AI-ENABLED LOAN UNDERWRITING AGENT FOR RURAL AND SEMI-URBAN INDIA

PROBLEM STATEMENT
2

PRESENTED BY:
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PRESENTED TO:
Hyperverge AI

Objectives and Goals

*Your company is launching a **mobile app** designed for rural and semi-urban India. The app must work reliably on low-spec smartphones, work with limited bandwidth, and be user-friendly for individuals with low digital literacy.*

The app must support:

- *Instant Personal Loans*
- *AI enabled underwriting and lending*

Your Task:

Design an end-to-end Loan Underwriting solution taking into account with key areas

INTRODUCING

50Kbps

Welcome

नमस्ते

English

Sign up using OTP

100 Kbps

50Kbps

10Kbps

Select your language

English

हिन्दी

தமிழ்

తెలుగు

বাংলা

AI Voice Mode ON

INTRODUCING

SAHYATA

सहायता

సహాయం

உதவி

50Kbps

Sign up using OTP

Enter your registered Phone Number

Enter OTP

Auto Detecting OTP from SMS

Link your DigiLocker Account

50Kbps

Face Verification

Capture your face for Verification

Retake

50Kbps

Upload Signature

Upload or Try again

Upload your Signature Verification

Proceed

50Kbps

Personal Details

Name

Age

M F

Place

50Kbps

Work Details

Income

Profession

Type of Income

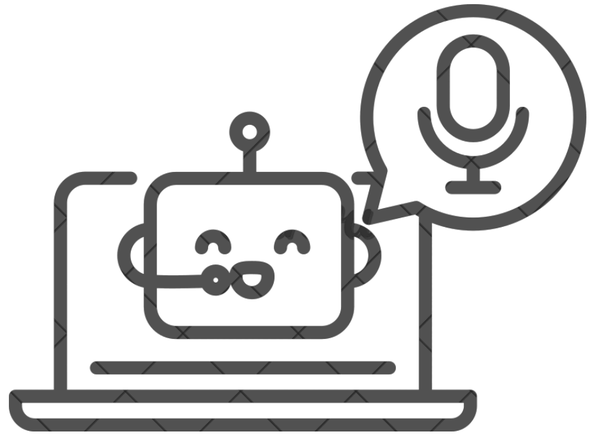
Do you have a PAN CARD ?

YES NO

Enter PAN Number

Check CIBIL Score

50Kbps



Survey

How do you earn money ?

Do you have a credit card?

Do you have any other loan?

What is your Family Income?

How many members in family?

Start REC

50Kbps

Welcome, Akhil

Apply for Instant Loan

Enter Amount

Purpose of Loan

Medical

Personal

50Kbps

Upload Document

Upload Income Proof

Upload Bank Statement

Upload ID Proof

Enter your Current Address

50Kbps

Summary

Loan Amount	
Purpose	Personal
Income Proof	✓
Bank Statement	✓
ID Proof	✓
Current Address	
Digilocker Status	✓
Cibil Score (If any)	

Proceed

50Kbps

Review

Loan Amount
₹50,000

Analyzing

Income Proof....
Banking Statements....
CIBIL Score....
Purpose...
Profession...
ID Proof...

50Kbps

Sanctioned Amount

As per Documents submitted and our policies to allocate amount. Here is your Sanction Summary

Loan Amount
₹50,000

Sanction Amount
₹40,000

Tenure
24 Months

Monthly EMI	Interest
₹1,843.00	10%

50Kbps

Consent

I agree with all the conditions and proceed with loan processing including 3% LP fees to Sahayata

Procced

I want to apply again

50Kbps

Loan Status

Approved

Loan has been appproved, Please select method of payout

Bank account

50Kbps

Loan Status

Pending Process

Loan is in process , Please contact our relavance department for further

Contact CC

50Kbps

Loan Status

Rejected

Loan is rejected, Please review following details and apply again!

