

# Rendezvous - Event Finder System Requirements Specification (SRS)

## 1. INTRODUCTION

### 1.1 Purpose

This Software Requirements Specification (SRS) document specifies the functional and non-functional requirements for Rendezvous, an AI-powered event discovery platform for Cameroon.

### 1.2 Scope

Rendezvous accumulates and recommends local events (concerts, festivals, tech talks, nightlife, etc.) using AI to solve the problem of scattered event information across social media platforms. The system serves three user types: regular users, event organizers, and administrators.

### 1.3 Definitions, Acronyms and Abbreviations

- **AI:** Artificial Intelligence
- **NLP:** Natural Language Processing
- **OCR:** Optical Character Recognition
- **RBAC:** Role-Based Access Control
- **JWT:** JSON Web Token
- **API:** Application Programming Interface
- **CDN:** Content Delivery Network
- **SRS:** Software Requirements Specification
- **User:** General platform user who discovers and attends events
- **Organizer:** User with additional permissions to create and manage events
- **Admin:** Platform administrator with full system access
- **Event Feed:** Personalized stream of recommended events
- **Digest:** Weekly AI-generated summary of relevant events.

## **2. PROJECT OVERVIEW**

### **2.1 Product Perspective**

Rendezvous is a standalone web and mobile application that:

- Accumulates events from multiple sources (manual entry, poster upload, link import)
- Uses AI for search, recommendations, categorization, and initial fraud detection
- Provides location-based discovery via interactive maps
- Connects event organizers with attendees

### **2.2 Product Functions**

- User registration and authentication
- Event discovery with AI-powered search and recommendations
- Event creation with multiple import methods (manual, poster upload, link import)
- Interactive map view of events
- Event management and analytics for organizers
- Content moderation and verification system for administrators
- Rating and review system for attended events
- Personal event planner and calendar integration

### **2.3 User Classes and Characteristics**

#### **General User (Anonymous):**

- Browse and discover events without registration
- View event details and locations
- Access basic search functionality
- View events on interactive map
- No authentication required
- Authentication is prompted if tried to access registered user functionalities

#### **Registered User:**

- Students, young professionals, residents

- Tech-savvy
- Wants personalized event discovery
- Save events, mark interest, review attended events
- Follow organizers for updates
- Receive personalized recommendations

**Event Organizer:**

- Universities, venues, promoters, cultural organizations
- Submit and manage events
- Need wider reach for their events
- Want analytics and verification badge
- Limited technical expertise
- May manage multiple events simultaneously

**Administrator:**

- Platform managers and moderators
- Manage platform content and quality
- Responsible for content quality and safety
- Need comprehensive moderation tools
- Handle verification requests and user reports

## 2.4 Operating Environment

- Web: React Vite
- Mobile: React Native app - Phase 2
- Backend: Express, Node.js
- Database: MongoDB Atlas
- APIs: Hugging Face, Mapbox/Google Maps
- Cloud Services: AWS S3 or Cloudinary (image storage), SendGrid or NodeMailer (email)

## 2.5 Design and Implementation Constraints

- Must use MERN stack
- Must integrate Hugging Face models for AI features

- Mobile app is Phase 2
- Must comply with Cameroon data protection regulations
- Must support French and English languages
- Free tier limitations for external APIs must be respected

### **3. FUNCTIONAL REQUIREMENTS**

#### **3.1 User Management**

##### **I. User Registration (MVP)**

- Users create accounts with name, email, password
- Email verification required before account activation
- Password strength validation (minimum 8 characters, must contain letters and numbers)
- Interest selection (3-5) from predefined categories during onboarding
- Location (city, neighbourhood) can be manually entered or auto-detected via browser geolocation during onboarding
- No duplicate email registrations

##### **Predefined Interest Categories**

- Music & Concerts
- Arts & Culture
- Sports & Fitness
- Food & Drink
- Business & Networking
- Technology
- Health & Wellness
- Community & Charity
- Entertainment
- Education & Workshops
- Family & Kids

- Nightlife

## II. User Authentication (MVP)

- Secure login with email and password
- JWT-based session management with 7 day token expiration
- Remember me functionality for extended sessions
- Password recovery via email reset link
- Social login integration (Google, Facebook) as alternative authentication method
- Role-based access control (user, organizer, admin)
- Automatic logout after token expiration
- Session invalidation on password change

## III. Profile Management

- Update personal information (name, location, interests)
- Change password with current password verification
- View account activity and event history (saved, interested, attended)
- Users shall view followed organizers list
- Account can be deleted with confirmation

### 3.2 Event Discovery

#### I. Personalized Event Feed (MVP)

- Personalized feed based on user interests, location, and behavior
- Real-time updates as new events are published
- Pull-to-refresh functionality
- Feed customization based on explicit interest modifications by user
- Trending events highlighted within feed (most saved/interested)
- Events from followed organizers prioritized
- "Because you liked..." suggestions with explanations will be shown
- Infinite scroll with lazy loading

