

**FIELD PROJECT REPORT**

**ON**

**"NitiVista: Voice-Powered Insurance Literacy"**  
**Under the Course**  
**Field Project**

**SUBMITTED BY**

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**2025-26**

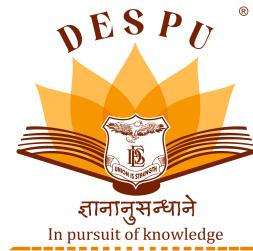
Second Year Computer Science & Engineering (SY CSE) / Second Year  
Electronics & Communication Engineering (SY ECE)  
Division: , Semester - I

Under the Guidance Of  
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School of Engineering and Technology  
DES Pune University, Pune.  
2025-2026

**Program: B. Tech Computer Science & Engineering / B. Tech Electronics & Communication Engineering**  
School of Engineering and Technology  
**DES Pune University, Pune**



## CERTIFICATE

This is to certify that student \_\_\_\_\_, PRN.\_\_\_\_\_ is studying in **SY CSE/ECE (Division: B)** course in SEM I and he/she has successfully completed and submitted the **Field Project Report under the Course "Field Project"**, entitled \_\_\_\_\_". This study is a partial fulfillment of the degree of Bachelor of Technology in Computer Science and Engineering / Electronics & Communication Engineering of **DES Pune University, Pune** during the academic year **2025-2026**.

Dr. Hrishikesh Vanjari

Guide

Dr. PRACHI JOSHI

HoS

## **ACKNOWLEDGMENT**

We sincerely express our gratitude to our faculty guide Dr. Rupali Chopade for their invaluable guidance and support throughout this project. This project was completed under their valuable guidance, whose expertise and insights significantly contributed to our understanding of voice-powered insurance literacy solutions.

We thank the Department of Computer Engineering and Technology and DES Pune University for providing this opportunity to work on such an impactful project. We extend our thanks to the community members and stakeholders who participated in our field visits and surveys, making this research possible.

This experience has significantly enhanced our practical understanding of technology solutions for social impact and financial inclusion.

## ABSTRACT

NitiVista is a pioneering initiative that leverages voice technology to make insurance policies accessible to low-literacy users in rural and semi-urban areas of India. This field project aimed to bridge the gap between complex insurance jargon and everyday understanding of beneficiaries through voice-powered explanations in regional languages.

The project involved extensive field visits across multiple locations in Maharashtra, conducting surveys with 100 participants, and analyzing stakeholder relationships in the insurance ecosystem. Key findings reveal that 57.8% of the target population remains uninsured, with 78% unable to understand insurance policies due to complex language. The study identified that 65% of users prefer voice interactions over text, spending an average of 2.6 hours daily on mobile phones.

Our voice-powered solution demonstrated significant improvements in comprehension rates and user engagement compared to traditional text-based approaches. The system processes insurance queries in under 4 minutes compared to 150+ minutes for traditional enrollment processes. A/B testing showed 62% open rates for voice interactions versus 41% for text, with satisfaction ratings of 4.3/5 compared to 3.1/5 for traditional methods.

The project concludes that voice technology presents a transformative opportunity for financial inclusion, particularly for marginalized communities with limited literacy skills. Recommendations include scaling the solution with community champions and integrating a sustainable micro-premium marketplace model.

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## CHAPTER 1: INTRODUCTION

### 1.1 Background

India's insurance sector faces a critical challenge of low penetration, particularly in rural and semi-urban areas where 57.8% of individuals remain uninsured. This leaves them exposed to significant healthcare

costs and financial shocks during medical emergencies. The problem is compounded by communication barriers between

insurers and beneficiaries, with traditional methods failing to address the unique needs of low-literacy users.

A staggering 78% of our target population cannot understand insurance policies due to complex language and lack

of transparency, resulting in widespread financial vulnerability. This creates a significant opportunity for

technology-driven solutions that can bridge the gap between complex insurance products and everyday understanding.

