

FINVISION

Agentic AI Powered Conversational Loan Origination System



Aadit Siroya

Indian Institute of Technology, Guwahati
8879822258

Role: AI Orchestration & System Design Lead

Designed the Agentic AI architecture using a Master-Worker agent framework and lead agent coordination.
Skilled in LangChain, CrewAI, and API-driven workflow automation with strong system design expertise.



Ashmit Rawat

Thadomal Shahani Engineering College
9892765476

Role: Full Stack & Integration Engineer

Built the chatbot frontend and backend orchestration connecting all agents.
Skilled in React.js, FastAPI, MongoDB, and Socket.io with a focus on seamless AI-to-UI integration.



Akshat Jain

DJ Sanghvi Engineering College
8422045473

Role: Backend & Data Simulation Engineer

Developed mock APIs for CRM, Offer Mart, and Credit Bureau systems.
Skilled in Python, Flask, and Pandas, ensuring reliable backend performance and efficient data handling.

Current State: Gaps in Digital Loan Journeys

The Indian retail lending ecosystem has seen rapid digital adoption over the past decade, yet loan origination remains a largely **fragmented** and **inefficient** process. Despite strong customer intent, a significant proportion of prospective borrowers drop off during digital journeys due to **rigid workflows**, **limited personalization**, and the **inability** of existing **chatbots** to provide **meaningful, trust-driven guidance**. This gap between digital engagement and successful loan disbursal directly impacts **conversion rates**, **turnaround time**, and **customer satisfaction**, particularly in high-volume products such as personal loans.

Mission Overview

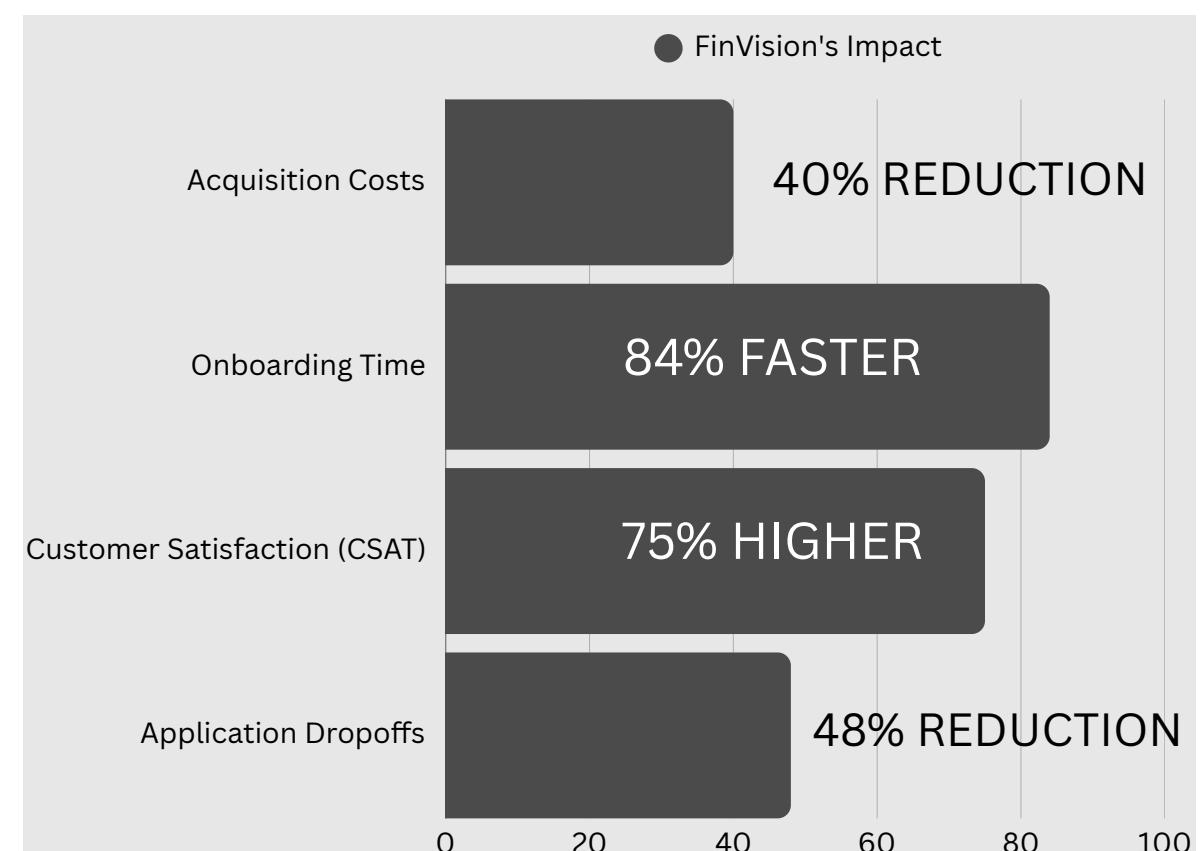
To address this challenge, our team proposes an **Agentic AI-powered Conversational Loan Origination System** designed to function as a **digital relationship manager** for Tata Capital's lending business. Unlike traditional rule-based chatbots, this solution is built on a **multi-agent architecture** where a **central Master Agent** orchestrates multiple **specialized Worker Agents** responsible for **sales interaction, verification, underwriting, document generation, and feedback capture**. Together, these agents collaborate in real time to guide users through the **entire loan journey**, from initial inquiry to instant sanction, within a single, continuous conversation.

The system leverages **advanced large language models** to deliver **empathetic, context-aware conversations** while integrating seamlessly with **backend systems** such as **CRM, credit bureaus, and offer engines** through **secure APIs**. By combining conversational intelligence with automated decision-making, the solution **reduces dependency on manual interventions, shortens loan processing timelines from days to minutes, and improves lead-to-loan conversion rates**.

IMPACT

- Delivers **measurable business impact** beyond operational efficiency
- **Lowers customer acquisition costs** through automation and guided journeys
- Enhances customer experience with **faster, more transparent loan processing**
- Enables **real-time visibility** into sales performance and funnel metrics
- Built with **scalability and regulatory compliance** at its core
- Easily **extendable** across multiple loan products, channels, and languages
- Serves as a **future-ready digital foundation** for Tata Capital's lending strategy

KEY METRICS



ARCHITECTURE



Understanding the problem

Introduction and Current Landscape

Despite high digital adoption in India's BFSI sector, personal loan origination continues to face low **conversion rates**, high customer abandonment, and long processing times. While customers increasingly expect instant, personalized, and conversational experiences, existing digital loan journeys rely on fragmented systems, manual verifications, and rule-based chatbots that lack contextual understanding and persuasive capability. As a result, customers disengage mid-journey, leading to lost revenue opportunities, higher acquisition costs, and operational inefficiencies, particularly in high-volume products such as personal loans.

Target Segment & Stakeholders

Category	Details
Target Industry	BFSI (Banking, Financial Services & Insurance)
Industry Type	B2C
User Group	Prospective & existing retail loan customers
User Department	Digital Sales, Credit Underwriting & Loan

Key Assumptions

Customers accept fast, personalized AI

Customer and credit data accessible

Solution Scenario

CRM and underwriting systems integrable

Digital channels drive loan acquisition

Conversational AI system

AI Agents

Eligibility and pricing rules digitized

RBI and data compliance ensured

Understanding Intent

verify customer details

Answering Queries

assess credit eligibility

What is the problem at hand ?

