IYA BOLA ASSISTANT

Bridging the Digital Divide

An AI-Powered Conversational Tool for Small Business Management

😊 **Iya Bola Assistant** 🔗

Empowering Africa through Data-Driven Inclusion 🌍

Where Language Meets Financial Access

Dataverse Datathon 2025 Submission

2. Problem Understanding: The Challenge of Digital Access & Financial Literacy
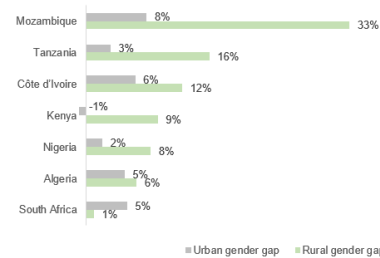
Key Pain Points in Sub-Saharan Africa

The Gap: In Sub-Saharan Africa, **only 49% of adults** have a bank account. Millions remain excluded due to **language barriers, digital illiteracy, and infrastructure gaps**. Significant disparities exist (**6% in South Sudan to 91% in Mauritius)**.

Language Barrier: Traditional digital tools are predominantly English-only, excluding millions of local-language speakers and low-literacy users.

The Burden (Time/Effort): Banks could be many kilometers away **taking hours of travel** for a small market vendor to reach, time that could be spent on sales.

Financial Exclusion: Many communities are still rural and remote therefore lacking access to banks and other financial institutionsand hence access to essential loans and credit facilities to SMEs.

Market Opportunity Visualization

	Urban gender gap	Rural gender gap
Mozambique	8%	33%
Tanzania	3%	16%
Côte d'Ivoire	6%	12%
Kenya	-1%	9%
Nigeria	2%	8%
Algeria	5%	6%
South Africa	1%	5%

Key Statistics (2024–2025)

Africa: Ghana's mobile money transactions hit **GH¢1.9 trillion (↑78.7%)** in 2023.

National: ~38 million adults remain financially excluded (CBN 2023) in Nigeria.

Gender Inequality:Women and rural dwellers form **>60%** of the unbanked population.

3. Data Pipeline Flow Diagram: From Conversation to Insight

1

Input: User Voice/Text (Local Language)
User speaks or texts their transaction in Yoruba, Pidgin, or English.

⬇️ **Data Ingestion**

2

Processing: Language Model & Translator (Gemini API)
Intent and entity recognition for classification (Account Balance, Transfer, Airtime/Data, etc.).

⬇️ **Entity Extraction**

3

Core Logic: Business Transaction Parser (Categorization/ Calculations)
Discerns intent, language and performing appropriate internal logic.

⬇️ **Record Keeping**

4

Logging: CSV downloadable file
Real-time loggingg of the last ten transactions record for storage and further analysis.

5

Output: App Response / Dashboard Update
Responds appropriately via text and audio and refresh analytics instantly.

4. User Personas: Who is Iya Bola? Meeting Our Users.

Iya Bola (Market Trader)

"E lo ni mo ti pa loni."

- **Goal:** Track daily sales and remaining stock accurately in her local dialect (Yoruba).
- **Pain Point:** No time to visit the bank; Poor or no English literacy.
- **Need:** Voice-first input and simple, visual reports.

Amina (Pidgin-speaking farmer, semi-literate)

"Make i quickly send my customer my aza make in pay me for yesterday."

- **Goal:** Tracks sales and savings from farm operations.
- **Pain Point:** Lives in a remote village with limited network coverage and bank is far away.
- **Need:** Fast, mobile access to financial services.

Chinedu (Young Entrepreneur & Service Provider)

"I need to quickly send my client a professional payment request."

- **Goal:** Generate quick invoices and summary reports for clients and investors.
- **Pain Point:** Traditional invoicing software is too cumbersome for mobile use.
- **Need:** Fast, mobile access to client data and PDF export capabilities.

5. App Blueprint: Conversational Transaction Flow

Example Transaction: Transfer

User: "Elo lo ku ni account mi?"

