

Technical Specification Document (TSD) — Financing Readiness Assessment and Investor Matching System

1. System Overview

1.1 Objective

This system aims to streamline the process by which Rwandan SMEs assess their financing readiness and connect with investors or lenders. It combines a sector-specific assessment engine, a post-assessment document vetting system, and investor matching algorithms into a cloud-native, multilingual Progressive Web App (PWA).

1.2 Deployment

- **Cloud Host:** Hostinger Cloud
- **Architecture:** Microservices
- **Device Access:** Mobile-first (low-end Android compatibility)
- **Offline Support:** Yes (Workbox caching)
- **Languages:** Kinyarwanda, English, French

2. System Modules & Workflow

2.1 Signup & Login (SMEs Only)

- **Signup Options:** Only SMEs can register; Investors are created by Admins
- **Email/Phone Verification:** Firebase Authentication with OTP/email confirmation
- **Login:** Secure JWT-based session for all users
- **Role-Based Routing:** Redirect based on role to SME Dashboard, Investor Portal, or Admin Panel
- **Password Recovery:** Email/OTP-based reset

2.2 SME Assessment Flow (Step 1)

- **Tailored Questionnaire:** Sector-specific questions rendered dynamically and can be edited by Admins via the Admin Portal
- **Validation & Scoring:** Scores computed for Business Model, Financial Health, Governance, Market Potential
- **PDF Generation:** Auto-generated summary with scores, gaps, and recommendations
- **Opt-in & Payment:** SMEs pay via Mobile Money (MTN/Airtel) to unlock the dashboard

2.3 SME Dashboard (Step 2)

- **Profile & Details:** Editable sections for governance, operations, and business plans
- **Document Upload:** Financial documents uploaded to Data Room; auto-data extraction via Google Document AI
- **Investor Requests:** SMEs respond to document or detail requests from investors
- **Profile Deletion:** SMEs can initiate deletions; Admins approve and log action

2.4 Investor Portal

- **Browse & Filter:** Vetted SMEs filtered by sector, score, funding size
- **Criteria Setup:** Investors define sector, funding range, score thresholds, required documents
- **Actions:** Approve SMEs, request documents, trigger notifications

2.5 Admin Portal

- **Questionnaire Management:** Create, edit, and assign sector-specific assessment questions to ensure alignment with sector best practices
- **Analytics:** Track SME engagement, submissions, payments, matches
- **Investor Onboarding:** Setup new investors and configure matching profiles

3. Technology Stack

Layer	Technology
Frontend	React.js, Material-UI, Chart.js, PDF.js
Backend	Node.js, FastAPI (Python), Redis, RabbitMQ
APIs	Firebase Auth, SendGrid, WhatsApp API, MTN/Airtel APIs, Google Cloud Document AI
Storage	PostgreSQL (Hostinger), Firebase Storage
Dev Tools	Workbox, Axios, Redux Toolkit

4. Database Design

- **Users:** Stores login, role, language preferences
- **SMEs:** Stores business profile, contact info, sector
- **Assessments:** Scores, gaps, sector-specific data
- **Documents (Data Room):** File path, vetting status, extracted financial data
- **Investors:** Preferences and criteria for matching
- **Matches:** Stores investor-SME matches with match score
- **Billing:** Payment status, transaction tracking
- **Notifications:** WhatsApp/Email alerts
- **Audit Logs:** All create/edit/delete actions

5. Security & Compliance

- **Authentication:** Firebase Auth with JWTs
- **Data at Rest:** AES-256 encryption (including Firebase Storage)
- **Access Control:** Role-based access enforced in frontend/backend
- **Audit Trail:** All actions logged with user_id, timestamp, and action type
- **Privacy:** Compliant with Rwanda's Data Protection Law No. 058/2021
- **Breach Protocol:** Notify users within 72 hours via WhatsApp/email

6. Non-Functional Requirements

Requirement	Specification
Performance	<3s load on low-end Android, <1s API response
Availability	99.9% uptime
Scalability	5,000 SMEs, 10,000 documents (year 1)
Backup	Daily cloud backups with 7-day retention
Multilingual	Full support (Kinyarwanda, English, French)
Accessibility	WCAG 2.1 AA (keyboard navigation, contrast, ARIA)
Offline Support	PWA caching for inputs, document queueing

7. SME Journey Summary

- 1. Signup and Login**
- 2. Create Profile**
- 3. Complete Assessment**
- 4. Download Readiness PDF**
- 5. Opt-in and Pay**
- 6. Access Dashboard**
- 7. Upload Financials**
- 8. Get Vetted**
- 9. Matched with Investors**
- 10. Engage or Request Deletion**

8. Investor Journey Summary

- 1. Investor Account Created by Admin**
- 2. Create Investor Profile**
- 3. Set Matching Criteria** (sector focus, funding range, minimum readiness score, required documents)
- 4. Browse Matched SMEs** through dashboard with filters (sector, financing amount, score)
- 5. View SME Profiles and Documents** (including assessment and vetting PDFs)
- 6. Approve SMEs or Request Additional Documents/Details** (e.g., tax returns)

7. **Trigger Notifications** to SMEs via WhatsApp/email
8. **Track Match Engagement Analytics** (number of matched SMEs, response rate, document completeness)
9. **Download Reports** or export matched SME lists for further engagement