

THE UNLOCKING SOCIETAL TRENDS IN AADHAAR ENROLMENT AND UPDATES

Data-Driven Innovation for Secure and Inclusive Digital Identity

Team Details

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PROPOSED SOLUTION FRAMEWORK FOR AADHAAR ENROLMENT & UPDATE OPTIMIZATION

Dynamic Aadhaar–SIM Linking

Automatically transfers Aadhaar–SIM linkage when a mobile number is recycled, preventing outdated mappings and reducing identity misuse.

Intelligent Duplicate & Fraud Detection

Automatic validation during enrolment using key attributes (Name, Father’s Name, DOB) to identify and prevent fraudulent records, enhancing data integrity.

Remote Aadhaar Photo Update

Allows photo updates via mobile with 3D face verification and liveness detection. Periodic updates are required, with penalties for non-compliance.

Mobile Biometric Update

Enables users to update 10-finger fingerprints every 3 years using phone sensors, with AI quality checks and UIDAI-compliant security

DATASET USED

Dataset Used Aadhaar Enrolment and Update Dataset (UIDAI), Year 2025,Daily Records

- **Geographic:** State, District, Pincode
- **Date-related:** Date, Year, Month
- **Enrolment:** Total, Age groups (0-5, 5-17, 18+)
- **Updates:** Biometric & Demographic for 5-17, 17+

Only UIDAI-provided Aadhaar datasets were used; no external data sources.

METHODOLOGY

Data Cleaning Standardized names, removed special characters, handled duplicates via aggregation,and validated missing values.

Data Preprocessing Standardized date formats, extracted year/month, created total enrolment metrics, and consolidated age groups.

Data Validation Cross-dataset consistency checks for geographic fields, verified non-negative values, and removed invalid records.

Transformation & Aggregation

Aggregated data by state, district, month, year, and age group for trend analysis.

Analysis-Ready Output Final clean analytical tables prepared for visualization and statistical analysis.

TECHNICAL APPROACH

DYNAMIC AADHAAR–SIM LINKING

Event-driven architecture triggered by SIM recycle events from telecom operators, integrating securely with UIDAI authentication services. Automates unlinking old Aadhaar and relinking new post OTP/biometric verification, ensuring real-time identity accuracy and preventing legacy SIM misuse.

INTELLIGENT DUPLICATE & FRAUD DETECTION AT ENROLLMENT

AI-based pre-ingestion validation layer employing fuzzy matching on Name, Parent Name, and Date of Birth, combined with phonetic matching and similarity scoring. High-risk records are flagged before Aadhaar creation, thereby ensuring data integrity.

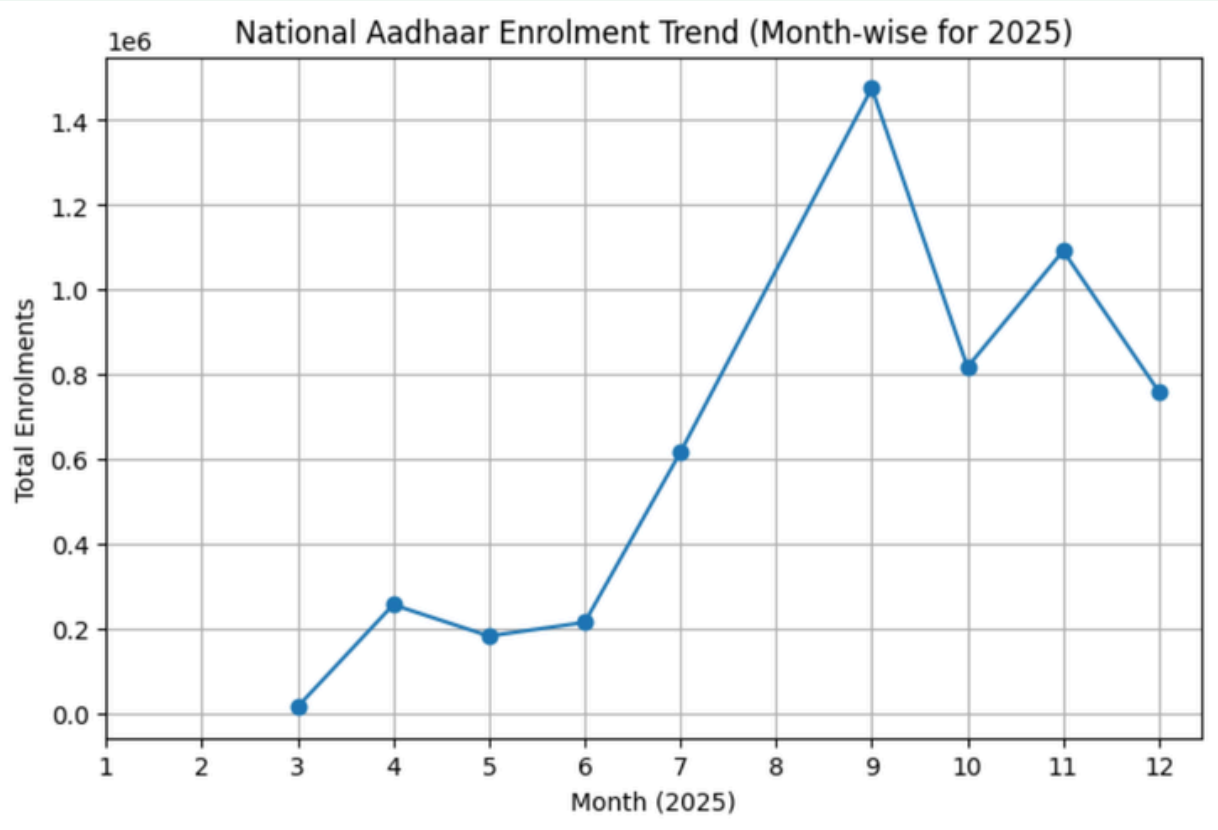
REMOTE AADHAAR PHOTO UPDATE (3D FACE VERIFICATION)

Mobile-based photo capture utilising 3D facial mapping and liveness detection through blink, head movement, and time-based capture. Ensures encrypted transmission and UIDAI-compliant verification, with periodic update enforcement aligned with policy controls.

