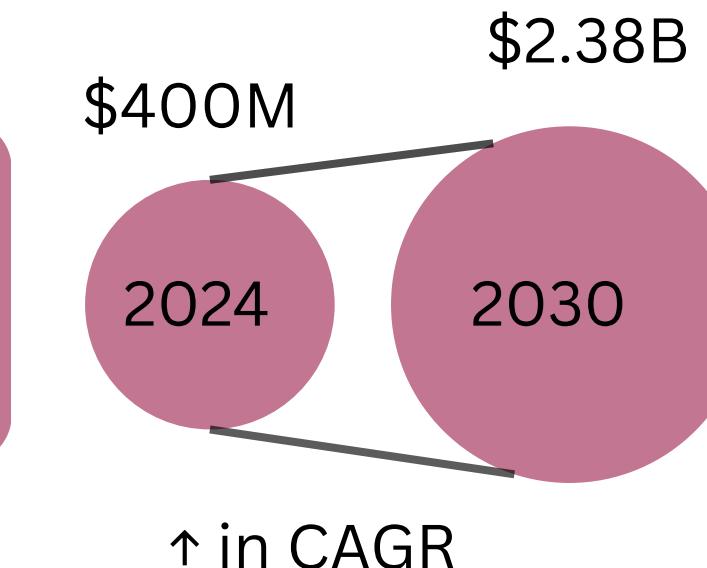


*AI-Enabled Loan Underwriting
Agent for Rural and Semi-Urban
India*

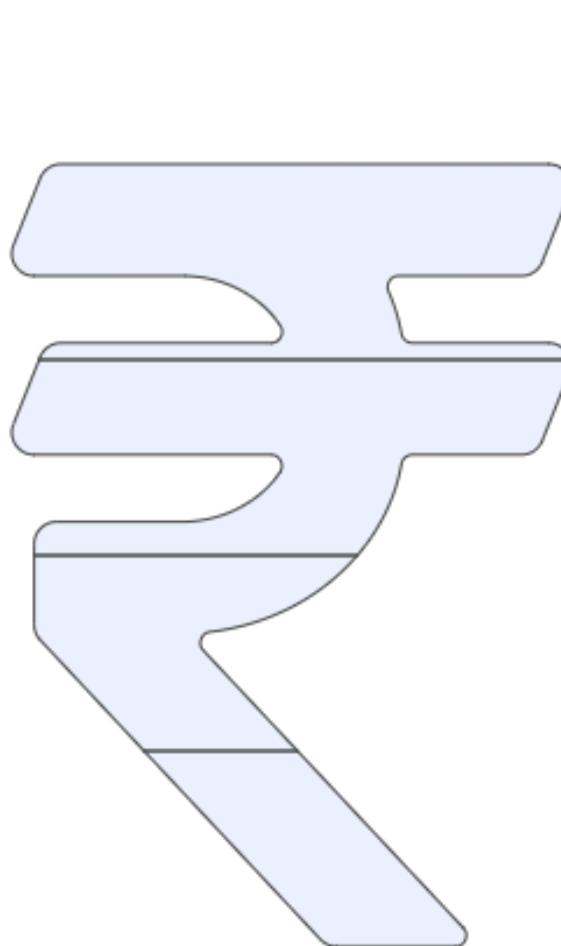
Prasannajeet Ojha

INTRODUCTION AND MARKET RESEARCH

Loan underwriting is the process lenders use to assess a borrower's financial risk and determine whether to approve their loan application.



