**Non-Functional Requirements Document (NFRD) v(1.0)**

**1. Introduction**

**1.1 Purpose**

This document specifies the non-functional requirements for the athlete management and event monitoring system. These requirements address performance, scalability, security, availability, and usability aspects of the system.

**1.2 Scope**

The non-functional requirements cover:

* Performance
* Scalability
* Security
* Availability
* Usability

**1.3 Audience**

* Project stakeholders
* Development team
* Quality assurance team
* System administrators

**2. Non-Functional Requirements**

**2.1 Performance**

* **Response Time**: The system should respond to user requests within 2 seconds for 95% of the requests under normal load conditions.
* **Throughput**: The system must handle at least 1000 concurrent users and maintain performance without degradation.
* **Resource Utilization**: The system should efficiently use CPU and memory resources to prevent excessive consumption and ensure smooth operation.

**2.2 Scalability**

* **Horizontal Scalability**: The system should be designed to scale horizontally, allowing the addition of more servers to handle increased load.
* **Database Scalability**: The database should support horizontal scaling or partitioning to accommodate growing data volumes.
* **Service Scalability**: Microservices should be independently scalable to manage increased workloads for specific functionalities.

**2.3 Security**

* **Authentication and Authorization**: The system must use JWT tokens for secure user authentication and authorization. User roles (admin, coach, athlete) must have access controls to ensure data protection.
* **Data Encryption**: All sensitive data, including personal information and credentials, should be encrypted both at rest and in transit.
* **Access Control**: Implement role-based access control (RBAC) to restrict access to resources based on user roles.
* **Vulnerability Management**: Regular security assessments and patch management practices should be in place to identify and address vulnerabilities.

**2.4 Availability**

* **Uptime**: The system should have a minimum uptime of 99.9% to ensure high availability.
* **Disaster Recovery**: Implement a disaster recovery plan with backup and restoration procedures to recover from system failures or data loss.
* **Fault Tolerance**: The system should be designed to handle hardware and software failures gracefully without significant downtime or data loss.

**2.5 Usability**

* **User Interface**: The user interface should be intuitive, with clear navigation and user-friendly design to ensure ease of use for all types of users.
* **Accessibility**: The system should comply with accessibility standards (e.g., WCAG 2.1) to ensure that users with disabilities can effectively use the system.
* **User Documentation**: Provide comprehensive user documentation and help guides to assist users in understanding and utilizing system features effectively.
* **Training**: Offer training resources or sessions for administrators and end-users to familiarize them with the system’s functionalities.

**3. Conclusion**

This document outlines the non-functional requirements for the athlete management and event monitoring system. These requirements are essential for ensuring that the system operates efficiently, securely, and reliably while providing a positive user experience.