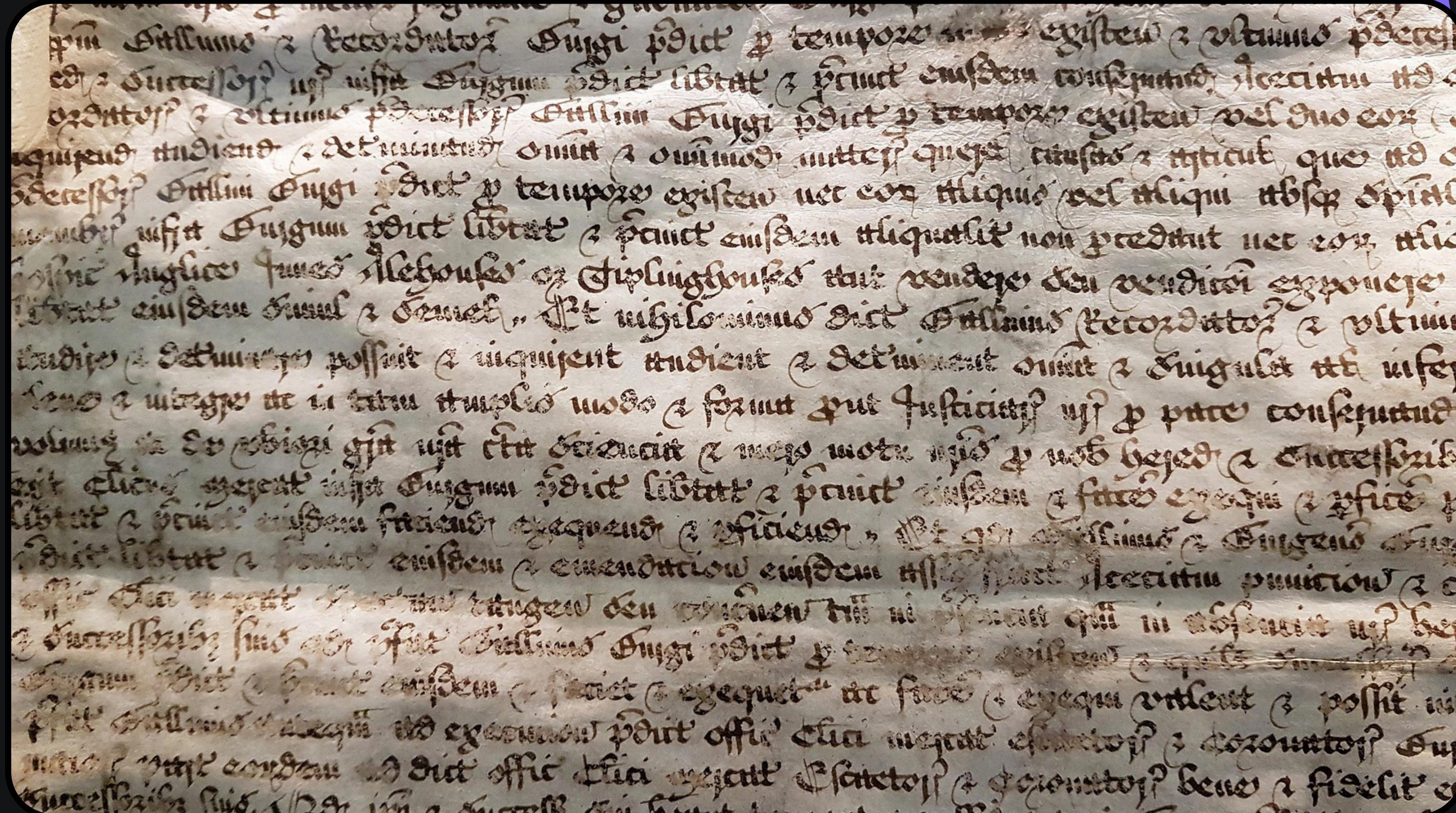


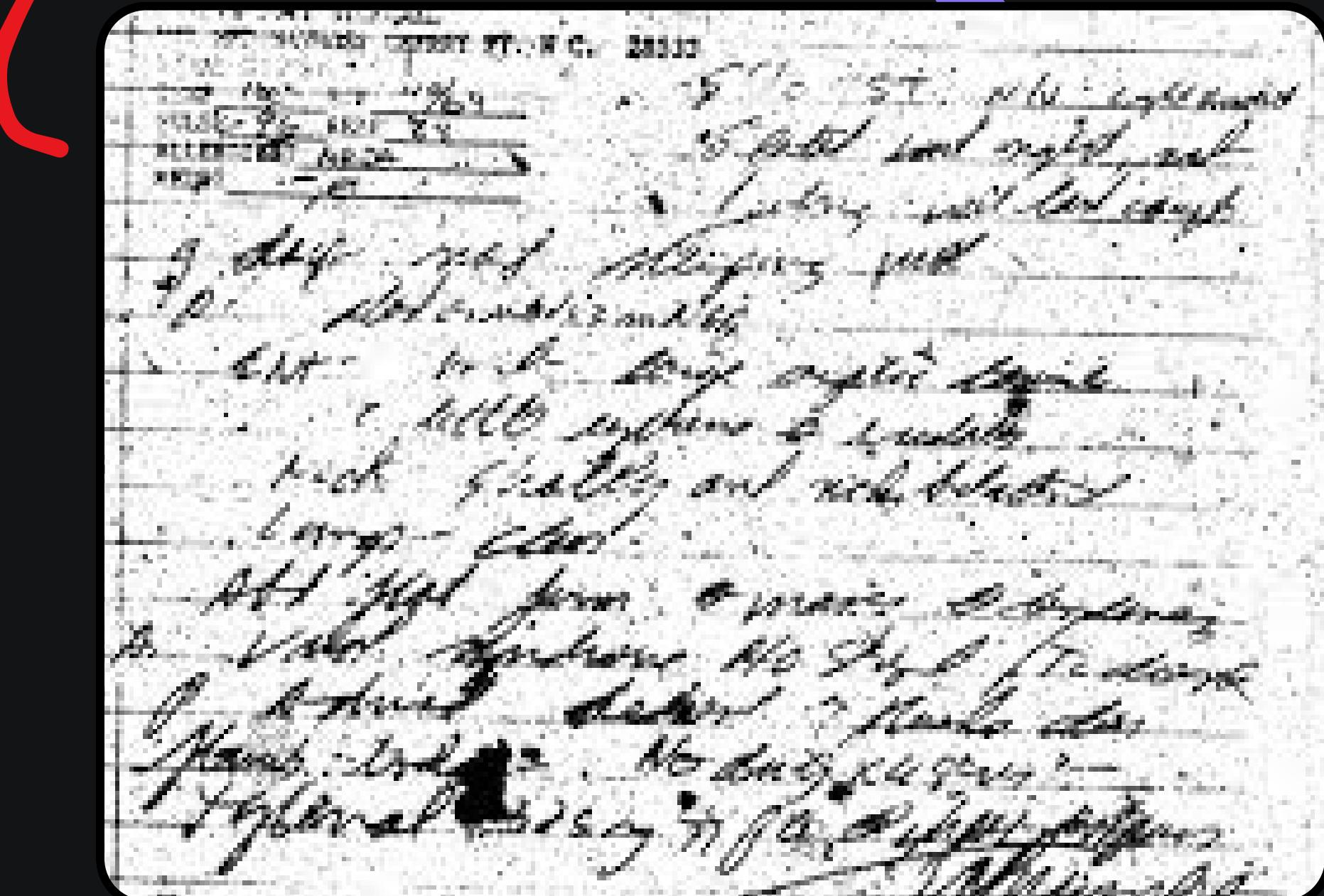
if you tried digitizing this,



You'll come across this:

- Poor image quality and degradation
 - faded ink, tears, strains. uneven lighting, skewed alignment reduced OCR readability
- Handwritten Complexity
 - Lack of support & standardised dataset from OCR for regional languages
 - Variation between handwritings

