Excellence in Digital Innovation

Pulse of People Platform

Technical Proposal

Pulse of People - Political Intelligence Platform

Eight-Module Comprehensive Enhancement Specification

PROPOSAL DATE	VERSION	PROJECT CODE	VALID UNTIL
November 4, 2025	1.0	POP-TVK-2025	December 31, 2025

Executive Summary

This technical proposal outlines the development of eight specialized modules for the Pulse of People application, designed to provide comprehensive political intelligence, voter engagement tracking, sentiment analysis, voter persona creation, behavioral cue understanding, and real-time TV debate/news channel monitoring capabilities for the TVK party's electoral campaign strategy.

Timeline: 12 weeks (parallel development)

> ***Note:*** *To meet election timelines, all features will be developed in parallel by specialized teams, achieving delivery in 12 weeks instead of sequential 20-24 weeks. Individual feature timelines remain as specified.*

Features Overview

Feature 1

Facebook Comment & Reaction Analysis Module

8-10 weeks

Feature 2

Tamil Social Media Sentiment Analysis Engine

10-12 weeks

Feature 3

Booth Agent Management System

12-14 weeks

Feature 4

Political Intelligence Dashboard

10-12 weeks

Feature 5

Mobile Application Technical Stack & Backend Architecture

8-10 weeks

Feature 6

Voter Persona Creation & Behavioral Cue Analysis

10-12 weeks

Feature 7

TV Debate & News Channel Analysis System

8-10 weeks

Feature 8

Security, Compliance & Election Commission Guidelines

6-8 weeks

Feature 1: Facebook Comment & Reaction Analysis Module

Real-time ingestion and processing system for analyzing Facebook comments and reactions across TVK and opponent party pages. The module utilizes Facebook Graph API to stream comments, analyze reaction patterns (Like, Love, Haha, Wow, Sad, Angry), generate dynamic word clouds, track sentiment journeys, and identify viral content with demographic inference.

In Scope

- Facebook Graph API integration for real-time comment streaming
- Reaction pattern analysis with temporal tracking
- Automated word cloud generation (excluding TVK mentions when required)
- Sentiment journey tracking across time periods
- Viral content identification based on engagement velocity
- Hashtag tracking and trending topic analysis
- Voter persona clustering based on comment behavior
- Demographic inference from public profile data
- Multi-page monitoring (TVK and competitor pages)
- Engagement velocity metrics and anomaly detection

Out of Scope

- Direct integration with platforms other than Facebook initially
- Paid advertising campaign management
- Content creation or automated posting tools
- Personal message monitoring (privacy-compliant)
- Historical data beyond 90 days (API limitations)
- TV debate live-streaming infrastructure

Client Requirements

- Facebook Page Admin API permissions and tokens
- Approval for Graph API extended permissions (pages_read_engagement)
- List of competitor Facebook pages for monitoring
- Access to influencer database for validation
- Definition of custom keywords and hashtags to track
- Designated point of contact for alert notifications

Deliverables

- Comment streaming service with 99% uptime
- Web dashboard for comment analytics
- Mobile-responsive visualization interface
- API documentation for integration
- Admin panel for page management
- Weekly automated reports

Timeline

8-10 weeks

Feature 2: Tamil Social Media Sentiment Analysis Engine

Advanced Natural Language Processing (NLP) pipeline specifically designed for Tamil-English code-mixed social media text. Utilizes transformer-based models (XLM-RoBERTa, IndicBERT) and hybrid deep learning architectures for accurate sentiment classification, dialect identification, offensive language detection, and entity recognition in political discourse.

In Scope

- Preprocessing pipeline for Tamil-English code-mixed text
- Language detection and script identification (Tamil/English/Mixed)
- Transliteration engine (Tanglish to Tamil Unicode)
- Sentiment classification (Positive, Negative, Neutral, Mixed)
- Tamil dialect classification (Standard, Kongu, Madurai, Nellai, Chennai)
- Offensive language and hate speech detection
- Political entity recognition (parties, leaders, policies)
- Emotion detection (anger, joy, fear, surprise, sadness)
- Sarcasm detection module
- Custom domain-specific model training

Out of Scope

- Real-time streaming beyond Facebook (Twitter/X, Instagram initially excluded)
- Video content transcription and analysis
- Audio speech-to-text for TV debates (separate module required)
- Automated content generation or response suggestions
- Cross-lingual translation services

Client Requirements

- API access to Facebook, YouTube for data collection
- Annotated datasets for model training (minimum 10,000 labeled examples)
- Access to Tamil language experts for validation
- Definition of offensive language criteria and political entities
- GPU-enabled server for model training (or cloud credits)
- Feedback mechanism for continuous model improvement

Deliverables

- Tamil NLP model repository with versioning
- REST API for sentiment analysis (FastAPI)
- Batch processing scripts for historical data
- Model performance evaluation reports
- Integration documentation with code examples
- Training data annotation guidelines
- Model retraining scripts with instructions

Timeline

10-12 weeks

Feature 3: Booth Agent Management System

Comprehensive mobile application for 70,000+ booth agents enabling secure authentication, voter registration, daily engagement tracking, family relationship tagging, sentiment collection, GPS-verified booth location tracking, and offline-first data synchronization. The system provides real-time visibility into ground-level campaign activities across all constituencies.

