



DEER CREEK

Golf Cart Management System for Deer Creek Practice and Performance - Application Report

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Overview

The Golf Cart Management System is designed to efficiently manage the use of golf carts within Deer Creek Practice and Performance. It tracks the availability, status, and order of the carts, ensuring smooth operation and effective maintenance. The system includes user authentication and role-based access control, ensuring that only authorized personnel can perform certain actions.

Main Features

1) User Authentication and Authorization (Figure 1)

- **Registration and Login:** Users can register and login using a username and password. Authentication is handled using JSON Web Tokens (JWT).
- **Role-Based Access Control:** Users are assigned roles (Admin or Employee), with different permissions based on their roles.

2) Cart Management (Figure 2)

- **Cart Status Tracking:** Carts can be marked as available, unavailable, out of order, charging, or assigned to staff.
- **Drag and Drop Ordering:** The order of carts can be managed using a drag-and-drop interface, ensuring that carts are efficiently utilized.
- **Out of Order Management:** When a cart is marked as out of order, the system tracks the reason and whether maintenance has been contacted and sends a email to the people specified on the mailing list.

3) Real-Time Updates

- **EventSource for Live Updates:** The system uses Server-Sent Events (SSE) to provide real-time updates on cart status to all connected clients.



4) Admin Panel (Figure 3)

- **User Management:** Admins can register new users and remove existing ones.
- **Cart Management:** Admins can add new carts, remove existing ones, and update the status of any cart.

Technical Implementation

1) Backend (Express.js)

- **Server Setup:** The server is set up using Express.js and handles all API requests.
- **Database:** MongoDB is used as the database, with Mongoose as the ORM (**Figure 4**).
- **Middleware:** Custom middleware functions handle authentication and authorization.
- **CORS:** Configured to allow specific origins for secure communication between the client and server.
- **Deployment:** Hosted on Render (<https://golf-cart-management.onrender.com>)

2) Frontend (React)

- **Authentication Context:** A context provider manages the authentication state and provides login and logout functions.
- **Protected Routes:** Certain routes are protected and can only be accessed by authenticated users.
- **Drag and Drop:** The react-beautiful-dnd library is used for the drag-and-drop functionality of cart ordering.
- **Deployment:** Hosted on Vercel with automatic HTTPS security (<https://golfcartmanager.app>)



3) Continuous Deployment

- **GitHub Integration:** The project is integrated with GitHub for automatic deployment. Changes pushed to the GitHub repository are automatically deployed to the respective hosting services (Render for the backend and Vercel for the frontend).

4) Security

- **Password Hashing:** User passwords are hashed using bcrypt before being stored in the database.
- **JWT Tokens:** JWT tokens are used for authentication, ensuring secure communication between the client and server.
- **Environment Variables:** Sensitive information such as JWT secrets and database credentials are stored in environment variables.

Conclusion

The Golf Cart Management System is a comprehensive solution for managing golf cart operations, ensuring efficient use and maintenance of carts. The system's robust authentication, real-time updates, and user-friendly interface make it an invaluable tool for golf course management.