Enhancing Loan Underwriting with AI



Creditworthiness Assessment

Evaluates credit risk using diverse data sources



Instant Decision-Making

Provides quick loan decisions through algorithms



Bridging the Gap

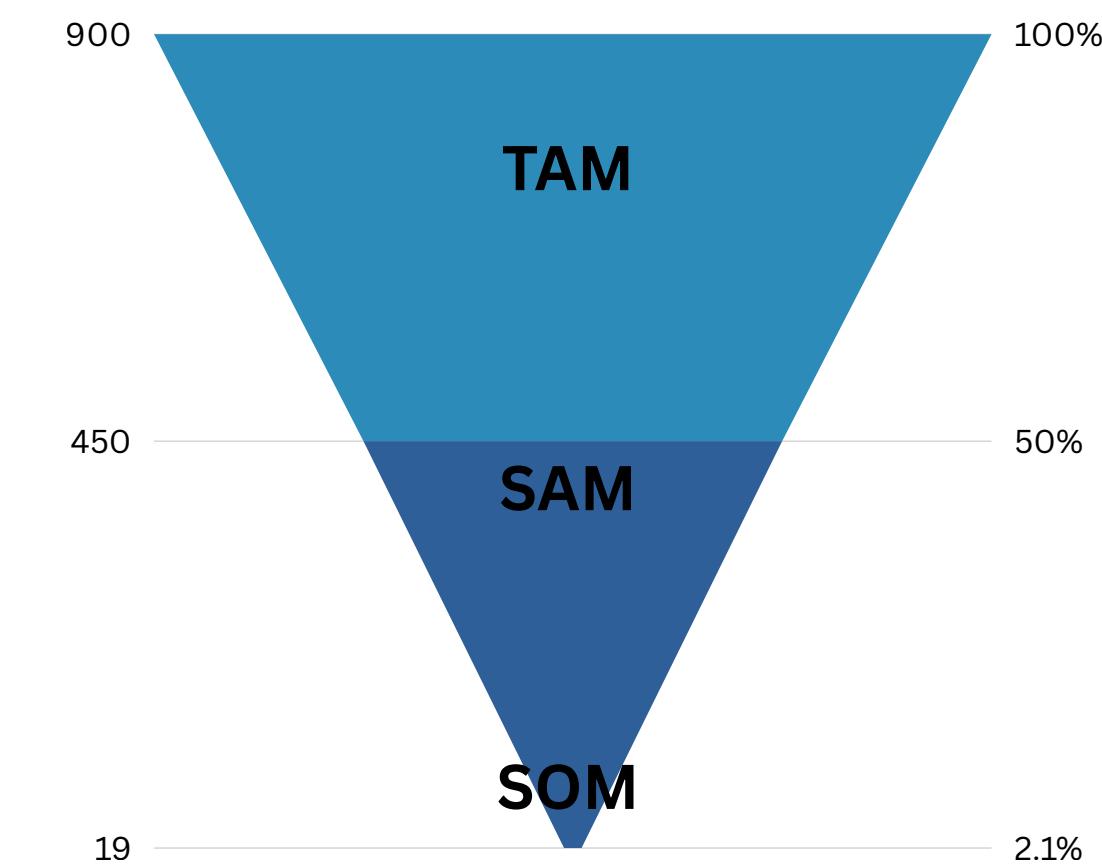
Connects underserved borrowers with credit systems



Financial Inclusion

Extends credit access to credit-invisible populations

"Traditional banks serve only 14% of India's credit needs, while 65% of the population in rural areas remains underserved"