In Scope

- Cross-platform mobile app (Android & iOS) using React Native
- OTP-based secure authentication system
- Voter registration form with photo capture
- Daily engagement tracking (meetings, calls, events)
- Family relationship tagging and genealogy mapping
- Sentiment collection with predefined categories
- GPS location verification with geofencing
- Offline-first architecture with background sync
- Booth-level activity dashboard
- Agent performance analytics
- Push notifications for tasks and alerts
- Multi-language support (Tamil, English)

Out of Scope

- Direct integration with Election Commission of India (ECI) electoral rolls
- Voter ID verification through government APIs (not publicly available)
- Biometric authentication (fingerprint/face recognition)
- In-app messaging or communication between agents
- Hardware device provisioning for agents

SIM card or data plan management

Client Requirements

- Access to existing voter roll data (from ECI or party sources)
- Designated field coordinators for agent onboarding
- Booth boundary definitions with GPS coordinates
- Agent database with phone numbers for OTP
- Target definitions for daily engagement metrics
- Server infrastructure for app backend (or cloud hosting approval)
- Google Play and Apple App Store developer accounts

Deliverables

- Android and iOS mobile applications
- Admin web portal (React + Next.js)
- Backend API with documentation
- Database schema and migration scripts
- User manuals for agents and supervisors
- Training videos (Tamil and English)
- Analytics dashboard for campaign managers

Timeline

12-14 weeks

Feature 4: Political Intelligence Dashboard

Unified analytics interface consolidating data from social media intelligence, booth-level field activities, sentiment trends, and election simulation models. The dashboard provides real-time visualization of campaign performance, swing voter analysis, constituency-level heatmaps, and predictive modeling for strategic decision-making.

In Scope

- Real-time data visualization dashboard (web-based)
- Multi-source data aggregation (social media, booth agents, surveys)
- Booth activity heatmaps with geographic visualization
- Sentiment trend analysis with time-series charts
- Campaign message effectiveness tracking
- Swing voter identification and targeting
- Election simulation module with scenario analysis
- Constituency-level performance metrics
- Influencer impact analysis
- Custom report generation with filters
- Role-based access control for different user levels
- Export functionality (PDF, Excel, PowerPoint)

Out of Scope

- Predictive modeling beyond assembly constituency level
- Integration with external polling agencies
- Automated campaign strategy recommendations
- Direct voter communication tools
- Offline desktop application (web-only)

Client Requirements

- Continuous data feeds from Features 1-3
- Access to historical election data for modeling
- Definition of key performance indicators (KPIs)
- User roles and access levels definition
- Feedback loop for model tuning and validation
- Designated analysts for dashboard training
- Secure hosting environment with backup

Deliverables

- Political intelligence web dashboard
- User management and permission system
- Custom report builder
- Election simulation module
- API documentation for data integration
- Training materials and user guides
- Performance optimization for large datasets

Timeline

10-12 weeks

Feature 5: Mobile Application Technical Stack & Backend Architecture

Comprehensive technical infrastructure for the Pulse of People ecosystem, including React Native mobile application with offline-first capabilities, state management, Tamil language support, and robust backend architecture using Supabase, Node.js REST APIs, Python microservices for NLP processing, and scalable database design with security best practices.

In Scope

- Cross-platform mobile app architecture (React Native)
- Offline-first data synchronization strategy
- Redux/Zustand state management implementation
- Tamil Unicode font rendering and i18n support
- RESTful API design and development (Node.js)
- Python microservices for NLP pipeline integration
- PostgreSQL database schema design with indexing
- Redis caching layer for performance optimization
- File storage for images and documents (S3/Supabase Storage)
- Background job processing (Bull/BullMQ)
- API rate limiting and authentication middleware
- Logging and monitoring infrastructure
- CI/CD pipeline setup (GitHub Actions)

Out of Scope

- End-user mobile device management (MDM)
- Hardware procurement or device distribution
- Telecom partnerships for data connectivity
- Custom firmware or OS modifications
- On-premise server infrastructure (cloud-only)