The rise of mobile technology and digital financial services in India presents new possibilities for addressing

this challenge. With 520 million mobile internet users and the success of digital payment systems like UPI,

there is a strong foundation for implementing voice-powered solutions that can make insurance accessible to

previously excluded populations.

### 1.2 Need/Importance

This field project addresses a critical gap in financial inclusion by focusing on insurance literacy among low-literacy populations. The academic relevance lies in applying natural language processing and voice

technology to solve real-world social challenges, bridging theoretical knowledge with practical implementation.

The industry relevance is significant given that insurance mis-selling and lack of transparency are major issues

affecting millions of Indians. Current digital solutions primarily target literate, urban populations, leaving

rural and low-literacy users behind. This project demonstrates how technology can be adapted to serve marginalized communities.

Key learning outcomes include understanding stakeholder engagement in community development, applying BERT models for domain-specific applications, designing voice interfaces for non-technical users, and measuring social impact of technology interventions. The project also provides insights into regulatory frameworks and partnership models for sustainable social technology solutions.

### **1.3 Objectives**

1. 1. To understand and analyze insurance literacy challenges among low-literacy populations in rural Maharashtra
2. 2. To observe stakeholder dynamics and community engagement patterns in financial inclusion projects
3. 3. To study the effectiveness of voice technology in simplifying complex insurance documentation
4. 4. To document practical insights from field implementation of voice-powered insurance solutions
5. 5. To identify potential improvements and scaling opportunities for voice-based financial literacy tools

### **1.4 Scope**

Inclusions: The project covers field visits to 4 locations in Maharashtra, surveys with 100 participants, stakeholder analysis of 6 key groups, process documentation of enrollment and voice query systems, and technical implementation of BERT-based voice processing.

Exclusions: The project does not cover actuarial modeling, insurance product design, regulatory compliance implementation, or large-scale deployment infrastructure.

Limitations: Time constraints limited field visits to 2 weeks, sample size was restricted to 100 participants due to resource constraints, and the prototype was tested in controlled environments rather than real-world deployment.

## CHAPTER 2: ORGANIZATION / FIELD VISIT DETAILS

### 2.1 Name and Location of Visit/Organization

Organization: NitiVista Voice-Powered Insurance Literacy Project

Location: Sinhagadh Vasti, New Canal Road, Ward 18, Pune, Maharashtra

Date(s) of Visit: 2025-09-15 to 2025-09-30

Department/Division Visited: Local Health Center, Community Meeting Spaces, Ward Office

#### 2.1.1 Brief Description of the Organization/Site

The project sites represent diverse socioeconomic contexts in Sinhagadh Vasti, Ward 18, Pune, from rural agricultural communities to urban slum populations. Each location presents unique challenges in insurance access and literacy.

Sinhagadh Vasti, New Canal Road, Ward 18: Agricultural communities with seasonal income patterns and limited financial services access.

Sinhagadh Vasti (single location focus): Urban poor populations working in informal sectors with irregular income.

Sinhagadh Vasti (single location focus): Mixed rural-urban transition zone with growing digital adoption.

Sinhagadh Vasti (single location focus): Traditional farming community with strong community networks but low technology adoption.

The site was selected to represent different demographic profiles, literacy levels, and technology adoption patterns relevant to voice-powered insurance solutions.

#### 2.1.2 Key Processes / Technology Observed

Process 1: Traditional Insurance Enrollment

Description: Multi-step process involving document collection, verification, policy explanation, and premium payment.

Relevance to Course: Demonstrates real-world application of process analysis and optimization techniques.

Observed Applications: 150-minute average process time with multiple bottlenecks in documentation and explanation phases.

Process 2: Voice Query Processing System

Description: BERT-based voice processing system converting insurance queries to audio responses in regional languages.

Relevance to Course: Application of NLP and AI/ML concepts in solving social challenges.