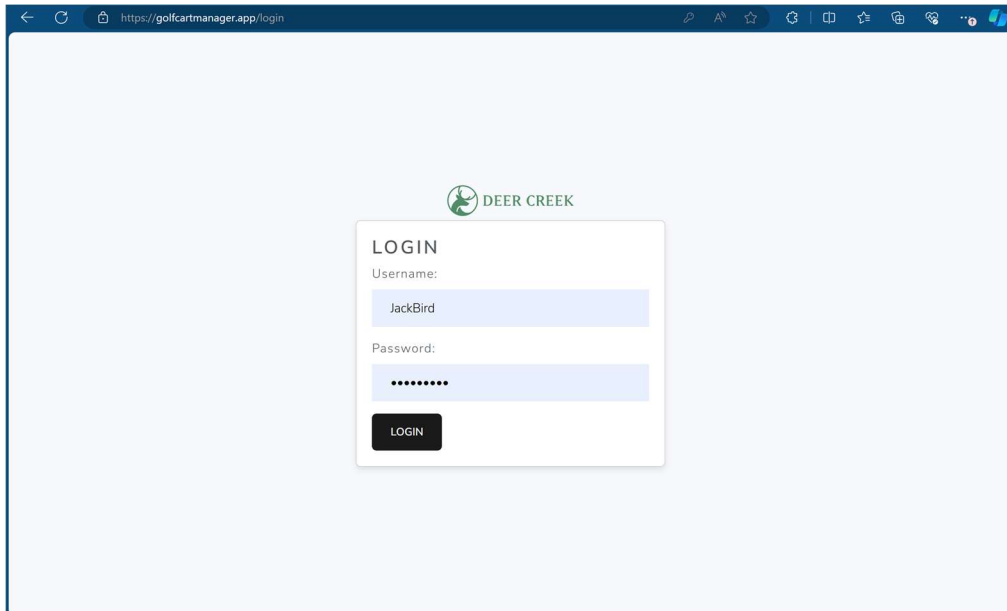


Figure 1: Login Page

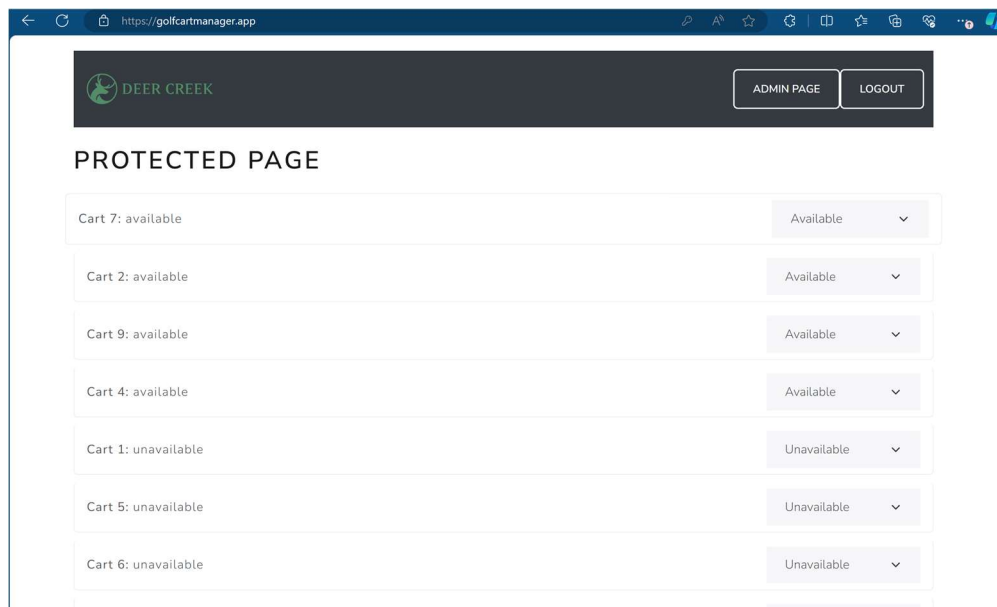


Figure 2: Cart Management Page for Employee Role