Client Requirements

- Access to Tamil language resources (fonts, dictionaries, translation APIs)
- Backend hosting environment selection (AWS, GCP, Azure, or Supabase)
- SSL certificates and domain configuration
- Third-party service API keys (SMS, maps, storage)
- Git repository access for development team
- Staging environment for testing
- Production deployment approvals and timelines

Deliverables

- Mobile app codebase with documentation
- Backend API services with endpoints
- Python NLP microservices
- Database schema and ER diagrams
- API documentation (Swagger UI)
- Development setup guide
- CI/CD pipeline configuration
- Infrastructure as Code (IaC) scripts
- Performance optimization report

Timeline

8-10 weeks (parallel with Features 1-4)

Feature 6: Voter Persona Creation & Behavioral Cue Analysis

Advanced machine learning system for creating actionable voter personas through psychographic segmentation, behavioral pattern analysis, and emotional cue detection. This module transforms raw voter data into strategic intelligence by identifying distinct voter segments, predicting behavior, and enabling personalized micro-targeting of campaign messages based on personality traits, values, communication preferences, and persuasion susceptibility.

In Scope

- Multi-source data aggregation (social media, surveys, voting history, behavioral data)
- Machine learning clustering algorithms (K-Means, hierarchical, random forest)
- Psychographic profiling with Big Five personality trait analysis
- Behavioral cue detection (emotional states, linguistic patterns, engagement timing)
- Persona profile development with demographic and psychographic attributes
- Emotional cue tracking (anger, fear, hope, disgust detection)
- Persuasion scoring and swing voter identification
- Communication preference mapping (channel, tone, timing)
- Real-time persona dashboard with interactive visualizations
- Persona-based audience segmentation for ad targeting
- Predictive scoring (turnout propensity, donation likelihood, volunteer potential)
- Dynamic persona updating based on behavioral changes

Out of Scope

- Personal data collection beyond publicly available information
- Direct integration with third-party commercial data providers initially
- Biometric or genetic personality assessment
- Psychological counseling or therapeutic applications
- Real-time video emotion detection from rallies/events
- Cross-border voter profiling

Client Requirements

- Annotated survey data with personality and issue preference labels (minimum 5,000 voters)
- Access to social media behavioral data from Features 1-2
- Historical voting patterns and turnout data by booth
- Definition of target personas and priority voter segments
- Access to Tamil language experts for cue validation
- GPU-enabled infrastructure for ML model training
- Feedback mechanism for continuous persona refinement
- Privacy compliance approval for behavioral tracking

Deliverables

- Voter persona library with 8-12 distinct segments
- ML-powered clustering and classification models
- Behavioral cue detection engine (emotion, language, timing)
- Interactive persona dashboard with drill-down capabilities
- Persona comparison matrix and geo-mapping visualization
- Persuasion scoring API for voter prioritization
- Audience export functionality for Facebook/Google Ads
- Persona migration tracking and trend analysis reports
- Personalized messaging recommendation engine
- Training materials on persona-based campaign strategy

Timeline

10-12 weeks

Feature 7: TV Debate & News Channel Analysis System

Real-time audio capture, transcription, and sentiment analysis system for Tamil TV news channels and political debates streamed on YouTube Live. This module provides automated speech-to-text conversion, entity-based sentiment tracking, keyword alerting, reputation monitoring, automatic translation, and daily summary generation for comprehensive media intelligence across all major news channels.

In Scope

- Live audio stream capture from YouTube Live channels (5+ channels)
- Real-time speech-to-text transcription (Tamil + English code-switching)
- Multi-engine STT pipeline (Whisper local + Google/AWS fallback)
- Political entity recognition and sentiment scoring per mention
- Custom keyword/phrase alerting with real-time notifications
- Reputation dashboard with sentiment trends and mention volume
- Automatic Tamil-to-English translation of transcripts
- Daily summary generation per political party (3-5 line insights)
- Transcript searchability with timestamps and metadata
- Party-wise sentiment aggregation (daily/weekly trends)
- Alert webhook integration for critical mentions
- Web dashboard with authentication and role-based access

Out of Scope

- Recording or storing full video content
- Transcription of archived (non-live) media content
- Deep learning-based video analysis or visual content detection
- Real-time SMS/push notification integration
- Deepfake detection or source reliability scoring

Integration with third-party campaign management software

Manual transcript editing or human moderation services

Client Requirements

- List of YouTube Live channel URLs to monitor
- API keys for Google Speech-to-Text or AWS Transcribe (fallback)
- Google Translate API key for Tamil-English translation
- Finalized list of political parties, leaders, and aliases for entity recognition
- Keyword lists and party-event mappings for alerting
- Webhook endpoints for real-time alerts (Slack, email, etc.)
- Hosting environment with GPU support for Whisper model
- Preferences for translation timing (real-time vs batch)

