

Whitepaper: Intelligent Claims & Fraud Detection Playbook

Autonomous Claims Processing and Real-Time Fraud Detection with Sovereign Agentic AI - w19

Intelligent Claims & Fraud Detection Playbook Autonomous Claims Processing and Real-Time Fraud Detection with Sovereign Agentic AI

Singularity IO Zurich, Switzerland

EXECUTIVE SUMMARY

Insurance claims processing is notoriously slow, expensive, and vulnerable to fraud. Manual review processes create bottlenecks, while traditional rule-based fraud detection systems miss sophisticated schemes and generate high false positives.

This whitepaper presents a sovereign multi-agent framework that automates claims processing end-to-end and delivers real-time, intelligent fraud detection with superior accuracy and speed.

Key Outcomes

- Claims processing time reduced from weeks to hours or days
- 50–70% reduction in manual claims handling effort
- 4–8x improvement in fraud detection rates
- Up to 60–75% reduction in false positives
- Automated regulatory reporting and audit trails
- Full DSG/GDPR + EU AI Act compliance by design

Built on the Singularity Agentic Platform running on Exoscale SKS in Swiss data centers, this playbook enables insurers to transform claims from a cost centre into a fast, accurate, and fraud-resistant capability.

INTRODUCTION

Claims handling is the moment of truth in insurance. Customers expect fast, fair, and transparent processing, while insurers must control costs and combat increasingly sophisticated fraud.

Sovereign Agentic AI enables a new standard: autonomous agents that can understand claims, verify documents, detect fraud patterns, make reasoned decisions, and orchestrate payments — all with full explainability and human oversight.

This playbook provides a complete, production-ready framework for intelligent claims automation and fraud detection.

THE CHALLENGE

Insurers and reinsurers face persistent problems in claims operations:

- High manual workload and slow processing times
- Significant leakage through undetected fraud
- High false positive rates overwhelming fraud teams
- Difficulty integrating structured and unstructured data (documents, photos, medical records, etc.)
- Growing regulatory expectations for fair and transparent claims handling
- Talent shortages in claims and fraud investigation

Legacy systems and simple automation tools cannot deliver the intelligence and coordination required.

OUR APPROACH – THE INTELLIGENT CLAIMS & FRAUD AGENT CREW

The Singularity Claims Framework deploys a coordinated crew of autonomous agents:

- **Claims Intake & Document Understanding Agent**
- **Fraud Detection & Risk Scoring Agent**
- **Damage Assessment & Verification Agent**
- **Policy & Coverage Analysis Agent**
- **Automated Decision & Payment Agent**
- **Investigation & Escalation Agent**

These agents collaborate in real time using stateful LangGraph orchestration, analyse documents and data with advanced vision and reasoning models, and execute secure actions.

All agents operate inside isolated sovereign namespaces on Exoscale SKS in Swiss data centers.

TECHNICAL ARCHITECTURE

Core Components:

- **Orchestration:** LangGraph for complex, multi-step claims workflows
- **Inference:** Ollama with GPU-accelerated vision and language models
- **Memory:** Qdrant vector database for fraud patterns and historical claims
- **Automation:** n8n for integration with core insurance systems, document management, and external databases
- **Observability:** Full explainable audit trails for every claim and decision

Key Capabilities:

- Intelligent document extraction and understanding
 - Behavioural fraud pattern recognition
 - Cross-claim and network analysis for organised fraud
 - Automated approval for low-risk claims with human escalation for high-risk cases
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IMPLEMENTATION GUIDE

12-Week Intelligent Claims & Fraud Implementation Roadmap

Phase 1: Foundation (Weeks 1–3)

- Claims process mapping and fraud typology analysis
- Data source integration assessment
- Singularity Platform tenant provisioning (Enterprise tier)

Phase 2: Agent Development & Integration (Weeks 4–8)

- Build core intake, fraud detection, and decision agents
- Training on historical claims and known fraud cases
- Integration with policy administration and payment systems

Phase 3: Pilot, Optimisation & Scale (Weeks 9–12)

- Parallel run with existing claims process
- Performance measurement and model refinement
- Full governance handover and claims team training

EXPECTED BUSINESS IMPACT & ROI

Typical Results for Insurance Carriers:

	Metric	Improvement	Annual Value
1	Claims Processing Time	-60% to -80%	Major efficiency gain
2	Fraud Detection Rate	4–8x improvement	Significant leakage reduction
3	False Positive Rate	-60% to -75%	Reduced investigation cost
4	Manual Claims Handling	-50% to -70%	Staff reallocation
5	Total Expected ROI	220–360%	Payback in 4–7 months

REGULATORY COMPLIANCE & GOVERNANCE

The framework is designed for full compliance with:

- EU AI Act high-risk requirements for automated decisions
- Swiss DSG / GDPR data protection standards
- Insurance-specific regulations (e.g. IDD, Solvency II)
- Comprehensive explainability and audit trails for every claim decision

CONCLUSION AND FUTURE OUTLOOK

Intelligent, sovereign Agentic AI transforms claims processing from a reactive, high-cost function into a fast, accurate, and proactive capability. Insurers that implement this framework will deliver superior customer experiences, dramatically reduce fraud losses, and achieve significant operational efficiencies — all while maintaining full data control within Switzerland.

The future of insurance operations is autonomous, intelligent, and sovereign.

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