Specification - Hunting Log

The goal of this web application is to provide hunters and hunting ground managers with an efficient tool for tracking hunting activities. The application will allow users to log visits, track hunting and manage detailed information about hunting grounds, lookout towers and feeding areas. Primary users of the application are hunters, who record their visits and game hunting and hunting ground administrators, who have extended permissions to manage areas, hunting lookouts and overall game reserve administration.

Functional requirements

Roles

The application distinguishes two roles:

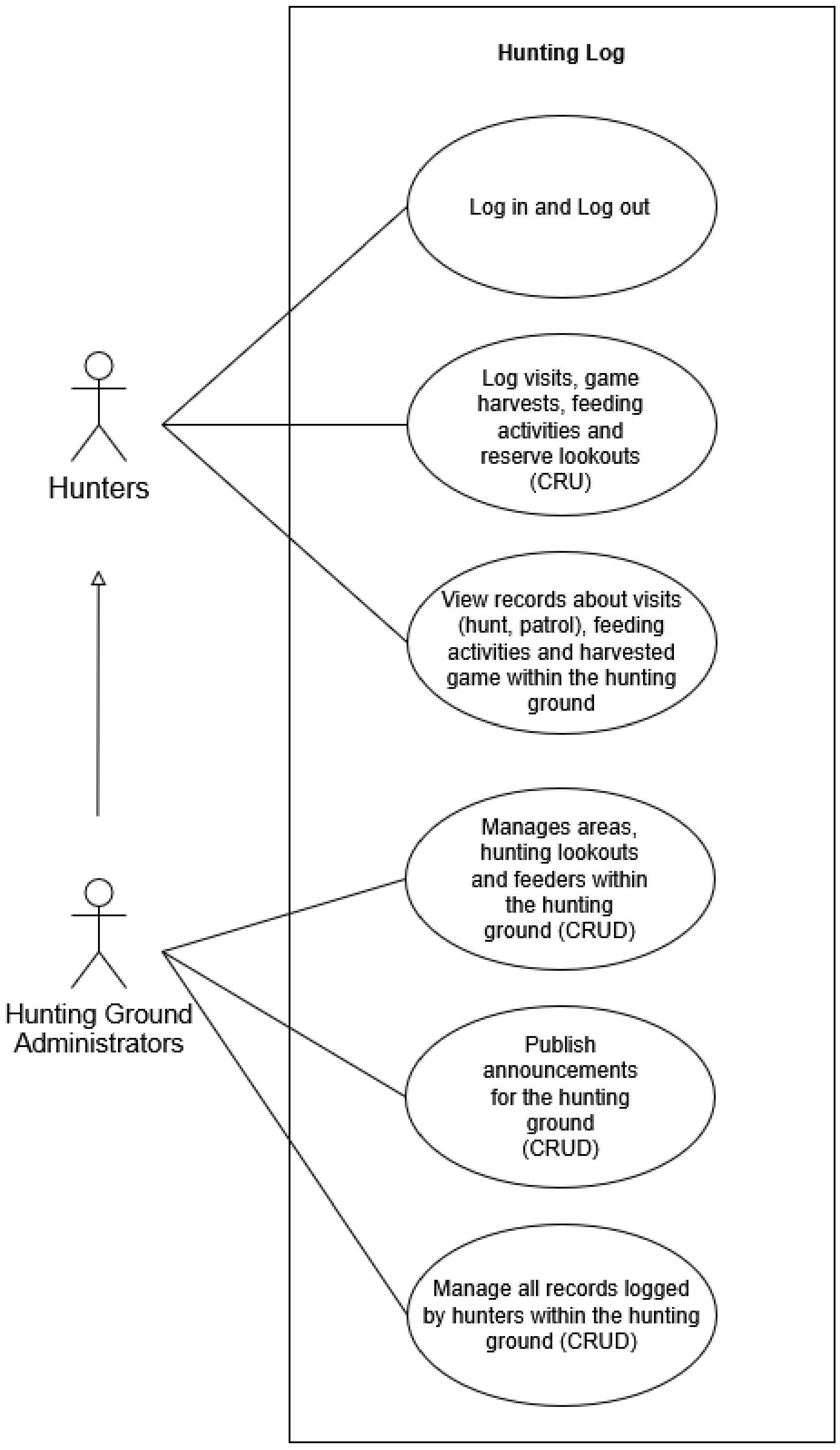
- **Hunters** - regular members of hunting grounds who log their activities, including visits, hunting records and feeding.