Gaps Identified

Low conversion despite high digital traffic

Fragmented Systems

Negotiating loan Parameters

instant digital sanction letter

High customer drop-offs mid-loan journey

Rule-Based Chatbots

Nature of Output

Long turnaround time for loan approvals

Manual & Delayed Processing

A web-based conversational loan application (extendable to mobile and WhatsApp) that delivers:

Limited personalization in digital channels

Poor Journey Continuity

- Real-time loan guidance
- Instant eligibility checks
- Personalized offers
- Digital loan sanctioning

Revenue loss due to abandoned applications

Limited Real-Time Insights

all through a unified, AI-driven interface.

SOLUTION VALUE PROPOSITION

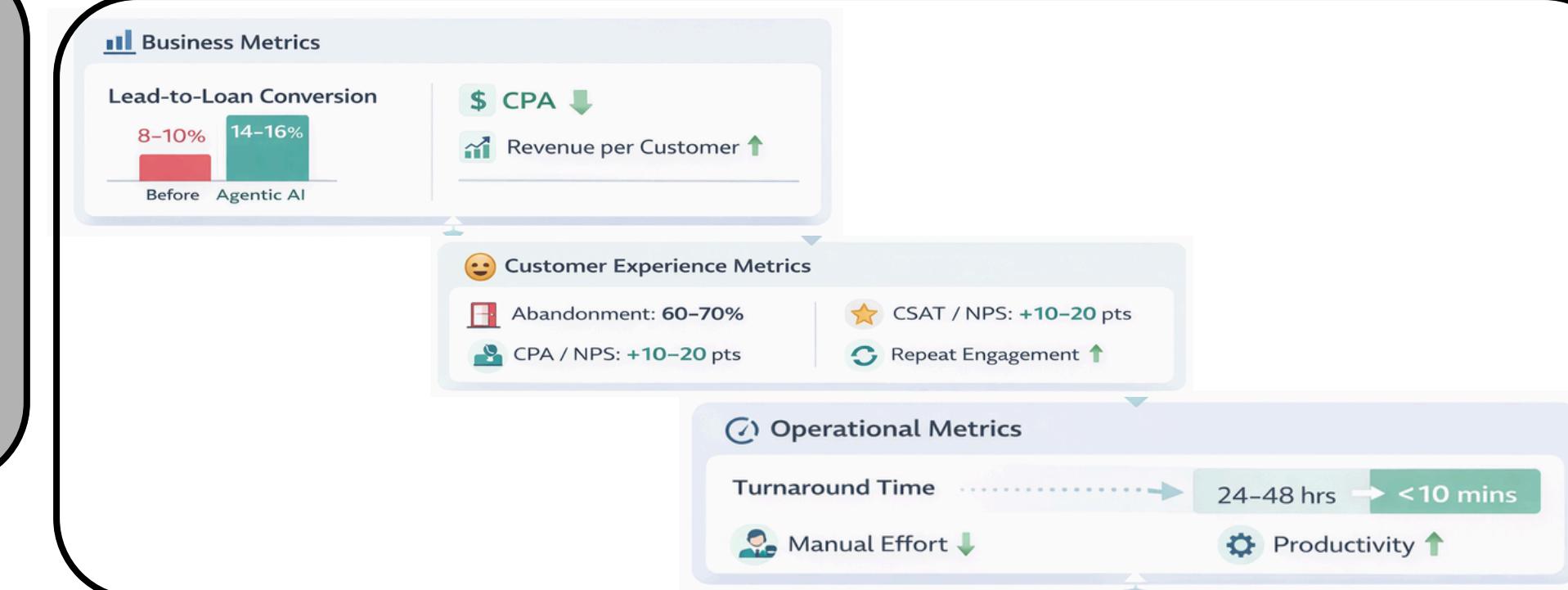
CUSTOMER VALUE

- Real-time, personalized explanations of eligibility, EMI, tenure, and interest trade-offs
- Conversational memory to reduce repeated inputs
- Human-like empathy during high-stakes financial decisions

BUSINESS VALUE

- Reduced reliance on manual sales follow-ups
- 20–40% improvement in digital lead conversion (AI-assisted sales benchmarks)
- 24x7 scalable digital sales channel

IMPACT METRICS



TECHNOLOGIES INVOLVED



ASSUMPTIONS

Conversational preference

API availability

Human-in-loop

CONSTRAINTS

RBI compliance

Explainability

Deterministic rules

DESIGN DECISIONS

Agentic > single LLM

Modular agents

Easier audits

EASE OF IMPLEMENTATION

- Phased, API-driven rollout with mock APIs in Phase 1
- No disruption to existing systems or frontend
- Automates verification, underwriting, and follow-ups
- Impact: TAT ↓ from days to minutes, conversions ↑ 25-40%