MOBILE BIOMETRIC FINGERPRINT UPDATE (ONCE IN 3 YEARS)

Smartphone fingerprint sensor-based capture of all 10 fingers, featuring AI-driven quality assessment and liveness detection. Processes data via a secure enclave with UIDAI-compliant encryption, improving accessibility while maintaining biometric

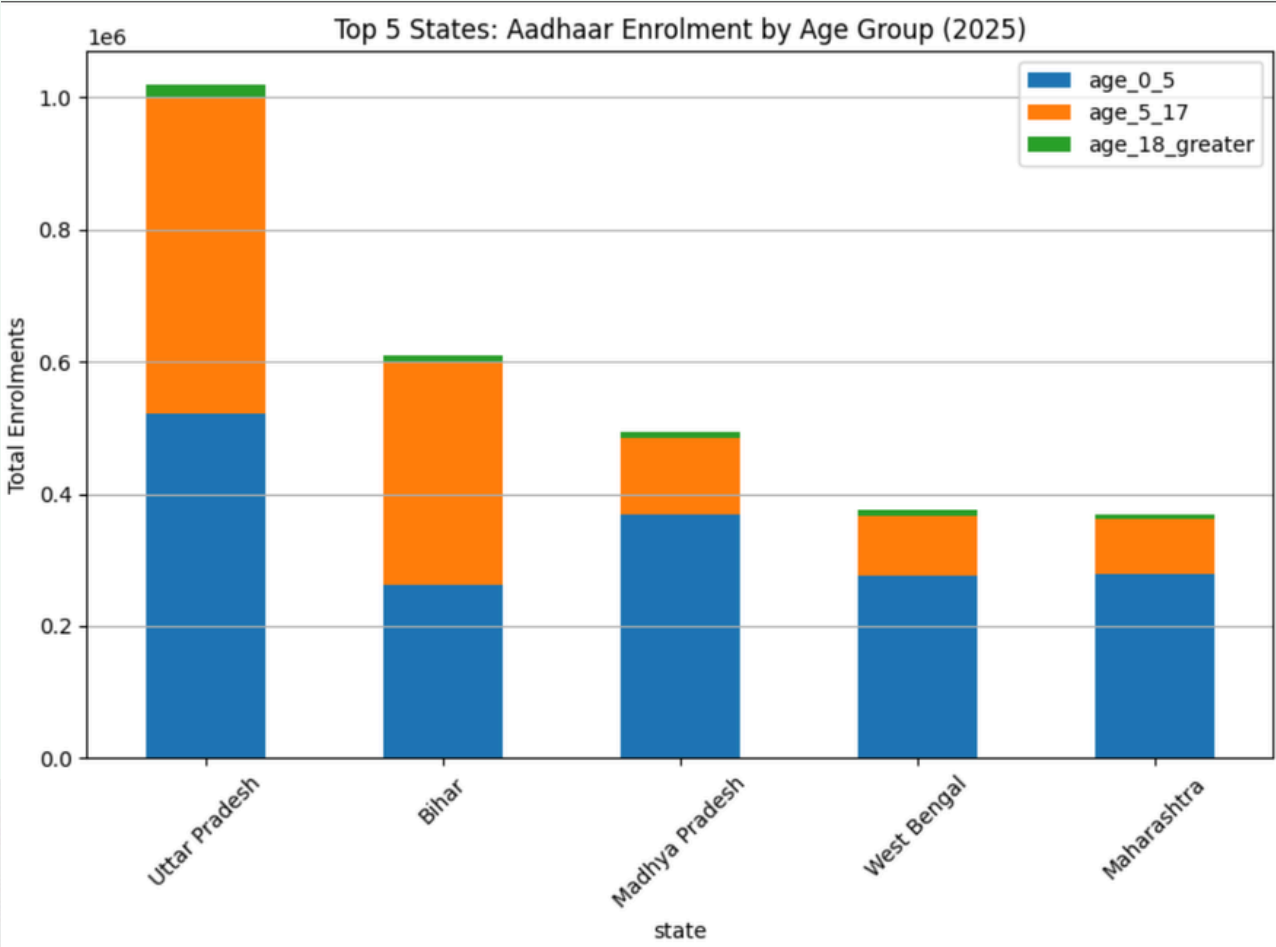
ANALYZING UIDAI AADHAAR DATA: UNLOCKING KEY INSIGHTS



UNIVARIATE ANALYSIS

BIVARIATE ANALYSIS

	biometric	enrolment	ratio
district			
serchhip	7312	102	71.686275
mamit	10241	171	59.888889
wardha	99008	1953	50.695341
gadchiroli	111394	2374	46.922494
mansa	50238	1124	44.695730
bhandara	83475	1903	43.864950
imphal east	48528	1132	42.869258
ratnagiri	109311	2603	41.994237
thoubal	44526	1067	41.730084
north and middle andaman	5382	132	40.772727



TRIVARIATE ANALYSIS

THANK YOU