accuracy is prone to drop with cursive writing

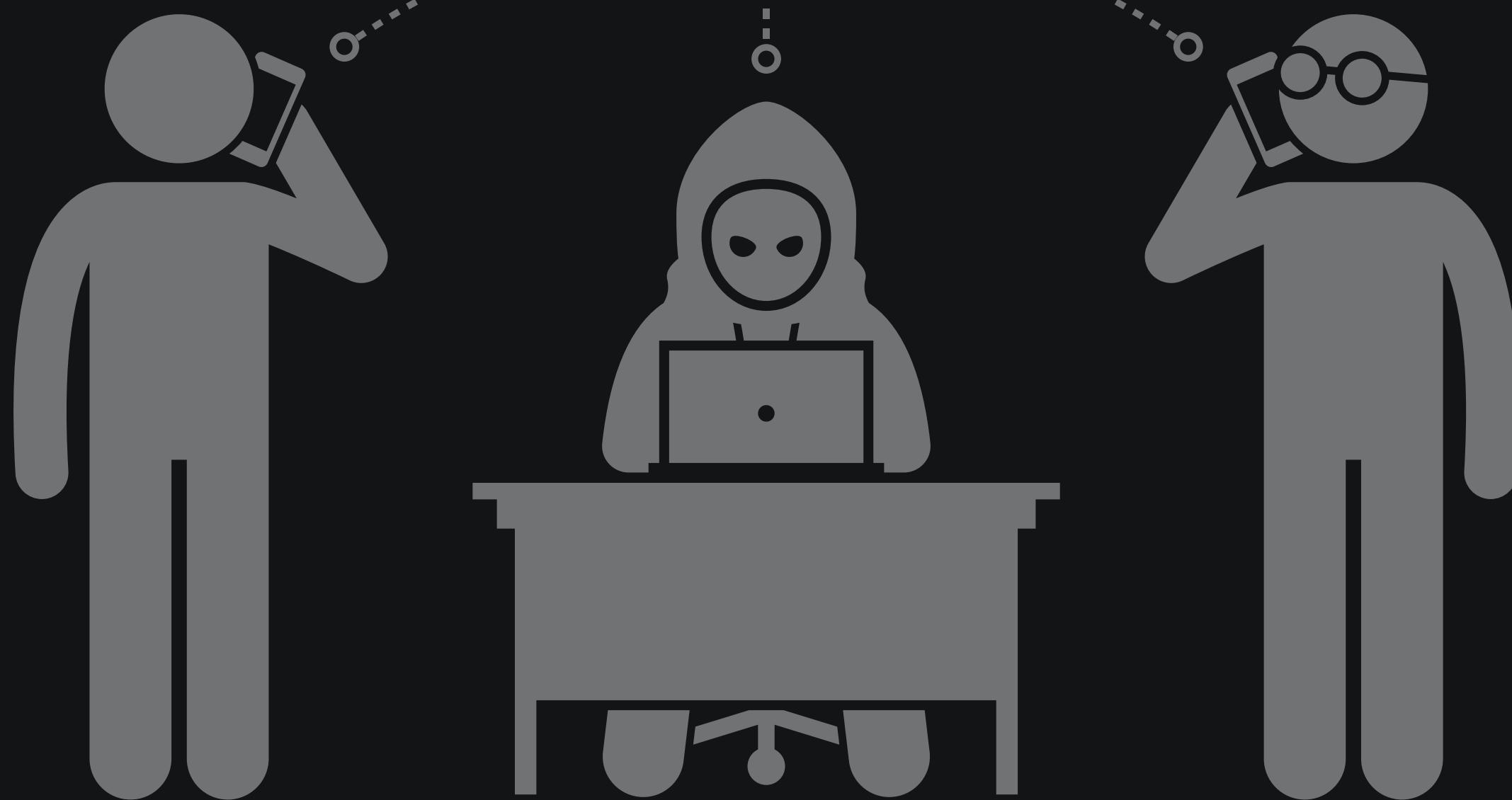


You'll come across this:

- Limited post procession support from OCR
 - Outputs require manual error correction and proof reading.
 - Cannot enhance images
- Security Risks
 - No mechanism to ensure integrity and authenticity of documents.



Manual Correction
and Translation



Existing System

OCR System	Type	Language Support	Handwriting Support	Regional Script Support	Accuracy on Degraded Docs	Limitations
Tesseract OCR	Open-source	Over 100 languages incl. Tamil, Telugu, Kannada	✗ Limited	✓ Partial (via trained models)	⚠ Low	Struggles with handwritten or noisy input
Google Cloud Vision OCR	Cloud-based (Paid)	Wide global language support incl. Indian scripts	✓ Basic handwriting	✓ Yes (good for printed)	✓ Moderate	Expensive, API dependent, data privacy concerns