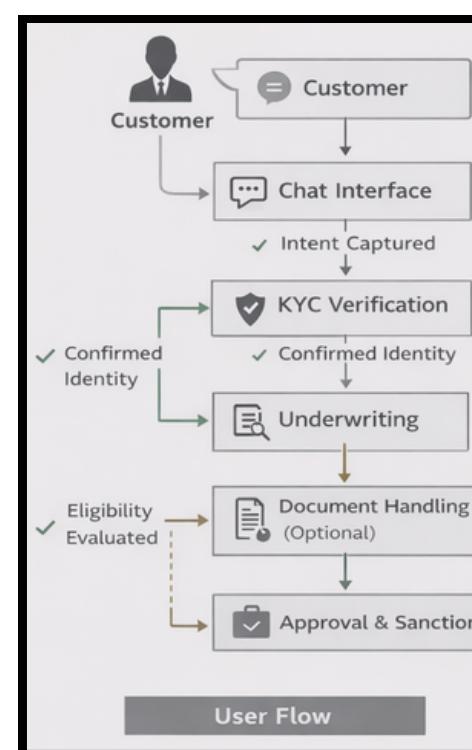
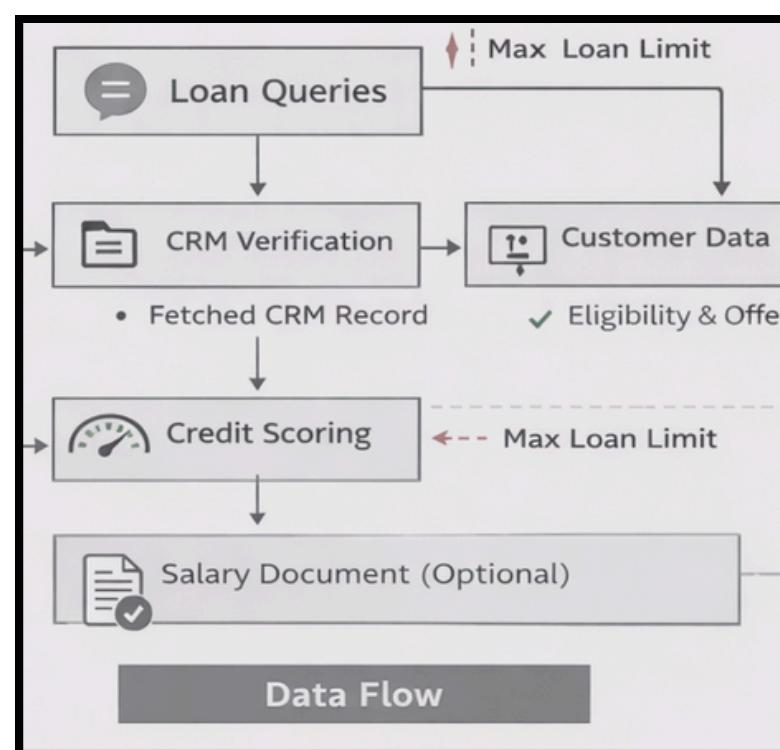
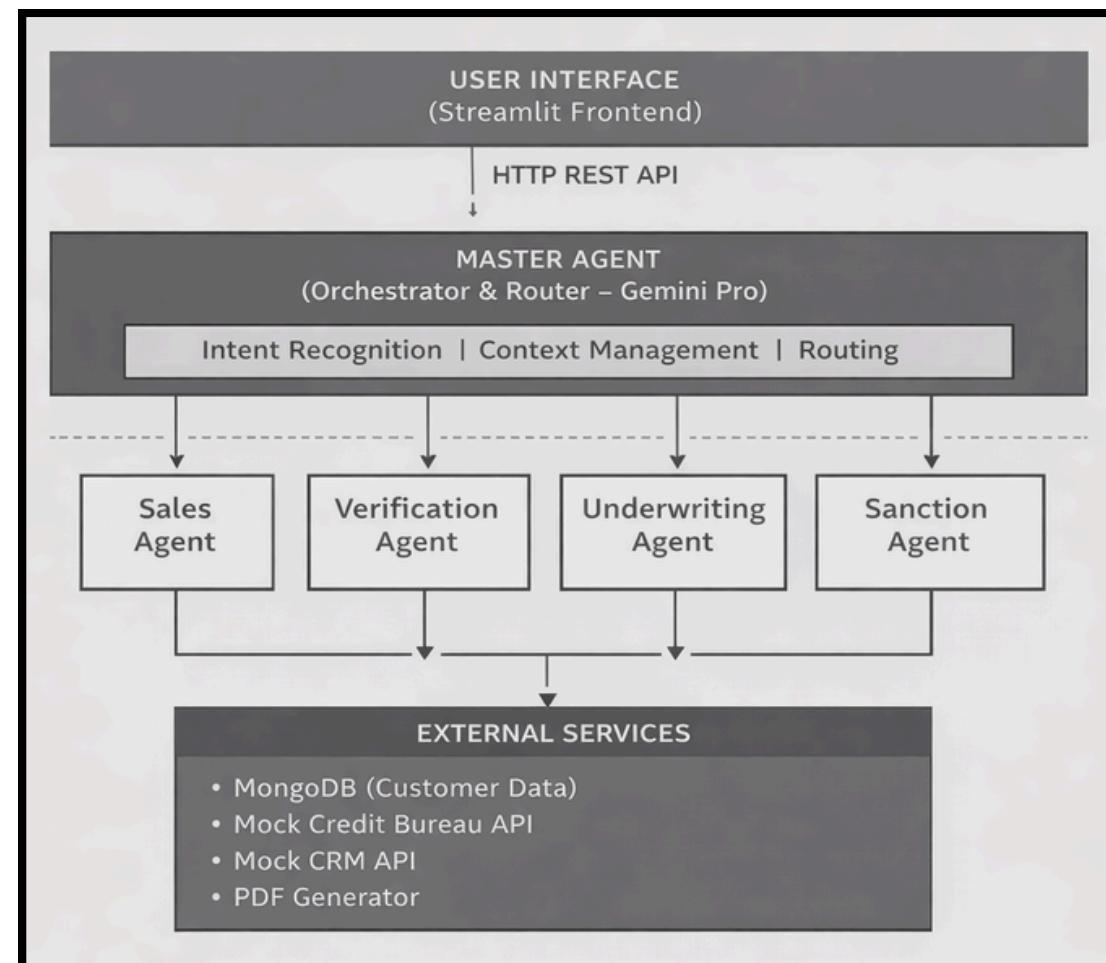
ROBUSTNESS & SCALABILITY

- Stateless backend enables horizontal scaling
- Independent agents ensure fault isolation
- Encrypted APIs, role-based access, audit logs
- Easily extensible to new loan products & languages