⬇️

Assistant Logic (Parsing & Categorization)

```
Action: Account Balance (Identified via "Elo ni mo ni account"); Language: Yoruba (`Elo ni mo
ni`); Intent: Account Balance (`account`).
```

⬇️

Database: Log entry.
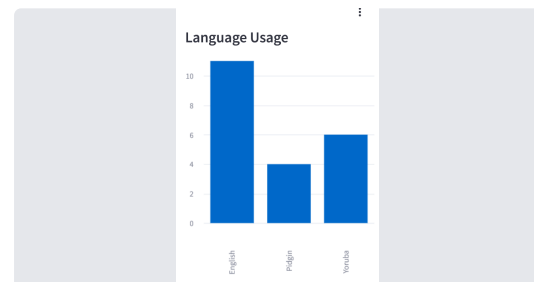
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Response: "Iwon re account balance: $xxx,yyy.zz"

6. Dashboard Insights: Transforming Data into Actionable Insight

The real-time dashboard gives users and partners immediate, visual understanding of what drives financial inclusion, derived from conversational data.

Chart 1: User Intent Distribution

Chart 2: Conversational Language Breakdown

Chart 3: Last ten Transactions Log

Last 10 Interactions

	timestamp	user_input
0	2025-10-11 19:23:54	weytin i get for accoun
1	2025-10-11 19:24:38	weytin dey my accoun
2	2025-10-11 19:24:59	I wan buy data
3	2025-10-11 19:25:13	elo ni mo ni account

⬇ Download Log (CSV)

Chart 4: Personal Segmentation

[Placeholder: Bar Chart: Farmers (60%), Traders (20%), Service Providers (10%), Other (10%)]

7. Scalability & Impact: The Road Ahead

Scalability & Technical Roadmap

Modular Language Pack: Easy integration of new languages (Hausa, Swahili, French) using dedicated fastText models.

API Integration: Seamless integration with third-party payment gateways and mobile money providers.

Advanced LLM Functions: Utilizing Gemini for predictive inventory based on historical sales and seasonal trends.

Firestore Architecture: Built on a secure, auto-scaling NoSQL database ready for millions of users.

Socio-Economic Impact

Financial Inclusion: Provides the foundation for credit scoring and formal banking access for the unbanked.

Economic Growth: Formalized records enable smarter business decisions, leading to higher profit margins for SMEs.

Literacy Bridging: Eliminates the language and digital literacy barrier, making technology accessible to all.

Gender Empowerment: Directly addresses the exclusion faced by female market vendors.

8. Learnings & Future Roadmap

Key Learnings (The Process)

Technical Challenge: Fine-tuning `fastText` for high accuracy in code-switching (mixing English/Pidgin/Yoruba) required extensive, targeted training data generation.

Design Lesson: The importance of simplicity. Complex features were deferred in favor of a flawlessly working, voice-first core transaction loop.

Data Management: Realizing that real-time Firestore logging, rather than batch processing, was critical for immediate user feedback and dashboard updates.

Next Steps (3/6/12 Month Plan)

Short-Term: Deploy user beta test with 50 market vendors to gather qualitative feedback and validate language models in a live environment.

Mid-Term: Integrate dedicated payment APIs (e.g., Flutterwave) to allow direct assistant-initiated transfers and bill payments.

Long-Term: Develop a robust, automated *Credit Scoring* feature based on 12 months of consistent transaction history.
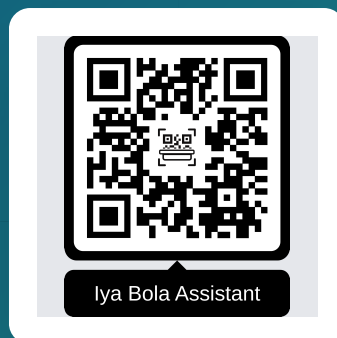
"The future belongs to those who learn new skills and combine them in creative ways."

Together, let's make financial inclusion not just a goal, but a lived reality for every African.

Experience Iya Bola Live!

Iya Bola Assistant

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