Microsoft Azure OCR	Cloud-based (Paid)	Strong multilingual support	✓ Moderate	✓ Yes (printed, limited handwriting)	✓ Moderate	Handwriting still experimental
Amazon Textract	Cloud-based (Paid)	Multilingual (not specialized in Indian languages)	✗ No	✗ Poor	⚠ Limited	Not suited for regional scripts or complex layouts
Kraken OCR	Open-source (ML-based)	Custom training possible	✓ Yes	✓ With training	✓ Moderate to High	Complex setup, limited pre-trained models
Sakhr OCR	Proprietary (Arabic-focused)	Arabic only	✓ Yes	✗ No	✓ Good for Arabic	Not applicable to Indian languages
ABBYY FineReader	Proprietary (Desktop)	>200 languages	✓ Partial (with training)	✓ Moderate	✓ High (for printed)	Expensive, limited regional script support

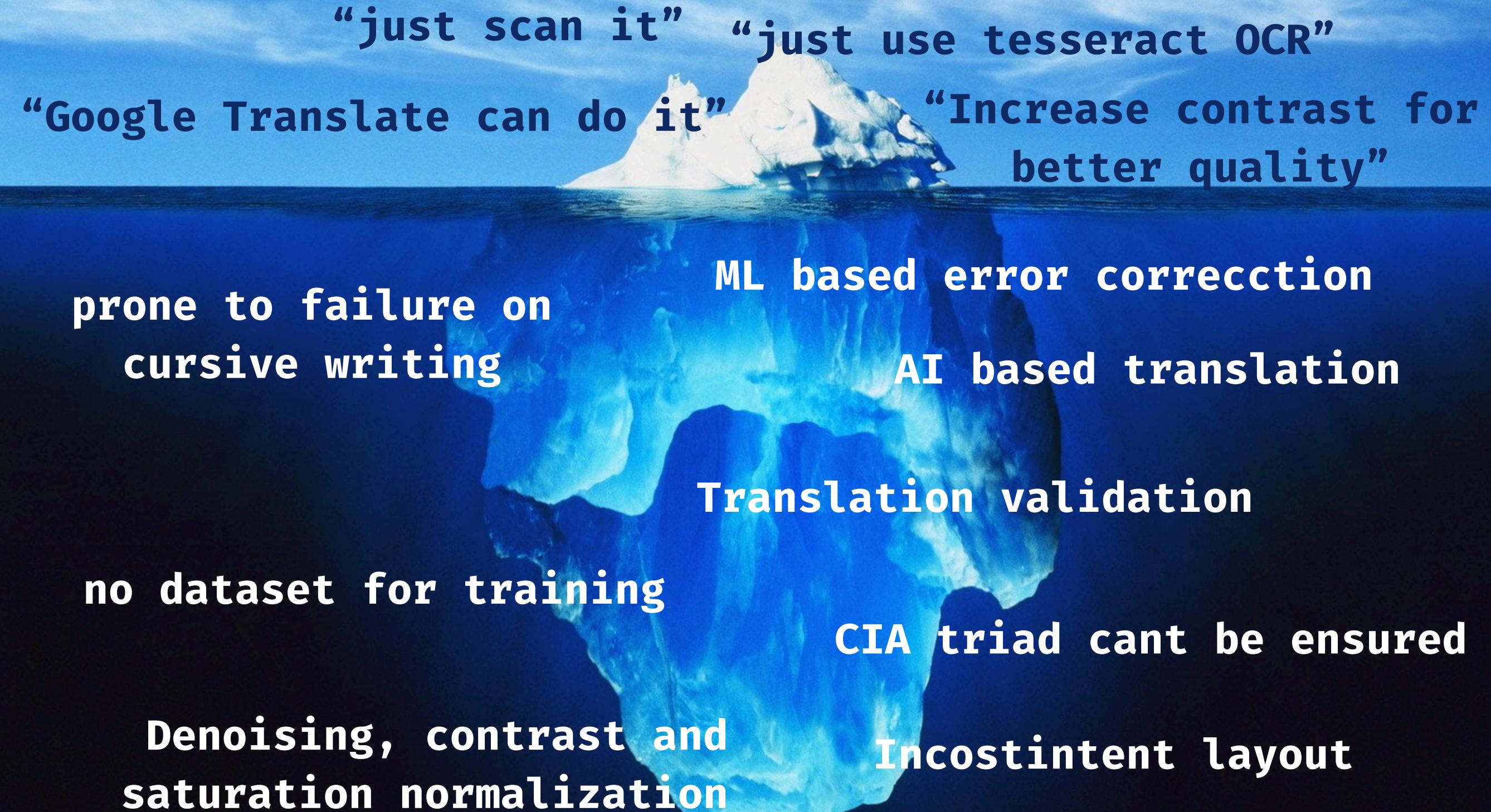
**GE19612 - PROFESSIONAL READINESS FOR INNOVATION,
EMPLOYABILITY AND ENTREPRENEURSHIP.**