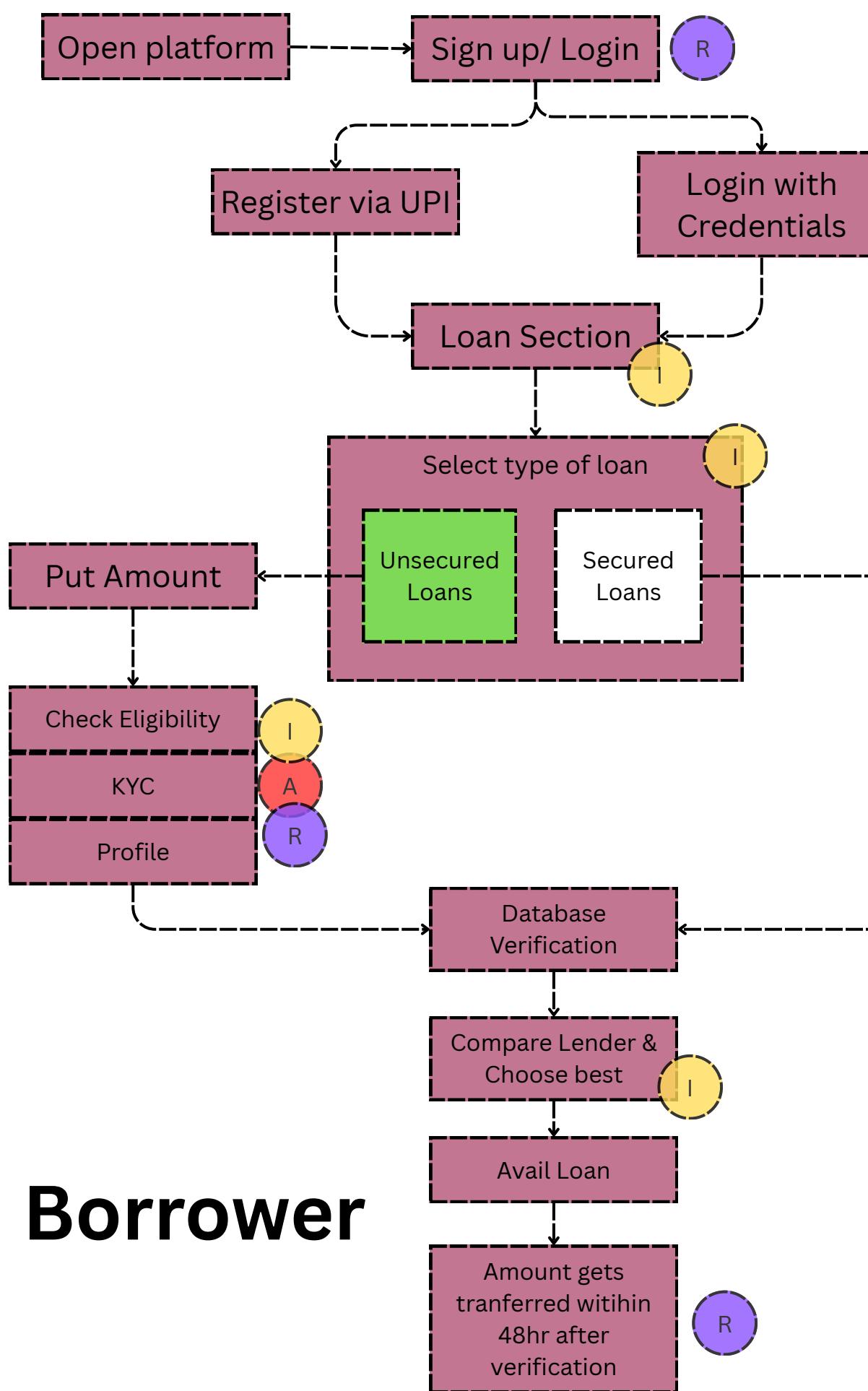
The Credit Crisis Statistics:

₹25 Trillion MSME credit gap in India

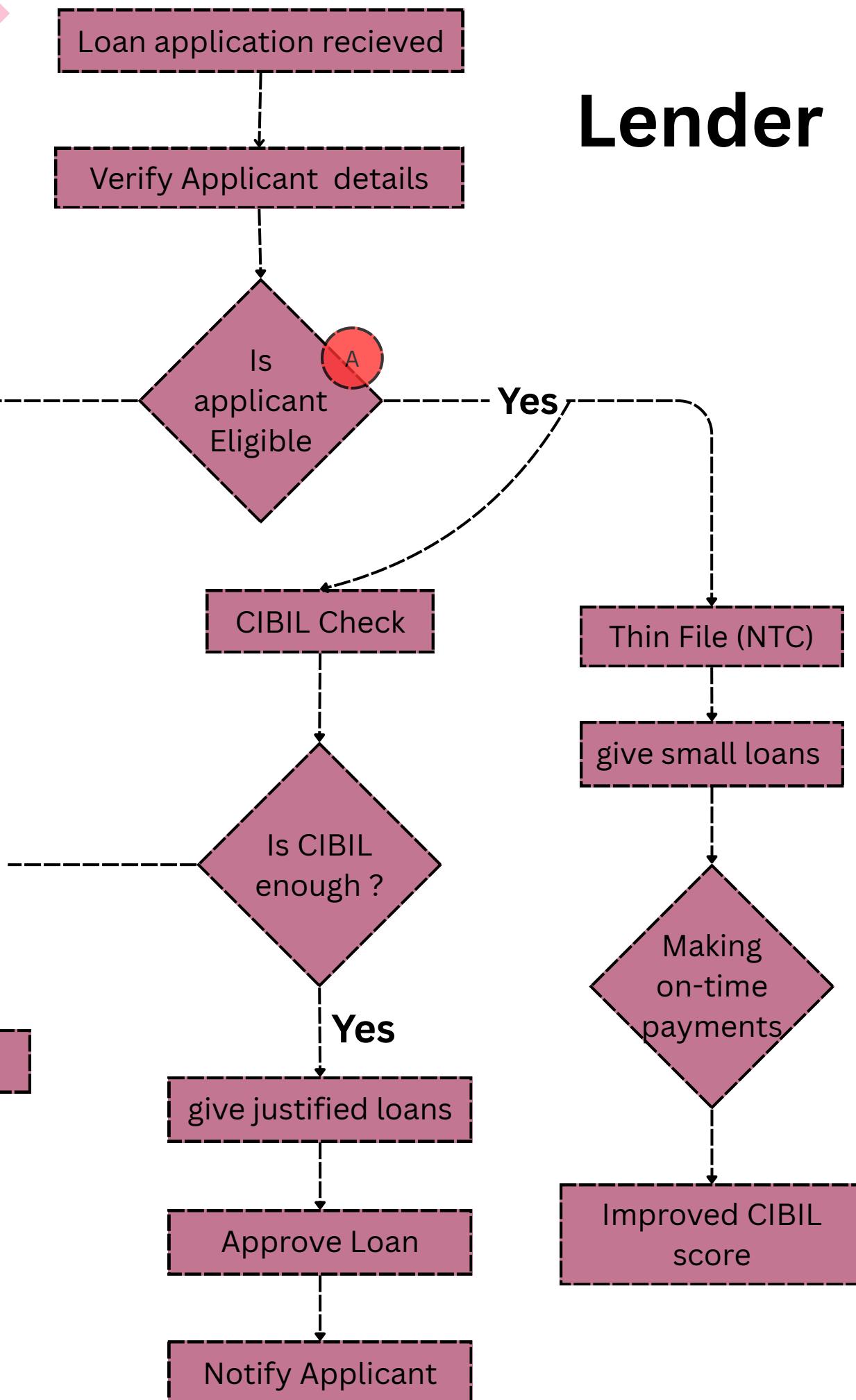
22% Adults still remain unbanked

46% Overall rural credit linkage gap

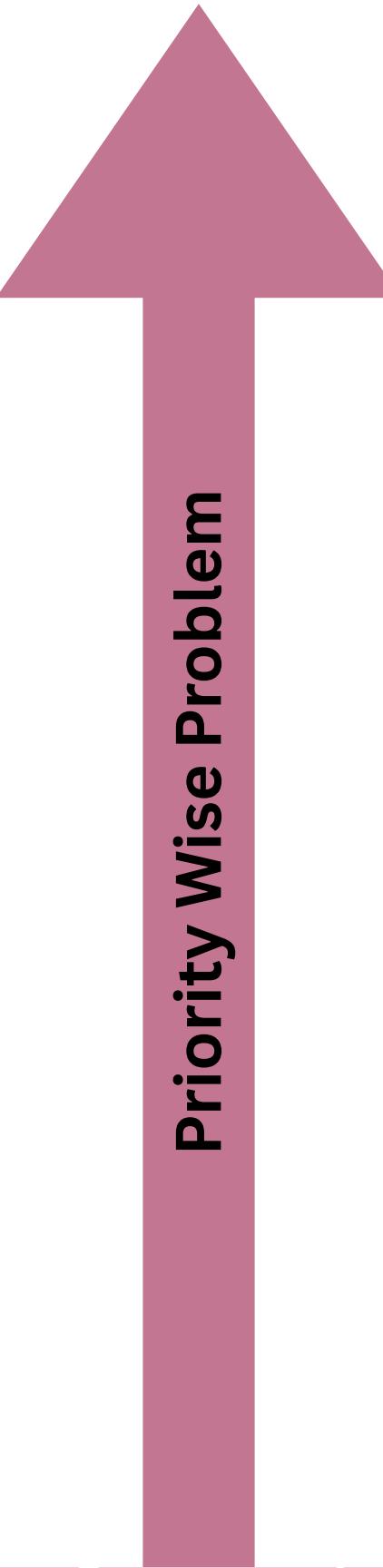
65% Rural population underserved by traditional banks



