

AFROKEN LLM – FRONTEND EXPERIENCE DESIGN SYSTEM

Design Specification for Citizen Service Copilot UI

1. DESIGN BRIEF

1.1 Project Overview

AfroKen LLM is a multilingual, agentic AI copilot enabling citizens to access government services in Kiswahili, Sheng, and English across mobile and web interfaces.

The frontend must reflect:

- **Simplicity and clarity** for low-literacy users
- **Trust and authenticity** aligned with national-government branding
- **Accessibility-first design** (USSD, voice, screen-reader support)
- **Consistent, scalable UI for national-level adoption**
- **Multichannel continuity** (WhatsApp → Web → Dashboard)

Screens and components must be optimized for the citizen-facing copilot, government officer dashboards, and county analytics panels described in the attached proposal (e.g., citizen support analytics on page 7).

1.2 Design Principles

1. Citizen-Centred Simplicity

- Reduce cognitive load using progressive disclosure.
- Default responses in simple Swahili unless user chooses otherwise.
- Minimize form fields and steps.

2. Multilingual Inclusivity

- Instant switching between English ↔ Swahili ↔ Sheng.
- Code-switching detection from input text (from model capabilities in pages 3–4).

3. Accessibility for All

- USSD-first hierarchy for underserved communities.
- Voice support using Whisper as per proposal (page 4).
- High-contrast UI and screen-reader compliance.

4. Trust and Government Integrity

- Powered-by-Kenya insignia.
- Clear citations for official sources (via RAG pipeline).
- No ambiguity in service instructions.

5. Modular & Scalable

- Dashboard modules for ministries/counties (page 7–8).
 - Expandable to 22,000+ eCitizen services in future phases.
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2. DESIGN SYSTEM

2.1 Color Palette

A. Primary Colors (Government Identity)

Purpose	Color	HEX	Notes
Primary	Kenyan Green	#006B3F	Represents trust, service, stability
Secondary	Kenyan Red	#BF0A30	Highlights alerts, priority states
Neutral Base	Nairobi Gray	#F2F4F7	Clean backgrounds
Brand Accent	Swahili Blue	#0052CC	Used for conversational bubbles

B. Semantic Colors

State	Color	HEX	Usage
Success	#0F9D58	Completed steps, verified info	
Warning	#F4B400	Pending or ambiguous data	
Error	#DB4437	Invalid inputs, service failures	
Info	#4285F4	Neutral guidance	

These align with themes of government integrity and citizen service clarity from problem statements on pages 2–3.

2.2 Typography

Primary Font: *Inter*

Modern, legible, optimized for mobile and low-end Android devices.

Secondary Font: *Noto Sans* (for extended language support)

Handles diacritics for Kiswahili, Sheng, Kikuyu, Luo, Luhya.

Hierarchy

Usage	Size	Weight
H1 Page Title	28–32px	Bold
H2 Section Title	22–26px	Medium
H3 Card Title	18–20px	Medium
Body	14–16px	Regular
Captions	12px	Regular

2.3 Iconography

Style

- Simple, line-based, material-like icons.
- Rounded edges to reflect friendliness of the copilot.

Key Icons

- Services → 
 - Chat →
 - Voice → 
 - Government Verified → 
 - Dashboard → 
 - Location →
 - Language switch → 
-

2.4 Component Library

Buttons

- **Primary CTA:** Green (#006B3F)
 - "Ask AfroKen"
 - "Start Guidance"
- **Secondary CTA:** White with green outline
- **Destructive CTA:** Red background (#BF0A30) for errors, resets

Chat Bubbles

- User bubble: Swahili Blue background (#0052CC)
- AfroKen bubble: White background, green border

Cards

Used for:

- Service categories
- Ministry listings
- Recent queries
- Alerts (warning, info, success)

Forms

- Max 3 fields per screen.
- Helper text in Kiswahili first.
- Auto-fill suggestions from procedural agent.

3. FRONTEND TOPOLOGY (UI FLOW MAP)

3.1 Citizen-Facing System (Web/WhatsApp/USSD)

Directly aligned with the user architecture on page 5 of the attached PDF.