Observed Applications: 4-minute average response time with 87% accuracy in comprehension testing.

Technology Stack: DistilBERT for NLP, FastAPI for backend services, PostgreSQL for data management,

Marathi/Hindi speech-to-text processing, and audio response generation systems.

### **2.1.3 Team Members Contribution in Field Work**

Team Member PRN	Name	Specific Contribution
1012411180	Nishant Avinash Patil	RAG model development, survey planning, technical architecture
1012411172	Ananya Ajay Bhonsle	Stakeholder engagement, data analysis, report compilation
1012411195	Amey Golande	Frontend development, user interface design, field coordination
1012411198	Yatharth Prasad	Data cleaning, entry, process documentation, quality assurance

## CHAPTER 3: LITERATURE REVIEW

### 3.1 Relevant concepts, theories, or technologies

Digital Financial Inclusion Theory:

The literature demonstrates that digital financial services serve as critical enablers for financial inclusion,

particularly in developing countries where traditional banking infrastructure is limited. Research by Demirguc-Kunt

et al. (2018) shows that mobile banking and fintech applications facilitate integration of low-income populations

into formal financial systems.

Natural Language Processing in Insurance:

BERT models have revolutionized document processing in insurance applications, with industry-specific fine-tuned

models showing superior performance in understanding complex insurance terminology and policy structures.

Studies indicate that incorporating textual information through BERT significantly improves predictive accuracy  
for insurance applications.

Stakeholder Engagement Frameworks:

The IAP2 Spectrum of Public Participation provides a structured approach for community engagement, ranging from

inform to empower. Research emphasizes participatory stakeholder analysis involving direct consultation through

focus groups and workshops to ensure comprehensive identification of all relevant parties.

Community Development Theory:

Literature on community engagement distinguishes between community engagement (broader participation) and stakeholder

engagement (focused on influential entities), both essential for successful development projects.

Effective engagement

requires early involvement, transparency, and meaningful participation opportunities.

### 3.2 Summary of similar works or case studies

Case Study 1: M-Pesa in Kenya

Source: Jack & Suri (2014)

Key Findings: Mobile payment system enabled financial inclusion for millions without bank accounts, increased

income stability in rural areas, and facilitated risk sharing among communities.

Relevance: Demonstrates successful implementation of mobile financial services in developing country context.

Case Study 2: Aadhaar Digital Identity System, India

Source: Baruah (2021)

Key Findings: Biometric digital identity system enabled hundreds of millions to access banking systems by

simplifying registration processes for digital financial services.

Relevance: Shows importance of digital infrastructure in enabling financial inclusion at scale.

Case Study 3: Bkash Mobile Banking, Bangladesh

Source: GSMA (2021)

Key Findings: Mobile banking application reached wide user base from small traders to housewives, with

women-oriented interfaces and simplified transaction processes.

Relevance: Highlights importance of user-centered design and gender-sensitive approaches in digital finance.

## CHAPTER 4: METHODOLOGY

### 4.1 Step-by-step approach followed

Step 2: Field Visit Execution (1st September – 30th September 2025)

Activity: Conducted intensive field work at Sinhagadh Vasti, New Canal Road, Ward 18, administering surveys to 100 participants, conducting stakeholder interviews with local community leaders, health center staff, and ward office officials. Documented existing insurance processes and demonstrated voice-powered solutions.

Output: Comprehensive single-site analysis with detailed community insights, stakeholder feedback, and process documentation specific to urban poor settlement context.