## **II. Event browsing (MVP)**

- Browsing by category
- Filtering of events by:
  - Date (today, weekend, this week, this month, custom range)
  - Price (free, <2000 FCFA, <5000 FCFA, 5000+ FCFA)
  - Location (city, neighborhood)
  - Event type (online, in-person, hybrid)
  - Category
- Event cards displayed with: title, image, date, price, location, interested count
- Save filter combinations as presets
- Sorting by: date, popularity, price

## **III. Natural Language Search (MVP)**

- Natural language search input queries
- Hugging Face NLP models extracts structured parameters ( event type/category, budget constraints, time frame, location, mood/vibe keywords)
- Filtered results matching parsed intent
- Handle queries in French and English
- Popular searches displayed when search is empty
- Query suggestions are provided as a user types
- Search history is saved for registered users
- Trending searches shall be displayed
- Fuzzy matching shall be implemented for misspelled terms

### **Examples Queries:**

- "free concerts douala this weekend"
- "networking events under 5000 FCFA"
- "calm places tonight"

- “art events under 3k”

#### **IV. Map View**

- Events displayed on interactive map using Mapbox or Google Maps
- Nearby event markers shall be clustered
- Event preview on marker click (image, title, date, price)
- Map filters (category, date, price)
- Users current location is shown
- Toggle between list and map view
- Different marker colors/icons by category
- Zoom controls and map navigation
- Distance from user's location to event will be shown

#### **3.3 Event Details**

##### **I. Event Information Display (MVP)**

- Full event information display
  - Title, description, category
  - Date, time, duration
  - Venue name & location (address with embedded map)
  - Price or free indicator
  - Organizer information (name, profile picture, verification badge if verified)
  - High-resolution cover image with gallery view for multiple images (1-5)
  - Number of people interested
  - Average rating (if event has occurred) and review count
  - Event status (upcoming, ongoing, past, cancelled)
  - Contact information for event inquiries
  - Show event capacity if specified
  - Links to event on socials (TikTok, Facebook, Instagram etc)
- Similar/related events (AI-recommended, top 5)
- Share event on social media (WhatsApp, Facebook, Twitter, Copy link etc)

- Organizer's other upcoming events are displayed
- "Get Directions" button linking to map

## **II. Event Interaction (MVP)**

- Save events to personal collection for later viewing
- Mark "I'm interested" to show attendance intent
- Follow organizers directly from event page
- Report suspicious events with reason selection
- Event views, saves, and interested count tracked in real-time
- Share event links via link copying or social media
- Add event to personal calendar
- Users unsave or remove interest from events

### **3.4 Event Creation (Organizers)**

#### **I. Manual Event Creation (MVP)**

- Event creation via form with fields:
  - Title (required, maximum 100 characters)
  - Description (required, maximum 2000 characters)
  - Category selection from dropdown (required), can be multiple
  - Date and time (required, with calendar picker)
  - Duration (optional)
  - Location: address input with map coordinate selection (required)
  - Event type: online, in-person, or hybrid (required)
  - Online event link (required if online/hybrid)
  - Price in FCFA or mark as free (required)
  - Capacity limit (optional)
  - Contact information: phone, email (required)
  - Upload 1-5 images (required, maximum 5MB each, JPG/PNG format)
  - Tags for better discoverability (optional, maximum 5)
- AI suggests category from description text

- Organizers save events as draft or publish immediately
- All required fields validated before submission
- Image preview before upload
- Auto-save draft functionality every 2 minutes

## **II. Poster Import**

- Organizers upload event poster images (JPG, PNG, maximum 10MB)
- OCR extracts text from poster using Tesseract.js or Hugging Face model
- NLP parses extracted text for:
  - Event title
  - Date and time
  - Location
  - Price
  - Description fragments
  - Contact information
- Form fields pre-filled with extracted data
- Organizers review and edit all fields before publishing
- Original poster retained as event image
- Multiple poster upload for better extraction accuracy

## **III. Link Import**

- Organizers paste event URL (Facebook event, Instagram post, website URL)
- System scrapes page content using Puppeteer or Cheerio
- NLP extracts structured event data from scraped content
- Form pre-filled with scraped data
- Organizers review and edit before publishing
- Source URL saved as event reference
- Import history tracked for each organizer

## **IV. Event Management (MVP)**

- Organizers edit their events before and after publication
- Event cancellation with reason and notification to interested users
- View all events organized with tabs: upcoming, draft, past, cancelled
- Past events cannot be edited except for cancellation status
- Duplicate event creation from existing events
- Bulk event management for recurring events
- Event republishing for recurring activities