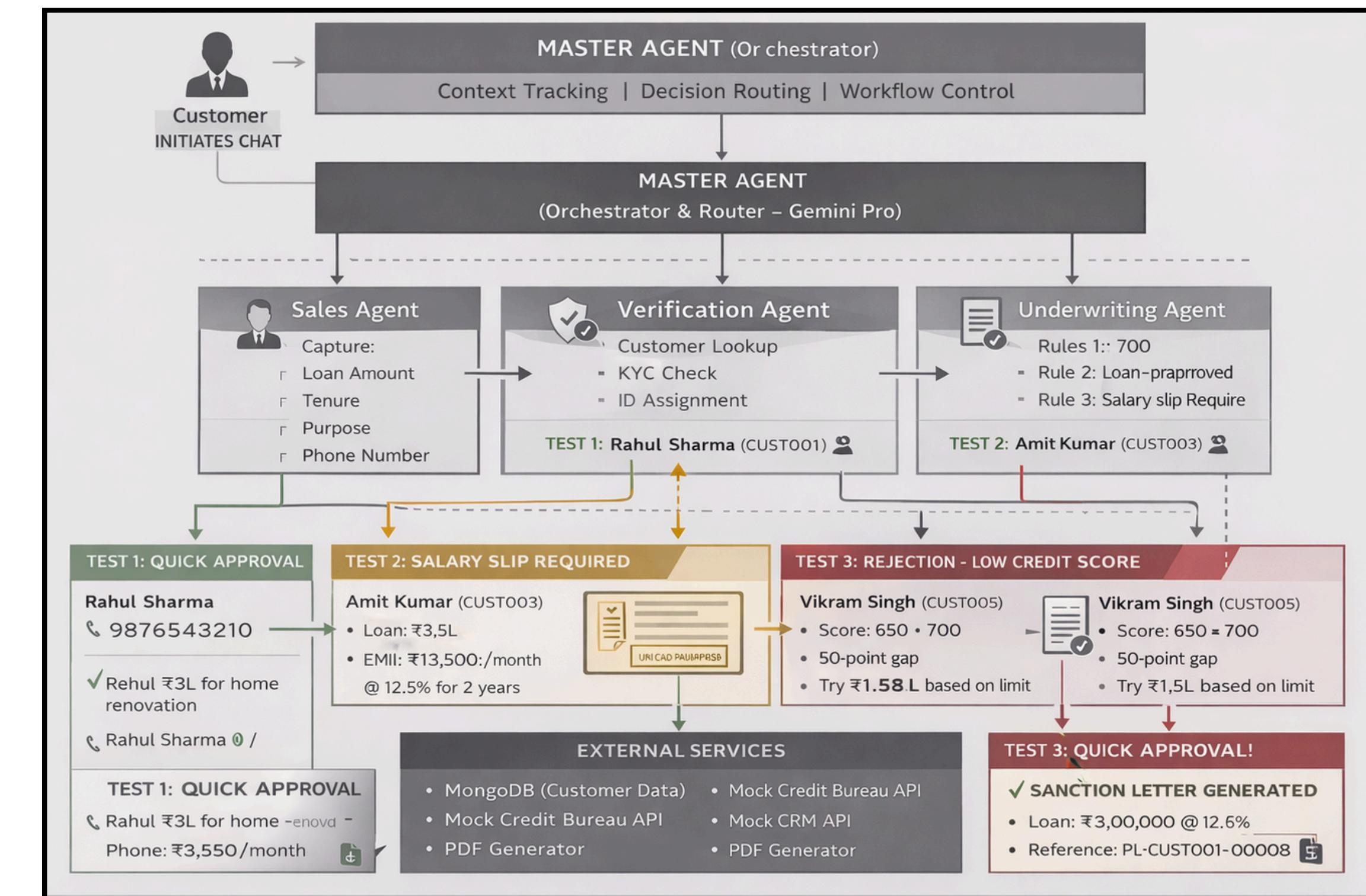
NEXT-ROUND COMPONENTS

- End-to-end conversational flow
- Agent orchestration
- Eligibility simulation
- Sanction letter
- Analytics dashboard