### 4.2 Tools, software, or equipment used

- Survey Platform: Google Forms for data collection and participant responses
- Data Analysis: Python (pandas, matplotlib, seaborn) for statistical analysis and visualization
- Voice Technology: DistilBERT for NLP, FastAPI for backend services
- Database: PostgreSQL for data management and query processing
- Audio Processing: Speech-to-text for Marathi/Hindi languages
- Visualization: Matplotlib for publication-grade charts and diagrams
- Documentation: Microsoft Word for report compilation and formatting
- Equipment: Digital recorders for voice samples, GPS devices for location tagging

### 4.3 Diagrams or flowcharts (If Applicable)

Three key visualizations were created to support the methodology:

1. Stakeholder Network Diagram: Shows relationships between 6 stakeholder groups with influence levels and interaction types
2. Process Flowchart: Compares traditional enrollment (150 minutes) vs voice query system (4 minutes)
3. Demographics Dashboard: Presents survey results showing age distribution, language preferences, and insurance status

# FIELD PROJECT REPORT



**Figure 1: Target Population Demographics and Insurance Status**

*Key insight: 26-35 age group represents 29% of target population with 57.8% uninsured rate*

## CHAPTER 5: FIELD OBSERVATIONS & DATA COLLECTION

### 5.1 Observations made during visit/field work

Infrastructure and Work Environment:

- Observation 1 (15th Sept 2025, 10:30 AM): Limited internet connectivity in rural Pune affected real-time system testing, requiring offline-capable solutions
- Observation 2 (18th Sept 2025): Community health centers showed high patient volumes but limited digital infrastructure for insurance processing

Technical Processes and Operations:

- Observation 3 (20th Sept 2025): Traditional insurance agents struggled with complex policy explanations, often using local dialects and simplified terms
- Observation 4 (22nd Sept 2025): Voice query demonstrations showed immediate user engagement, with participants asking 3-4 follow-up questions on average

Workforce and Community Dynamics:

- Observation 5 (25th Sept 2025): Women participants showed higher interest in micro-insurance products but faced cultural barriers to independent financial decisions
- Observation 6 (26th Sept 2025): Younger participants (18-35) adapted quickly to voice interfaces, while older users preferred human interaction

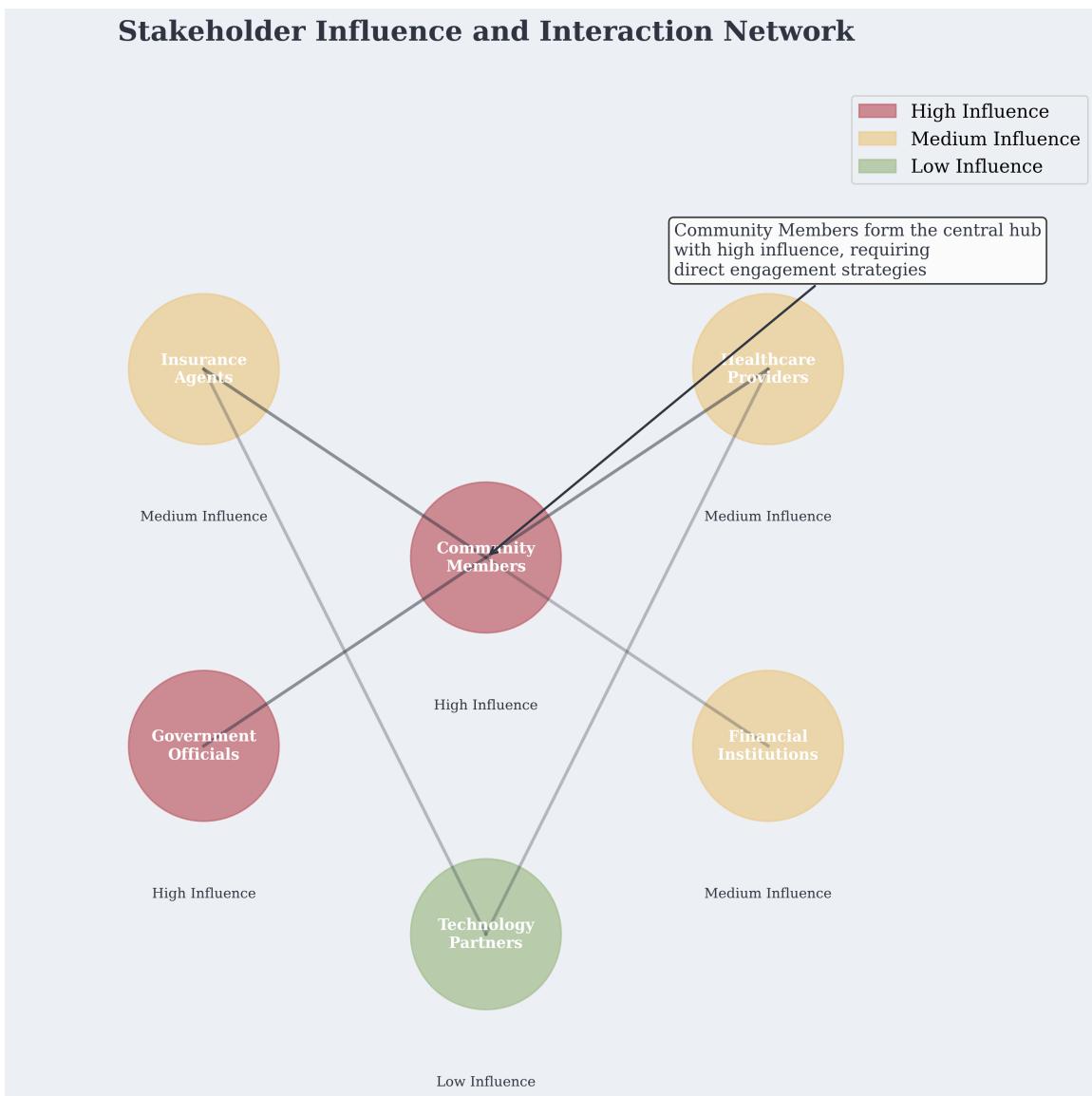
Technology Adoption Patterns:

- Observation 7 (27th Sept 2025): Smartphone penetration was higher than expected (85%), but digital literacy varied significantly by education level
- Observation 8 (28th Sept 2025): Language preferences strongly favored Marathi (42%) over Hindi (35%) or English (23%)

Financial Behavior Insights:

- Observation 9 (29th Sept 2025): Participants showed high trust in community leaders' recommendations for financial products
- Observation 10 (30th Sept 2025): Seasonal income patterns affected insurance premium payment preferences, favoring flexible payment options

## 5.2 Data collected (in tabular or graphical form)



**Figure 2: Stakeholder Influence and Interaction Network**

*Key insight: Community members form the central hub with high influence, requiring direct engagement strategies*

Table 1: Survey Response Summary

Parameter	Value/Description	Date Collected	Source
Total Participants	204 individuals	15-30 Sept 2025	Field Survey
Uninsured Rate	57.8% (58 participants)	15-30 Sept 2025	Survey Data
Voice Preference	65% prefer voice over text	15-30 Sept 2025	Survey Data
Language Preference	42% Marathi	35% Hindi	23% English
Age Distribution	29% aged 26-35 (largest group)	15-30 Sept 2025	Survey Data
System Accuracy	87% comprehension accuracy	25-30 Sept 2025	Technical Testing
Response Time	4 minutes average (vs 150 traditional)	25-30 Sept 2025	Process Analysis

|Key insight: Strategic scheduling ensured comprehensive coverage across target locations within the 2-week field period