AI Powered OCR for Digitizing Historical Handwritten Documents into Regional Languages

Presented By
220701283 - Someshwar K M
220701326 - Yashwanth Ramesh

13/05/2025

for context,



Proposed Solution

1. GAN Based Image Preprocessing

- a. correction skew
- b. enhancing contrast
- c. handle noise and ink degradation

2. OCR Model

- a. Scans the document
- b. produces raw text

3. SGD-based Error Correction

- a. Error hanlding
- b. Corrects spelling mistakes

4. Translation Medium

- a. Uses DEEPSEEK-R1 671B API
- b. Translation Validation

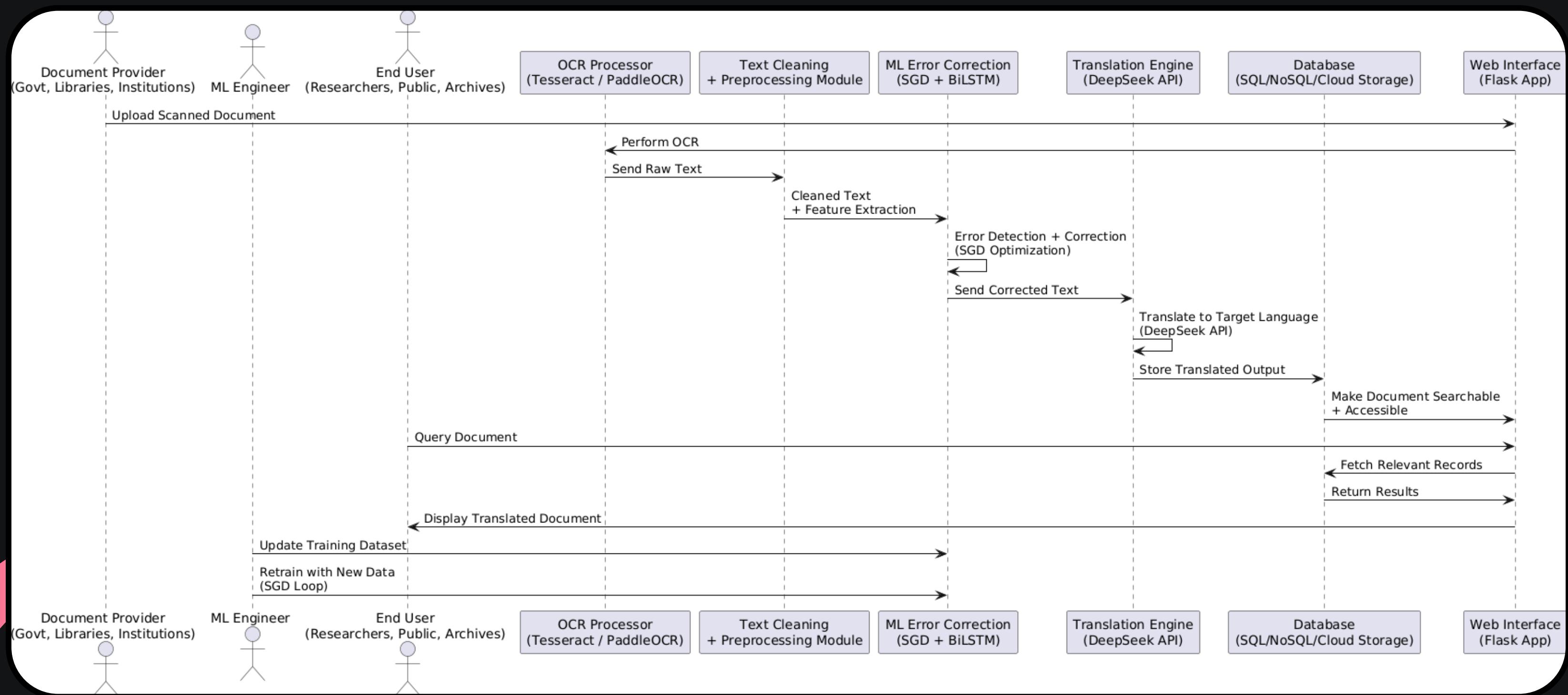
5. Secure storage and retreival

- a. Ensure CIA triad using blockchain or allied technologies
- b. Provides a web interface to feed documents and obtain digitised counterpart

