BRNO UNIVERSITY OF TECHNOLOGY

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FACULTY OF INFORMATION TECHNOLOGY

FAKULTA INFORMAČNÍCH TECHNOLOGIÍ

Advanced Database Systems (PDBe)

PROJET TITLE

GeoBook – A Location-Based Book Insight Application.

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Contents

1. Software specification

Requirements

1. **Location-Based Book Insights**

Users can search and view locations mentioned within the book text. These locations are displayed on a map.

2. **Multimedia Information**

For each location in the book, users can view multimedia content such as images that provide further context.

3. **Search Functionality**

Users can search locations to find relevant information.

4. **Web Interface**

The application will work as a web application.

User Interface Description

- **Search Bar**

Located at the top of the interface, the search bar allows users to enter keywords related to the location, or chapter.

- **The Map**

The primary display area features map where locations from the book are plotted as pins. Clicking on a pin reveals a pop-up with multimedia content and details about the location.

- **Location Details**

A sidebar contains the locations tied to the book, will appear on the map.

- **Multimedia Content Viewer**

When a location is clicked, a section of the interface displays associated images, and text that explains the significance of the location within the context of the book.

2. Database specification

Data to be Stored in the Database

1. **Books Data**

   - **Fields** Book title, author, ISBN.
   - **Purpose** This is the core metadata about the book itself, used for searching and categorizing.

2. **Chapters/Sections Data**

   - **Fields** Chapter number, chapter title, location description, location coordinates.
   - **Purpose** This connects specific chapters of the book to real-world locations.

3. **Location Data (Spatial Data)**

   - **Fields** Latitude, longitude, place name, chapter association, multimedia association.
   - **Purpose** Stores geographic data related to locations mentioned in the book. Used for spatial queries to display points on a map and associate them with specific book chapters.

4. **Multimedia Data**

   - **Fields** Multimedia ID, file type (image), file location (path), description.
   - **Purpose** Stores paths to multimedia content related to specific locations. This data will be served alongside the location data when a user interacts with the map.

Queries

1. **Search for Books**

   - Query the database for books by title, author, ISBN.

2. **Retrieve Locations for a Book**

   - Fetch all locations (latitude, longitude) and multimedia data associated with a selected book.

3. **Find Nearby Locations**

   - Using geospatial queries, find locations near the user's current location.

4. **Fetch Multimedia for a Location**

   - Query the database for images content linked to a location.

3. Development specification

Week 6–7

- Initial setup and database design.

Tasks

1. Define the schema for books, chapters, locations, and multimedia in the Oracle database.
2. Set up the Oracle database on the server and implement basic CRUD operations for each table.
3. Build basic UI wireframes to outline the structure of the user interface.

Deliverables: Database schema, basic CRUD operations, and UI mockups.

Week 8–9

- Spatial data integration and book location mapping functionality.

Task

1. Implement geospatial data storage (using Oracle's SDO_GEOMETRY for location data).
2. Display books on the map based on location data retrieved from the database.

Deliverables: A functional map interface with books plotted as points based on location.

Week 10–11

- Multimedia content integration and location search, testing and final deployment.

Tasks

1. Develop functionality to upload and associate multimedia (images) with specific locations.
2. Implement a search function that retrieves books and their associated locations based on user input.
3. Enable pop-ups with multimedia content and descriptions when a location pin is clicked on the map.
4. Perform testing on database queries and the client interface to ensure smooth operation.

Deliverables: Full multimedia integration and working search functionality for books and locations with functional application.