Problem Identification

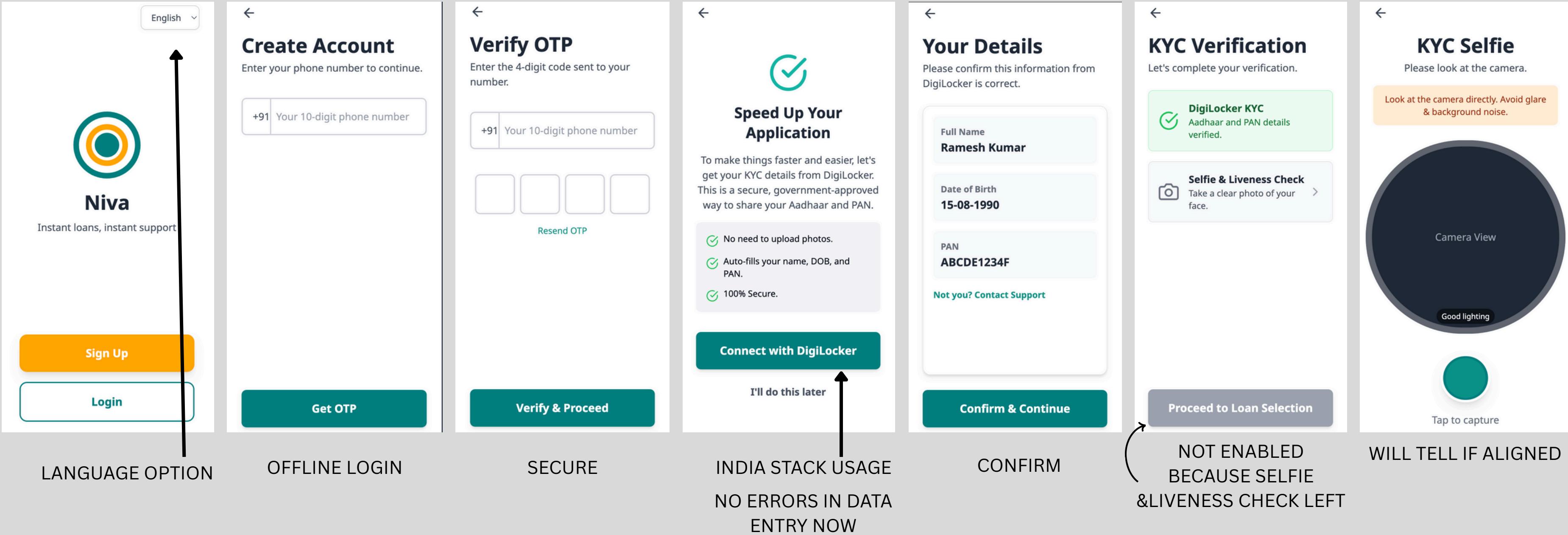


Rice Prioritization of problem



#	Problem Description	Pain Type	Reach (R)	Impact (I)	Confidence (C)	Effort (E)	RICE = (R×I×C)/E
1	No alternative scoring for credit-invisible users (flat rejection on no CIBIL)	I	10	10	8	5	160
3	Confusing loan-type selection screen (many options, low literacy)	I	8	8	9	4	144
4	Complex legal agreement text (no localized guidance)	I	7	7	8	3	130.7
8	Language barriers (English-only UI)	I	5	6	7	2	105
2	KYC failures on 2G/3G networks (OCR/liveness errors)	A	9	9	7	6	94.5
6	Manual entry of PAN/DOB/Pincode (error-prone, slows flow)	A	7	6	8	4	84
7	Hidden fees & unclear EMI breakdown	I	6	7	6	3	84
5	Bank mandate (e-NACH) setup failures on poor connectivity	A,R	8	6	7	5	67.2
9	No feedback on rejection (opaque decision process)	I	6	8	7	6	56
10	App crashes or stalls on low-end devices	A	7	5	6	7	30