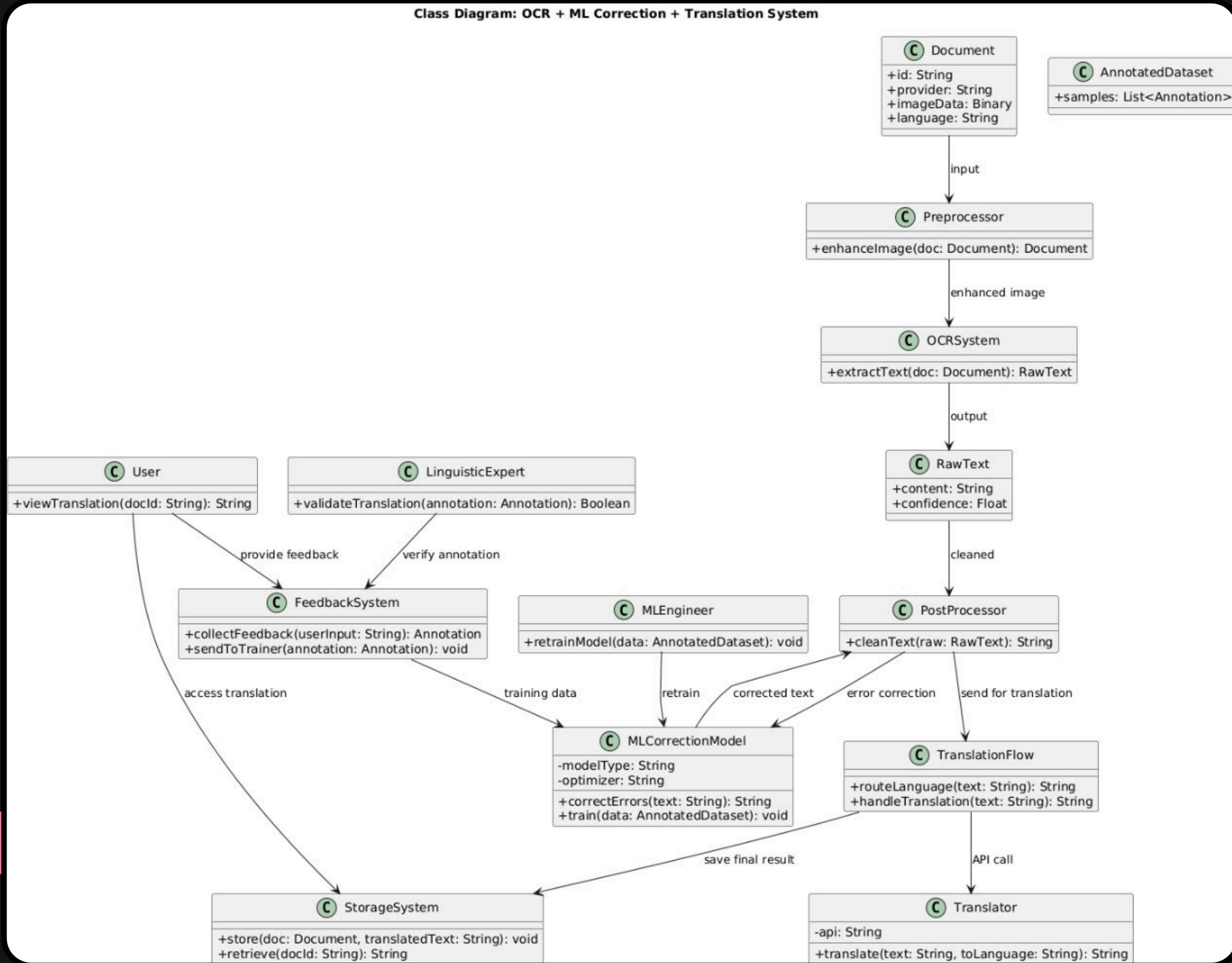
Stakeholders

Stakeholder / User Group	Role / Interest	Primary Use Case / Interaction	Access Type
Historians / Researchers	Analyze and study digitized manuscripts	Access clean, searchable versions of old documents; conduct text-based research	Read-only
Archivists / Librarians	Preserve and catalog records	Upload scanned manuscripts, verify OCR results, manage archives	Read/Write/Admin
Government Officials	Authenticate digital records	Validate documents, generate tamper-proof digital records using blockchain	View + Verify
Academic Institutions	Education and curriculum enhancement	Use digitized content in teaching, curriculum, and research	Read-only
ML Engineers / Developers	Maintain and improve AI models	Annotate, train, test and validate OCR and error correction models	Full access
Blockchain Administrators	Manage data integrity and transparency	Validate transaction logs, manage smart contracts, ensure data auditability	Admin (Blockchain)
General Public / End Users	Access cultural documents	Search and view digitized ancient texts and validate via blockchain proof	Public Read
Fake Profile Analysts	Investigate online threats	Analyze suspected profiles via UI, interpret AI predictions, export reports	Investigative Access
Cybersecurity Agencies	National-level monitoring of social identity	Use fake profile detection dashboard, validate flags from ML-based outputs	Secure API access
NGOs & Cultural Organizations	Advocate for digital heritage	Access historical data, generate awareness, use data for exhibitions	Read / Export

