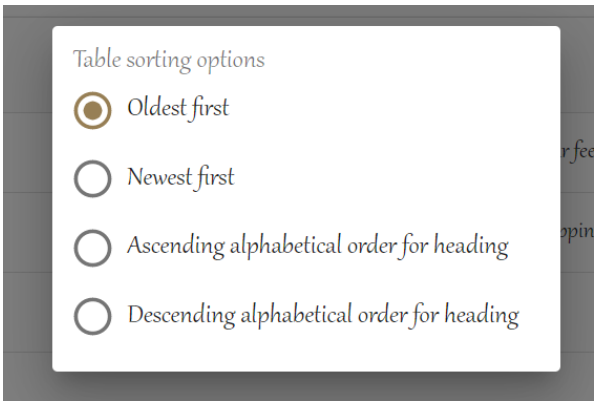
The slides table is a table showing the project slides. Only a fixed number of slides are shown at a time. To see other slides, use the arrow buttons located in the bottom right corner to traverse between the sets of slides.

The “+”-button functionality has not been implemented.
The “Heading”-column displays the heading of the slide, and the “Description”-column shows the slide’s description.
Under the table header, each row represents an individual slide, where the slide image (cannot be loaded at the moment), the slide header, and the slide description are shown.

At the right bottom corner, the numbers of showed slides are shown, and how many slides there are in total. The number of slides shown per page can be changed at the “Rows per page”-section.



At the top left of the table there are “Sort”- and “Filter”-buttons.

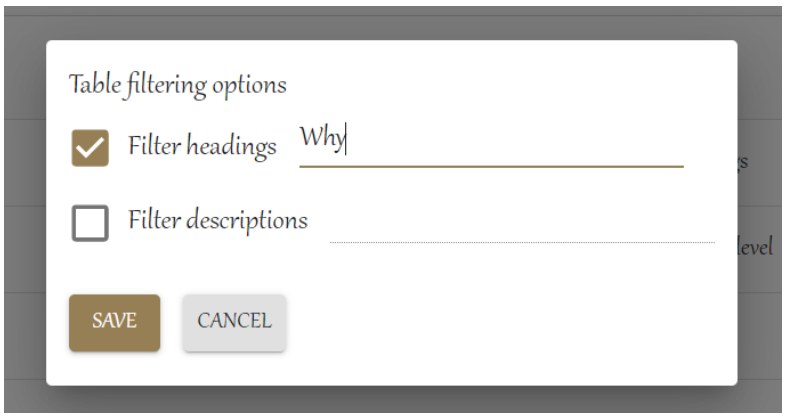


The “Sort”-button opens a dialog, where the user can change the sorting method of the slides.

The available methods are:
- From oldest to newest
- From newest to oldest
- Ascending alphabetical order for heading
- Descending alphabetical order for heading

Clicking a method option selects the method and closes the dialog.

The “Filter”-button opens a dialog where the user can set the filter options for the slides table.



The user can filter the slides according to headings or descriptions or both.

The text fields next to the filter options are used to define the strings that the slides’ headings/descriptions have to contain.

The check boxes of the filter options have to be checked in order for the filters to be made active.

To save the filter settings and to close the dialog, click the “Save”-button.
To cancel any changes and to close the dialog, click the “Cancel”-button.

Software Structure

Connections between different resources

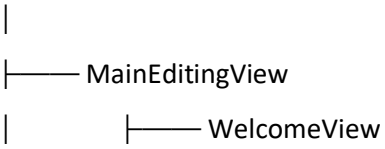
index.js file is the main file of the application.