Rural Shopkeeper (B2C)	Gig Worker (B2C)	Fresh Graduate (B2C)				
Market Research	Problem Identification	Prioritization	User Persona	Solution	Technical Arch	KPIs and Challenges
 <p>Navanil Das, 38</p> <ul style="list-style-type: none"> - Runs a small kirana store in Bihar village - Primary school education, Hindi speaker - Uses a basic 3G smartphone for UPI payments <p>Goals</p> <ul style="list-style-type: none"> - Access a small working-capital loan (₹20 K-50 K) to purchase stock before harvest - Repay in daily micro-installments from daily UPI receipts - Build credit history for future expansion <p>Pain Points</p> <ol style="list-style-type: none"> 1. Credit Invisibility: No CIBIL score despite steady UPI sales 2. Network Failures: KYC/OCR often times out on 3G/4G 3. Complex UI: Loan-type options confusing in Hindi interface 4. Documentation Gap: Lacks PAN/passport for formal KYC <p>Ideal Solution Features</p> <ul style="list-style-type: none"> - LLM-based alternative-data scoring using UPI & phone metadata - Offline-first KYC with progressive image compression & resume support - Hindi voice-guided form assistance - Simplified “micro-loan” conceptual UI <p>Key Metrics</p> <ul style="list-style-type: none"> - Onboarding completion rate (> 85%) - Approval rate among thin-file users (> 60%) - Drop-off rate during KYC (< 15%) - Daily repayment compliance (> 95%) 	 <p>Ashwin Mambster, 27</p> <ul style="list-style-type: none"> - Works as a delivery rider in semi-urban Pune - Secondary education, Marathi & English - Owns an entry-level Android phone, heavy data user <p>Goals</p> <ul style="list-style-type: none"> - Secure a ₹30 K top up loan within minutes for bike repairs - Ensure flexible repayment aligned with irregular earnings - Avoid high-interest informal lenders <p>Pain Points</p> <ol style="list-style-type: none"> 1. Eligibility Surprises: Flat rejection due to zero formal income proof 2. Equipment Downtime: Cannot afford repeated app crashes during form-fill 3. Hidden Fees: Unclear EMI breakdown hurts tight margins 4. Mandate Setup: e-NACH OTP fails on poor mobile network <p>Ideal Solution Features</p> <ul style="list-style-type: none"> - Real-time chat-bot guidance in Marathi for eligibility steps - Edge-AI liveness & OCR checks that retry automatically on poor networks - Instant cost-calculator with EMI preview - One-tap mandate via aggregated payment SDK <p>Key Metrics</p> <ul style="list-style-type: none"> - Time-to-approval (< 30 s) - Error-rate in OCR & liveness checks (< 2%) - Chat-bot resolution rate (> 80%) - Repeat-loan uptake (> 40%) 	 <p>Kartikey Vishi, 21</p> <ul style="list-style-type: none"> - First-generation graduate from Gorakhpur - Employed at an IT services company, ₹14 LPA - No prior credit history, smartphone savvy <p>Goals</p> <ul style="list-style-type: none"> - Obtain a ₹100 K personal loan instantly to buy a laptop - No collateral or CIBIL required - Transparent repayment schedule to manage first salaried income <p>Pain Points</p> <ol style="list-style-type: none"> 1. CIBIL Barrier: PhonePe and banks reject without score 2. Opaque Underwriting: No explanation for eligibility failure 3. Legal Jargon: Loan agreement text too complex 4. Setup Delay: e-NACH and mandate linking requires bank visit <p>Ideal Solution Features</p> <ul style="list-style-type: none"> - “No-CIBIL” instant-loan product powered by alternative-data risk model - Natural-language explanation of approval decision - English/Hindi toggle with glossary tooltips - In-app mandate via net-banking deep-link (no OTP) <p>Key Metrics</p> <ul style="list-style-type: none"> - Instant disbursal rate (> 90%) - User satisfaction score for decision explanation (> 4.5/5) - Net Promoter Score (> 60) - e-NACH success rate (> 90%) 				



KYC Verification

Let's complete your verification.

DigiLocker KYC
Aadhaar and PAN details verified.

Selfie & Liveness Check
Verified

Proceed to Loan Selection

VERIFIED

Get Your Loan

Choose your amount and how you'd like to repay.

Loan Amount: ₹25,000

Tenure: 12 Months

FlexiRepay

Daily **Weekly** **Monthly**

Monthly Payment (Kist)
₹2,292

Check Eligibility

NO INTEREST PERCENT
DIRECTLY SEE HOW MUCH
YOU HAVE TO PAY?

Boost Eligibility

Securely link your UPI app to improve your chances of approval.

UPI Transaction History

PhonePe **Link Account**

G Pay **Link Account**

Or enter other UPI ID

Verify UPI ID

Community Trust Score

We only use the number of contacts on your phone. We never see or store your contacts' details.