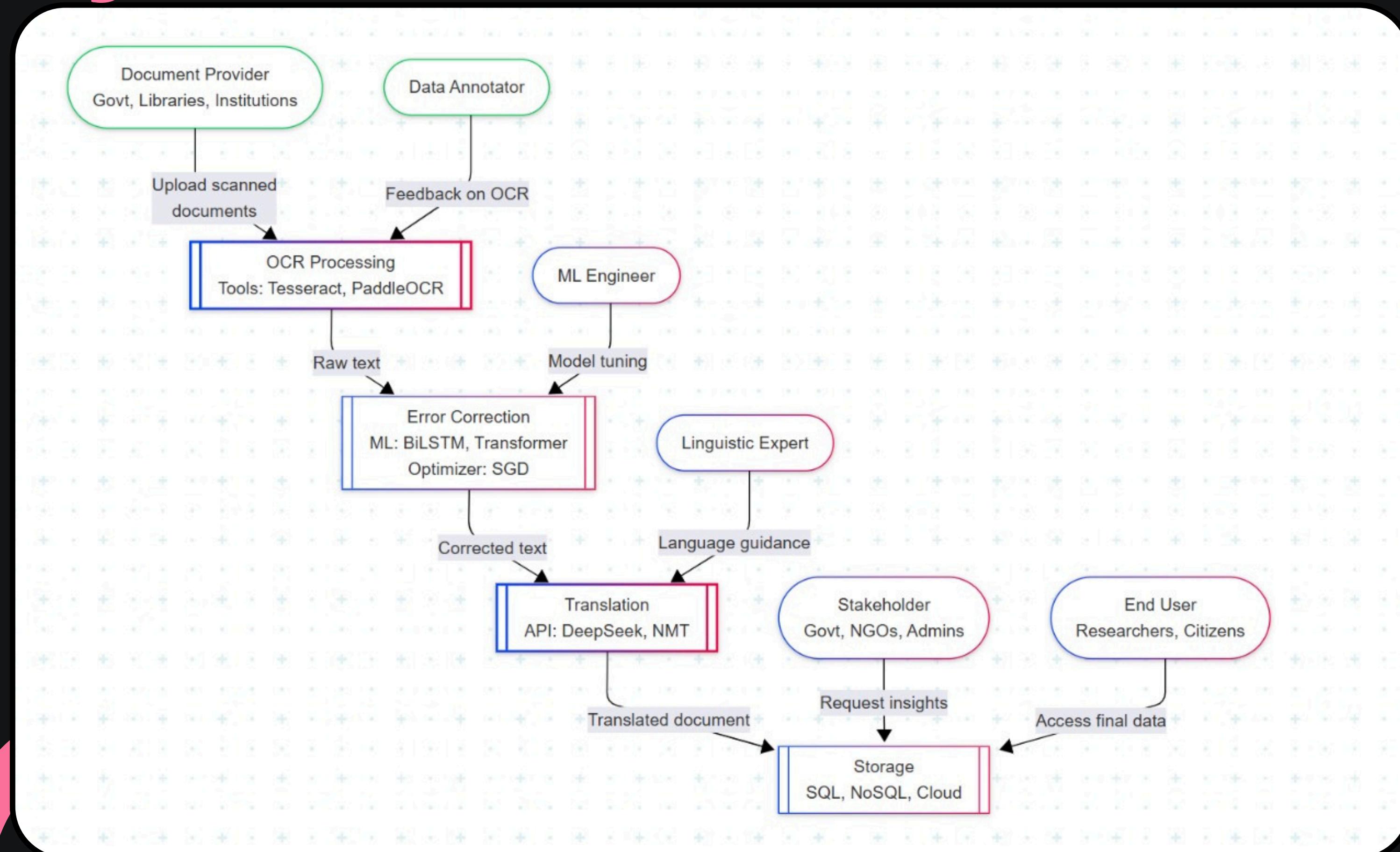
Sequence Diagram



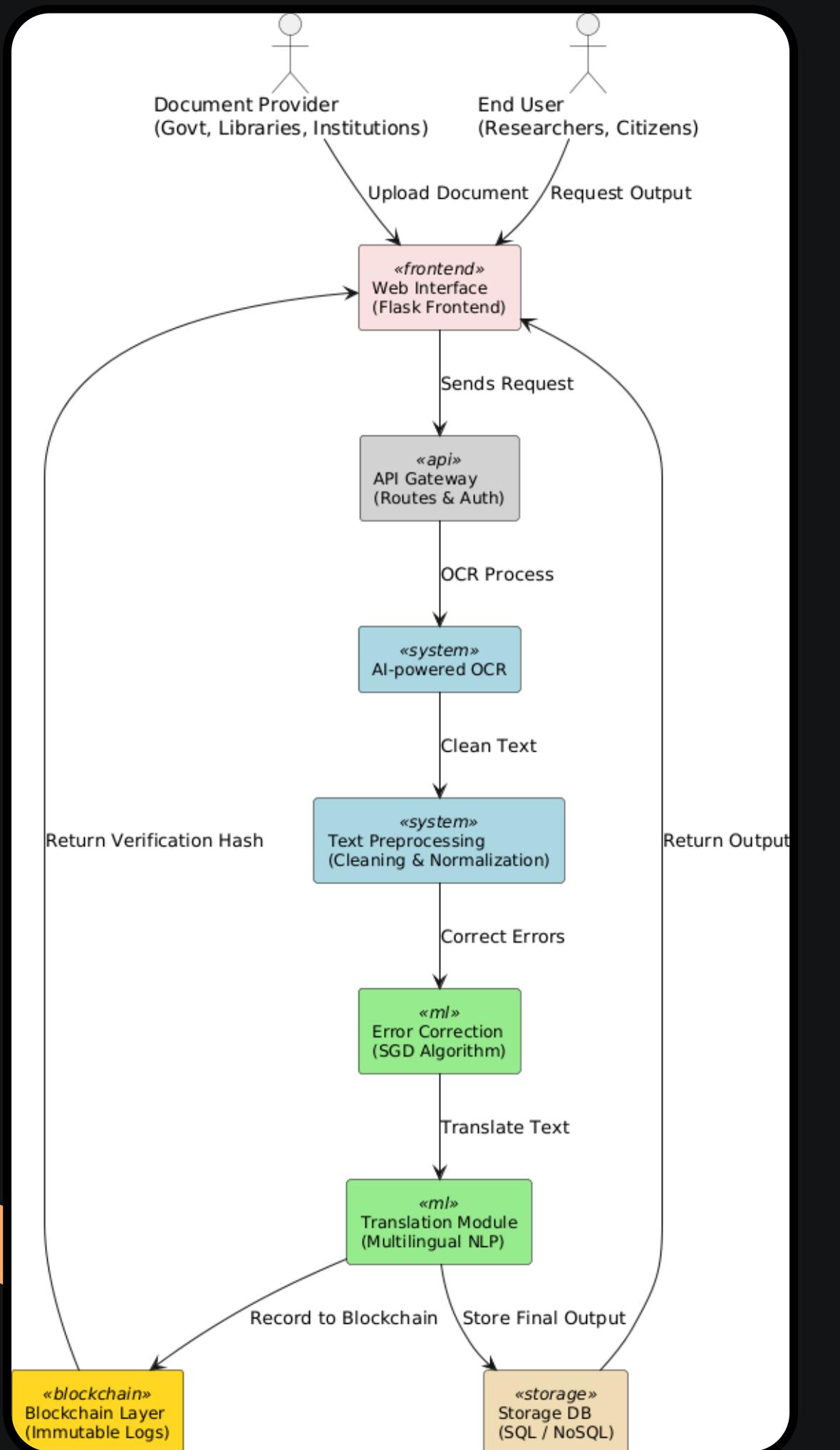
Class Diagram



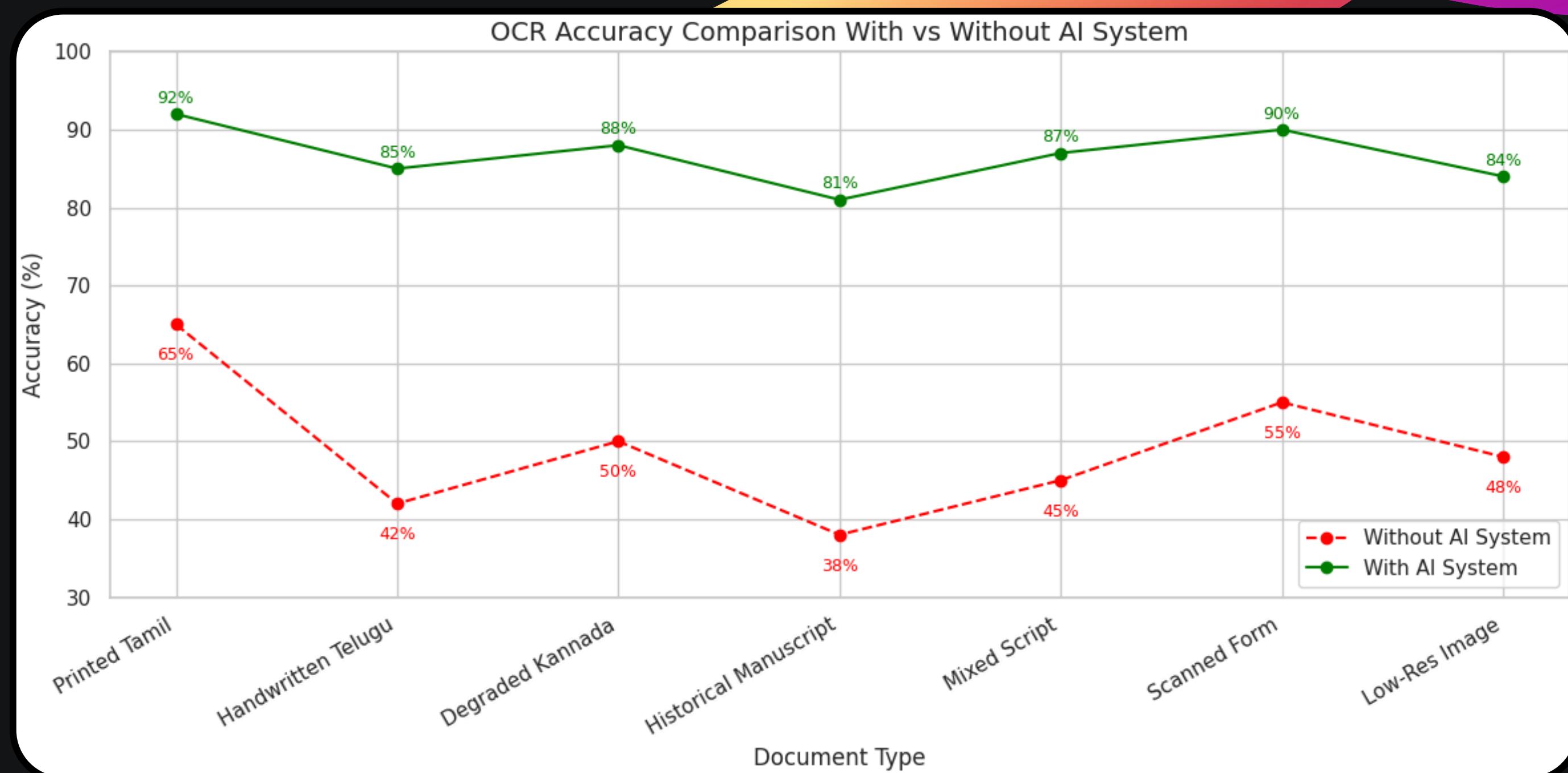
System Architecture



Abstract Workflow