A. Entry Layer

- **Landing Page**
 - "Ask AfroKen" CTA
 - Language selector
 - Quick categories (NHIF, KRA, ID, Business, County Services)

B. Conversational Layer

- Chat Interface:
 - Messages → Intent → RAG → Response
 - Voice note → Whisper transcription → Response
 - Citations shown as expandable tags

C. Procedural Guidance Layer

- Step-by-step checklist pages
- Countdown timelines (e.g., "Process takes ~2 days")
- Required documents list

D. Transaction Layer

- Appointment booking
- Status checks
- Form generation (PDF)
- Saved queries

E. Offline / Low-bandwidth Layer

- SMS fallback pages
- USSD screens formatted as:
 - 1. NHIF Status
 - 2. KRA Pin
 - 3. Birth Certificate Steps
 - 4. Business Permit
 - 98. Language
 - 99. Exit

3.2 Government Officer & County Dashboard

Based on insights on pages 7–9 ("county-level insights, dashboards, and service bottlenecks").

Dashboard Modules

A. National Overview

- Daily query volume
- Service distribution (KRA, NHIF, Education)
- Most asked questions
- Sentiment analytics

B. County Dashboard

- County-specific query trends
- Local language usage
- Service bottlenecks
- Geo-mapped citizen concerns

C. Service Performance

- Average response time
- Accuracy scores from LLM audits
- Hallucination rate indicators

D. Administration

- Add/update service manuals
- Upload policy changes
- Manage integration tokens (NHIF, KRA APIs)

E. Audit & Governance

- Logs
 - Drift detection
 - Fairness evaluation panel
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4. PAGE-BY-PAGE UI DESIGN

4.1 Landing Page

Top Navigation:

- Home | Services | Languages | Support

Hero Section:

- Headline: "*Karibu AfroKen – Your Citizen Service Copilot.*"
 - CTA: "Start Chat"
 - Subtext in Kiswahili.
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4.2 Chat Interface

- WhatsApp-style layout
 - Rounded chat bubbles
 - Microphone button for voice
 - Floating QuickActions:
 - “Track Application”
 - “Get Service Steps”
 - “Talk in Swahili”
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4.3 Services Explorer

Grid Layout:

- NHIF
- KRA
- ID/Passport
- Birth/Death
- Lands
- County Services

Each card has:

- Icon
 - Short title
 - “Guide Me” button
-

4.4 Step-by-Step Guidance UI

- Numbered steps
 - Inline attachments
 - Estimated time
 - Document checklist
 - Button: “Send to My WhatsApp”
-

4.5 Status Tracking Page

- Application reference input
- Status timeline (Submitted → Processing → Ready)
- Government verification badge

4.6 Voice Experience Page

- Circular glowing microphone
 - “Speak in Kiswahili or Sheng”
 - Animated waveform
 - Real-time transcription
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4.7 USSD Screens

Plain text.

Max 6 menu items.

Number shortcuts.

5. FRONTEND TECHNOLOGY STACK

- **Web:** React + Tailwind + Next.js
 - **Mobile:** Flutter
 - **Chat:** Twilio WhatsApp API
 - **USSD:** Africa’s Talking
 - **Voice:** Whisper (client-side or server-assisted)
 - **Dashboards:**
 - React + Recharts/Plotly
 - Mapbox for geospatial citizen insights (aligned with authors’ GIS expertise)
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6. ACCESSIBILITY STANDARDS

- WCAG 2.2 AA
- Screen-reader support
- High contrast mode
- Keyboard-only navigation
- Simple language mode (Swahili)
- Low-bandwidth mode

✓ AFROKEN LLM – FRONTEND DESIGN SYSTEM & TOPOLOGY (FINAL MERGED VERSION)

Citizen Service Copilot for Inclusive Governance

Version 1.1 (Updated with Attached Additions)

Date: November 2025

1. DESIGN BRIEF

1.1 Project Overview

AfroKen LLM is a multilingual, multimodal, AI-powered government service copilot supporting **53 million Kenyans across 47 counties**. It operates across:

- WhatsApp
- SMS/USSD
- Web App
- Voice (Whisper ASR)
- Officer Dashboards
- County Analytics Panels

The frontend must enable seamless, culturally-aware, accessible government assistance — aligning with accessibility and inclusivity goals found in the design document (page 1).

