Inventory Management Software Group

IMSG

Meet The Team

Clients

Jude Killy - Director of Athletics

Nick Fox - Assistant Athletics Director

Kevin Ritz - Head Equipment Manager

The Team

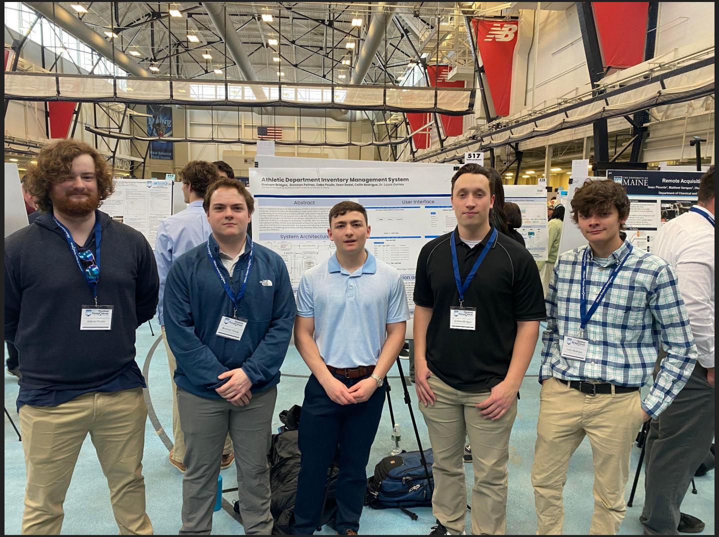
Sean Radel - Scrum Master, Backend Dev

Collin Rodrigue - Project Manager, Frontend Dev

Graham Bridges - UI/UX Designer, Frontend Dev

Gabriel Poulin - Client Liaison, Frontend Dev

Brennan Poitras - Database Lead, Backend Dev



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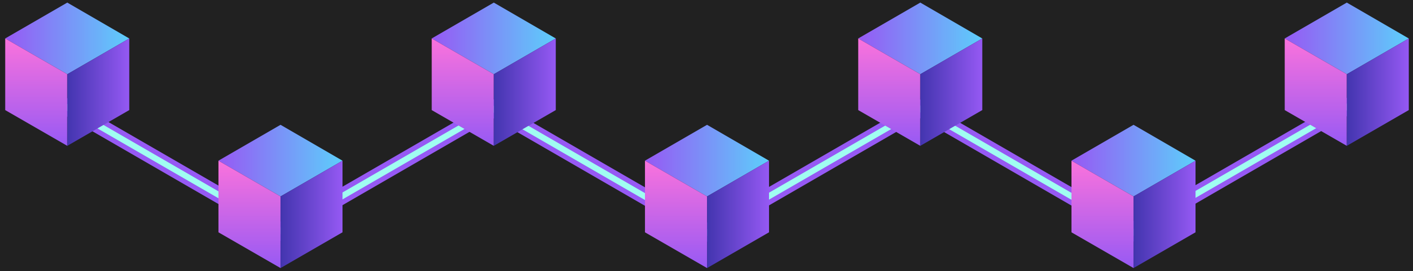

Problem and Solution
Requirements
System Design
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Problem

- Lack of an effective athletic equipment inventory management system
- Previously utilized a costly solution that was:
  - Not user intuitive
  - Not fit for the departments needs
- Current solution is an Excel spreadsheet
  - Inefficient
  - Not sustainable

Our Solution

- We developed a web application that increases the efficiency of:
  - entering data items,
  - storing inventory data
  - tracking the distribution of items to athletes and teams
- Benefits
  - Less reliance on manual tracking of equipment assignment
  - Greater visibility of data
  - Provided to the Athletic Department at no cost

Functional Requirements

- **Core Functionality**
  - Creating, reading, updating, and deleting objects
  - FR4: The system shall allow a user to create a new sports team.
  - FR10: The system shall allow a user to update an equipment item.
  - FR11: The system shall allow a user to delete a player.