### **3.5 Organizer Dashboard**

#### **I. Dashboard Overview (MVP)**

- Quick statistics (total events, upcoming events, total views, followers)
- Recent activity feed
- Performance charts (views over time, interest trends)
- Quick action buttons (create event, view analytics, manage events)
- Notifications for new reports or questions

#### **II. Analytics (MVP)**

- Analytics for each event displayed:
  - Total views with daily breakdown
  - Saves count over time
  - Interested count with growth chart
  - Click-through rate for external links
  - Geographic distribution of interested users
  - Ratings and reviews summary
- Follower count and growth trends
- Overall organizer rating (average of all event ratings)
- Analytics export to CSV format
- Comparison between multiple events
- Analytics updated in real-time
- Top performing events highlighted

### **III. Verification (MVP)**

- Organizers request verification badge through form submission
- Required verification documents:
  - Organization name and registration number (if applicable)
  - Contact person details
  - Physical address
  - Previous event portfolio or social media links
  - Government-issued ID or business license
- Verification status displayed: pending, approved, rejected
- Verification badge displayed on organizer profile and events once approved
- Verified status benefits explained to organizers
- Reapplication allowed after rejection with improvements

### **IV. Communication Tools**

- View and respond to user questions on events
- Respond to event reports with explanations
- Notification when new questions or reports arrive
- Mark questions as answered
- FAQ builder for common questions

## **3.6 Rating and Review System**

### **I. Event Ratings (MVP)**

- Users rate events 1-5 stars with optional text review (maximum 500 characters)
- Rating allowed only for attended events (after event date)
- Rating window closes 30 days after event date
- One rating per user per event enforced
- Users edit or delete their own ratings within 7 days
- Average event rating calculated and displayed with total count

- Organizer overall rating updated based on all event ratings
- Review helpfulness voting (helpful/not helpful)
- Inappropriate reviews flagged and reviewed by admins
- Reviews sorted by: newest, highest rated, lowest rated, most helpful

### **3.7 Event Planner**

#### **I. Personal Calendar**

- Users add events to personal planner from any event page
- Calendar view displayed: day, week, month views
- Daily event schedule with timeline view
- Event conflicts highlighted (overlapping times)
- Color-coding by event category
- Export events to Google Calendar or iCal format
- Calendar sync with external calendar applications
- Email reminders sent 1 day before saved events
- Push notifications 2 hours before event start (mobile app)
- Print calendar view functionality

### **3.8 AI Features**

#### **I. Natural Language Search (MVP)**

- Hugging Face NLP models for query understanding
- Entity extraction and intent classification from queries
- Bilingual query support (French and English)
- Search results returned within 5 seconds
- Query suggestions as user types
- Search history saved for registered users
- Trending searches displayed
- Fuzzy matching for misspelled terms
- Context-aware search refinement

## **II. Event Recommendations (MVP)**

- Hybrid recommendation approach:
  - Content-based filtering: interest and category matching
  - Collaborative filtering: similar user behavior patterns
  - Embedding-based similarity: semantic text matching
- Event embeddings generated using sentence transformers
- Recommendations updated based on user interactions (saves, interests, attendance)
- "Because you liked X" explanations for each recommendation
- Diversity in recommendations to avoid filter bubbles
- Cold start problem addressed with location and explicit interests
- Recommendation quality improves over time with user data

## **III. Auto-Categorization (MVP)**

- Event category suggested from description using zero-shot classification
- Confidence score displayed for suggestion
- Organizer overrides allowed
- Multi-label categorization for cross-category events
- Category suggestions improve with platform data

## **IV. Fraud Detection (MVP)**

- Suspicious events flagged for admin review based on:
  - Suspicious keywords: "guaranteed", "must pay now"
  - High prices from new unverified organizers (>10,000 FCFA)
  - Missing critical details (vague location, no contact information)
  - Excessive urgency language
  - Multiple user reports (threshold: 5 reports)
  - Duplicate event detection
- Fine-tuned text classification model on scam/legitimate event dataset

- Events not auto-removed, only flagged for review
- Flag reason and confidence score displayed to admins
- False positive feedback mechanism to improve model
- Regular model retraining with new data

## V. Similar Events (MVP)

- 5 similar events recommended on event detail page
- Cosine similarity of event embeddings calculated
- Factors: category, description semantic similarity, location proximity
- Same organizer events excluded from similar recommendations
- Similar events updated when new events published

## VI. Weekly Digest

- Personalized weekly email digest generated every Monday at 8 AM
- Top 5-10 recommended events selected per user
- Events selected based on user interests, location, and trending status
- Digest includes event images, titles, dates, and quick links
- Unsubscribe option provided
- Email open and click tracking for improvement

### 3.9 Admin Panel

#### I. Content Moderation (MVP)

- Queue of flagged events displayed with priority sorting
- Flag reasons displayed: AI detection score or user report details
- Event preview with full details
- Moderation actions: approve, request edits, reject, remove
- Warning messages sent to organizers for violations
- Malicious organizers and users banned with reason
- Ban duration: temporary (7, 30 days) or permanent
- All moderation actions logged with timestamp and admin ID

