Umnini Digital Boundaries Software Development Plan

1. Project Overview

Umnini Digital Boundaries is a web application designed to digitize and manage home boundaries online.

The system will have a hierarchical land mapping structure, interactive maps, user profiles, land search,

update request features, and legal documentation upload.

2. Requirements

Functional Requirements

1. **User Authentication and Authorization**
   - Users can register and log in.
   - Different user roles: Inkosi (Chief), Induna (Headman), and Homeowner.
   - Role-based access control.

2. **Interactive Map**
   - Users can view and edit property boundaries.
   - Ability to toggle traffic layers.
   - Zoom functionality to navigate through Izizwe, Izigodi, and Imizi.

3. **User Profiles**
   - Profile management for different user roles.
   - Role-specific functionalities and access permissions.

4. **Land Search and Update Requests**
   - Search for land by name, ID, or coordinates.
   - Submit requests for boundary updates.

5. **Legal Documentation Upload**

- Upload legal documents to verify land ownership.
- Secure storage of uploaded documents.

6. **Drone & GIS Integration**
- Use drone imagery to map land plots.
- AI-assisted refinement of property boundaries.

Non-Functional Requirements
1. **Performance: Fast loading maps and data processing.**
2. **Security: Secure authentication, encryption, and audits.**
3. **Usability: Intuitive UI, mobile-friendly, and accessible.**
4. **Scalability: Handle large data and user base efficiently.**

3. System Architecture

High-Level Architecture
- **Frontend: React, Tailwind CSS**
- **Backend: Node.js, Express.js**
- **Database: MongoDB**
- **Authentication: JWT (JSON Web Tokens)**
- **Map Integration: Google Maps API**
- **Drone & GIS Data: AI-assisted land mapping**

4. Development Plan

Milestones & Timeline
1. **Project Setup & Basic Structure (2 weeks)**
2. **User Authentication & Authorization (3 weeks)**
3. **Interactive Map Integration (4 weeks)**
4. **User Profiles & Access Control (3 weeks)**
5. **Land Search & Update Requests (3 weeks)**
6. **Legal Documentation Upload (2 weeks)**
7. **Drone & GIS Integration (4 weeks)**
8. **Testing & Quality Assurance (4 weeks)**

9. **Deployment & Launch (2 weeks)**

Development Workflow
- **Version Control: Git**
- **Project Management: Jira**
- **CI/CD: GitHub Actions**
- **Testing Tools: Jest, Cypress, OWASP ZAP**

5. Deployment Plan

Infrastructure
- **Hosting: AWS (EC2, S3)**
- **Database: MongoDB Atlas**
- **CI/CD: GitHub Actions**

Deployment Steps
1. Set up AWS & MongoDB Atlas
2. Configure CI/CD pipeline
3. Deploy backend, frontend, and database
4. Monitor & maintain

6. Maintenance & Support

- **Monitoring: New Relic, Datadog**
- **Error Tracking: Sentry**
- **Security Updates: Regular patches and audits**
- **User Support: Help desk and documentation**

7. Conclusion
This development plan provides a roadmap for building Umnini Digital Boundaries, integrating traditional land governance with modern technology.