**FUNCTIONAL REQUIREMENTS DOCUMENT**

**Project Name:** Empowering Athletes with Tech Insights

**1. Introduction**

This document outlines the functional and non-functional requirements for the Empowering Athletes with Tech Insights project. The system will provide athletes, coaches, and sports organizations with easy-to-use tools to analyze performance data and identify areas for improvement.

**2. Functional Requirements**

**2.1 User Management**

**Athlete Registration:** The system shall allow new athletes to create a profile by providing personal details (name, age, sport, etc.).

**Coach Registration:** The system shall allow coaches to create a profile with their details (name, qualifications, and teams managed).

**Team Registration:**The system shall allow the creation of teams, associating multiple athletes and a coach.

**2.2 Performance Metrics Management**

**Submit Performance Metrics:** The system shall allow athletes to submit their performance metrics (e.g., speed, accuracy, endurance) via a dedicated interface.

Each submitted metric shall include a type (e.g., speed), value, and timestamp.

**Retrieve Athlete Metrics:** The system shall allow athletes and coaches to retrieve an athlete's performance metrics over a specified time frame.

**2.3 Performance Analysis**

**Analyze Performance Data:** The system shall analyze submitted performance metrics against sport-specific standards to determine if each metric is within the acceptable range.

The analysis results shall include whether each metric meets the standard and overall performance evaluation.

**Generate Performance Reports:** The system shall generate performance reports for athletes, including:

Detailed metrics analysis.

Comparison against historical performance.

Trend analysis over time.

**2.4 Sport Standards Management**

**Define Sport Standards:** The system shall allow administrators to define and update performance standards for different sports.

Each sport shall have a defined set of metrics with minimum and maximum acceptable values.

**Retrieve Sport Standards:** The system shall allow users to retrieve the performance standards for a specific sport.

**2.5 Coach and Team Management**

**Associate Coaches with Teams:** The system shall allow coaches to be associated with one or more teams.

Coaches shall be able to view the athletes under their management and their performance metrics.

**Team Composition Management:** The system shall allow the addition and removal of athletes from teams.

The system shall allow retrieval of the current team roster, including athletes and their performance metrics.

**2.6 Notifications and Alerts**

**Performance Alerts:** The system shall send notifications to coaches when an athlete's performance metrics fall below acceptable standards.

The system shall notify athletes when their performance has significantly improved or declined based on trend analysis.

**2.7 Security and Authentication**

**User Authentication:** The system shall implement user authentication for athletes, coaches, and administrators to access their profiles securely.

The system shall require login credentials for access to sensitive information.

**Role-Based Access Control:** The system shall implement role-based access control, restricting access to certain functionalities based on the user's role (athlete, coach, admin).

**2.8 Administration and Maintenance**

**Manage Users and Roles:** The system shall allow administrators to manage user accounts, including creating, updating, and deleting user profiles.

**System Monitoring:** The system shall include monitoring tools for tracking performance, system health, and metrics usage.

**3. Non-Functional Requirements**

**3.1 Usability**

**Requirement:**  The system must be user-friendly and accessible for all types of users, including athletes, coaches, and administrators.

**Details:**

* **Intuitive User Interface:** The platform should feature a straightforward design, allowing users to navigate easily between profiles, performance metrics, and team management features without extensive training.
* **Customizable User Experience:** Users can personalize their dashboards to display relevant information, such as performance alerts and athlete metrics, according to their preferences.

**3.2 Performance**

**Requirement:** The platform must ensure efficient performance for all operations, especially during peak usage.

**Details:**

* **Response Time:** The system should provide responses to user actions (e.g., retrieving metrics or generating reports) within 2 seconds under normal operating conditions.
* **Scalable Performance:** The platform should efficiently handle increasing numbers of users and performance metrics submissions, maintaining optimal response times.

**3.3 Reliability**

**Requirement**: The system should maintain high availability and reliability to support continuous operation.

**Details:**

* **Uptime:** The platform must have an uptime of at least 99.9%, ensuring that users can access it during critical training periods and competitions.
* **Data Integrity**: The system must have mechanisms in place to prevent data loss, including regular backups of user data and performance metrics.

**3.4 Security**

Requirement: The platform must ensure robust security measures to protect user data and system integrity.

**Details:**

* **Data Encryption:** All sensitive user data, including personal details and performance metrics, must be encrypted during transmission and storage to prevent unauthorized access.
* **Access Control:** Role-based access control should restrict functionalities based on user roles, ensuring that athletes, coaches, and administrators can only access relevant data and actions.

**3.5 Scalability**

**Requirement**: The system must be scalable to accommodate future growth in user numbers and data volume.

**Details:**

* **Horizontal Scaling:** The architecture should allow the addition of more servers or nodes to manage increased user demand and data processing requirements without degradation of performance.
* **Vertical Scaling**: The system should support upgrades to existing servers to enhance processing power and storage capabilities as user needs evolve.

**3.6 Interoperability**

**Requirement:** The platform should be capable of integrating with other systems and tools used in athlete management and performance tracking.

**Details:**

* **API Availability:** The system must provide APIs for integration with third-party fitness and analytics platforms to facilitate data exchange and enhance functionality.
* **Data Compatibility**: The platform should support importing and exporting data in common formats (e.g., CSV, JSON) to enable easy data sharing and integration with other software.

**3.7 Maintainability**

**Requirement:** The system should be easy to maintain and update to ensure continued relevance and performance.

**Details:**

* **Modular Architecture:** The platform should be designed with modular components, allowing for easier updates and maintenance without disrupting overall functionality.
* **Documentation:** Comprehensive documentation should be provided for system administrators and developers to facilitate efficient system management and troubleshooting.

**3.8 Support and Documentation**

**Requirement:** The platform must provide adequate support and documentation for all users.

**Details:**

* **User Training Resources**: Training materials (e.g., tutorials, user guides) should be available to help users understand how to effectively use the system.
* **Technical Support:** A support system must be in place to address user inquiries and technical issues promptly, ensuring user satisfaction and system reliability.

**4. Tech Stack**

**1. Front End**

* HTML
* CSS
* TypeScript
* Angular

**2. Back End**

* Java
* Spring Boot

**3. Database**

* MongoDB