



COMPLIANCE: AI-Powered Compliance Engine Powers Delivery Document Authentication



OBJECTIVE

A leading multinational beverage and brewing company wanted to develop and deploy a scalable, secure, and intelligent AI-driven solution to automate the validation of Proof of Delivery (POD) documents in complex, multilingual supply chain environments. The goal was to reduce manual verification errors, prevent fraud, and mitigate revenue leakage, while ensuring compliance with regional financial and regulatory mandates.



METHODOLOGY

Step 1: Document Ingestion and Preprocessing

- Scanned POD documents (PDFs) are ingested from various warehouses and delivery endpoints.
- Preprocessing modules clean and normalize document layouts for consistent processing.

Step 2: Computer Vision and Element Detection

- Applied computer vision models detect and extract:
 - Government-issued ID cards
 - Package photos
 - Customer/delivery agent signatures
- Bounding boxes and image enhancement techniques improve visual clarity for further analysis.

Step 3: OCR and Multilingual Text Extraction

- Optical Character Recognition (OCR) is applied to extract text data from both Spanish and English documents.
- Text normalization accounts for regional language nuances, accents, and format variations.

Step 4: Multimodal Analysis via Vision Transformers

- Multimodal Vision Transformers analyze relationships between text and images:
 - Match extracted names from IDs with delivery records.
 - Cross-validate package photo with manifest data.
 - Confirm signature presence and compare with agent registry.

Step 5: Compliance Scoring and Risk Flagging

- Machine Learning models assign an Authentication Score to each document based on:
 - Document consistency
 - Visual evidence validity
 - Textual accuracy and match rates
- Low-score documents are flagged for manual review or automated escalation.

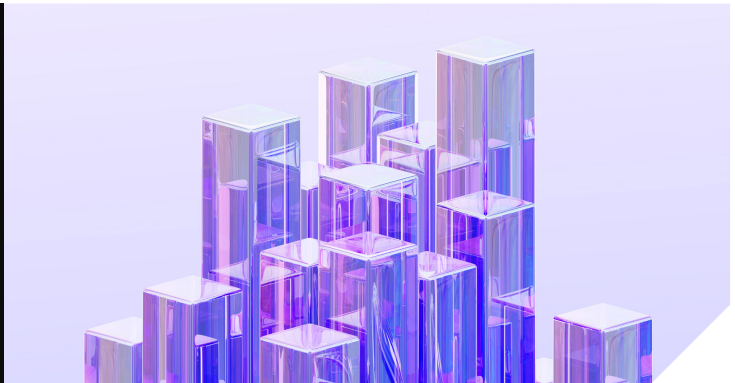
Step 6: Agentic AI Workflows for Exception Handling

- Documents with anomalies are routed to specialized AI agents for:
 - Categorization of exceptions (e.g., missing signature, name mismatch)
 - Auto-recommendation for resolution steps
 - Benchmarking delivery agent performance based on exception trends

Step 7: Deployment and Integration

- Integrated with internal compliance
- Audit systems for real-time alerting and reporting.

KEY INSIGHTS



1. Multimodal AI significantly enhances validation accuracy – Integration of visual and textual inputs enables robust understanding of POD context, reducing reliance on brittle rule-based checks.
2. Language support is critical in global compliance scenarios – Native support for Spanish and English increased accuracy in diverse markets and ensured regional mandate adherence.
3. Agentic AI improves operational scalability – Autonomous exception handling via agentic workflows minimized manual workload and improved turnaround time on flagged documents.
4. Authentication Scoring creates transparent risk metrics – The scoring model provided explainability on each compliance decision, supporting auditability and trust in AI outputs.
5. Deployment ensures data sovereignty and security – The enterprise-grade, offline architecture met stringent security requirements of regulated environments (e.g., in Brazil).

OUTCOME

- **Accuracy:** Achieved 95%–100% accuracy across key POD validation metrics (name match, signature detection, package photo matching)
- **Risk Mitigation:** Identified and mitigated \$9 million USD in fraud and compliance risks in Brazil within the first quarter post-deployment
- **Operational Efficiency:** Reduced manual compliance workload by over 70% through intelligent automation
- **Global Rollout:** Currently being scaled globally to extend integrity and risk controls across multiple markets
- **Security:** Ensured full hybrid, secure deployment in alignment with regional data protection laws and enterprise IT policies

ABOUT US

C5i is a pure-play AI & Analytics provider that combines the power of human perspective with AI technology to deliver trustworthy intelligence. The company drives value through a comprehensive solution set, integrating multifunctional teams that have technical and business domain expertise with a robust suite of products, solutions, and accelerators tailored for various horizontal and industry-specific use cases. At the core, C5i's focus is to deliver business impact at speed and scale by driving adoption of AI-assisted decision-making.

C5i caters to some of the world's largest enterprises, including many Fortune 500 companies. The company's clients span Technology, Media, and Telecom (TMT), Pharma & Lifesciences, CPG, Retail, Banking, and other sectors. C5i has been recognized by leading industry analysts like Gartner and Forrester for its Analytics and AI capabilities and proprietary AI-based platforms.



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