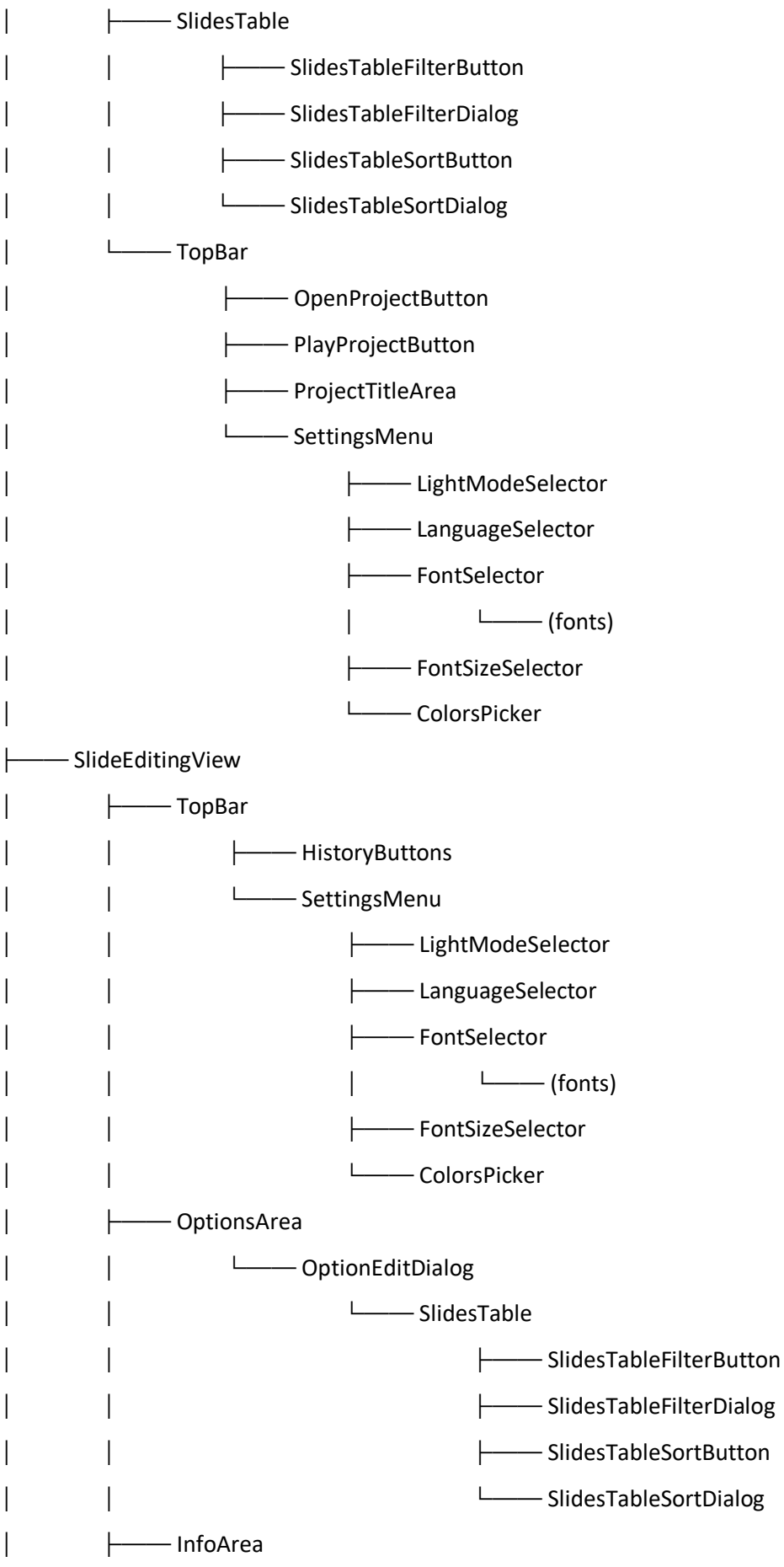
In this file, the Redux store is connected to the interface’s main component (SlideLinker), and the main component is rendered.
SlideLinker.js is the file containing the main interface component.