- Moderation history accessible per event and organizer
- Bulk moderation actions for similar violations
- Automated suspension after repeated violations

## **II. Organizer Verification (MVP)**

- Verification requests displayed in queue with submission date
- Organizer profile and verification documents reviewed
- Past event history and ratings accessible
- Verification decision: approve or reject with reason
- Verification badge applied upon approval
- Rejection reason sent to organizer with improvement suggestions
- Reapplication tracking
- Manual verification badge removal for policy violations
- Verification statistics tracked

## **III. Platform Analytics**

- Dashboard displaying key metrics:
  - Total users, registered users, anonymous visitors
  - Total events: active, past, upcoming, draft
  - Total organizers and verified organizers count
  - Active events by category (pie chart)
  - Trending events (most viewed, saved, interested)
  - Flagged/removed content count
  - User engagement: daily active users , monthly active users
  - Event views, searches, and interactions
  - Growth charts: user signups, events created over time
  - Geographic distribution of users and events
  - Analytics updated daily at midnight
  - Data export to CSV or PDF
  - Custom date range selection
  - Real-time metric refresh option

## **IV. Report Management (MVP)**

- All user reports displayed with categorization:
  - Scam/fraud
  - Inappropriate content
  - Incorrect information
  - Spam
  - Duplicate event
  - Other
- Report details: reporter, event, timestamp, description
- Priority sorting by number of reports per event
- Report status tracking: pending, investigating, resolved, dismissed
- Actions taken logged
- Reporter notification of resolution
- False report tracking per user
- Analytics on report types and resolution time

### **3.10 Notification System**

#### **I. Email Notifications**

- Event reminders sent 1 day before saved events (6 PM local time)
- Weekly personalized digest sent every Monday at 8 AM
- New event notifications when followed organizers publish events
- Verification decision emails to organizers
- Password reset confirmation emails
- Welcome email upon successful registration
- Event cancellation notifications to interested users
- Rating requests sent 1 day after event date
- Notification preferences configurable in user settings
- Email open tracking for engagement metrics

#### **II. In-App Notifications (Phase 2)**

- Real-time notifications for new events from followed organizers

- Event update notifications (time, location changes)
- Response notifications for organizers (new interests, ratings)
- Verification status updates
- System announcements and feature updates
- Notification badges on navigation bar
- Mark as read/unread functionality
- Notification history with 30-day retention

## 4. NON-FUNCTIONAL REQUIREMENTS

### 4.1 Performance

- Page load time shall not exceed 5 seconds on stable network connection
- Search results returned within 5 seconds
- AI model inference less than 2 seconds per request
- Support 100 concurrent users (MVP phase)
- Database queries optimized with proper indexing
- API response time shall not exceed 500ms for 95% of requests
- Image loading optimized with lazy loading and CDN
- Map rendering less than 2 seconds

### 4.2 Security

- Passwords hashed using bcrypt (minimum 10 salt rounds)
- JWT tokens expire after 7 days
- Refresh tokens for extended sessions
- HTTPS enforced for all communications
- Input validation and sanitization to prevent SQL/NoSQL injection
- XSS protection with content security policy
- CSRF protection with tokens
- Rate limiting: 100 requests/minute per user
- CORS policy restricts API access to authorized domains
- Session invalidation on password change

#### **4.3 Reliability**

- System uptime of 99% (excluding planned maintenance)
- Graceful degradation if AI services unavailable:
  - Fallback to keyword-based search
  - Basic recommendations without AI
- Regular automated database backups
- Error logging and monitoring
- Real-time monitoring with alerts
- Automatic failover for critical services

#### **4.4 Usability**

- Quick event creation
- Easy and quick event discovery
- Intuitive UI requiring no training for basic features
- Clear error messages with recovery suggestions
- Contextual help and tooltips
- Onboarding tutorial for new users (Phase 2)
- System shall support keyboard navigation
- Compatible with screen readers
- Multi-language support (English, French)

#### **4.5 Scalability**

- Database schema supports horizontal scaling
- API designed for microservices architecture migration
- Caching strategy:
  - Redis for session management
  - CDN for static assets and images
  - Database query result caching
- Load balancing across multiple server instances
- Auto-scaling based on traffic patterns
- Pagination for large data sets (20-50 items per page)
- Asynchronous processing for heavy tasks

#### **4.6    Maintainability**

- Comprehensive API documentation
- Unit test coverage > 70%
- Integration tests for critical user flows
- Version control using Git with branching strategy
- Code review process before merging
- Documentation updated with each release
- Modular and loosely coupled architecture

#### **4.7    Portability**

- Backend compatible with major cloud platforms
- Frontend compatible with all modern browsers
- Mobile app supports iOS and Android (Phase 2)
- Environment-specific configuration management
- Database migration scripts for schema changes