- **Hunting ground administrators -** users with extended permissions who manage hunting ground areas, create and edit lookout towers, assign zones. They can also publish important announcements visible to all hunters in the hunting ground. Hunting ground administrators are also hunters and can log their own hunting activities. There can only be one administrator per hunting ground, but they have the ability to transfer administration rights to another hunter if needed.

Use Case Diagram

Notes:

- CRUD = Create, Read, Update, Delete
- Log in and Log out are not primary user goals, but they are necessary for accessing other features. All other use cases require authentication, meaning users must be logged in before they can log visits, record hunting activity or manage the hunting ground.
- Delete operations: Some delete functionalities for the hunting ground administrator role may be implemented as a soft delete to maintain data integrity due to existing references. The exact implementation details will be determined during the development phase.


Hunting Log
Log in and Log out
Log visits, game harvests, feeding activities and reserve lookouts (CRU)
View records about visits (hunt, patrol), feeding activities and harvested game within the hunting ground
Manages areas, hunting lookouts and feeders within the hunting ground (CRUD)
Publish announcements for the hunting ground (CRUD)
Manage all records logged by hunters within the hunting ground (CRUD)
Hunters
Hunting Ground Administrators

Data model

The following conceptual data model includes entities, attributes and their relationships.

Entities and Attributes:

User

- Represents hunters and hunting ground administrators.
- Constraints and rules:
  - A user can belong to only one hunting ground.
  - The user's role (hunter or admin) is not stored here, but in the User_Hunting_Ground table.
- Attributes:
  - id - Unique identifier for each user.
  - username - Unique login name.
  - email - Unique email address.
  - password_hash - Securely stored hashed password.
  - first_name - User's first name.
  - last_name - User's last name.
  - street - Street name.
  - house_number - House number.
  - postal_code - Postal code.
  - city - City.

Hunting_Grounds

- Represents individual hunting ground.
- Attributes:
  - id - Unique identifier.
  - name - Name of the hunting ground.
  - description - Additional details about the hunting ground.

User_Hunting_Ground

- Defines the relationship between users and hunting ground.
- Constraints & Rules:
  - A user can belong to only one hunting ground.
- A user can have only one role per hunting ground (either hunter or admin).
- Attributes:
  - user_id – (Foreign Key → Users.id).
  - hunting_ground_id - (Foreign Key → Hunting_Grounds.id) Assigned hunting ground.
  - role - (ENUM: Hunter, Admin) Defines the user's role in that hunting ground.

Hunting Areas

- Each hunting ground consists of multiple areas where hunts take place.
- Attributes:
  - id - Unique identifier.
  - hunting_ground_id - (Foreign Key → Hunting_Grounds.id)
    The hunting ground where the area belongs.
  - name - Name of the area.

Structures

- Represents lookout towers, feeding stations and other structures inside an area.
- Attributes:
  - id - Unique identifier.
  - hunting_area_id - (Foreign Key → Hunting_Areas.id) The area where the structure is located.
  - name - Name of the structure.
  - type - (ENUM: Lookout Tower, Feeding Station, Shelter/Lodge).
  - notes - (Nullable) Additional details.