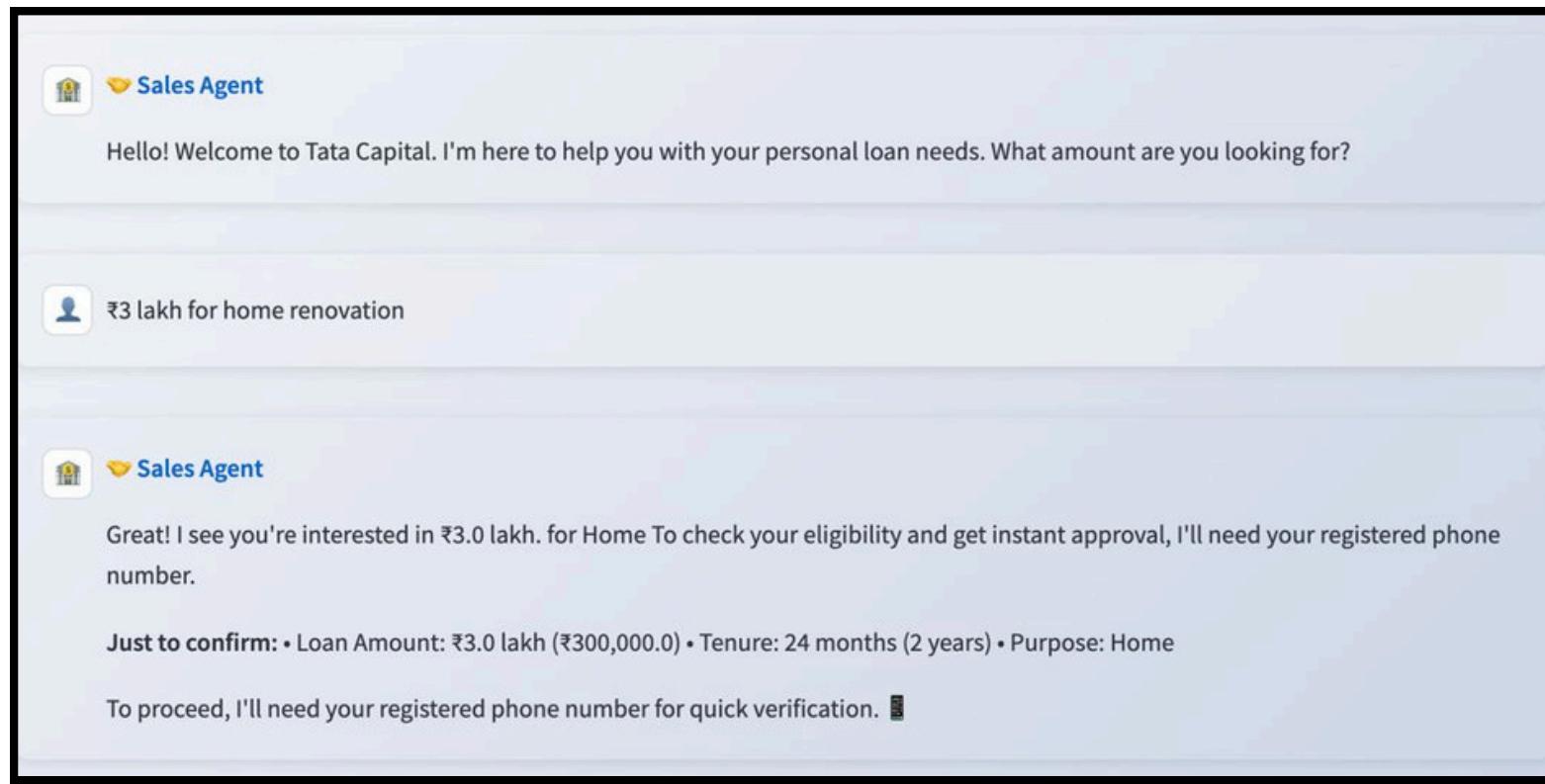
ARCHITECTURAL DIAGRAM



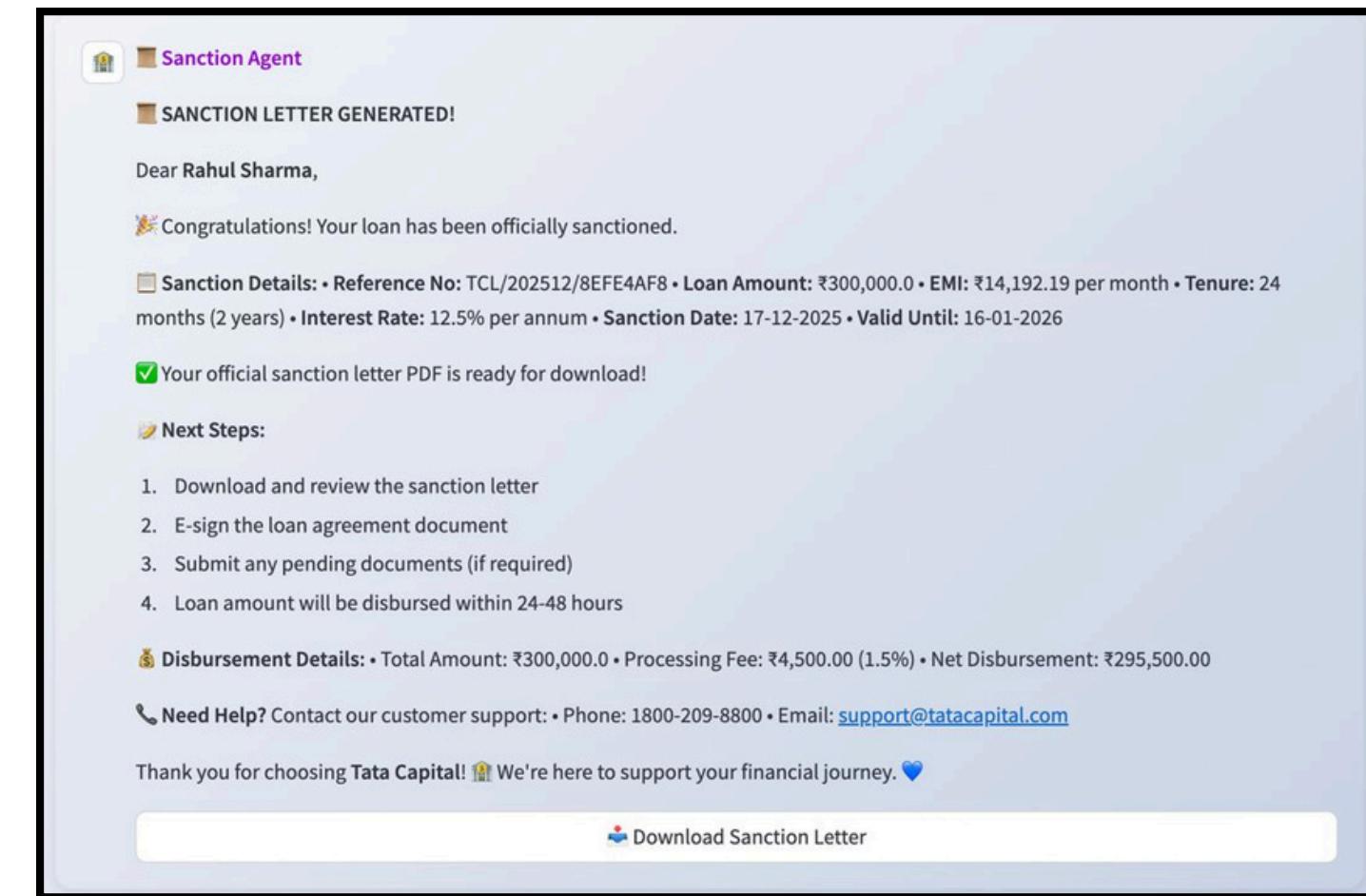
END-TO-END AGENTIC AI WORKFLOW



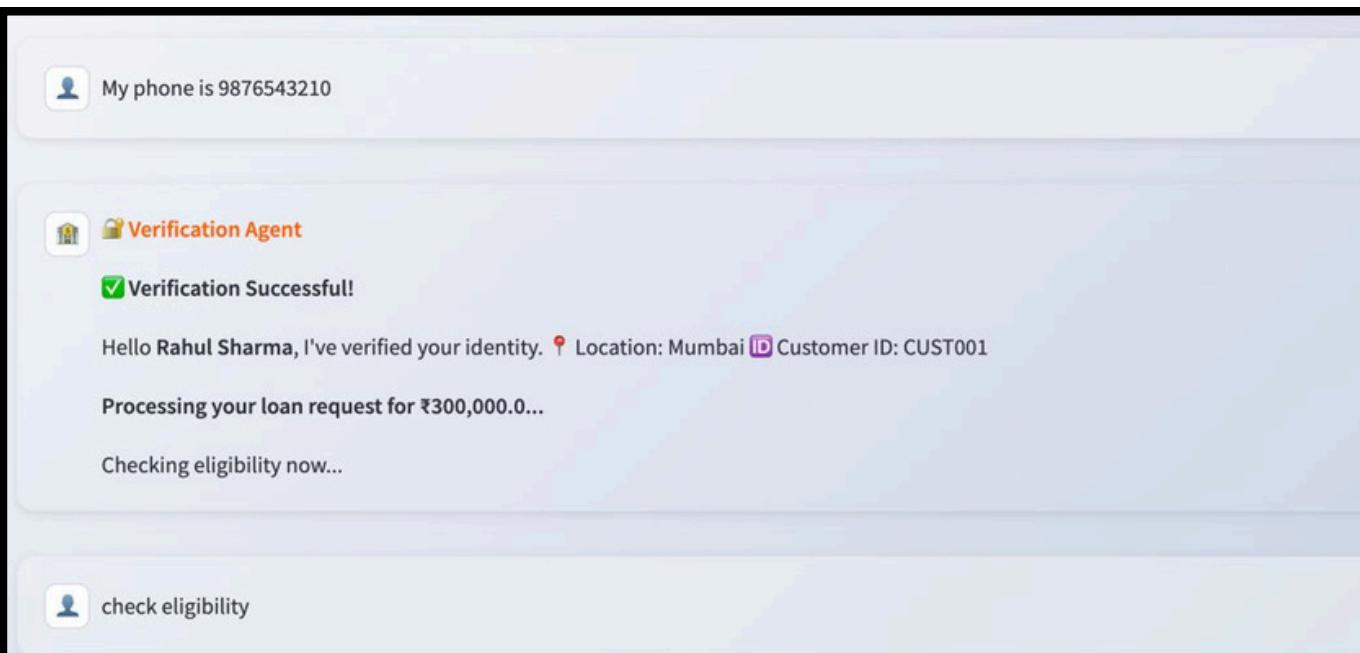
CONVERSATIONAL FLOW



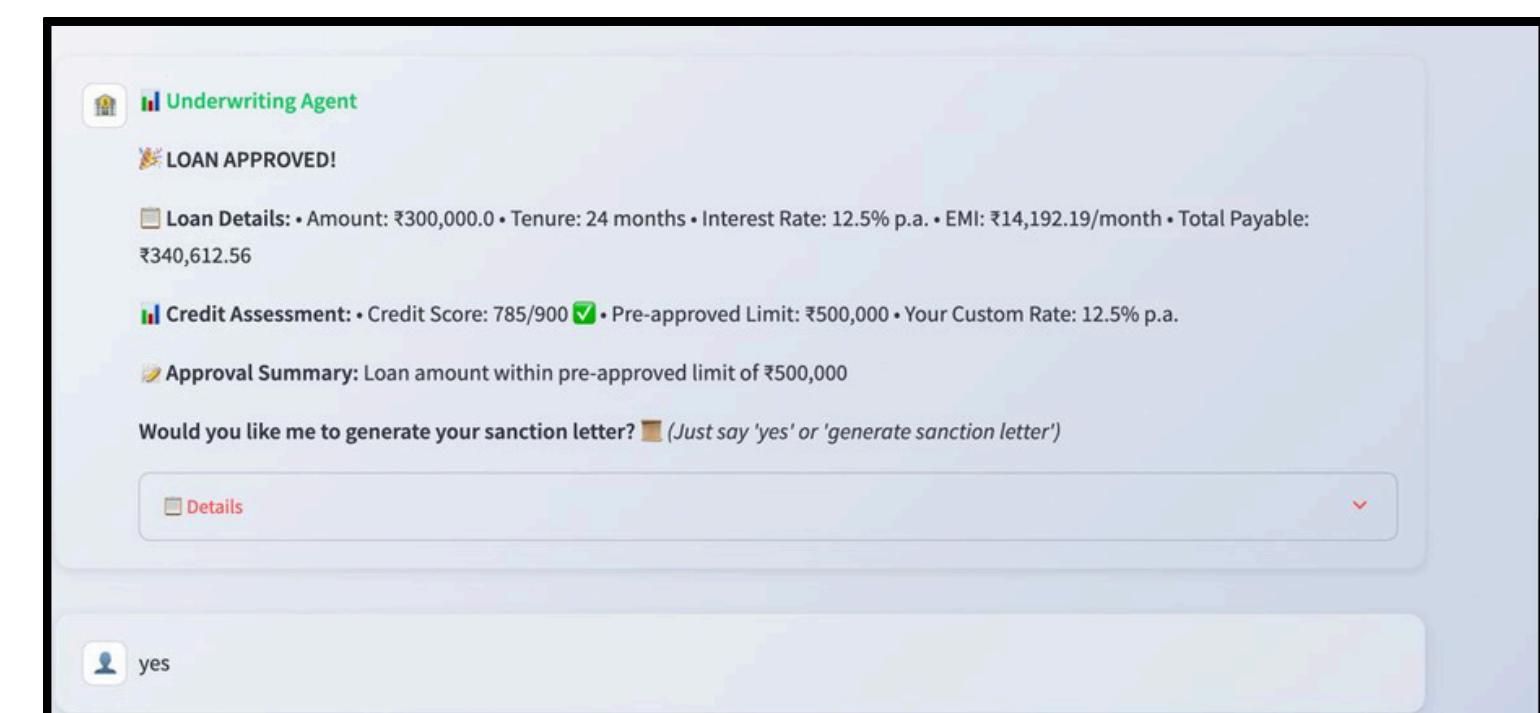
THE USER HAS INQUIRED FOR A 3 LAKH INR LOAN FOR HOME RENOVATION → SALES AGENT ASKS FOR USERS PHONE NUMBER



