

Architect Memo — Smart Quoting Agent PoC

Author: Peter Adzoa

Project: Veracity Insurance – AI Smart Quoting PoC

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1. Objective

The purpose of this Proof of Concept is to demonstrate the viability of an automated **Smart Quoting** system that allows potential customers to upload their **Certificate of Insurance (COI)** and instantly receive a competitive quote based on Veracity's underwriting appetite and pricing model.

This PoC validates that we can:

- Extract required values (General Aggregate, Expiration Date, Premium) from an uploaded COI
- Apply internal business rules
- Provide automated eligibility and pricing responses without manual intervention

This establishes foundational capability for an enterprise-scale automated underwriting and quoting platform.

2. Architectural Overview

The solution is built around a lightweight, modular design intended for rapid validation. The architecture is composed of four primary layers:

Layer	Responsibilities
Ingestion Layer	Receives uploaded COI PDFs via Streamlit UI
Extraction Layer	Parses document text using PyPDF2 OCR fallback + regex-based entity extraction
Decision Engine	Executes underwriting rules and pricing logic
Response Layer	Returns eligibility decision and competitive quote proposal

Future-state integrations such as **secure storage**, **rating engine**, **CRM**, and **audit & compliance logging** are represented in the architecture to demonstrate scalability beyond PoC.

3. Workflow Summary

1. Customer uploads a COI PDF

2. Text extraction is performed using PyPDF2 (OCR fallback option available)
 3. Key fields are extracted:
 - **General Aggregate Limit**
 - **Policy Expiration Date**
 - **Current Premium**
 4. Rules engine applies internal appetite constraints:
 - Decline if **General Aggregate > \$2M**
 - Decline if **Expiration < 30 days**
 5. If eligible → calculate price:
Our Quote = 90% of current premium (10% savings)
 6. Output returned to user with reasons and next steps
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4. Technology Decisions

Component	Choice	Reasoning
UI Front-End	Streamlit	Rapid prototyping, simple file upload handling
Document processing	PyPDF2 + Regex	Lightweight, fast for structured PDFs
Deployment model	Single-container Python application	PoC simplicity / portability
Rules Engine	Python logic module	Transparent, easily replaceable with BPM/Rating later
Future state integration	Optional S3, CRM, Rating engine	Supports scalability and enterprise workflows

5. Security & Compliance Considerations

Although simplified for PoC, production architecture will include:

- COI document storage encryption (S3 + SSE-KMS)
- Role-based access control & audit logs
- PHI/PII classification & retention policy
- Secure API gateway for rating engine integration

6. Roadmap Toward Production

Phase	Description
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PoC (This Project)	Validate technical feasibility + accuracy of extraction + rule execution
MVP	Add secure document storage, CRM pipeline automation & authentication
Full Production	Replace pricing logic with real Rating Engine , add workflow orchestration , observability, SLA
Enterprise Scale	Integrate with policy admin system & automated bind process

7. Risks & Mitigations

Risk	Impact	Mitigation
Variability in COI formatting	Extraction errors	AI OCR + ML entity extraction via OpenAI/Claude
Document security requirements	Compliance gaps	Encrypted storage + access logging
Business rule changes	Update cost	Externalize rules via decision service or rules engine
Scaling for volume	Performance & distribution	Containerization + serverless ingestion pipeline

8. Conclusion

This PoC demonstrates a viable path toward automated quoting and competitive conversion strategies. It successfully proves that Veracity can:

- Automate extraction of critical COI fields
- Apply rule-based decisioning without manual review
- Produce pricing recommendations instantly

This foundational capability will help accelerate digital underwriting workflows, reduce operational workload, and improve customer acquisition conversion.

This PoC provides a shared technical foundation that enables engineering, underwriting, and product leadership to validate feasibility quickly. It accelerates decision-making, reduces architectural ambiguity, and enables alignment across teams before investing in full production build.