- **Inventory Management**
  - FR7: The system shall allow a user to assign an equipment item to a team.
  - FR8: The system shall allow a user to assign an equipment item to a player.
  - FR22: The system shall allow a user to filter the general inventory.
  - FR24: The system shall allow a user to view the inventory history.
    - Based on team, sport, or time-period

Backend Design

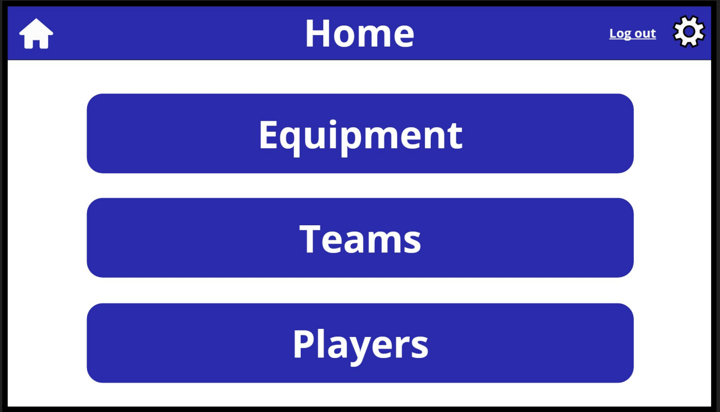
API

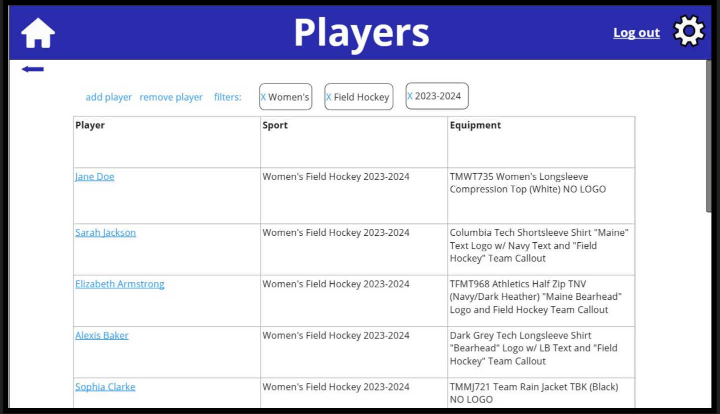
- Used to connect our frontend to our database
  - Provides a set of functions used by the frontend for data creation and retrieval
- Utilizes an MVC architecture
  - Models:
    - Representation of our data
    - Direct interaction with the database
    - A one-to-one mapping between a class and table
  - View:
    - User Interface layer
    - Displays data from the model
    - Forwards data to the controller for processing
  - Controllers:
    - Core application logic
    - Interacts with the models
    - Updates the view accordingly

Database

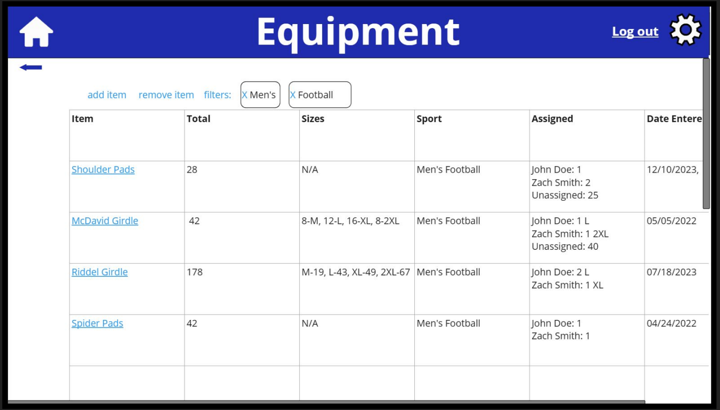
- We used a MySQL database
  - Relational database
    - Uses a predefined schema
    - Relationships between objects can be defined
      - Equipment -> Players
    - Ability to perform complex joins and aggregations
  - Allows for strong data integrity
    - Transactions preserve schema integrity and any defined constraints
  - Performance was not a large concern
    - Small number of users