1.2 Key Constraints

As identified in the uploaded brief (page 1–2):

- **Low literacy** and linguistic diversity
- **High feature-phone usage (80% rural)**
- **Unstable connectivity (2G/3G first)**
- **Accessibility requirements (WCAG 2.1 AA)**
- **User trust & data privacy**

1.3 Success Metrics (From PDF Brief)

- ❖ ≥90% user satisfaction across platforms
- ❖ <3 second load times on 3G
- ❖ ≥85% task completion rate on first attempt
- ❖ Zero language errors
- ❖ Full accessibility compliance (WCAG 2.1 AA)

(Ref: Metrics provided in page 1–2 of uploaded PDF)

2. DESIGN PRINCIPLES

(A merged version of the earlier design & PDF principles)

Principle 1: Inclusion-First

- Multilingual by default
- Accessible to low-literacy users
- Feature-phone optimized
- Cultural sensitivity in icons, examples, and tone

(PDF page 1–3)

Principle 2: Simplicity > Complexity

- Progressive disclosure
- Minimal text, maximum clarity
- Step-by-step guidance layouts

Principle 3: Trust & Transparency

- Verified government source citations
- Confidence scores
- Government branding, clear disclaimers

Principle 4: Conversational Flow

- Chat-first interface modeled on WhatsApp (PDF page 16)
- Human-friendly tone sensitized for Kenyan culture

Principle 5: Accessibility-First

- WCAG AA
- Screen-reader support
- High contrast mode
- Voice input and output

Principle 6: Resilient Performance

- 2G fallback
- Image compression, offline caching
- USSD-first hierarchy

Principle 7: Privacy & Sovereignty

- DP Act compliance
 - Local-first storage where possible
 - Clear consent for transactions
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3. DESIGN SYSTEM

This merges your original colors/system with new detailed tables from the PDF (pages 2–4).

3.1 Color Palette (Updated)

Primary Colors (Kenyan Government Identity)

Color	HEX	Usage
Kenyan Green	#1B5E20	Primary CTA, trust, verification
Kenyan Teal	#00897B	Secondary actions, highlights
Kenyan Gold	#FFB300	Warnings, important notices
Kenyan Red	#C41C3B	Errors, critical alerts

(From PDF page 3)

Semantic Colors

Role	HEX	Usage
Success	#2E7D32	Verified status, completion
Warning	#F57F17	Pending, attention
Error	#D32F2F	Failures, incorrect input
Info	#0288D1	Helpful tips, citations

Accessibility Grays

(From PDF page 3–4)

- Black: #121212
- Dark Gray: #424242
- Light Gray: #E0E0E0
- White: #FFFFFF

Contrast ratios meet WCAG AAA.

3.2 Typography System (Merged)

Typography (Updated from PDF page 4)

Usage	Font	Size	Weight	Notes
Headlines (H1)	Poppins	32px	700	Warm, modern
H2	Poppins	24px	600	Section titles
Body	Roboto	16px	400	Readable on low-end phones
Chat text	Roboto	16px	400	Core UI
Captions	Roboto	12px	400	Helper text
Buttons	Inter	16px	600	High readability

Multilingual notes:

- ✓ Swahili = +10–15% longer string length (PDF page 4)
 - ✓ Sheng = code-switched, avoid aggressive autocorrect
-

3.3 Spacing & Layout

(8px grid system from PDF page 5)

- XS: 4px
- SM: 8px
- MD: 16px
- LG: 24px
- XL: 32px
- 2XL: 48px
- 3XL: 64px

Breakpoints (PDF page 5):

- XS: 320px (Feature phone)
 - SM: 480px
 - MD: 768px (Tablet)
 - LG: 1024px
 - XL: 1280px
 - 2XL: 1536px
-

3.4 Component Library (Merged)

Buttons

(from PDF page 6–7)

