FAMILY MEMBER COMMUNITY REGISTRATION SYSTEM

PROJECT PROPOSAL (UPDATED – LATEST REQUIREMENTS)

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1. Executive Summary

The objective of this project is to design and develop a **secure, scalable, bilingual (English + Telugu) Community Member Registration & Verification System**.

The platform enables community members to:

- Verify themselves using **Mobile OTP or Email verification**
- Submit detailed registration information
- Download a **PDF copy of submitted details**
- Receive a **Membership ID upon admin approval**

The system is designed to handle **5,000 – 8,000 users**, with a strong focus on **data accuracy, security, operational reliability, and low maintenance cost**.

This document outlines the **project scope, technical architecture, deployment approach, cost estimation, and deliverables**.

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2. Project Scope

2.1 User Module

- Initial verification using **ONE method**:
  - Mobile Number + OTP (via **MSG91**)
  - Email ID + OTP / Verification link (via **Brevo**)
- Registration form available **only after successful verification**
- Full registration form with:
  - Personal details
  - Community details (Gothram – free text)
  - Address details
  - Education & occupation
  - Reference details

- **English + Telugu** language support with toggle

- Upload passport-size photo (Max 5 MB)

- **Auto-generated PDF download** after form submission

- Duplicate prevention (Mobile / Email based)

- Submission goes to **Admin approval queue**

- After approval:

    o User receives **Approval Message with Membership ID**

    o Message sent via **SMS or Email** based on verification method

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2.2 Admin Module

- Secure admin login

- Dashboard to view all pending registrations

- View complete user profile + uploaded photo

- Approve / Hold / Reject registrations

- On approval:

    o Auto-generate **Community Membership ID**

    o Move record from pending to verified database

    o Send approval message (SMS / Email)

- Filters and search by:

    o Gothram

    o Mandal

    o City

    o District

    o State

    o Surname

- Export and backup member records

- Admin activity & audit logs

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3. Technology Stack

Frontend

- **Lovable Platform**

- React / Next.js (auto-generated)

- English & Telugu multilingual UI

- Mobile and desktop responsive design

Backend

- **Python – FastAPI**

- REST APIs for:

    - Mobile OTP verification

    - Email verification

    - Registration submission

    - PDF generation

    - Admin approval workflow

    - Membership ID generation

Database

- **PostgreSQL**

- Optimized for 10,000+ records

- Core tables:

    - users_pending

    - users_verified

    - admin_users

    - audit_logs

File Storage

- Cloud Storage (Cloudflare R2 / Firebase Storage / Google Drive API)

- Only file **URL stored in database**

- Max file size: **5 MB**

Email Service

- **Brevo (Sendinblue)**

- Used for:

    - Email OTP / verification

    - Approval notifications (email users)

SMS Service

- **MSG91**

- Used for:
  - Mobile OTP
  - Approval notifications (mobile users)
- DLT-compliant delivery

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4. System Architecture

Frontend (Lovable UI)
→ **FastAPI Backend**
→ **PostgreSQL Database**
→ **Cloud Storage (Images + PDFs)**
→ **Admin Dashboard**

Key Characteristics

- Scalable architecture
- Secure API communication
- Low maintenance
- Optimized queries with indexing
- Clear separation of frontend & backend

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5. Performance & Security

Performance

- PostgreSQL indexing for fast search & filtering
- Server-side image compression
- Caching of frequently accessed data
- OTP rate limiting

Security

- OTP-based authentication (Mobile / Email)
- Encrypted storage for sensitive fields
- Role-based admin access
- Duplicate validation logic
- API throttling & CSRF protection

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6. Deployment & Hosting Plan

Backend Hosting

Provider	Approx. Monthly Cost
Railway	₹300 – ₹500
Render	₹400 – ₹600
DigitalOcean	₹600 – ₹800
AWS Lightsail	₹400 – ₹600
PythonAnywhere	₹200 – ₹400

Frontend Hosting

Provider	Cost
Vercel	Free
Netlify	Free

Database Hosting

Provider	Cost / Month
Neon	₹400 – ₹600
Supabase	₹500 – ₹700
Railway PostgreSQL	₹400 – ₹600

Image & PDF Storage

Provider	Cost / Month
Cloudflare R2	₹150 – ₹200
Firebase Storage	₹200 – ₹300

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7. Messaging Cost Estimation

SMS (MSG91)

- OTP + Approval messages

- ₹0.18 – ₹0.25 per SMS

For 8,000 users:

- OTP SMS ≈ ₹1,600

- Approval SMS ≈ ₹1,600
  Total SMS Cost: ~₹3,200 (one-time)

Email (Brevo)

- Free tier + low-cost plans

- Suitable for OTP & approval emails

- Minimal additional cost

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8. Estimated Monthly Maintenance Cost

Component	Estimated Cost
Backend Hosting	₹300 – ₹600
Database Hosting	₹400 – ₹500
Storage	₹100 – ₹200
SMS & Email Usage	₹200 – ₹400
Total Estimated Monthly Cost	**₹500 – ₹1,000**

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9. Development Phases (Execution Flow)

1. Backend API development (FastAPI)

2. Database schema setup

3. Mobile OTP & Email verification integration

4. Admin workflow implementation

5. PDF generation module

6. Frontend development using Lovable

7. Frontend ↔ Backend integration

8. Testing (functional & load)

9. Deployment & production setup

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10. Final Deliverables

- Fully deployed web application

- English + Telugu user interface

- Mobile & Email verification system

- Admin dashboard with approval workflow

- Auto-PDF generation on submission

- Membership ID generation

- Secure FastAPI backend

- PostgreSQL database with indexing

- Cloud storage integration

- Technical & admin documentation

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11. Risks & Mitigation

Risk	Mitigation
High OTP usage	Rate limiting & retry control
Duplicate registrations	Backend validation
Storage growth	File size limits & cleanup
Server load	Scalable hosting
Incorrect entries	Manual admin verification

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12. Assumptions

- Client provides MSG91 DLT credentials

- Client approves SMS & Email templates

- English & Telugu content finalized by client

- OTP supported for Indian mobile numbers

- Email verification allowed for foreign users

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13. Conclusion

This proposal presents a **robust, secure, and scalable Community Registration System** designed to handle **up to 10,000 members** with minimal maintenance.

By using **FastAPI, PostgreSQL, Lovable, Brevo, and MSG91**, the solution ensures:

- Reliable verification

- Low operating cost

- Secure data handling

- Smooth admin-controlled enrollment process