Visits

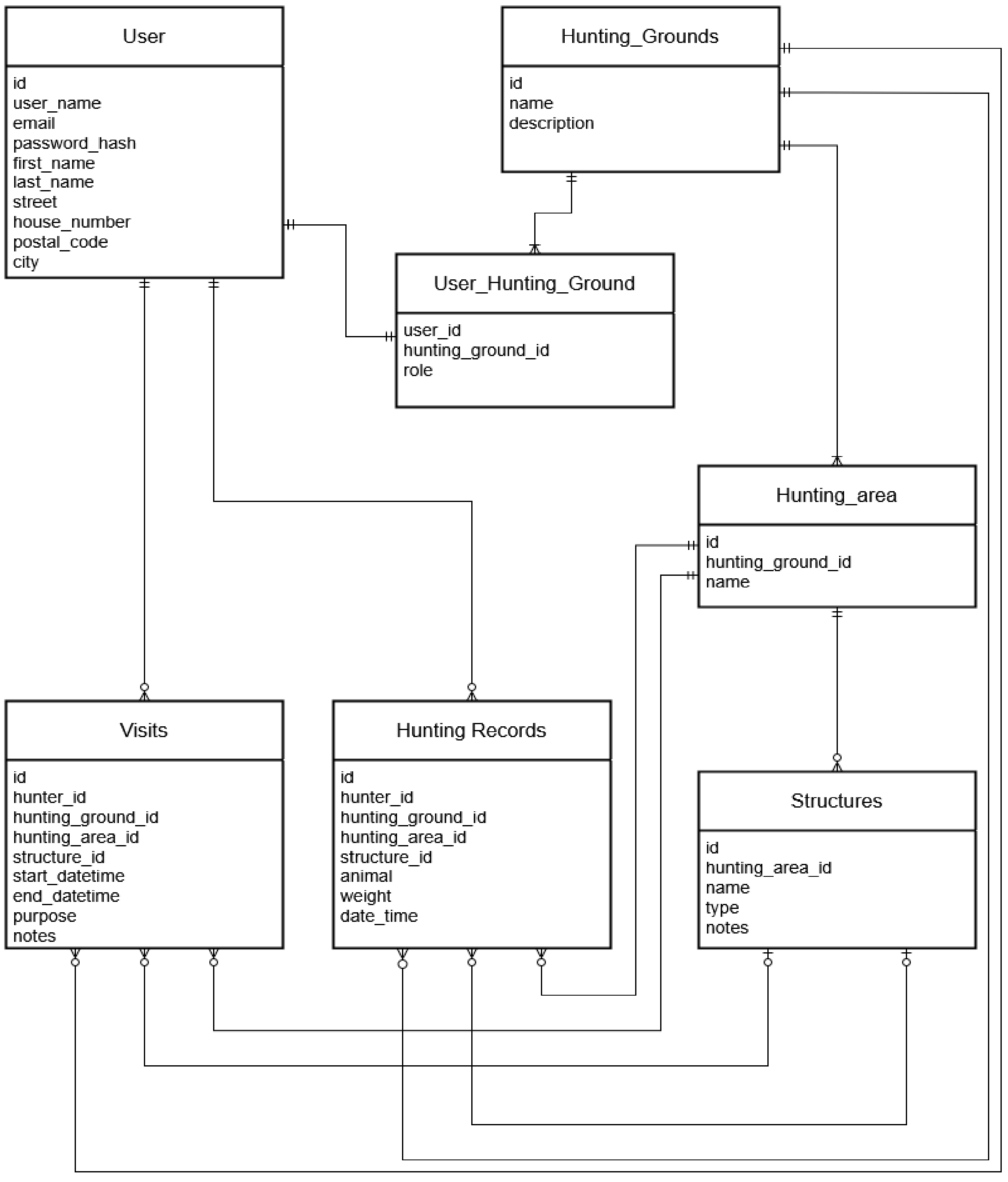
- Stores records of visits to hunting ground, including their purpose.
- Attributes:
  - id - Unique visit identifier.
  - hunter_id - (Foreign Key → Users.id) The hunter who visited.
  - hunting_ground_id - (Foreign Key → Hunting_Grounds.id) The hunting groud here the visit took place.
  - hunting_area_id - (Foreign Key → Hunting_Areas.id) The area visited.
  - structure_id - (Foreign Key → Structures.id, Nullable) The specific lookout tower or feeding station visited.
  - start_datetime - (DATETIME) The exact date and time when the visit started.
  - end_datetime - (DATETIME) The exact date and time when the visit ended.
  - purpose - (ENUM: Hunting, Inspection, Feeding, Repair, Lodge stay).
  - notes - (Nullable) Additional details.

