Sprint 5 Review

UI Localization

UI was localized utilizing Java's ResourceBundle. A button row for switching languages was added to the Login screen, which is the first screen that the user sees upon launching. As of now, the UI supports 3 additional languages on top of the original English, all translated by native speakers - Russian translation by Armas Nevolainen, Finnish translation by Santtu Saaranen, Chinese translation by Jiayue Zheng.

Database Localization

The database now supports non-latin characters for user-entered fields. It does not hold predefined multilingual content except for roles and role permissions. In the UI, roles are displayed using Java's ResourceBundle. Role permissions are not visible to users and therefore not localized.

Plan and prepare the database

As part of planning for database localization, we considered the following potential structure:

1. **Translation table structure**

The main content tables would store language-independent data, and the translatable fields (such as names, descriptions, etc.) would be stored in a separate translation table with language codes (e.g., 'en', 'fi', 'ru', 'zh').

2. **Translations only for table columns in translateservice**

Only the tables and fields registered in the translateservice module would support multilingual translations, in order to maintain performance and reduce complexity.

3. **Changes to database (planned)**

- **User language preference table:** A table to store the preferred language(s) selected by each user for use on StudyShelf.

- **Default category translations:** The system defines a set of default categories (e.g., "Math", "Science") available in all supported languages. When a teacher creates a course, they can use either a localized default category (based on user preference) or define a custom category (e.g., "Math101") with multilingual support.

- **Material type display names:** A set of default material types (e.g., PDF) is predefined and stored in the system. These are translated using a translation table to support multilingual display.

- **Date, time, and number formatting:** These are handled via localization libraries on the application/frontend layer, based on the user's language and region preferences.

Strategy for managing character encoding and locale settings

1. Character Encoding

The database uses UTF-8 encoding to support all major language characters.

Set tables study_materials, reviews and categories to support all Unicode characters including Chinese and Russian (utf8mb4).

2. Locale Handling

The user's language preference will be used to dynamically select the appropriate translation from the database. Locale settings will be considered on both the backend and frontend to ensure consistent formatting of dates, numbers, and messages.

Product Backlog Update

Trello Board Status

5 User Stories with sub tasks, all completed: 0 post-poned
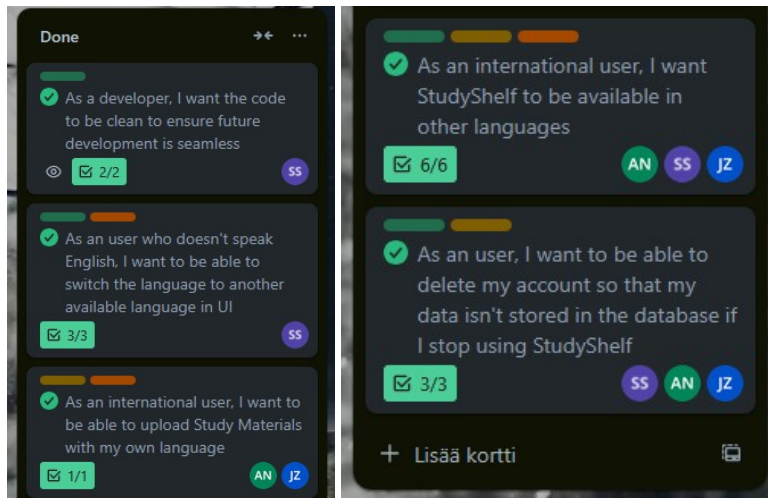
User Stories

- "As a developer, I want the code to be clean to ensure future development is seamless"
  - Concerns the presentation folder, the controller folder required organization
  - Completed
- "As an user who doesn't speak English, I want to be able to switch the language to another available language in UI"
  - Creation of the LanguageManager singleton class, as well as the UI menu component to switch between them. Utilizing Java's ResourceBundle
  - Completed
- "As an international user, I want to be able to upload Study Materials with my own language"
  - Ensuring that the database supports non-latin character entries for user-entered fields
  - Completed
- "As an international user, I want StudyShelf to be available in other languages"
  - Finnish, Russian and Chinese translations were created
  - Completed
- "As an user, I want to be able to delete my account so that my data isn't stored in the database if I stop using StudyShelf"
  - Leftover task from SEP 1 course: account deletion has been implemented
  - Completed

Localization Resources Identification

Essential Resources

To support localization, we identified key resources:

- **Translators**: Native speakers on the team (Finnish: Santtu Saaranen, Russian: Armas Nevolainen, Chinese: Jiayue Zheng)
- **Content management tools**: We proposed using a shared Google Sheet as a temporary collaboration space to manage initial translations and coordinate input from native speakers.

Translation Management Approach

- Translations can be entered into the shared Google Sheet and reviewed by native speakers for quality and consistency.
- If used, finalized data can be exported as CSV and imported into the database.
- In the future, translation management may be supported by a simple functionality, such as integrating the Google Translate API, allowing admins or teachers to manage translations without manual input.

Team Member Tasks

Name	Task	Time estimate
Santtu Saaranen	LanguageManager for UI	3 hrs
Santtu Saaranen	Replacing UI strings to use rb.getString()	6 hrs
Santtu Saaranen	Account Deletion in UI	4 hrs
Santtu Saaranen	Finnish Translation	1 hr
Santtu Saaranen	Sprint 5 Plan + Trello	2 hr
Jiayue Zheng	Chinese Translation	1 hr
Jiayue Zheng	Database Localization Planning	6 hrs
Jiayue Zheng	Identification of Localization Resources Planning	4 hrs
Armas Nevolainen	Russian Translation	1 hr
Armas Nevolainen	Database non-latin character support	2 hr
Armas Nevolainen	Database Localization Planning	6 hr