Check My Loan Offer

LINK EVERYTHING IF YOU
DO NOT HAVE CIBIL SCORE
MORE CONTACTS MEANS
LESS LIKELY FRAUD
CUSTOM UPI SUPPORT

Boost Eligibility

Securely link your UPI app to improve your chances of approval.

UPI Transaction History

Redirecting...
You will be securely redirected to PhonePe to authorize this action.

Continue

Community Trust Score

We only use the number of contacts on your phone. We never see or store your contacts' details.

Check My Loan Offer

REDIRECTED TO APP

Not Approved Yet

Here's why & what you can do:
Your recent UPI transaction history is low.

Link another Bank Account

See Tips to Improve

OOPS NOT ELIGIBLE!
SEE WHY OUR LLM GIVE
TAILORED MADE
FEEDBACK

Not Approved Yet

Tips to Improve Your Score

- Pay your bills (electricity, phone) on time using UPI.
- Increase your regular UPI transactions for daily needs.
- Maintain a healthy bank account balance.

Got it

LLM ON WORK!

Wireframe #2

[LINK of DEMO \(CLICK\)](#)

The wireframe illustrates the user journey through several application screens:

- Loan Approval Screen:** Shows a green checkmark icon and the message "You're Approved!". It displays the "Your Loan Offer" with a loan amount of ₹35,000, an interest rate of 1.5% per month, and a monthly kist of ₹3,205.
- Loan Agreement Screen:** The final step of agreement and e-sign. It includes sections for "Loan Details" (loan of ₹35,000 over 12 months), "Repayment" (12 monthly payments of ₹3,205 starting Oct 5, 2025), and "Late Fees" (late fee of ₹250). It features a "Sign with Aadhaar eSign" button and a "Listen to the agreement" audio icon. A checkbox for terms and conditions is present.
- Setup UPI AutoPay Screen:** Allows users to authorize automatic payments via UPI. It shows "Your Mandate Details" (amount up to ₹3,205 per month, monthly frequency, valid for 12 months) and "Authorize using" options for PhonePe, G Pay, or entering a UPI ID. A large "Authorize via UPI" button is at the bottom.
- Welcome, Ramesh! Screen:** The user's loan summary. It shows an outstanding balance of ₹35,000, 0 of 12 payments made, and a "Make Payment" button. Below it is a "Apply for a New Loan" button, noting availability after 50% repayment. Navigation icons for Home, Loans, Profile, and Support are at the bottom.
- My Loans Screen:** Lists active and closed loans. Microloan #12345 is active with an amount of ₹35,000 and next payment on 5 Oct 2025. Personal Loan #98765 is closed with an amount of ₹20,000 and closed on 12 Aug 2024. Buttons for "View Details" and "View Statement" are shown.
- Profile & Settings Screen:** User profile information (Full Name: Ramesh Kumar, Phone Number: +91 *****123, Language: English) and settings (Notifications, Privacy Policy, Logout).
- Help & Support Screen:** Frequently Asked Questions (How do I repay my loan?, Can I change my payment date?, What happens if I miss a payment?), Contact Us (chat with support bot), and a "Start Chat" button.