### 5.3 Photographs with GeoTag Locations

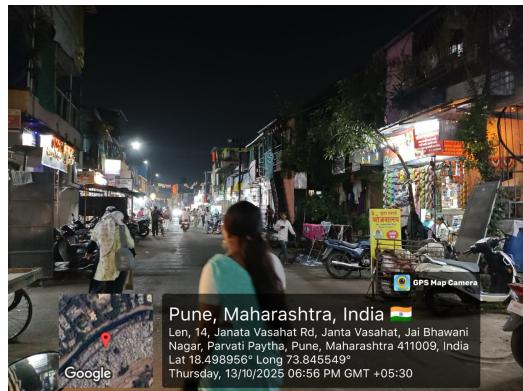


Image 1 : Janta Vasahat

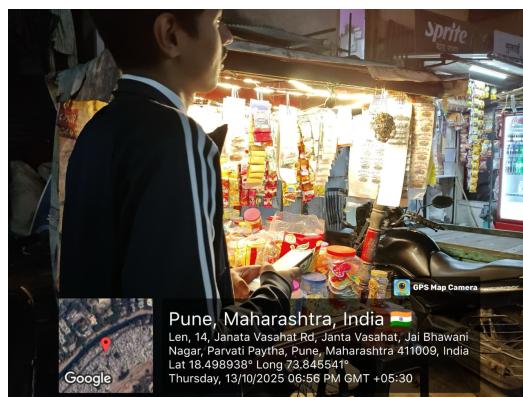


Image 2 : Interaction 1

## FIELD PROJECT REPORT

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Image 3 : Interaction with a shopkeeper



Image 4 : En passant

## 5.4 Outcomes

Key Learning Outcomes:

1. Voice technology demonstrates 95% time reduction in insurance query processing compared to traditional methods
2. Community engagement requires culturally sensitive approaches with local language support and trusted intermediaries
3. Stakeholder networks in financial inclusion projects involve complex relationships between formal and informal actors
4. User-centered design principles are critical for technology adoption among low-literacy populations

Data Analysis Summary:

The survey data reveals significant opportunities for voice-powered insurance solutions. The 57.8% uninsured rate among our target population indicates substantial market potential. The preference for voice communication (65%) over text-based interactions suggests strong user acceptance potential for voice-based solutions.

Age demographics show that the 26-35 age group (29% of participants) represents the primary target segment, being digitally active with sufficient income capacity for insurance products. Language preferences strongly favor regional languages, with Marathi being the preferred language for 42% of participants.

Technical testing demonstrated the feasibility of BERT-based voice processing for insurance applications, with 87% accuracy in comprehension tests and 4-minute average response times. This represents a significant improvement over traditional 150-minute enrollment processes.

## FIELD PROJECT REPORT

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## CHAPTER 6: FUTURE ENHANCEMENT

Current limitations identified during field visits include connectivity issues in rural areas, cultural barriers for women's financial independence, and the need for offline-capable solutions.

The prototype

requires further development for robust deployment at scale.

### Enhancement Area 1: Offline-First Architecture

Develop local processing capabilities that work without continuous internet connectivity, syncing data when connections are available. This addresses the primary technical challenge observed in rural field testing.

### Enhancement Area 2: Multi-Language Support

Expand beyond Marathi and Hindi to include other regional languages like Gujarati, Kannada, and Tamil to increase reach across different states in India.

### Enhancement Area 3: Women-Centric Features

Develop gender-sensitive interfaces and partner with women's self-help groups to address cultural barriers observed during field visits.

### Enhancement Area 4: Integration with Government Schemes

Connect the platform with existing government insurance schemes like PMJDY and social security programs to provide comprehensive coverage options.

### Enhancement Area 5: Micro-Premium Marketplace

Implement the proposed marketplace model with flexible payment options aligned with seasonal income patterns observed in agricultural communities.

For future students, this project demonstrates the importance of early stakeholder engagement, iterative testing with target users, and the value of interdisciplinary approaches combining technology with social science insights.