User Interface Design

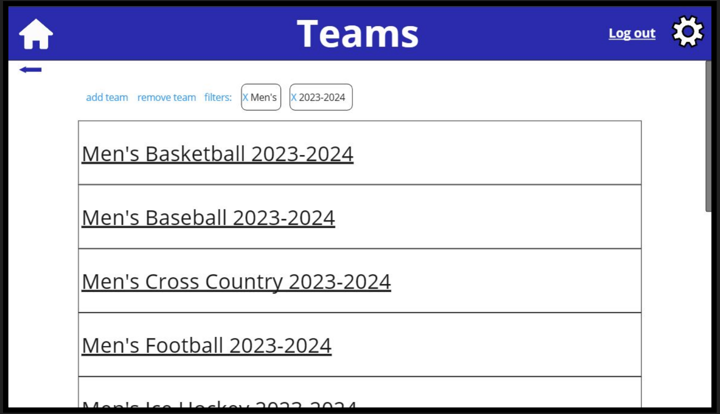




Player	Sport	Equipment
Jane Doe	Women's Field Hockey 2023-2024	TMWT735 Women's Longsleeve Compression Top (White) NO LOGO
Sarah Jackson	Women's Field Hockey 2023-2024	Columbia Tech Shortsleeve Shirt "Maine" Text Logo w/ Navy Text and "Field Hockey" Team Callout
Elizabeth Armstrong	Women's Field Hockey 2023-2024	TFMT968 Athletics Half Zip TNV (Navy/Dark Heather) "Maine Bearhead" Logo and Field Hockey Team Callout
Alexis Baker	Women's Field Hockey 2023-2024	Dark Grey Tech Longsleeve Shirt "Bearhead" Logo w/ LB Text and "Field Hockey" Team Callout
Sophia Clarke	Women's Field Hockey 2023-2024	TMMJ721 Team Rain Jacket TBK (Black) NO LOGO



Item	Total	Sizes	Sport	Assigned	Date Entere
Shoulder Pads	28	N/A	Men's Football	John Doe: 1 Zach Smith: 2 Unassigned: 25	12/10/2023,
McDavid Girdle	42	8-M, 12-L, 16-XL, 8-2XL	Men's Football	John Doe: 1 L Zach Smith: 1 2XL Unassigned: 40	05/05/2022
Riddel Girdle	178	M-19, L-43, XL-49, 2XL-67	Men's Football	John Doe: 2 L Zach Smith: 1 XL	07/18/2023
Spider Pads	42	N/A	Men's Football	John Doe: 1 Zach Smith: 1	04/24/2022