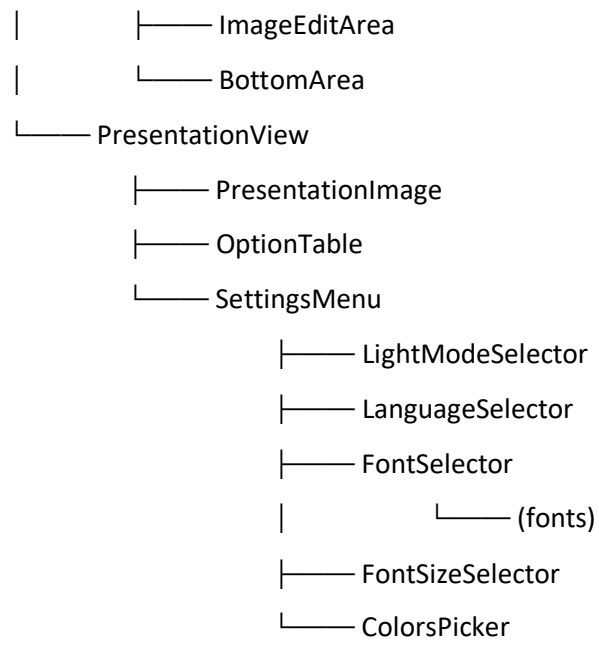
Also, the react-i18next object is initialized here. react-i18next enables internationalization in the application.
i18n.js file includes the initialization settings for react-i18next.

Interface components’ structure

The following structure expresses the parent/child relations between the interface components.

SlideLinker



SlidesTable
SlidesTableFilterButton
SlidesTableFilterDialog
SlidesTableSortButton
SlidesTableSortDialog
TopBar
OpenProjectButton
PlayProjectButton
ProjectTitleArea
SettingsMenu
LightModeSelector
LanguageSelector
FontSelector
(fonts)
FontSizeSelector
ColorsPicker
SlideEditingView
TopBar
HistoryButtons
SettingsMenu
LightModeSelector
LanguageSelector
FontSelector
(fonts)
FontSizeSelector
ColorsPicker
OptionsArea
OptionEditDialog
SlidesTable
SlidesTableFilterButton
SlidesTableFilterDialog
SlidesTableSortButton
SlidesTableSortDialog
InfoArea



Redux structure and implementation

Redux store's state and actions are mapped to interface components in the file index.js

Redux store implementation is found in folder /src/state
- The action type definitions are found in file /src/state/action_types/projectsTypes.js
- The action definitions are found in file /src/state/actions/projectsActions.js
- The project reducers are found in file /src/state/reducers/projectsReducers.js
- The store's root reducer is found in file /src/state/reducers/mainReducers.js

State (reducers') structure:

```
{
    projectList: {},
    addedProject: {},
    selectedProject: {
        selectedProjectInfo: {},
        slideList: {},
        addedSlide: {},
        selectedSlide: {},
        updatedSlide: {},
```

```
        deletedSlide: {}
    },
    updatedProject: {},
    deletedProject: {}
}
```

Important resource files

react-i18next loads the translations from folder /public/locales
English translations are loaded from file /public/locales/en/translation.json
Finnish translations are loaded from file /public/locales/fi/translation.json

The project files can be found in folder /src/save_files
Two default project files are provided:
- An awesome project.json
- Hello project.json

The images related to the projects are found in folder /src/save_files/images
In this version of the application, the application cannot load the images automatically, but they could be used to test the drag-n-drop or other image features, for example.

Used Tools

The application was developed using React, Material-UI, and Redux Thunk.
Microsoft Visual Studio Code was used as the text editor, GitHub version control was used to prevent chaos.

Material-UI packages used:
- material-ui/core
- material-ui/icons
- material-ui/lab
- material-ui-color-picker

react-i18next was used for internationalization and translations.

React Helmet was used to manually set the application's name. Could be used to define other meta data as well.

react-hotkeys-hook was used to define the keyboard shortcuts used in the application.

NOTE:
An old version of react-scripts was used, because I could not even start the application with any of the react-scripts versions beyond 2.1.8
Because of this, there might appear a lot of warnings when installing the dependencies. You can try if the application works with the newest react-scripts, but I haven't been able to get it to work.

Project Timeline

The project started 28.04.2020. The project plan was worked on little by little and returned 13.05.2020.

The Redux plan was started on 20.05.2020, and 30.05.2020 Redux functionality was done.

The main editing view was started 02.06.2020 and finished 14.06.2020. During this time the settings menu was also created, and start of the internationalization was implemented.

The slide editing view was started 14.06.2020 and finished 23.06.2020.

The presentation view was started 23.06.2020 and finished 24.06.2020.

From 25.06.2020 to 27.06.2020 the application features and the source code were polished.

28.06.2020 the project report and all the final steps were finished, two days before the original deadline.

The project was developed solely by Aleksi Salminen.