Deliverables

- Live audio capture pipeline using yt-dlp and ffmpeg
- Multi-engine STT system with confidence-based fallback
- Named entity recognition module for political parties and leaders
- Sentence-level sentiment classification engine
- Real-time alerting system with configurable triggers
- Reputation monitoring dashboard with charts and visualizations
- Tamil-English translation API with caching
- Daily automated summary generator per party
- Searchable transcript database with full-text search
- Admin UI for managing alert rules and channel configuration
- API documentation for external integrations

Timeline

8-10 weeks

Feature 8: Security, Compliance & Election Commission Guidelines

Comprehensive implementation of data protection measures aligned with India's Digital Personal Data Protection Act (DPDP) 2023, privacy-aware data handling, role-based access control (RBAC), election expenditure tracking, and compliance with Election Commission of India guidelines for digital campaigning and voter data management.

In Scope

- Data encryption at rest and in transit (AES-256, TLS 1.3)
- Consent management system for voter data collection
- Data anonymization and pseudonymization techniques
- Role-based access control (RBAC) with audit logs
- Activity logging for all data access and modifications
- Election expenditure tracking and reporting
- Secure API authentication (OAuth 2.0, JWT)
- Regular security audits and penetration testing
- Data retention and deletion policies
- Incident response plan and breach notification procedures
- Compliance documentation and policy templates
- GDPR-style data subject rights (access, rectification, erasure)

Out of Scope

- Legal advisory services or compliance certification
- Cybersecurity insurance procurement
- External security audits (client-arranged)
- Physical security for office premises
- Background verification of personnel
- Ongoing legal monitoring for regulatory changes

Client Requirements

- Access to Election Commission of India guidelines and updates
- Legal team consultation for compliance validation
- Data storage infrastructure location (India-based servers required)
- Designated Data Protection Officer (DPO) contact
- Incident response team formation
- Regular security review meetings
- Compliance with IT Act 2000 and DPDP Act 2023

Deliverables

- Data Protection Impact Assessment (DPIA) report
- Privacy policy and terms of service documents
- Consent management system (web and mobile)
- RBAC implementation with user roles
- Audit log system with reporting
- Security best practices guide
- Incident response plan document
- Election expenditure tracking module
- Compliance checklist for ECI guidelines
- Data retention and deletion policy

Timeline

6-8 weeks (parallel with all features)

Features Summary

Feature	Timeline
Facebook Comment & Reaction Analysis Module	8-10 weeks
Tamil Social Media Sentiment Analysis Engine	10-12 weeks
Booth Agent Management System	12-14 weeks
Political Intelligence Dashboard	10-12 weeks
Mobile Application Technical Stack & Backend Architecture	8-10 weeks
Voter Persona Creation & Behavioral Cue Analysis	10-12 weeks
TV Debate & News Channel Analysis System	8-10 weeks
Security, Compliance & Election Commission Guidelines	6-8 weeks
Total (Parallel Development)	**12 weeks**

Accelerated Delivery: 12-Week Parallel Development Plan

To meet critical election timelines, DRM Hope Software will deploy multiple specialized teams working in parallel, compressing the total delivery time from 20-24 weeks to 12 weeks without compromising quality.

Development Phases:

- **Weeks 1-8:** Core data collection modules (Features 1-3) + Backend infrastructure (Feature 5)
- **Weeks 4-10:** Dashboard (Feature 4) + Voter persona system (Feature 6)
- **Weeks 6-12:** TV/news analysis (Feature 7) + Security implementation (Feature 8)
- **Weeks 10-12:** Integration testing, optimization, UAT, and deployment

> *This approach requires coordinated project management but ensures all modules are delivered within 12 weeks, providing 4-5 months for campaign utilization before elections.*

Terms and Conditions

Acceptance Criteria: Each feature will be considered complete upon successful user acceptance testing (UAT) by client-designated personnel.

Change Requests: Any scope changes beyond defined features will be quoted separately and may affect timeline and cost.

Client Responsibilities: Timely provision of required data, API access, feedback, and decision-making is critical for project success.

Intellectual Property: All custom code and models developed will be owned by the client upon final payment. Third-party libraries remain under their respective licenses.

Data Security: DRM Hope Software will implement industry-standard security measures but cannot guarantee against all breaches. Client is responsible for compliance with election laws.

Warranty: 90-day warranty for bug fixes post-deployment. Feature enhancements and ongoing support available under separate AMC.

Force Majeure: Delays due to API changes, regulatory restrictions, or client-side dependencies will not be attributable to DRM Hope Software.

Proposed By:

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DOCUMENT INFORMATION

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