Hunting Records

- Represents successful hunts recorded in the system.
- Attributes:
  - id - Unique hunting record identifier.
  - hunter_id - (Foreign Key → Users.id) The hunter who recorded the hunt.

- hunting_ground_id - (Foreign Key → Hunting_Grounds.id) The hunting ground where the hunt took place.
- hunting_area_id - (Foreign Key → Hunting_Areas.id) The area of the hunt.
- structure_id - (Foreign Key → Structures.id, Nullable) The specific lookout tower, feeding station or other structure where the visit or hunting activity took place, if relevant.
- animal - Type of animal hunted.
- weight - Weight of the animal.
- date_time - Timestamp of the hunt.

ER model



Architecture

The application will be based on the client-server architecture and it will use the SPA (Single Page Application) approach.

Technological requirements

- Client-side: React 18, JavaScript, HTML5, CSS3, Bootstrap v5.3.2
- Server-side: node.js 23, express.js 4.21.2, JavaScript
- Database: PostgreSQL 16
- Interface client - server: Rest API
- Hosting: render.com
- Supported browsers: Chrome, Firefox

Future work

As the application evolves, the following enhancements could be implemented:

- Display the hunting ground on a map with lookouts, feeding stations and other key locations to improve terrain orientation and simplify log entries.
- Allow a hunter to be registered in multiple hunting ground under a single account.
- Enable hunting ground administrators to manage multiple hunting ground instead of being limited to a single one.
- Implement an internal chat or messaging system within the hunting ground to allow hunters and administrators to coordinate activities.

Time schedule

Week 4

- Define the visual layout and structure of core application screens (login, dashboard, logging form).
- Implement initial page components with temporary content and working navigation.
- Probably about 6 - 8 h.

Week 5

- Implement user authentication with secure registration, login and password hashing.
- Set up role-based access control to ensure hunters and administrators can access only the sections of the application relevant to their assigned roles.
- Probably about 8 - 10 hours.

Week 6

- Implement backend logic for managing visit logs and hunting records, including data validation and saving to the database.
- Build frontend components to allow users to add and view visit logs and hunting activity.
- Ensure data flows correctly between user input, the server and the database.
- Probably about 8 - 9 hours.

Week 7

- Develop the administration interface for managing the hunting ground: create, edit areas and structures (lookout towers, feeders, lodges, etc.).
- Add basic access checks so that only administrators can use this part of the system.
- Probably about 8 - 10 hours.

Week 8

- Implement search filters and sorting options for visit and hunting record pages.
- Improve the overall user experience to make navigation and interaction more intuitive.
- Probably about 6 - 8 hours.

Week 9 (Beta version)

- Finalize core functionality: visit logs, hunting records, user authentication and admin management of areas and structures.
- Perform testing to ensure all selected features work properly.
- Deploy the working Beta version to a public hosting platform for review and feedback.
- Probably about 10 hours.

Week 10

- Gather feedback from testing, fix major bugs and optimize performance.
- Add any last-minute improvements based on user feedback.
- Probably about 6 - 8 hours.

Week 11 (Final version)

- Finalize the last improvements and make sure the application looks and works well.
- Deploy the final version, do final testing and prepare for the project presentation.
- Probably about 6 - 8 hours.