Visualisation Tool for Volleyball Match Statistics

Report Name	Project Outline
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1. Project description

Project Overview:
The Volleyball Visualisation Tool is a comprehensive web-based platform designed to manage, display, and analyse match and player data for both men's and women's volleyball teams. It aims to streamline data management, enhance performance tracking, and support data-driven decision-making through intuitive tools and visualizations.

Key Components:

- **Data Management:** Efficient handling of match records, player profiles, and performance metrics.
- **Data Display & Visualization:** Dynamic dashboards showcasing match history, statistics, and leaderboards.
- **Data Manipulation:** Advanced filtering, sorting, and graphing tools for in-depth analysis.
- **User Authentication:** Secure login platform with role-based access control.
- **Data Upload & Editing:** Easy data import from Excel and direct data entry with validation.

Motivation:
Match statistic presentation is an important factor in the progression for volleyball athletes at the University of Aberystwyth. Currently, the presentation of these statistics is inefficient and lacks clarity in the identification of strengths and weaknesses for the individual. The clear visualisation of these statistics would likely encourage specified skill development and allow for comparative improvement between past and present performances. An intuitive presentation of the data which potentially includes motivational benefits dependent on the individual. With objective outlines allowing athletes to have targets to build towards.

Features:

1. **Database Design**
   Structured relational database to manage player information, match records, statistics and user credentials.
   Optimised schema to support efficient data retrieval, updates and scalability.
2. **Data Display**
   Match History: Detailed records of past matches, including scores, dates, and match statistics.
   Match Statistics: Comprehensive stats for each game, covering metrics like serves, aces, errors, and more.
   Player Statistics: Individual performance metrics for players, tracking progress over time.
   Player Leaderboard: Dynamic leaderboard ranking players based on customizable criteria.
3. **Dashboard**
   A Google-style Dashboard to showcase all the websites features and allow the user to intuitively navigate to each of them.
   Separate views for men's and women's match statistics to provide focused insights.
   Merged leaderboard option for combined performance evaluation.
   Interactive graphs showcasing game results over the past academic year or a rolling 12-month period.

4. **Data Manipulation**
   Advanced filtering options to isolate specific players, matches, or game aspects (e.g., serve performance).
   Graphing tools to visualize trends and comparative analyses effectively.
5. **Login Platform**
   Secure authentication system with role-based access control.
   Game Data Upload features for administrators to add, edit or remove match records
   User management features for administrators to add, edit, or remove users.
6. **Data Upload**
   Import functionality to upload match and player data from Excel spreadsheets.
   Manual data entry forms for direct input into the system.
7. **Data Editing**
   Intuitive interface for editing existing data entries.
   Validation checks to ensure data accuracy and consistency.
8. **Website Features**
   User-friendly interface with responsive design for optimal performance across devices.
   Navigation menus (Dashboard) for seamless access to different modules (Match History, Player Leaderboard, Data Manipulation, etc.)

Project Goals:

- To streamline data management processes for Aberystwyth Volleyball Club.
- To provide insightful analytics that support performance improvement.
- To create a scalable and adaptable platform that can grow with the organization's needs.

Target Users:

- Players seeking to track personal performance metrics
- Club's Coaches to use when analysing games and during team meetings

This project will deliver a versatile and powerful tool for sports data analysis, fostering data-driven decision-making and enhanced team performance.

2. Proposed tasks

The following tasks will be performed on this project:

- **Create a program to automatically upload the excel Volleyball Data to the database.**
  The program will automate the process of transferring the data from the original excel sheet
- **Relational Database to store and organise the data**
  Create a database to store all the recorded volleyball match statistics.
- **Data Analysis/Manipulation**
  Create a program which will interact with the data and explore different ways it can be used and displayed.
- **Design Documents**
  I will create a series of documents when planning the design of my website and will possibly organise it all into one document I can reference in my final report.
- **Website**
  Display Data Analysis
  The data analysis feature will be intuitive to use and will allow the user to have full control over what data is displayed and how it is shown.
  Create a Login Platform
  A login is necessary to keep the match data safe. Once logged in the user will be able to upload new games to the database.
  Uploading/Editing Match Statistics
  The platform needs to have a way to easily edit and add more data within the website. I will either use the program I created to upload the excel data or make a way for them to manually input the data or give the user the option to do both.
  Generate Leaderboards
  Using the match data alongside the player information I will generate a leaderboard for different skills or statistics like Most Points Scored.
- **Testing**
  A Testing document will consist of a testing table which will test for all the functional requirements and provide details on how I managed to fix the tests that failed. I also intend to do some programmed testing within my application.
- **Feature Driven User Testing**
  A select few individuals will test features as they are developed so that they can provide timely feedback to support my goal in making a useful tool for the website.

3. Project deliverables

The following project deliverables are expected.

- **Database** - A relational database which stores all the Volleyball Game Data and organises it in a way so that it is easy to edit and add to.
- **Data Analysis Program (Python, ChartJS) -** A backend which formats the data into graphs and tables which can be displayed on the website.
- **Website –** The website is the biggest deliverable within the project. It will consist of the following features: Login, Game Upload/Editing, Customisable Data Display.
- **Testing & User Testing Document –** The User Testing will be running every few weeks during the development process with the goal of getting consistent feedback to create a product which will truly be used by the club members. The document will have a testing table investigating the functionality of the product and a section exploring the process of the User Testing and whether the goal of creating a useful product for the volleyball team was achieved.
- **Final Report –** This document will be the Major Project Report. In addition to discussing the work, there will be acknowledgement for any 3rd party libraries, frameworks and tools used to assist with the project.

4. Initial annotated bibliography

The following is a simple list, i.e. not using EndNote or Microsoft Word's Referencing tool. You could insert any citations as cross-references in Word [1]**Error! Reference source not found.Error! Reference source not found.Error! Reference source not found.**.

[1] Nuxt JS Documentation.
https://nuxt.com/docs/getting-started/introduction
I used this documentation when researching which framework to use when creating my software and will refer to it throughout the development process.

[2] VueFire Documentation
https://vuefire.vuejs.org/guide/
This will be used to manage the connection between my database and webserver.

[3] FireBase Documentation
https://firebase.google.com/docs/database
This is the database software I will be using for my application

[4] Responsive Dashboard Article
https://medium.com/@francesco.saviano87/build-responsive-dashboards-with-chart-js-fc5f7cc42f52
An article I used to guide me in planning the display I would like on my website.

[5] ChartJS Documentation
https://www.chartjs.org/docs/latest/
The library I will use to create the dashboard on my website

[6] JxmyHighroller Youtube Channel
https://www.youtube.com/@JxmyHighroller
I use the videos on this channel to support my research on the data display I would like in my website because the youtuber creates interesting graphs to support his analysis.