- *Incomplete Form details*
- *Mismatch in given data*
- *Low CIBIL Score*
- *Invalid PAN card*

SAHYATA FEATURES

AI Voice Mode **ON**

1 AI Voice will read out each field and wait until user respond then move to next

2 Always Speed Check for Rural Area

100 Kbps

50Kbps

10Kbps

When red, app will prompt user to close application and continue later

Select your language

English

हिन्दी

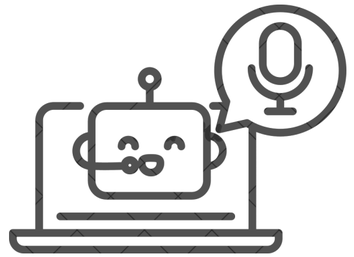
தமிழ்

తెలుగు

বাংলা

3 Multilingual Support

Survey which helps for undertake deicisons in backend **4**



Survey

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Target Audience

- Low-digital-literacy users
- Primary borrowers
- Micro-entrepreneurs
- Women & SHG members
- Young gig & informal workers

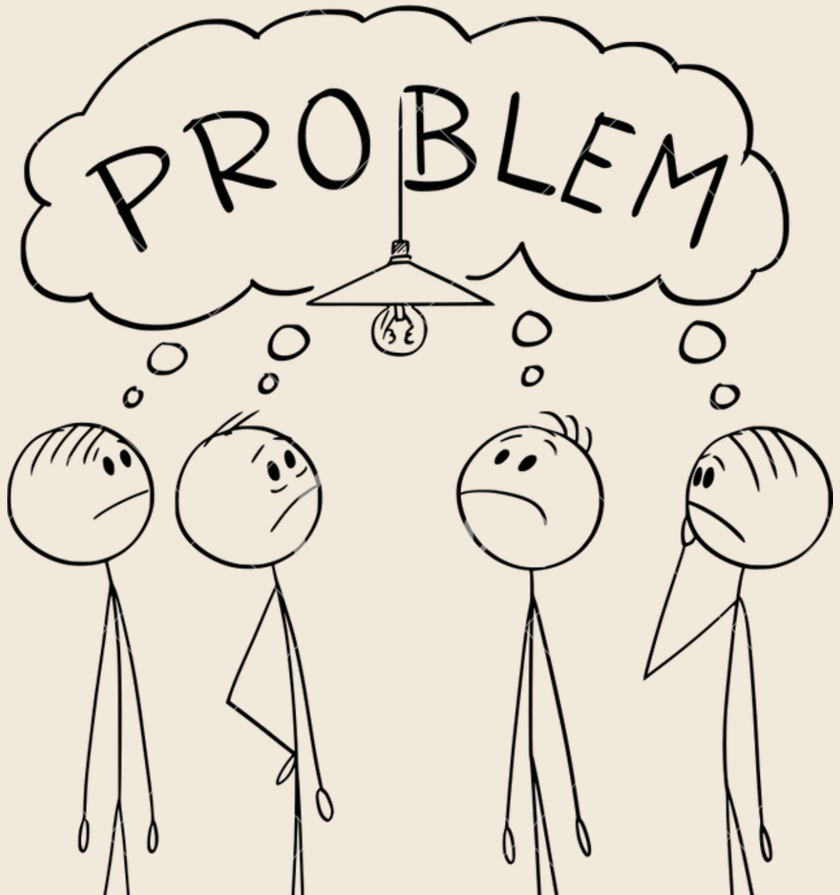
QUESTION 1

Features

What specific problems will your solution address? How will you prioritise the most important problems?

What specific problems will your solution address?

- *Fraud & weak KYC*
- *Low digital literacy*
- *High manual review load*
- *Thin/no formal credit history*
- *Lack of transparent explanations*
- *Intermittent connectivity & low bandwidth*



SAHYATA **Will solve this**

QUESTION 2

Features

Create two innovative features powered by LLMs that can improve underwriting accuracy or ease of use

Feature #1

LLM-assisted Financial Narrative Extractor

What:

After the user records a short voice or typed answer about their livelihood (30–60 seconds), an LLM extracts structured financial signals: income cadence (daily/weekly/monthly), seasonal variability, expense categories, family dependents, and implicit trust signals .