UPON VERIFICATION, THE SANCTION AGENT SANCTIONS THE LOAN AND GENERATES THE SANCTION LETTER



THE VERIFICATION AGENT VERIFIES THE USER AND CHECKS ITS ELIGIBILITY VIA THE UNDERWRITING AGENT



Underwriting Agent

Additional Documentation Required

Your loan request for ₹350,000.0 needs verification.

Status: Loan amount ₹350,000.0 exceeds pre-approved limit ₹200,000. Please upload salary slip for verification.

Current Assessment: • Requested Amount: ₹350,000.0 • Pre-approved Limit: ₹200,000 • Maximum Eligible: ₹400,000 (with salary proof) • Your Salary: ₹75,000/month • Potential EMI: ₹16,804.51/month

EMI vs Salary Check: EMI (₹16,804.51) must be \leq 50% of verified salary 50% of ₹75,000 = ₹37,500.0

What you need to do:

1. Upload your latest salary slip using the file upload section below
2. Ensure it clearly shows monthly salary of ₹75,000 or more
3. We'll verify that EMI (₹16,804.51) is \leq 50% of your verified salary

Quick Option: Type: 'I've uploaded my salary slip showing ₹75,000 monthly salary'

The upload section should appear below this message.

Details

Upload Required Documents

To process your loan application for ₹350,000.0, please upload your latest salary slip.

Test: Use "I've uploaded salary slip" in chat if file upload doesn't work

Choose your salary slip (PDF, PNG, or JPG)

Drag and drop file here
Limit 200MB per file • PDF, PNG, JPEG, JPEG

Browse files

Please select a file to upload

WHEN THE USER'S LOAN REQUIREMENT EXCEEDS HIS APPROVED LOAN LIMIT, THE UNDERWRITING AGENT ASKS FOR ADDITIONAL DOCUMENTS LIKE SALARY SLIP TO CHECK USER'S ELIGIBILITY FOR A LOAN

Underwriting Agent

LOAN APPROVED!

Loan Details: • Amount: ₹350,000.0 • Tenure: 24 months • Interest Rate: 14.0% p.a. • EMI: ₹16,804.51/month • Total Payable: ₹403,308.24

Credit Assessment: • Credit Score: 680/900 ⚠ • Pre-approved Limit: ₹200,000 • Your Custom Rate: 14.0% p.a.

Approval Summary: Loan approved with salary slip. EMI ₹16,804.51 is \leq 50% of salary ₹75,000

Salary slip verified: ₹75,000/month **EMI Check:** EMI ₹16,804.51 \leq 50% of salary

Would you like me to generate your sanction letter? (Just say 'yes' or 'generate sanction letter')

Details

UPON VERIFICATION THE LOAN IS SANCTIONED AND THE SANCTION LETTER IS GENERATED BY THE SANCTION AGENT

SANCTION LETTER

TATA CAPITAL

SANCTION LETTER

Reference No: TCL/202512/8EFE4AF8 Date: 17-12-2025

To,
Rahul Sharma

Dear Rahul Sharma, We are pleased to inform you that your loan application has been approved by Tata Capital. The details of your sanctioned loan are as follows:

Particulars	Details
Loan Amount	₹ 300,000.00
Loan Tenure	24 months
Rate of Interest	12.5% p.a.
EMI Amount	₹ 14,192.19 per month
Sanction Date	17-12-2025
Sanction Valid Until	16-01-2026

Terms and Conditions:

1. This sanction is valid until the validity date mentioned above.
2. The loan will be disbursed subject to execution of required documents.
3. EMI payment will start from the month following disbursement.
4. Late payment charges of 2% per month will be applicable on overdue amounts.
5. Prepayment charges may apply as per the loan agreement.
6. Tata Capital reserves the right to modify terms if required.

For Tata Capital Limited Authorized Signatory

CASE: LOAN REQUEST REJECTED

The screenshot shows a web application interface for a loan application system. At the top, there's a navigation bar with icons for star, download, and more, along with a 'Deploy' button. Below the navigation is a 'Control Panel' section with a 'New Conversation' button. The main content area is titled 'Underwriting Agent' and displays the following information:

- Application Status:** Current Agent: UNDERWRITING
- Customer:** CUST005 (Status: KYC Verified)
- Loan Amount:** ₹100,000 (Status: Not Approved)
- Reason:** Credit score 650 is below minimum requirement of 700.
- Your Credit Profile:** Current Score: 650/900 • Minimum Required: 700/900 • Gap: 50 points
- Quick Wins to Improve Your Credit Score:** Pay 2-3 EMIs on time → +30-40 points (2-3 months) • Clear credit card dues → +40-50 points (1 month) • Fix credit report errors → +50-100 points (immediate) • Reduce credit utilization to <30% → +30 points (1 month)
- Your Current Eligible Amount:** ₹150,000 Would you like to apply for ₹150,000 instead?

At the bottom, there's a sidebar for 'Test Customers' listing 'Rahul Sharma', 'Amit Kumar', and 'Vikram Singh'. A message input field says 'Type your message here...' with a send button. The footer includes copyright information: '© 2024 Tata Capital Limited | Powered by AI' and 'Secure • Confidential • Fast Processing'.