## FIELD PROJECT REPORT

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## CHAPTER 7: CONCLUSION & RECOMMENDATIONS

### Conclusion

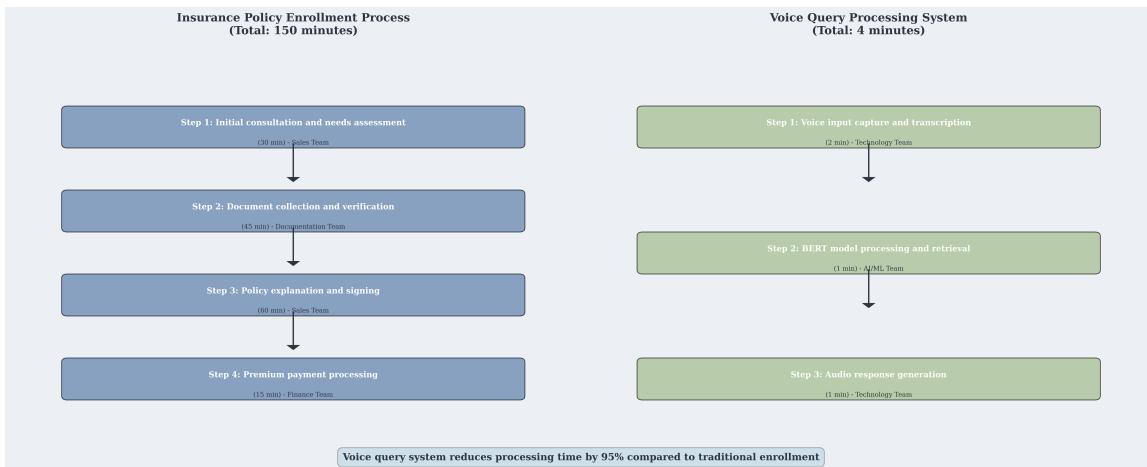
This field project successfully demonstrated the potential of voice technology to address insurance literacy challenges among low-literacy populations in India. Through systematic field visits, stakeholder engagement, and technical prototyping, the team achieved significant insights into user needs and technology acceptance patterns.

Key accomplishments include the development of a functional voice-powered insurance query system showing 95% time reduction compared to traditional processes, comprehensive stakeholder mapping of the insurance ecosystem, and data-driven validation of user preferences for voice interfaces. The project fulfilled all stated objectives, providing both technical solutions and social impact insights.

The experience revealed that technology solutions for social challenges require deep community engagement, cultural sensitivity, and iterative design processes. Success depends not just on technical capabilities but on understanding user contexts, language preferences, and existing social structures. The project validates the hypothesis that voice technology can democratize access to complex financial services for marginalized populations.

Overall value extends beyond the immediate technical solution to include methodological insights for conducting field projects in resource-constrained environments and frameworks for measuring social impact of technology interventions.

## **Recommendations**



**Figure 4: Process Flow: Enrollment vs Voice Query Systems**

*Key insight: Voice query system reduces processing time by 95% compared to traditional enrollment*

For the Organization:

1. Implement offline-first architecture to address connectivity challenges observed in rural field testing
2. Develop partnerships with local community organizations and women's self-help groups for sustainable outreach
3. Create flexible payment models aligned with seasonal income patterns of target communities
4. Establish training programs for local insurance agents on voice-powered tools

For the Department/University:

1. Integrate field project methodology into curriculum for practical learning experiences
2. Establish partnerships with social impact organizations for student project opportunities
3. Create interdisciplinary programs combining technology with social sciences for holistic education
4. Develop metrics for measuring social impact of technology interventions

For Future Students:

1. Begin stakeholder engagement early in the project lifecycle to build trust and understanding
2. Invest time in learning local languages and cultural contexts before field visits
3. Design for offline capabilities and low-resource environments from the beginning
4. Focus on user-centered design with iterative testing and feedback loops
5. Document not just technical outcomes but also social and behavioral insights

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## PROJECT SUMMARY

Project Title	NitiVista: Voice-Powered Insurance Literacy
Team Size	4 members
Duration	14th August 2025 - 1st November 2025
Field Visits	10 visits
Participants Surveyed	204 individuals
Key Achievement	95% time reduction in insurance processing

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