Why it helps underwriting:

extracts signals that traditional forms miss; improves risk estimation for cash-flow-dependent borrowers.

Feature #2

LLM-guided Low-Literacy Form Filling and Evidence Verification

What:

A compact LLM microservice that takes user's audio responses, photos of documents, and minimal metadata and produces: (1) corrected structured fields, (2) confidence scores per field

Why it helps:

reduces user input errors, accelerates submission, and provides transparent feedback that increases trust and reduces drop-offs.

QUESTION 3

Features

How will you decide which features should be built first? Provide a clear prioritisation matrix.

Decision rule: use RICE = (Reach * Impact * Confidence) / Effort

Feature (group)	Reach (0–100)	Impact (1–10)	Confidence (0–1)	Effort (1–10)	RICE
Phone OTP onboarding & KYC	100	8	0.95	1	760
Camera ID capture (guided OCR)	90	7	0.9	3	189
Explainability UI (local-language, short reasons)	100	4	0.9	2	180
Chunked resumable uploads + offline persistence	100	6	0.9	3	180
UPI repayment integration	90	4	0.95	2	171
Agent-assist & IVR/SMS fallback	80	5	0.85	2	170
Server-side baseline AI scoring	100	9	0.9	5	162
LLM-guided form filling (pilot)	70	7	0.75	3	123

QUESTION 1

Product Design and User Experience

How will the app accommodate users with low digital literacy?

Scope

1. Mobile-first app for Android low-spec smartphones (API 21+), working on < 2G/2.5G through 4G.
2. Core product: instant personal loans to customers in rural and semi-urban India with limited credit records using AI-enabled underwriting.
3. Focus on low digital literacy UX, offline/low-connectivity reliability, minimal data usage, and explainable decisions.

First Approach with assumptions

1. Primary language(s): Hindi + English + regional languages in later phases; initial MVP: Hindi + English.
2. Users may have intermittent connectivity; many will have single-core or older devices with limited memory.
3. Regulatory compliance required (KYC, RBI guidelines) – assume bank partnership for disbursal.
4. Basic smartphone capability: camera, SMS, phone number.

Build order

- Phone OTP KYC (MVP)
- Camera ID capture + Explainability UI + Chunked uploads (parallel)
- UPI repayment + Agent/IVR fallback
- Baseline server scoring (iterative, keep warm)
- LLM-guided form-fill pilot → expand if accuracy/correction rates acceptable
- Fraud/KYC hardening implemented in parallel with 2–4 (must pass Compliance gate)
- LLM Financial Narrative pilot (limited geographies)

Gates and overrides

- Compliance/Security gate: fraud/KYC controls must be implemented before wide scale disbursal – may be built in parallel even if RICE lower.
- Pilot gate: LLM features launch as pilots in controlled regions; promote only if extraction accuracy and fairness metrics meet thresholds.
- Operational gate: prioritize features that reduce manual review and user drop-off in first two sprints.

QUESTION 2

Product Design and User Experience

Describe the user flow for every step of the journey.

50Kbps

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English

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100 Kbps

50Kbps

10Kbps

USER FLOW & WIREFRAME

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தமிழ்

తెలుగు

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AI Voice Mode **ON**

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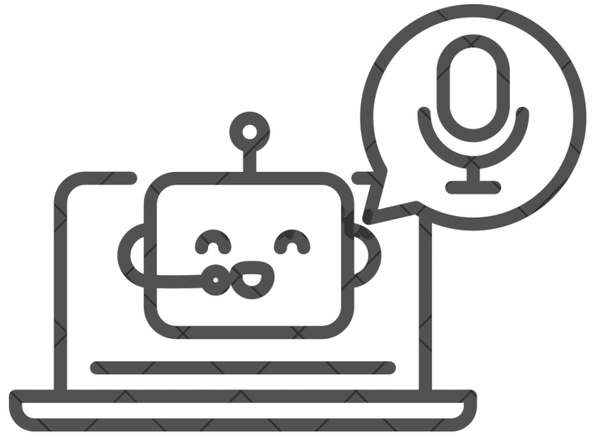