Primary Button

- Background: #1B5E20
- Text: White
- Radius: 8px
- Touch Target: 48x48px

Secondary Button

- Border: Kenyan Teal
- Text: #00897B

Icon Button

- 44x44px circle
 - Used for voice, attachments, menu
-

Forms

(from PDF pages 7–9)

- Floating label inputs
 - Error states with red borders (#D32F2F)
 - WCAG-compliant labels
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Chat Components

(from PDF pages 9–10)

User Bubble

- Right aligned
- Background: Kenyan Green
- Text: White
- Max-width: 80%

AfroKen Bubble

- Left aligned
- Light gray background
- Shows **source citations** (blue info badge)

System Messages

- Center aligned
 - Light blue background
-

Cards

Service Card, Status Card, Citation Card
(From PDF page 10)

Navigation

(from PDF pages 10–11)

- Top navigation (web)
- Bottom nav bar (mobile)
- Side nav (desktop dashboards)

4. FRONTEND TOPOLOGY (FULL FLOW)

Integrates earlier topology + PDF sections (pages 14–20).

4.1 Citizen Web App Flow

Home Page

- Hero message: “Karibu AfroKen – Your Citizen Service Copilot”
- Shortcuts:
 - NHIF
 - KRA
 - National ID
 - Business Services
 - County Services

Chat Interface

- Real-time assistant
- Voice note support
- Citation tags
- Quick Actions:
 - Track Status
 - Get Requirements
 - Download Forms

Service Explorer

Grid of categories → Select service → Step-by-step guide.

Guided Workflows

Clear numbered steps, time estimates, documents required.

Status Check

Ref No → AI-assisted status breakdown.

4.2 Mobile Topology (WhatsApp + App)

- Full-screen chat (from PDF page 16–17)
 - Voice input
 - Contextual buttons
 - Auto-suggestions (chips)
-

4.3 USSD/SMS Flow (Feature Phone)

PDF pages 16–18 contain detailed mapping.

Main Menu
1. National ID
2. NHIF
3. KRA
4. Business Permit
5. Application Status
98. Change Language
99. Exit

All menus max 6 items for clarity.

4.4 Voice Interface Flow

(PDF page 18–19)

- System slows down speech automatically
 - Confirmation after each step
 - Optional SMS follow-up
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4.5 Officer Dashboard Topology

(Combined with your proposal pages 7–9)

Modules:

- National Analytics
- County Dashboard
- Service Performance
- Policy Updates Manager

- AI Audit Tools (LLM accuracy, hallucination detection)

Graphs powered by:

- Recharts or Plotly
 - Mapbox for geospatial insights
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5. RESPONSIVE DESIGN PATTERNS

(from PDF pages 19–20)

Mobile

- Single-column
- Bottom navigation
- Prioritize chat

Tablet

- Sidebar visible
- Two-column

Desktop

- Wide chat + service panel
 - Multi-panel officer dashboards
-

6. ACCESSIBILITY SYSTEM

All WCAG 2.1 AA requirements included (pages 20–22).

7. INTERACTION PATTERNS

- Inline validation (page 21)
- Skeleton loaders (page 22)
- Friendly empty states (page 22–23)
- Confirmations (page 23)

8. DARK MODE

Full dark-mode palette from PDF page 23–24.

9. INTERNATIONALIZATION (i18n)

Languages roadmap (PDF page 24–25):

- English (Live)
 - Swahili (Live)
 - Sheng (Live)
 - Kikuyu (Q1 2026)
 - Luo (Q1 2026)
 - Kamba, Samburu, Maasai
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10. PERFORMANCE TARGETS

Core Web Vitals (PDF page 25–26):

- LCP <2.5s
 - FID <100ms
 - CLS <0.1
-

11. DESIGN TOKENS & CODE

CSS Variables (from PDF page 26–27) ready for Tailwind/SCSS.

12. DEV HANDOFF PACKAGE

Included in PDF (page 28–30):

- Figma Kit
 - Storybook components
 - Icons & assets
 - Accessibility checklist
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13. FUTURE ENHANCEMENTS

From PDF pages 30–31:

- AR-based ID photo capture
- Progressive Web App
- Biometric integration
- Regional language expansion