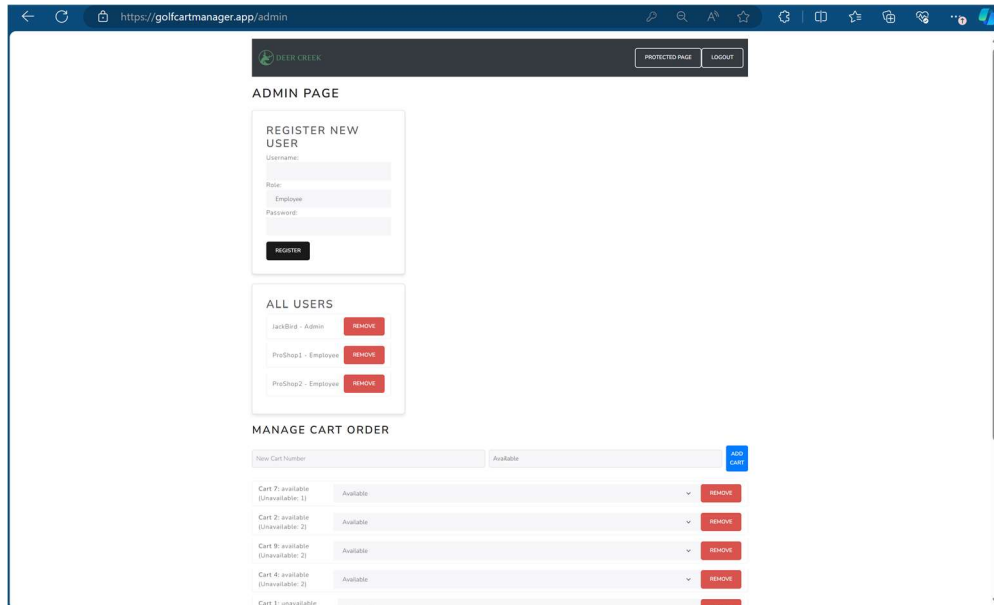


Figure 3: Admin Page

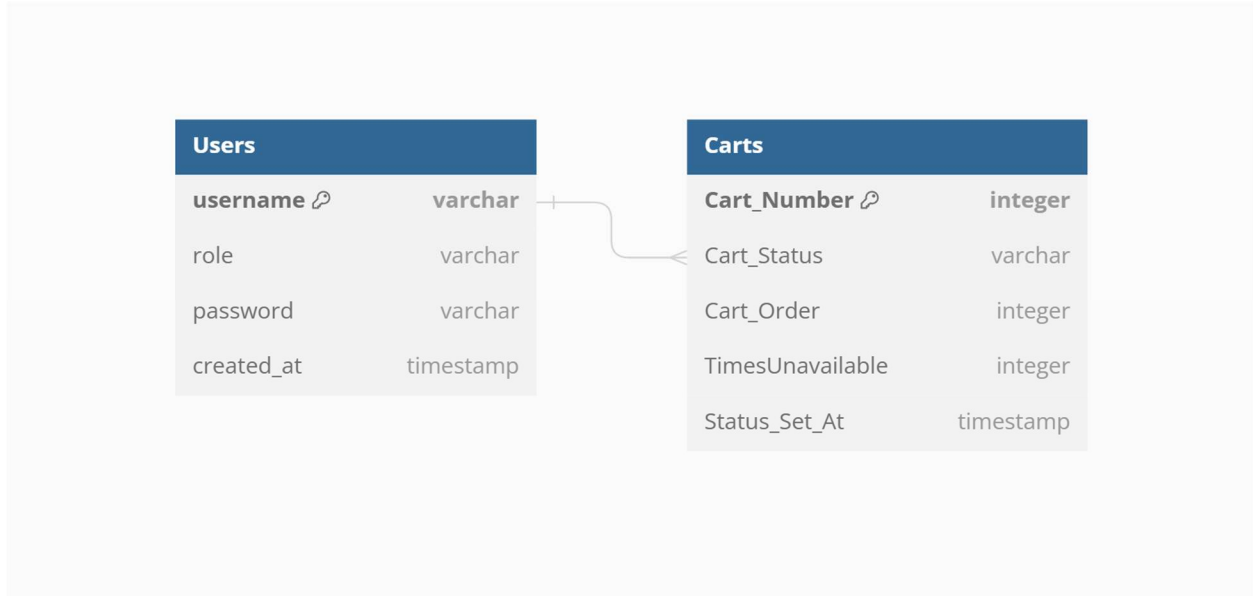


Figure 4: MongoDB Schema