### **5. EXTERNAL INTERFACE REQUIREMENTS**

#### **5.1    User Interfaces**

- Web UI: Responsive design for desktop, tablet, mobile, small mobile screens
- Mobile UI: React Native app (Phase 2)
- Accessibility: WCAG 2.1 AA compliance
- Consistent color scheme and typography across all pages
- Clean, intuitive and consistent navigation across pages
- Loading indicators for asynchronous operations
- Error states with clear, actionable messaging
- Empty states with helpful guidance
- Progressive image loading

## 5.2 Hardware Interfaces

- Standard web browsers
- Mobile devices with GPS (for location features)
- Camera (for poster upload)

## 5.3 Software Interfaces

Database:

- MongoDB Atlas (cloud-hosted)
- Collections: users, events, organizerProfiles, reviews, reports, verificationRequests, adminLogs, searchHistory
- Indexes on frequently queried fields for optimization
- 2dsphere indexes for geospatial queries

Hugging Face Inference API:

- Model endpoints for NLP tasks (search parsing, categorization, embeddings)
- Rate limiting: 500 requests/day (free tier)
- Fallback keyword-based search if AI hits rate limits

Maps:

- Mapbox GL JS or Google Maps JavaScript API:
- Map display and geocoding
- Geocoding and reverse geocoding
- Marker clustering for event visualization
- Directions service integration

Email Service:

- SendGrid or NodeMailer (with Gmail SMTP)
- Transactional email templates
- Limited daily emails under free-tier quota
- Delivery tracking and analytics

Cloud Storage:

- AWS S3 or Cloudinary
- Event images with CDN delivery
- Automatic image optimization and resizing

- Maximum 2MB per image, JPG/PNG formats

OCR Service:

- Tesseract.js or Hugging Face free models optional for better accuracy
- Image text extraction
- Post-MVP feature

Web Scraping:

- Puppeteer or Cheerio
- Social media content extraction
- Extract content from public event pages only
- Post-MVP feature

## 5.4 Communication Interfaces

**HTTP/HTTPS Protocol:**

- RESTful API communication
- Base URL: <https://api.rendezvous.cm/v1>
- Standard HTTP methods (GET, POST, PUT, DELETE)
- HTTPS enforced for all communications

**Data Format:**

- Request and response bodies in JSON
- Standardized error response format
- ISO 8601 format for dates and timestamps

**WebSocket (Phase 2):**

- Real-time event feed updates
- Live notification delivery
- Optional for future enhancement