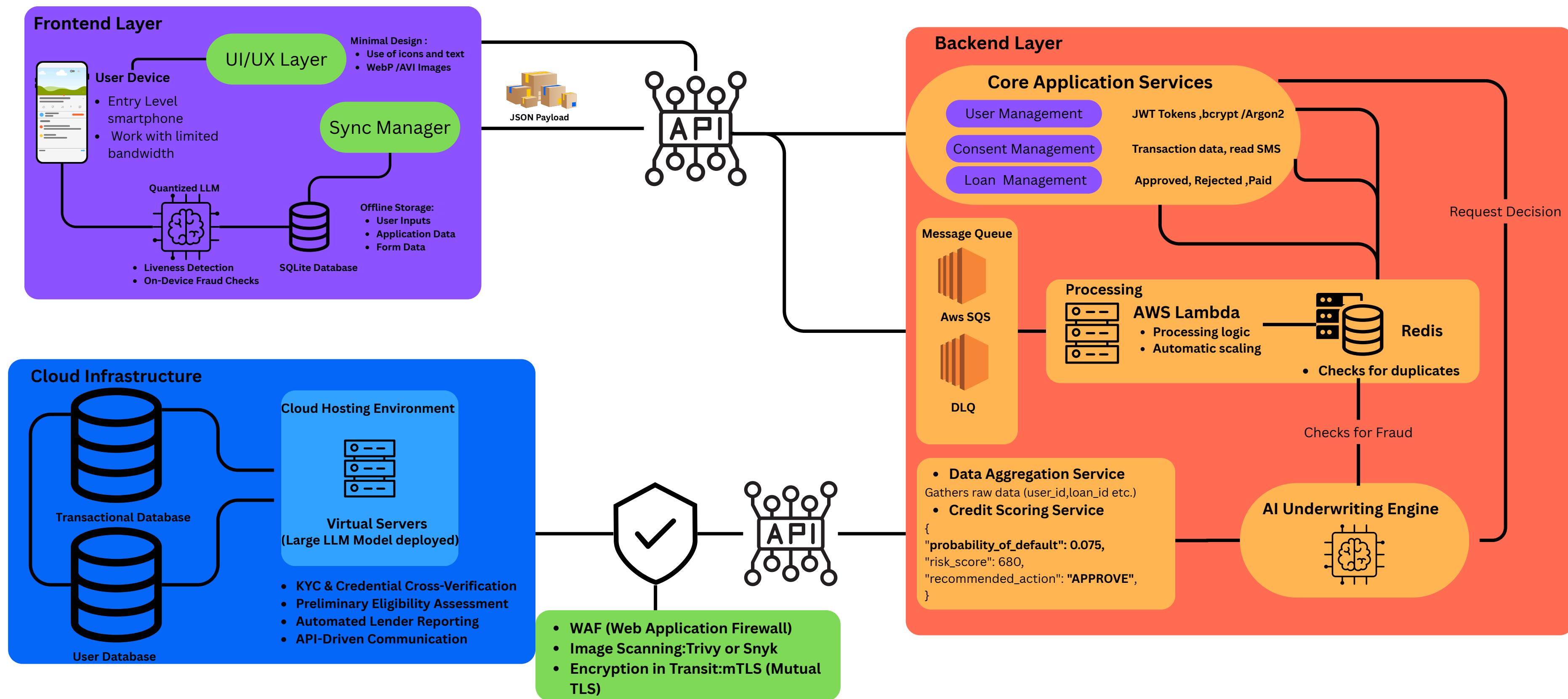
Annotations provide specific instructions:

- IF APPROVED CONFIRM IT
- GIVE CONSET
- DON'T WANT TO READ?
HEAR IT OUT!
- E-MANDATE AUTOPAY
- ONLY AFTER 50% PAYMENT YOU CAN AVAIL LOAN AGAIN
- OTHER PAGES AND WITH LLM AGENT AS CHAT BOT

Wireframe #3

[LINK of DEMO \(CLICK\)](#)

Technical Architecture



MARKET
RESEARCH

PROBLEM
IDENTIFICATION

PRIORITIZATION

USER
PERSONA

SOLUTION

TECHNICAL
ARCH

KPI'S AND
CHALLENGES

KPIs and Challenges

MARKET
RESEARCH

PROBLEM
IDENTIFICATION

PRIORITIZATION

USER
PERSONA

SOLUTION

TECHNICAL
ARCH

KPIS AND
CHALLENGES

KPI	Definition	Target	Measurement Method
Onboarding Completion Rate	% of users who finish Sign Up → KYC → Eligibility flow	≥ 85%	(Completed onboarding / Total starts) × 100
Monthly Active Borrowers (MAB)	Number of unique users with at least one active microloan	≥ 100 K	Distinct borrower IDs in past 30 days
Approval Rate for Thin-File Users	% of users without CIBIL approved via alternative-data scoring	≥ 60%	(Approved thin-file / Thin-file applicants) × 100
EMI Repayment Compliance	% of EMIs paid on or before due date	≥ 95%	(On-time EMI payments / Total EMIs due) × 100
Net Promoter Score (NPS)	Customer satisfaction and likelihood to recommend	≥ 60	Survey: %Promoters – %Detractors

Challenges

In our control

App UX/UI simplicity and vernacular voice guidance

Offline-first sync manager and resumable flows

Alternative-data model accuracy and explainability

Transparent fee structure & empathetic communication

Customer support responsiveness via chatbot/hotline

Not in our control

Network reliability on 2G/3G infrastructure

Regional language dialect diversity

Macro-economic shocks affecting repayment capacity

Regulatory changes in digital lending and eKYC