WHEN CREDIT SCORE IS LESS THAN 700

Impact Metrics Dashboard

Category	Metric	Expected Impact
Business	Conversion Rate	+20-40%
Business	Cost per Acquisition	↓ 25-35%
Ops	Turnaround Time	Days → Minutes
Ops	Agent Productivity	+2-3x
CX	CSAT / NPS	+10-20 pts

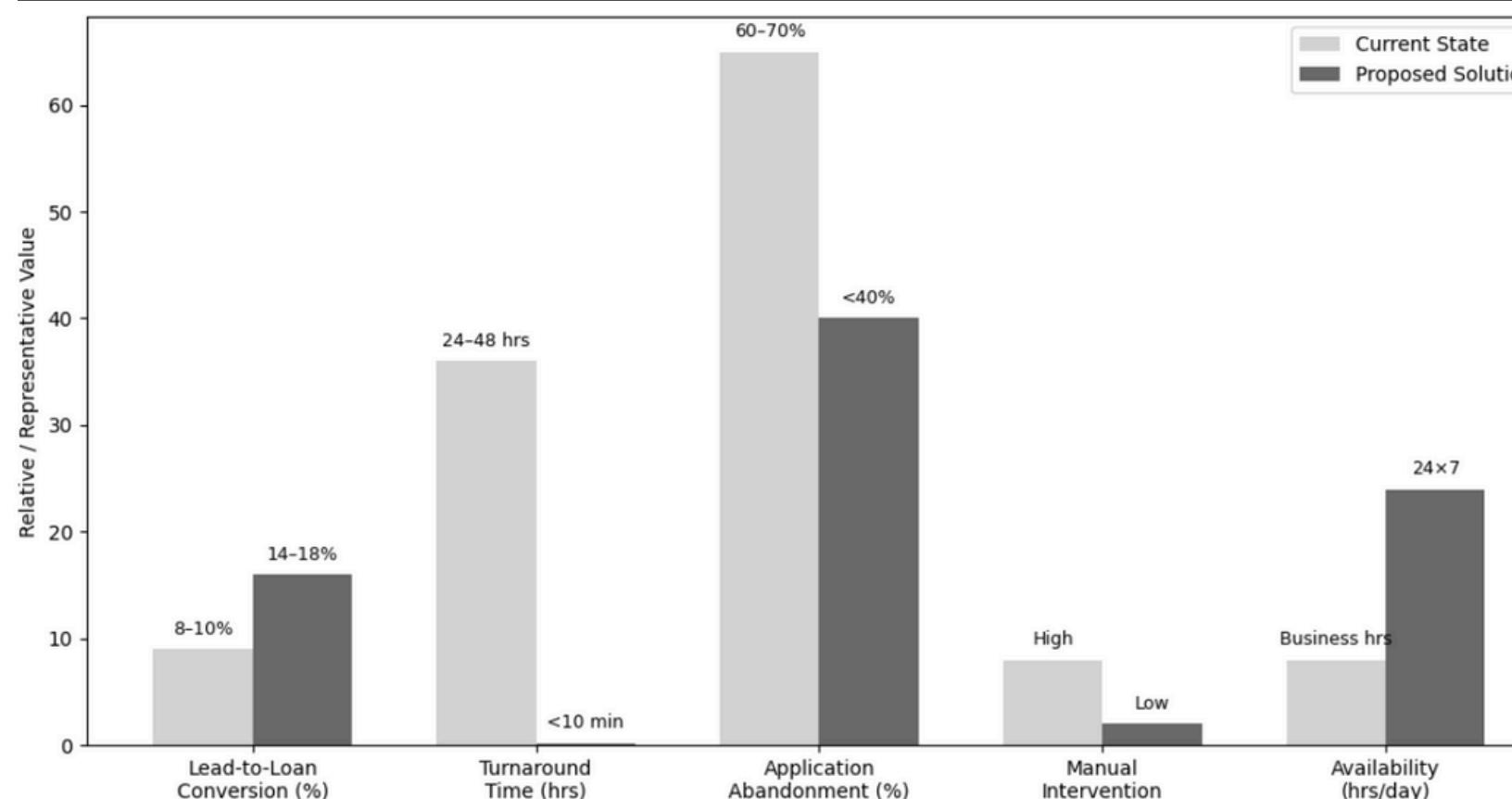
Digital Loan Conversion Pyramid



Estimated Annual Impact

Metric	Before	After
Loans / month	1,000	1,300
Cost per loan	₹3,000	₹2,000
Revenue / loan	₹25,000	₹27,000

Current vs Proposed Solution -Overall Performance Comparison



Customer Journey Experience

Stage	Traditional	Agentic AI
Discovery	Static pages	Conversational
Eligibility	Forms	Guided chat
Verification	Manual	Automated
Approval	Delayed	Instant
Trust	Low	High

EY_FINVISION Private

Watch 0

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Go to file t Add file Code

Ashmit-A-Rawat Update README.md · 01f8041 · yesterday · 8 Commits

File / Commit	Message	Date
agents	salary slip upload fixed	yesterday
models	feat: Complete Tata Capital Agentic AI Loan Assistant	2 days ago
services	all cases except salary slip	yesterday
.gitignore	feat: Complete Tata Capital Agentic AI Loan Assistant	2 days ago
README.md	Update README.md	yesterday
app.py	salary slip upload fixed	yesterday
backend.py	all cases except salary slip	yesterday
requirements.txt	all cases except salary slip	yesterday
run.py	feat: Complete Tata Capital Agentic AI Loan Assistant	2 days ago