# 6. SYSTEM MODELS

## 6.1 Use Case Diagram

**Actors:**

- Anonymous User
- Registered User

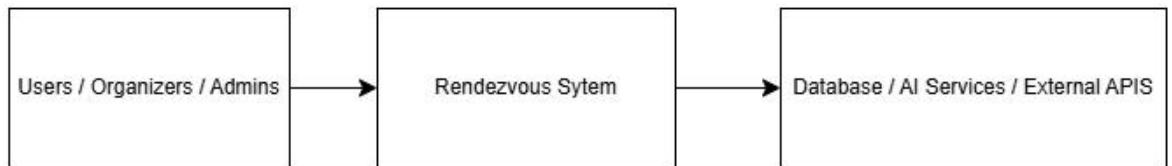
- Event Organizer
- Administrator

**Key Use Cases:**

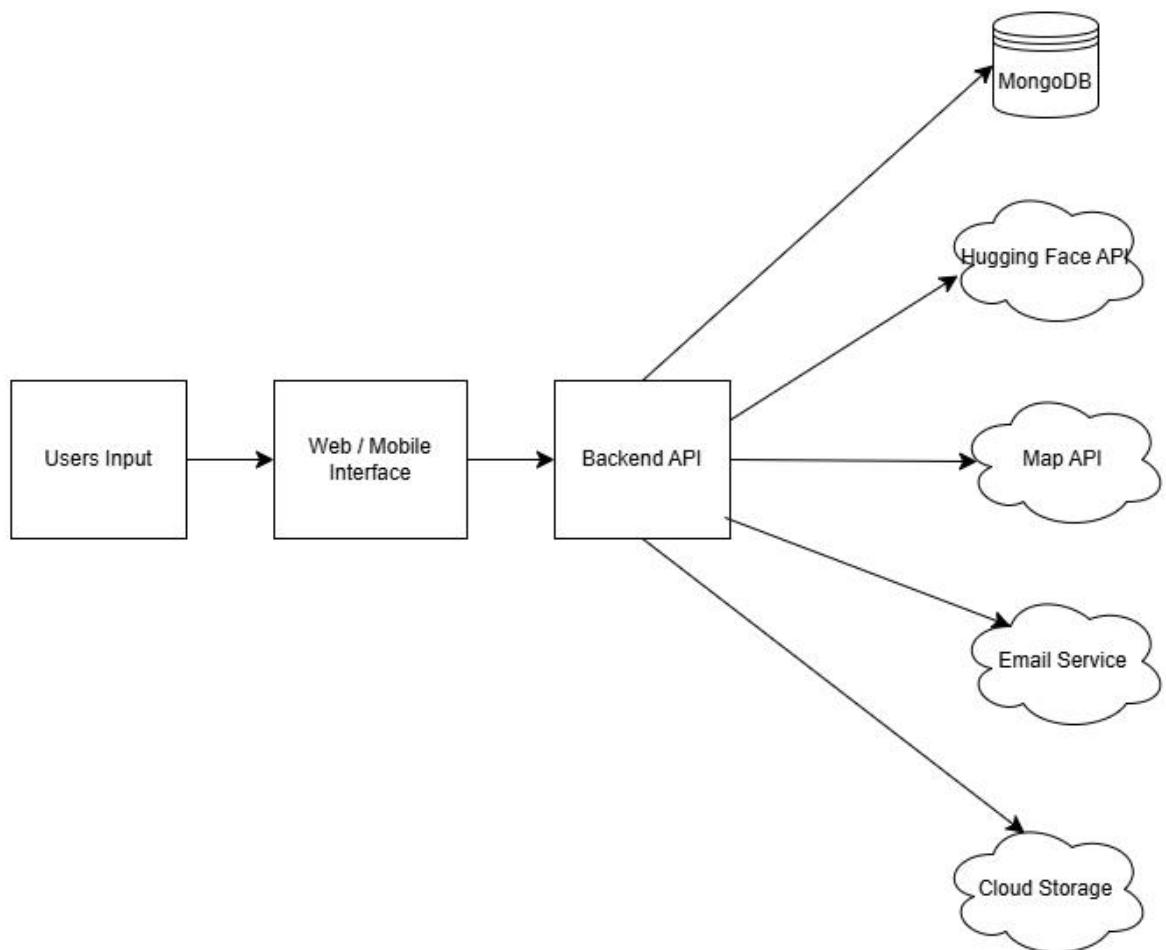
- Anonymous User: Browse Events, View Event Details, Search Events, View Map
- Registered User: Register, Login/Logout, Browse Events, Search, Save Events, Mark Interest, Rate Events, Follow Organizers, Manage Profile
- Organizer: Create Event (Manual/Poster/Link), Edit Event, Cancel Event, View Analytics, Request Verification, Manage Event Portfolio
- Administrator: Review Flagged Events, Verify Organizers, Manage Reports, View Platform Analytics, Moderate Content, Ban or suspend Users/Organizers

## 6.2 Data Flow Diagram

**Level 0 (Context):**



### Level 1:



### 6.3 State Transition Diagram

#### Event States:

- Draft → Published → Active → Past → Archived
- Published → Flagged → Under Review → Approved/Removed
- Any State → Cancelled (by organizer)

#### User States:

- New → Active → Inactive (90 days no login) → Dormant

#### Organizer States:

- Unverified → Verification Requested → Verified
- Verified → Suspended (policy violation) → Banned

## 7. APPENDICES

### 7.1 Technology Stack Summary

#### Frontend:

- React.js with Vite build tool
- React Native (mobile - Phase 2)
- Tailwind CSS for styling
- Redux Toolkit for state management
- React Router for navigation
- Axios for HTTP requests

#### Backend:

- Node.js
- Express.js
- Mongoose ODM for MongoDB
- JWT for authentication
- Bcrypt for password hashing
- Multer for file uploads

#### Database:

- MongoDB (Atlas cloud)

#### AI/ML:

- Hugging Face Inference API

#### External APIs:

- Mapbox GL JS or Google Maps JavaScript API
- SendGrid or NodeMailer for emails
- AWS S3 or Cloudinary for image storage

#### DevOps:

- Git/GitHub for version control
- Heroku/Railway/Render for deployment
- MongoDB Atlas for database hosting
- Postman for API testing

## 7.2 Glossary

**Event:** A scheduled activity with date, time, location, and organizer

**Organizer:** Entity or individual responsible for hosting and managing events

**Verification:** Manual admin approval process confirming organizer legitimacy and credibility

**Flagged Event:** Event marked by AI or users as potentially fraudulent, inappropriate, or violating platform policies

**Interested:** User action indicating intent or desire to attend an event

**Embedding:** Vector representation of text used for semantic similarity calculations and recommendations

**Digest:** Weekly personalized email summary of recommended events based on user preferences

**Feed:** Personalized stream of events displayed on user's home page

**Draft:** Unpublished event saved by organizer for future completion

**OCR (Optical Character Recognition):** Technology extracting text from images

**NLP (Natural Language Processing):** AI technology understanding and processing human language

**FCFA (Central African Franc):** Currency used in Cameroon

**MVP (Minimum Viable Product):** Initial version with core features

**Rendezvous:** Platform name

## 7.3 Development Timeline

### Week 1: Project Setup & Core Authentication

- Development environment configuration
- Database schema design and implementation
- User authentication system (registration, login, JWT)
- Basic UI framework and routing setup
- Profile management features