Accuracy Comparison



Future Enhancements

Support for more languages

Multilingual OCR

Enhanced layout Detection

Realtime Mobile OCR

Contextual analysis and prediction using LLMs

Grammar Correction

Crowdsourced Correction

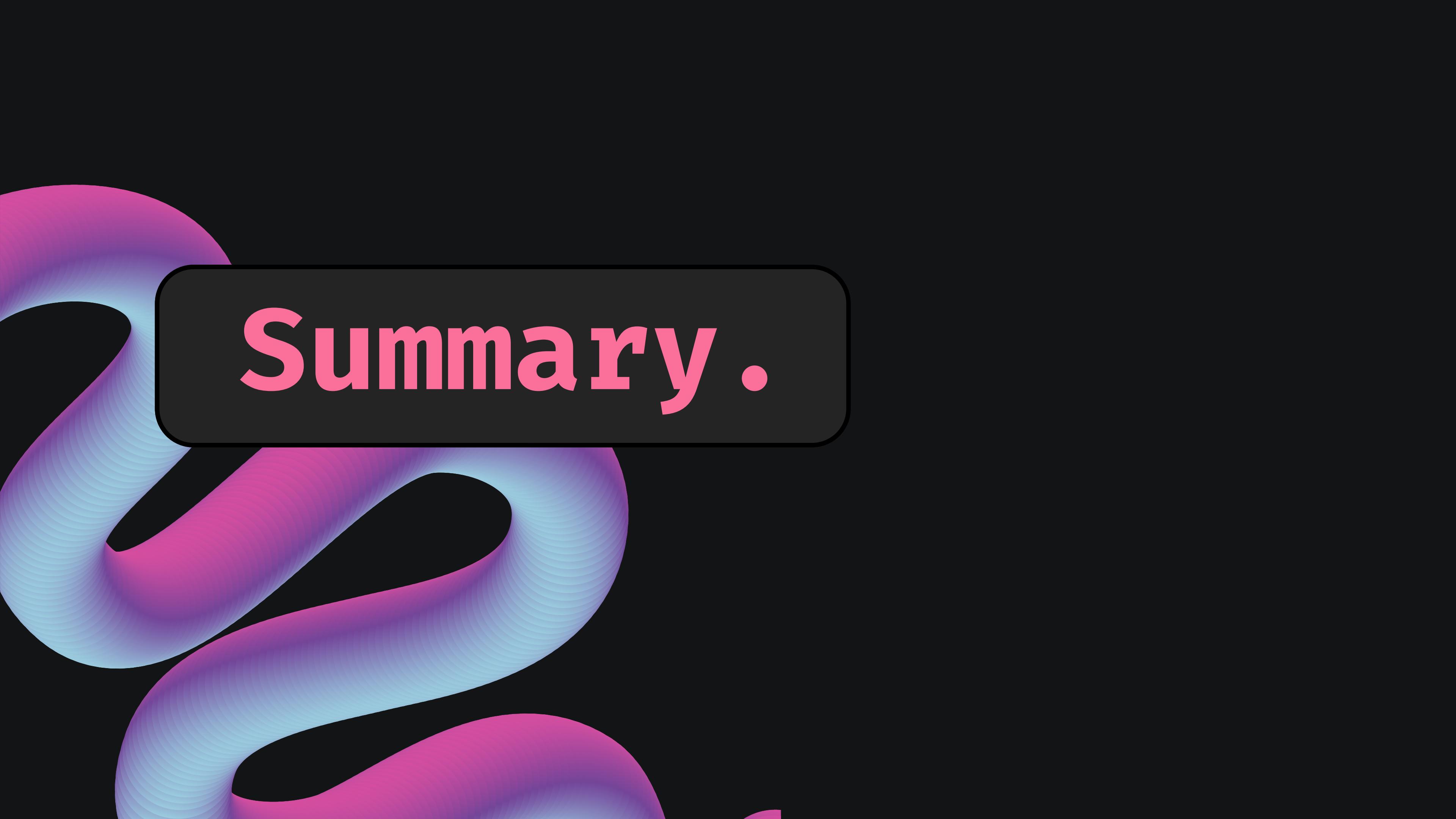
API support.

Enhanced security using biometrics.

Interoperability.

Integration with institutions





Summary.