Men's Basketball 2023-2024

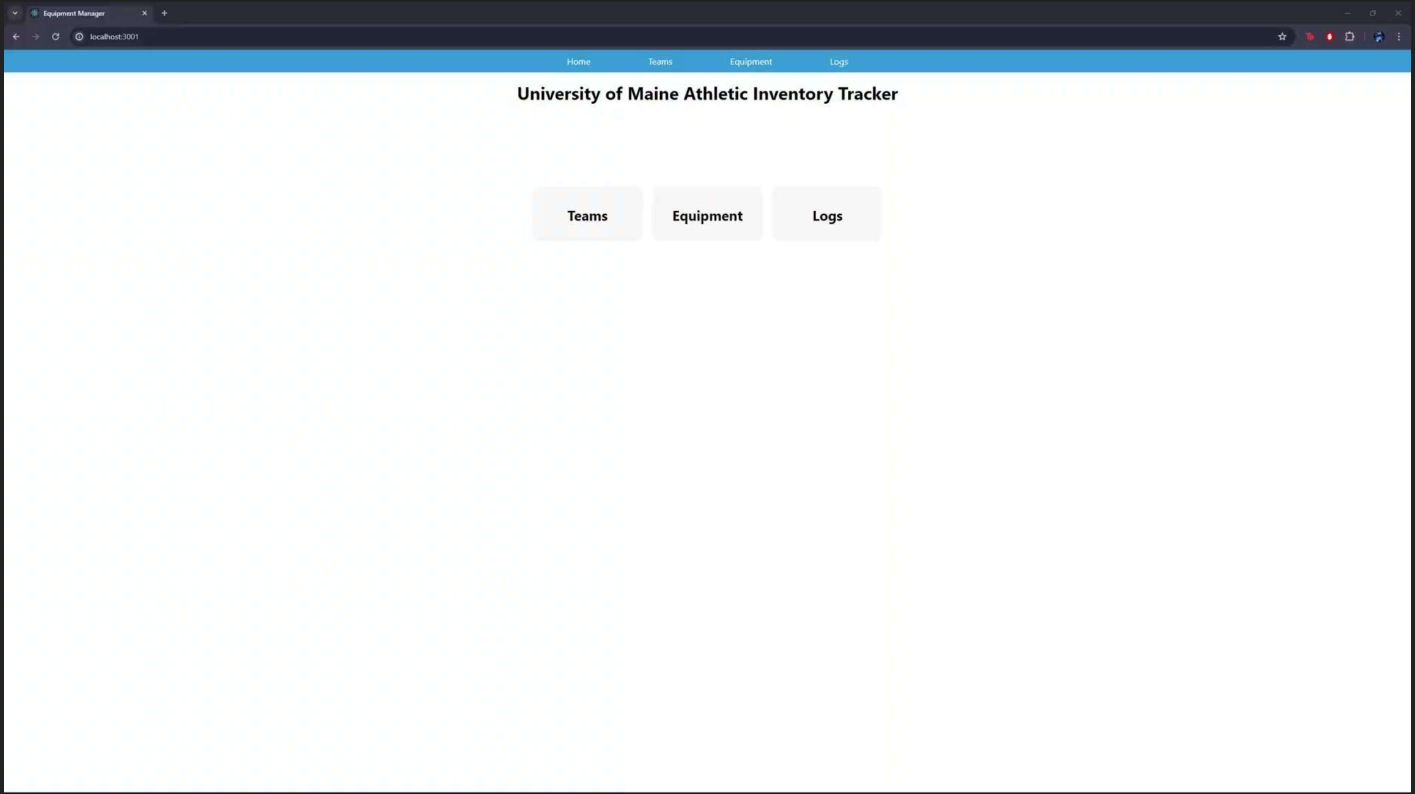
Men's Baseball 2023-2024

Men's Cross Country 2023-2024

Men's Football 2023-2024

Men's Ice Hockey 2023-2024

Recorded Demo!



University of Maine Athletic Inventory Tracker

Development Tools

Docker - Deployment

React - Frontend Development

MySQL - Database

Node JS - API

Postman - Testing

Collaboration Tools

Trello - Issue Tracking/Sprint Management

Git - Version Control

Github - Code Collaboration Repo

Discord - Team Communication

Development Process

- SCRUM Model
  - Two-week iterative sprints
  - Sprint retrospective every Tuesday
    - Discuss successes and failures
    - Demo new features
  - Sprint planning every Thursday
    - Discuss high priority features
    - Roll over unfinished work
    - Assign new work from product backlog
      - Features and identified bugs
  - Both meetings were additionally used as development time

- Team Structure
  - Three frontend developers
    - Responsible for developing our UI and connecting to the API
  - Two backend developers
    - Responsible for developing our API and configuring the database schema

- DevOps
  - Code Reviews
    - All pull requests were subject to a code review by a member of the same sub-team.
  - GitHub Actions for testing
    - Docker Build testing
  - API and Backend testing
    - API testing with Postman

What we are proud of

- Fully functional full stack application
  - Functional frontend, with a user-intuitive interface
  - Backend functionality for posting data, removing data and modifying data
  - A frontend that communicates with the backend to create a visual database for use for our client
  - Ability to deploy quickly on any computer with Docker-compose

- Our SCRUM model and sprint methods were consistent and worked very well for us.
- Developed an application that benefits our own university and has a local impact
- Met regularly with clients to design a product that fits their needs
- Proud of our development as software engineers and working collaboratively through our capstone course

Future Work

- Long Term Hosting Solution
  - Cloud vs Local Computer
- Login / Authentication
  - Login with UMaine Email
- Authorization
  - Currently, any user has privileges to do any action
- User Interface Updates
- Order Tracking Page
- Generated Logging Reports
- More Testing for Malicious Code Injection

Retrospective

- Development takes a lot of time
  - Time constraints were our biggest challenge
  - Focus is split between document deliverables, homework, quizzes, other classes, work, and life!
- Hosting held up our initial development
  - It was hard to get started without our database
  - Wanted to use a cloud-based solution, but due to cost went with running locally
  - Learning the deployment and figuring out our solution took up valuable time
- We all learned a lot about full-stack development and the development process

Acknowledgements

Thank you to Dr. Gurney and our clients Kevin Ritz, Nick Fox, and Jude Killy!

Also, thank you to Team SEWDO for being a great peer team!

Q&A?