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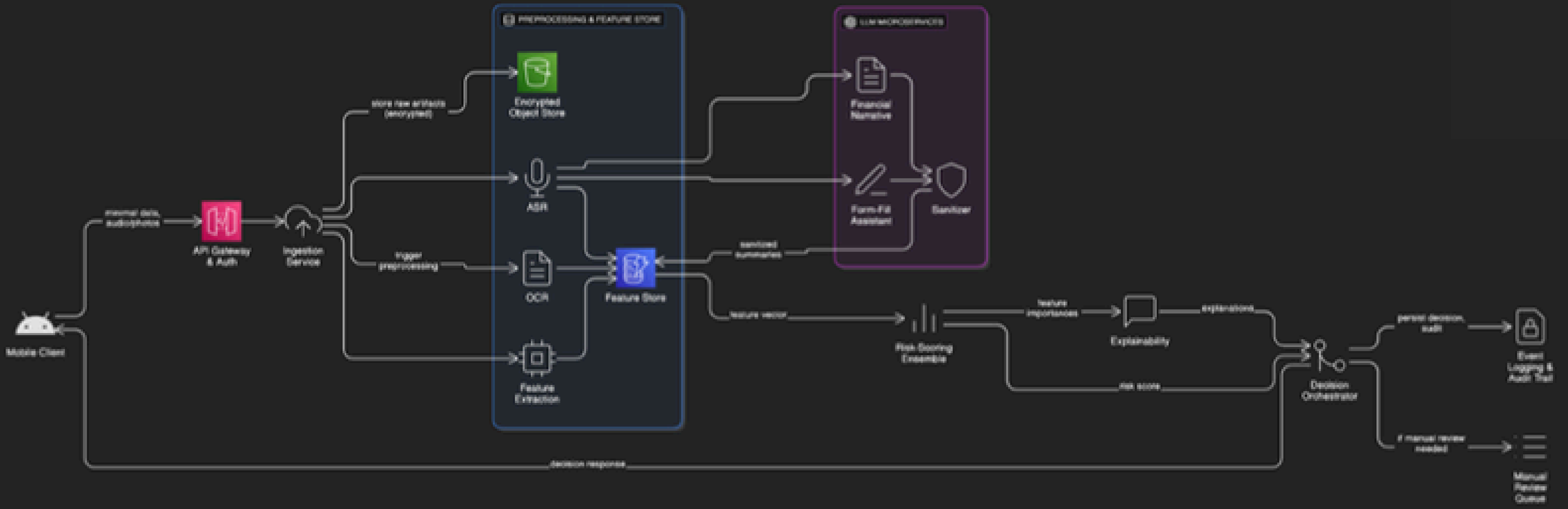
QUESTION 1

Technical Architecture

Present a high level system design architecture that supports your AI enabled underwriting feature.

System Design Architecture



QUESTION 2

Technical Architecture

Explain how you will handle low bandwidth environments, especially retry and resume logic to ensure a seamless experience

SEAMLESS EXPERIENCE

Network resilience patterns (detailed)

- **Start upload:** client requests a resumable upload session from Ingestion service; server returns session id + chunk size.
- **Upload chunk**: client sends chunk with sequence number and checksum; server replies with ack. Client will mark chunk as uploaded locally.
- **Resume**: client queries session to get acknowledged chunks and resumes remaining.
- **Finalize**: client calls assemble endpoint after last chunk; ingestion triggers processing.

Security on unreliable networks

- Use TLS + mutual auth where possible; sign each chunk with HMAC + session token.

SEAMLESS EXPERIENCE

Client strategies

- **Request minimization:** ask minimal fields first; lazily collect optional documents.
- **Compression & image optimization**: reduce captured images to small, readable size (e.g., 600 px, WebP) before upload.
- **Chunked uploads:** split large artifacts into N-byte chunks with per-chunk checksums and a resumable upload session ID.
- **Background retry with exponential backoff**: retry on network failure up to 5 attempts; after that, store as pending and inform the user.
- **Offline queue & local persistence**: store application state and artifacts in local encrypted DB (e.g., SQLCipher or encrypted shared prefs) until successful upload.