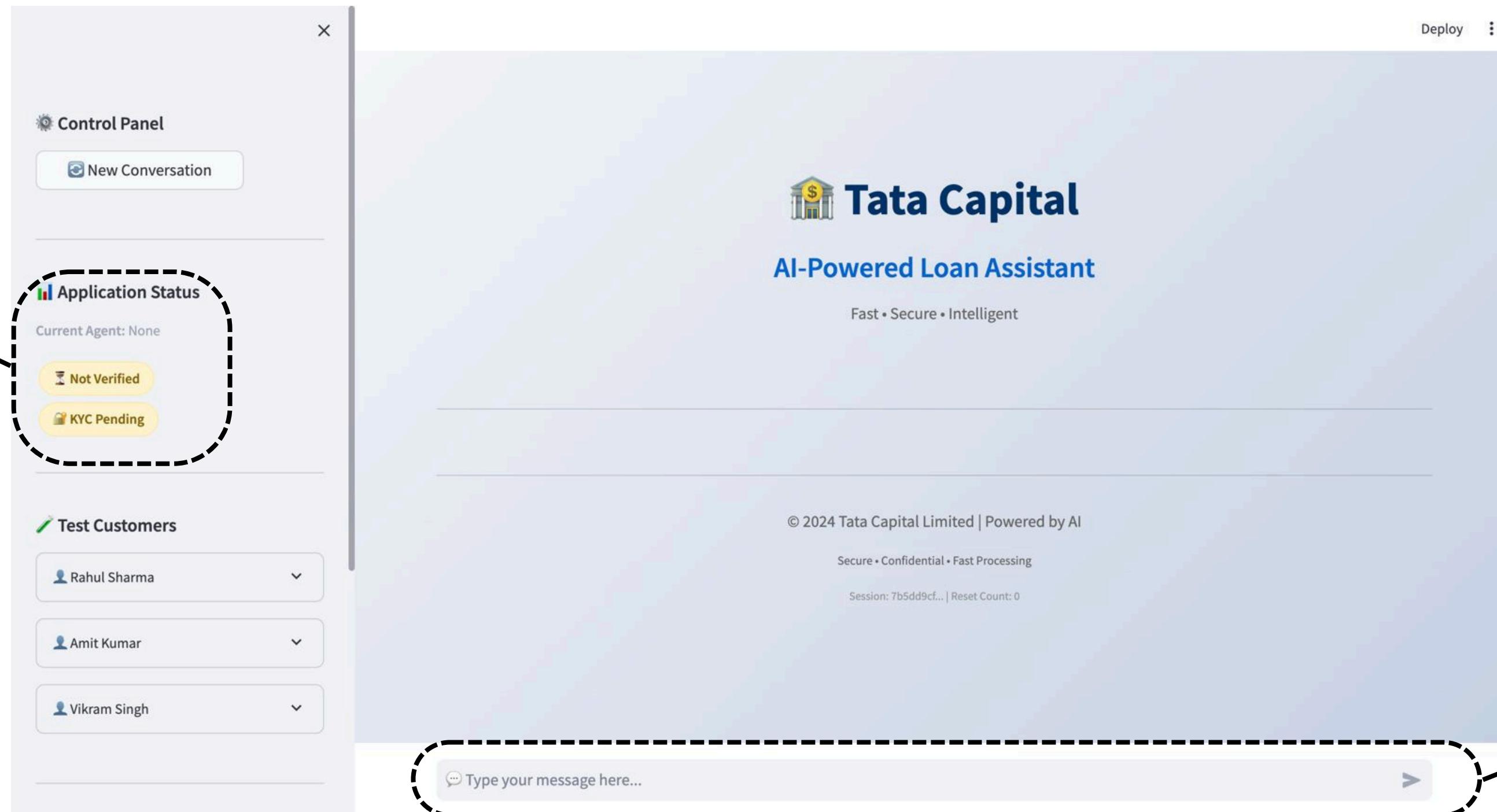
[GITHUB LINK](#)

✓ EY_BFSI_LOAN_ASSISTANT ⏺ C ⏻ ...

- > __pycache__
- ✗ agents
 - > __pycache__
 - ✗ __init__.py
 - ✗ master_agent.py
 - ✗ sales_agent.py
 - ✗ sanction_agent.py
 - ✗ underwriting_agent.py
 - ✗ verification_agent.py
- ✗ models
 - > __pycache__
 - ✗ __init__.py
 - ✗ schemas.py
- ✗ sanction_letters
 - ✗ sanction_20251217_193031.pdf
 - ✗ sanction_20251217_204613.pdf
 - ✗ sanction_20251217_204927.pdf
- ✗ services
 - > __pycache__
 - ✗ __init__.py
 - ✗ database.py
 - ✗ mock_apis.py
 - ✗ pdf_generator.py
 - ✗ .env
 - ✗ .gitignore
 - ✗ app.py
 - ✗ backend.py
 - ✗ README.md
 - ✗ requirements.txt
 - ✗ run.py

FINVISION

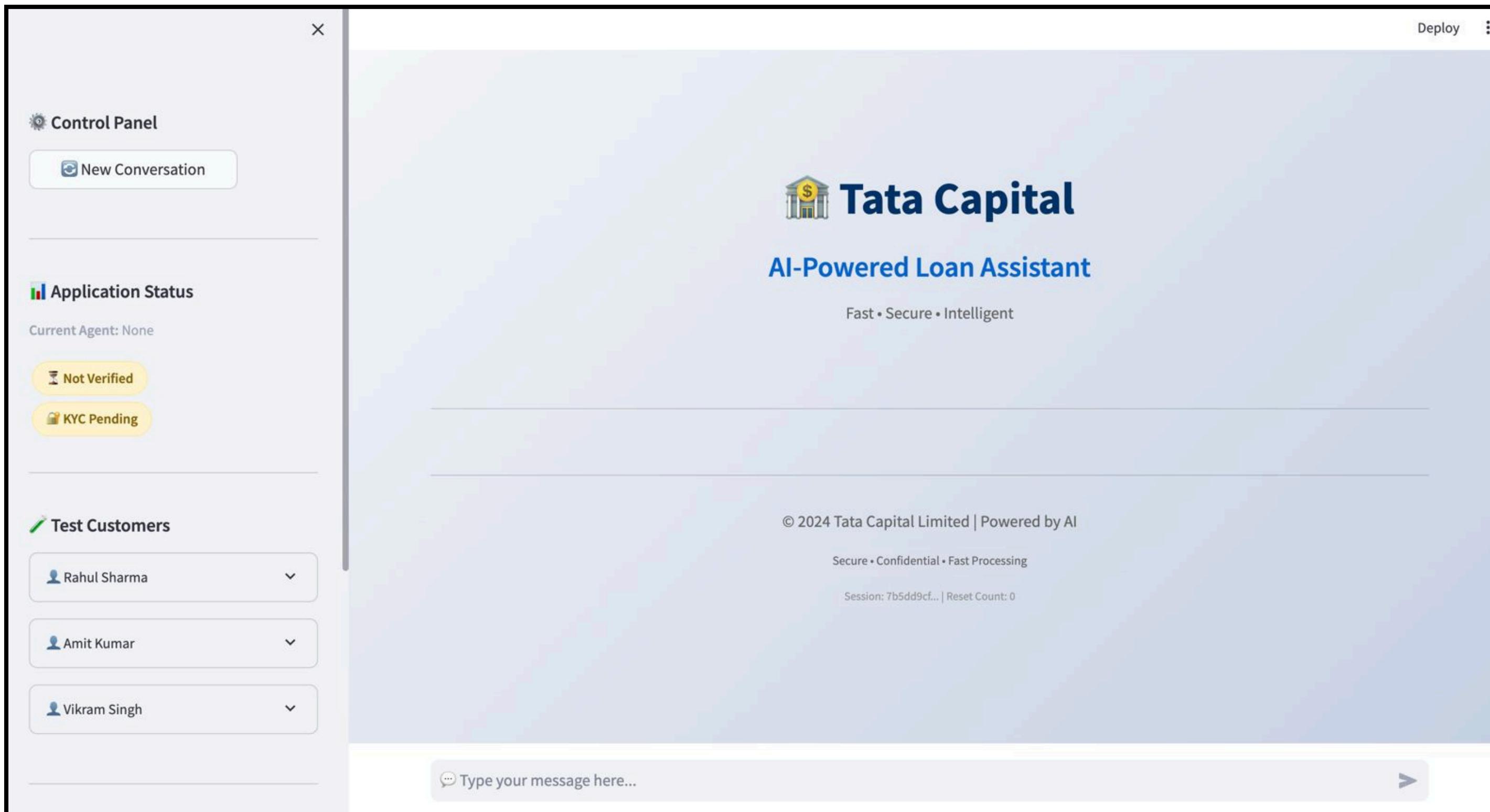
CURRENT
APPLICATION
STATUS



Agentic AI Powered Conversational Loan Origination System

[CLICK HERE FOR DEMO VIDEO](#)

TEAM FINVISION PRESENTS “THE AI LOAN ASSISTANT”



FRONTEND
BACKEND