# Software Requirements Specification (SRS)

Project: Marathon Management System  
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## 1. Introduction

### 1.1 Purpose

This document specifies the software requirements for the Marathon Management System (MMS) version 1.0. The scope of this SRS includes online registration, event scheduling, route management, real-time participant tracking, and analytics reporting. This solution is intended to streamline the management of marathon events for organizers, participants, and sponsors.

### 1.2 Document Conventions

• Headings follow the IEEE SRS standard numbering convention.  
• Requirements are uniquely identified using tags such as REQ-1, REQ-2.  
• High-priority requirements are indicated explicitly within their respective sections.  
• Bulleted lists are used for clarity and readability.

### 1.3 Intended Audience and Reading Suggestions

This document is intended for:  
• Developers – to implement the required modules.  
• Project Managers – to plan and monitor the project.  
• Testers – to prepare test plans based on functional requirements.  
• Event Organizers – to understand the software capabilities.  
It is recommended to start with the Introduction and Overall Description before reading the functional requirements.

### 1.4 Product Scope

The Marathon Management System (MMS) aims to automate marathon event organization. It will handle participant registration, payments, communication, event scheduling, real-time tracking, and analytics. The software will help improve operational efficiency, reduce errors, and enhance the experience for both organizers and participants.

### 1.5 References

• IEEE Std 830-1998: IEEE Recommended Practice for Software Requirements Specifications  
• Event Management Industry Reports  
• Web Application UI/UX Guidelines  
• Marathon Federation Rules and Regulations

## 2. Overall Description

### 2.1 Product Perspective

MMS is a standalone system with optional third-party integrations (e.g., payment gateways, GPS tracking services). It provides cloud support for scalability and can be accessed from web and mobile devices.

### 2.2 Product Functions

• Online participant registration and payment processing  
• Event scheduling and route mapping  
• Real-time participant tracking  
• Leaderboard and results management  
• Notification system for updates  
• Analytics dashboard for organizers

### 2.3 User Classes and Characteristics

• Event Organizers: Manage events, participants, and schedules.  
• Participants: Register, view event details, and track their results.  
• Sponsors: Access event visibility and analytics data.  
• Volunteers: Assist organizers with event operations.  
• IT Support: Maintain system performance and resolve technical issues.

### 2.4 Operating Environment

• Platforms: Web browsers, Android, iOS  
• Operating Systems: Windows 10+, Linux, macOS  
• Database: MySQL or PostgreSQL  
• Hosting: Cloud-based (AWS or Azure)

### 2.5 Design and Implementation Constraints

• Must comply with data privacy regulations (GDPR).  
• Limited offline functionality for some features.  
• Must integrate with third-party payment gateways.

### 2.6 User Documentation

• User Manual for Organizers and Participants  
• API Documentation for third-party integrations  
• Online Tutorials and FAQs

### 2.7 Assumptions and Dependencies

• Users have access to internet-enabled devices.  
• Payment gateway integration will be supported.  
• GPS services for real-time tracking will be available.

## 3. External Interface Requirements

### 3.1 User Interfaces

The UI will include an organizer dashboard, participant portal, registration forms, payment modules, and analytics sections. It will follow modern UI/UX principles with responsive design.

### 3.2 Hardware Interfaces

Supports barcode scanners for participant check-ins and GPS-enabled devices for tracking.

### 3.3 Software Interfaces

• Payment gateways (Stripe, PayPal)  
• GPS tracking APIs  
• Notification services (Firebase or Twilio)

### 3.4 Communications Interfaces

• Protocols: HTTPS for secure communication  
• Email, SMS, and push notification support  
• Encrypted data transmission for sensitive information

## 4. System Features

### 4.1 Online Registration

#### 4.1.1 Description and Priority

Enable online participant registration and payment. Priority: High

#### 4.1.2 Stimulus/Response Sequences

Participant fills form → System processes payment → Registration confirmation is sent

#### 4.1.3 Functional Requirements

REQ-1: System must allow secure online registration.  
REQ-2: System must integrate with payment gateways.

### 4.2 Real-Time Tracking

#### 4.2.1 Description and Priority

Track participants using GPS. Priority: High

#### 4.2.2 Stimulus/Response Sequences

Participant runs with GPS → System updates location → Organizer dashboard displays live status

#### 4.2.3 Functional Requirements

REQ-3: System must support GPS tracking.  
REQ-4: System must provide real-time location updates.

## 5. Other Nonfunctional Requirements

### 5.1 Performance Requirements

System must support 5,000 concurrent users with a response time under 2 seconds.

### 5.2 Safety Requirements

System must include data backup mechanisms to prevent loss.

### 5.3 Security Requirements

System must use two-factor authentication for organizers.

### 5.4 Software Quality Attributes

System must be scalable, reliable, and user-friendly.

### 5.5 Business Rules

Only authorized organizers can modify event details.

## 6. Other Requirements

System must comply with marathon event regulations.

## Appendix A: Glossary

MMS: Marathon Management System  
GPS: Global Positioning System

## Appendix B: Analysis Models

Use case diagrams, class diagrams, and sequence diagrams will be included in the design phase.

## Appendix C: To Be Determined List

TBD-1: Final selection of GPS tracking API.  
TBD-2: Payment gateway integration options.