Bandwidth cost controls

- Limit number of images to 3 per application by default; recommend photo of whole document instead of multiple close-ups.
- Use server-side image enhancement to extract text from lower-quality image

QUESTION 1

Additional Considerations

How will you define and measure success for the app (including key performance indicators)?

SUCCESS

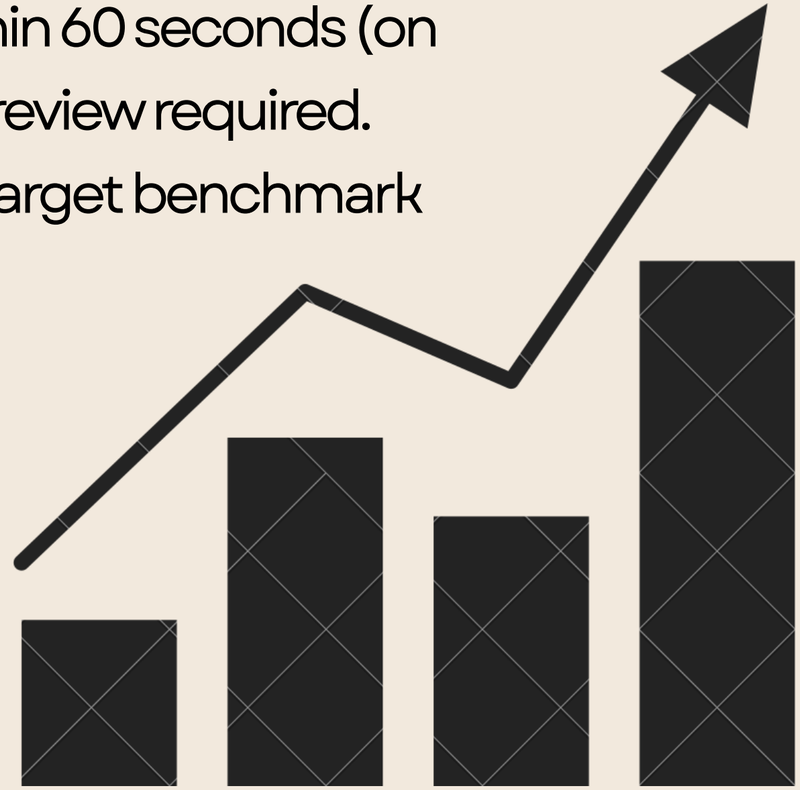
Activation: 30k installs in target districts, 40% activation rate (account created and KYC started).

Conversion: 10% of activated users receive an approved loan offer.

Time-to-decision: 90% of applications receive a pre-decision within 60 seconds (on decent connection); final decision within 24 hours where manual review required.

Default rate: keep 30-day default below 5% for loans < 6 months (target benchmark variable by product).

User satisfaction: >4.0 average rating on UX questions for comprehension and ease (surveyed sample).



QUESTION 2

Additional Considerations

What security concerns must you address, and how will you mitigate them?

- **Data Security**: AES-256 encryption at rest, TLS 1.2+ in transit, with KMS-managed hardware-backed keys and role-based access controls.
- **Privacy Protection**: Minimize PII transmission through on-device processing, implement data retention policies with irreversible hashing, and maintain consent-first approach with easy opt-out.
- **Fraud Prevention**: Deploy multi-factor authentication signals including device fingerprinting, SIM metadata, geolocation consistency, and liveness verification.
- **Bias Mitigation**: Conduct demographic parity checks, subgroup performance testing, human review for edge cases, and maintain appeals workflows with clear explanations.
- **Regulatory Compliance**: Maintain immutable audit logs of inputs, model versions, and decisions with exportable decision rationale for regulators.
- **Monitoring & Detection**: Implement transaction monitoring, anomaly detection models, and behavioral pattern correlation for fraud identification.
- **Incident Response**: Conduct regular security reviews, penetration testing, third-party audits, and maintain disaster recovery plans with breach response playbooks.

Thank you