# **Walansi Kontonbile**

# **Software Requirements Specification**

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### **1.1 Executive Summary**

Walansi Kontonbile addresses the critical need for culturally relevant digital safety education for girls and young people in Ghana, particularly in underserved communities where technology-facilitated gender-based violence, misinformation, and cyber threats are prevalent.

### **1.2 Business Objectives**

* **Primary Goal**: Reduce digital exclusion of girls and young people from online spaces
* **Secondary Goals**:
  + Decrease incidents of TGBV through prevention education
  + Combat misinformation in local communities
  + Increase civic engagement among youth
  + Build digital literacy using culturally appropriate methods

### **1.3 Success Metrics**

* User engagement: 70% monthly active users within 6 months
* Safety impact: 40% reduction in reported harassment cases among users
* Fact-checking usage: 1000+ daily fact-check requests
* Language adoption: 60% of interactions in local languages
* Community reach: Deployment in 50+ schools/communities

### **1.4 Target Stakeholders**

* **Primary Users**: Girls and young people (13-25 years) in Ghana
* **Secondary Users**: Educators, community leaders, parents
* **Partners**: NGOs, schools, government agencies, fact-checking organizations

## **2. Functional Requirements**

### **2.1 User Management**

* **FR-001**: System shall support user registration via WhatsApp, SMS, and Telegram
* **FR-002**: System shall maintain anonymous user profiles (no personal data collection)
* **FR-003**: System shall allow users to select preferred language (Waali, Dagbani, Twi, Hausa, or English)
* **FR-004**: System shall remember user language preference across sessions

### **2.2 Multilingual & Multimodal Interface**

* **FR-010**: System shall process text messages in different languages (Waali, Dagbani, Twi, Hausa or English)
* **FR-011**: System shall accept and process voice messages
* **FR-012**: System shall generate audio responses in user's preferred language
* **FR-013**: System shall support SMS for low-connectivity environments
* **FR-014**: System shall integrate with WhatsApp Business API
* **FR-015**: System shall integrate with Telegram Bot API

### **2.3 AI Story-Teacher Module**

* **FR-020**: System shall embed cultural elements (proverbs, folktales, idioms) in responses
* **FR-021**: System shall maintain database of culturally appropriate teaching content
* **FR-022**: System shall adapt explanation complexity based on user literacy level
* **FR-023**: System shall provide contextual digital safety education

### **2.4 Fact-Checking Engine**

* **FR-030**: System shall accept text, links, and image inputs for verification
* **FR-031**: System shall integrate with fact-checking APIs (Dubawa, Africa Check)
* **FR-032**: System shall return verification status (True/False/Misleading)
* **FR-033**: System shall generate shareable fact cards
* **FR-034**: System shall provide explanations in user's preferred language
* **FR-035**: System shall maintain local misinformation database

### **2.5 SafeSpace SOS Module**

* **FR-040**: System shall recognize trigger words ("Help", "Harassment", "Walansi")
* **FR-041**: System shall provide immediate safety guidance
* **FR-042**: System shall offer escalation options to trusted partners
* **FR-043**: System shall maintain directory of support organizations
* **FR-044**: System shall ensure confidential handling of SOS requests

### **2.6 Campaign Generator**

* **FR-050**: System shall generate advocacy content templates
* **FR-051**: System shall create culturally relevant memes and graphics
* **FR-052**: System shall produce audio content with local language voiceovers
* **FR-053**: System shall provide TikTok-style script templates
* **FR-054**: System shall incorporate Ghanaian cultural elements in designs

### **2.7 Data Analytics & Reporting**

* **FR-060**: System shall log anonymous interaction data
* **FR-061**: System shall generate monthly community dashboards
* **FR-062**: System shall track misinformation trends
* **FR-063**: System shall provide usage analytics for stakeholders
* **FR-064**: System shall ensure full data anonymization

## **3. Non-Functional Requirements**

### **3.1 Performance Requirements**

* **NFR-001**: Response time ≤ 3 seconds for text messages
* **NFR-002**: Voice message processing ≤ 10 seconds
* **NFR-003**: System availability ≥ 99.5%
* **NFR-004**: Support for 10,000+ concurrent users
* **NFR-005**: Fact-checking response ≤ 15 seconds

### **3.2 Security Requirements**

* **NFR-010**: End-to-end encryption for all communications
* **NFR-011**: No storage of personal identifiable information
* **NFR-012**: Secure API integrations with third-party services
* **NFR-013**: Regular security audits and penetration testing
* **NFR-014**: Compliance with data protection laws

### **3.3 Scalability Requirements**

* **NFR-020**: Horizontal scaling capability
* **NFR-021**: Multi-region deployment support
* **NFR-022**: Database partitioning for performance
* **NFR-023**: CDN integration for media content

### **3.4 Usability Requirements**

* **NFR-030**: Interface accessible to users with basic literacy
* **NFR-031**: Support for low-bandwidth environments
* **NFR-032**: Intuitive command structure
* **NFR-033**: Cultural appropriateness validation by local experts

### **3.5 Reliability Requirements**

* **NFR-040**: Automated failover mechanisms
* **NFR-041**: Data backup and recovery procedures
* **NFR-042**: Error handling with user-friendly messages
* **NFR-043**: Monitoring and alerting systems

## **4. Technical Requirements**

### **4.1 Platform Requirements**

* **Cloud-based deployment** (AWS/Azure/GCP)
* **Microservices architecture**
* **API-first design approach**
* **Mobile-responsive web interface**

### **4.2 Integration Requirements**

* WhatsApp Business API
* Telegram Bot API
* SMS gateway providers (e.g., Twilio)
* Fact-checking APIs (Dubawa, Africa Check)
* Speech-to-text and text-to-speech services
* Local language processing tools

### **4.3 Data Storage Requirements**

* **NoSQL database** for conversation logs
* **Relational database** for structured data
* **File storage** for media content
* **Cache layer** for performance optimization

**4.4 Architecture Patterns**

**Microservices**: Enables independent scaling of AI-intensive services vs. simple messaging services

**Layered Architecture**: Provides clear separation of concerns and maintainability

**Event-Driven**: Essential for real-time messaging and analytics requirements

**API Gateway**: Necessary for managing multiple client types (WhatsApp, Telegram, SMS)

**CQRS**: Optimizes for both real-time interactions and analytical reporting

**Caching**: Critical for performance in low-bandwidth environments

## **5. Constraints and Assumptions**

### **5.1 Technical Constraints**

* Limited internet connectivity in rural areas
* Varying smartphone capabilities among users
* Local language processing limitations
* Third-party API dependencies

### **5.2 Budget Constraints**

* Development budget: To be determined based on funding
* Operational costs including API usage fees
* Content creation and localization costs

### **5.3 Timeline Constraints**

* MVP development: 6 months
* Beta testing: 2 months
* Full deployment: 3 months

### **5.4 Assumptions**

* Users have access to basic mobile phones
* Community partners will support user acquisition
* Fact-checking partners will provide API access
* Local language experts will be available for content validation

## **6. Risk Assessment**

### **6.1 Technical Risks**

* **API dependencies**: Mitigation through multiple provider contracts
* **Language processing accuracy**: Extensive testing with native speakers
* **Scalability challenges**: Phased rollout approach

### **6.2 User Adoption Risks**

* **Cultural resistance**: Community leader engagement strategy
* **Digital literacy barriers**: Simplified interface design
* **Trust building**: Transparency in AI decision-making

### **6.3 Operational Risks**

* **Content moderation**: Human oversight protocols
* **False information spread**: Robust fact-checking workflows
* **Privacy concerns**: Clear data handling policies