### Week 2: Event Management

- Event CRUD operations (create, read, update, delete)

- Event browsing with filters and sorting
- Basic keyword search functionality
- Image upload and storage integration
- Event detail pages

### **Week 3: AI Integration**

- Natural language search implementation with Hugging Face
- Recommendation system (content-based + collaborative filtering)
- Event embeddings generation
- Auto-categorization
- "Because you liked X" explanations
- Basic fraud detection

### **Week 4: Maps & Advanced Features**

- Interactive map view with Mapbox/Google Maps
- Geospatial queries and marker clustering
- Organizer dashboard with analytics
- Rating and review system
- Follow organizers functionality

### **Week 5: Admin & Deployment**

- Admin panel and moderation tools
- Organizer verification workflow
- Platform analytics dashboard
- Email notification system
- Comprehensive testing (unit, integration, user acceptance)
- Bug fixes and performance optimization
- Documentation completion
- Production deployment

### **POST-MVP ENHANCEMENTS - NICE TO HAVE:**

#### **Import Features:**

- Event creation via poster upload (OCR)

- Event creation via link import (web scraping)

#### **Advanced User Features:**

- Personal event calendar/planner
- Calendar export (Google Calendar, iCal)
- Event reminders (email, 1 day before)
- Social login (Google, Facebook)
- Weekly personalized digest emails

#### **Enhanced AI:**

- Auto-categorization with confidence scores
- Advanced fraud detection with fine-tuned models
- Multi-label categorization
- Improved recommendation diversity algorithms

#### **Community Features:**

- Event comments/questions to organizers
- Review helpfulness voting
- FAQ builder for organizers

#### **Analytics:**

- Advanced organizer analytics (geographic distribution, conversion funnels)
- Export analytics to CSV
- Event comparison tools

#### **System Improvements:**

- Real-time updates via WebSockets
- Advanced caching (Redis)
- Performance optimizations
- Comprehensive onboarding tutorial

### **PHASE 2 - MOBILE APP:**

- React Native mobile applications (iOS and Android)
- Push notifications (event reminders, updates)
- Camera integration for poster upload
- Native calendar integration
- Offline event viewing

- Location-based notifications
- Biometric authentication
- App-specific features (swipe gestures, native animations)

## 7.4 Database Schema

### Users Collection:

```
{
  _id: ObjectId,
  name: String, // required
  email: String, // required, unique, indexed
  password: String, // hashed with bcrypt
  role: String, // enum: ['user', 'organizer', 'admin'], default: 'user'
  interests: [String], // 3-5 category strings required
  location: {
    city: String,
    neighborhood: String,
    coordinates: {
      type: { type: String, default: 'Point' },
      coordinates: [Number] // [longitude, latitude]
    }
  },
  followedOrganizers: [ObjectId],
  savedEvents: [ObjectId],
  interestedEvents: [ObjectId],
  isEmailVerified: Boolean,
  emailVerificationToken: String,
  resetPasswordToken: String,
  resetPasswordExpires: Date,
  lastLogin: Date,
  createdAt: Date,
  updatedAt: Date
}
```

### Events Collection:

```
{
  _id: ObjectId,
  title: String, // required, max 100 chars
  description: String, // required, max 2000 chars
  categories: [String], // required, from predefined list
  date: Date,
  time: String,
  duration: Number, // minutes
  location: {
    address: String,
  }
}
```

```
city: String,  
neighborhood: String,  
coordinates: {  
    type: { type: String, default: 'Point' },  
    coordinates: [Number]  
}  
,  
eventType: String, // enum: ['online', 'in-person', 'hybrid']  
onlineLink: String,  
price: Number, // FCFA, 0 for free  
capacity: Number,  
images: [{  
    url: String,  
    publicId: String  
}],  
organizer: ObjectId,  
tags: [String],  
contactInfo: {  
    phone: String,  
    email: String  
},  
status: String, // enum: ['draft', 'published', 'flagged', 'cancelled', 'past']  
flagReason: String,  
flaggedBy: String,  
flagConfidence: Number,  
metrics: {  
    views: Number,  
    saves: Number,  
    interested: Number,  
    averageRating: Number,  
    reviewCount: Number  
},  
embedding: [Number],  
externalLinks: {  
    facebook: String,  
    instagram: String,  
    tiktok: String,  
    website: String  
},  
createdAt: Date,  
updatedAt: Date,  
publishedAt: Date,  
cancelledAt: Date,  
cancellationReason: String  
}
```

**Additional Collections:** Reviews, Reports, VerificationRequests, OrganizerProfiles, AdminLogs, SearchHistory

## 7.5 API Endpoint Summary

**Base URL:** <https://api.rendezvous.cm/v1>

### Authentication Routes (/api/auth)

- POST /register - Register new user
- POST /login - Login user
- POST /logout - Logout user
- POST /verify-email - Verify email with token
- POST /forgot-password - Request password reset
- POST /reset-password - Reset password with token
- GET /me - Get current user profile

### Event Routes (/api/events)

- GET / - Get all published events (with filters, pagination)
- GET /feed - Get personalized event feed (requires auth)
- GET /:id - Get single event details
- POST / - Create new event (requires organizer auth)
- PUT /:id - Update event (requires organizer auth, own events)
- DELETE /:id - Delete event (requires organizer/admin auth)
- POST /:id/save - Save event
- DELETE /:id/save - Unsave event
- POST /:id/interest - Mark interested
- DELETE /:id/interest - Remove interest
- POST /:id/view - Track event view
- GET /:id/similar - Get similar events
- POST /:id/cancel - Cancel event (requires organizer auth, own events)

### Search Routes (/api/search)

- GET / - Natural language search
- GET /trending - Get trending searches

### Map Routes (/api/map)

- GET /events - Get events within bounds or radius

### **Review Routes (/api/reviews)**

- POST / - Create review
- GET /event/:eventId - Get all reviews for event
- PUT /:id - Update own review
- DELETE /:id - Delete own review

### **Organizer Routes (/api/organizer)**

- GET /dashboard - Get dashboard overview
- GET /events - Get own events (all statuses)
- GET /analytics/:eventId - Get detailed event analytics
- GET /profile - Get own organizer profile
- PUT /profile - Update organizer profile
- POST /verification/request - Request verification
- GET /verification/status - Get verification status

### **Admin Routes (/api/admin)**

- GET /dashboard - Platform analytics
- GET /events flagged - Get flagged events
- POST /events/:id/moderate - Moderate flagged event
- GET /reports - Get all reports
- POST /reports/:id/resolve - Resolve report
- GET /verification/requests - Get verification requests
- POST /verification/:id/approve - Approve verification
- POST /verification/:id/reject - Reject verification
- POST /users/:id/ban - Ban user
- POST /users/:id/unban - Unban user
- GET /logs - Get admin action logs

## **7.6 Fallback Strategies**

### **AI Service Failures:**

#### **Hugging Face API Unavailable:**

- Fall back to keyword-based search using MongoDB text indexes

- Simple pattern matching for common queries
- Display message: "Smart search temporarily unavailable. Showing keyword results."

#### **Event Recommendations:**

- Use simple content-based filtering (interest matching)
- Sort by date proximity and popularity
- Display message: "Personalized recommendations will improve as our AI learns your preferences."

#### **Map API Failures:**

- Display static list view with text addresses
- Provide "Get Directions" button opening external map app
- Show "Map view temporarily unavailable" message

#### **Image Upload Service Failures:**

- Store images locally on server temporarily
- Display placeholder image with retry mechanism
- Queue failed uploads for retry
- Email organizer about delayed processing

#### **Email Service Failures:**

- Queue emails in database with retry mechanism
- Display in-app notifications as alternative
- Retry every 30 minutes for 24 hours
- Prioritize critical emails (password reset, verification)

#### **Database Failures:**

- Return cached data with warning message
- Display "Service temporarily unavailable" for write operations
- Queue writes for retry
- Automatic reconnection attempts every 10 seconds

## **7.7 Assumptions and Dependencies**

### **Assumptions:**

- Users have stable internet access for platform usage
- Users allow browser location permissions for location-based features
- Events primarily concentrated in major Cameroonian cities (Douala, Yaoundé, Bamenda, Buea)
- Event organizers provide accurate and truthful information
- Target users are comfortable with French and/or English languages
- Mobile device adoption is high among target demographic
- Users have access to email for verification and notifications

### **Dependencies:**

- Hugging Face API availability and free tier limitations
- Map API quotas for free tier
- Email service delivery for free tier
- Cloud service uptime and reliability
- MongoDB Atlas free tier capacity
- Availability of training data for AI model fine-tuning
- Stable internet connectivity for cloud services

## **7.8 Success Metrics for MVP**

### **Technical Metrics:**

- User can successfully register and login
- User can browse minimum 30 events across categories
- User can search events (even basic keyword search)
- User can view events on interactive map
- Organizer can create and edit events
- Admin can review and moderate flagged events
- Application is deployed and accessible via URL
- Page load times under 5 seconds
- No critical bugs in production

#### **User Engagement Metrics:**

- At least 50 registered users within first month
- At least 100 events created within first month
- Average session duration > 3 minutes
- Return user rate > 20%
- Event save/interest actions > 100 per week