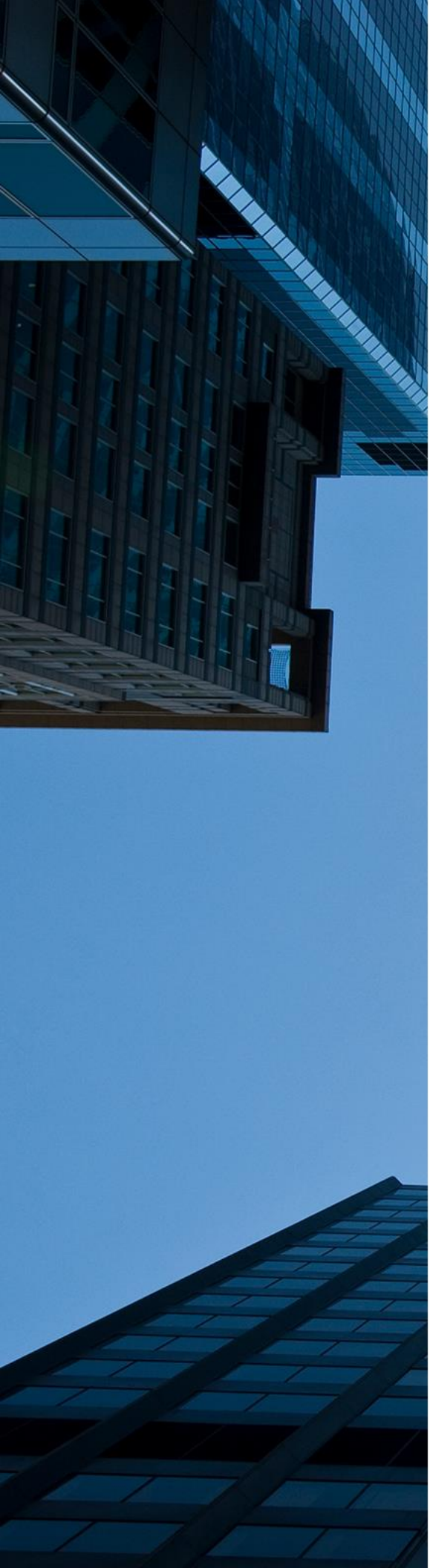

Aite Novarica

OCTOBER 2022

ELEVATING ANOMALY DETECTION WITH FEDERATED AI

A QUEST FOR COLLABORATIVE INNOVATION

PREPARED FOR:

Red Hat

OCTOBER 2022

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A Quest for Collaborative Innovation

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

INTRODUCING FEDERATED LEARNING

Today's increasingly complex financial ecosystem and business challenges require new thinking and capabilities. Financial institutions (FIs), fintech firms, and other new financial services entrants must uncover and adopt innovative strategies and solutions to balance loss reduction, client experience, operating efficiency, and risk management. Traditional approaches and legacy systems are becoming less operationally effective. These organizations must embrace the upside in big data, evolving technology, and collaborative innovation. Successful adoption will empower these organizations to harness larger sets of information faster to do things humans have not been able to do, drive more effective and efficient processes, and cultivate sharper insights and intelligence.

SWIFT, a leading global provider of secure financial messaging services, recognized that it is in a prime position to help shape the future of the financial industry, particularly as goods and services are moving more quickly and across greater distances than ever before. The limitless power of collaborative innovation will be able to enable financial organizations to solve today's complex business challenges together and move value faster, smarter, and safer.

SWIFT is partnering with Red Hat to create a cloud-based AI platform that will be future-ready, large-scale, and high performing. By leveraging a solution built on collaborative innovation and modern computing, financial organizations will be able to lower transactional costs, boost operational performance, and launch new services creating new revenue opportunities. This reimagined platform would transform the way machine learning would be done and become the cornerstone for future innovation across the financial services industry. As the maiden use case, SWIFT aims at applying machine learning algorithms to further improve the accuracy of its existing fraud detection service, Payment Controls. This white paper explores how SWIFT is collaborating with Red Hat and other emerging technology firms to build a high-performing federated anomaly detection model for the financial services industry.

METHODOLOGY

The research for this white paper is based on ongoing Aite-Novarica Group interviews with leaders at SWIFT and Red Hat and a range of financial crime risk practitioners at financial organizations.

FIGHTING FINANCIAL CRIME: CHALLENGES AND OPPORTUNITIES

Financial crime frameworks are expected to account for and adapt to ever-evolving risks and threats. Yet, financial crime continues to escalate, especially as global criminal organizations hunt for vulnerabilities within the financial system to exploit. Tech-savvy and sophisticated nefarious groups are becoming extremely adept at concealing their identities and evading detection. Moreover, these organizations leverage the increasing interconnectedness of the global economy and the ease of using the dark web to conduct their crimes internationally.

Many challenges confront global financial services organizations and the effectiveness and efficiency of current financial crime programs. Fraud and AML executives worry that legacy rules-based detection systems often miss questionable parties and networks and anomalous activity. Inabilities in harnessing data for effective analysis and detection and a high volume of false positives erode detection, lower operational efficiency, degrade customer experiences, and increase operational costs (Table A).

TABLE A: FINANCIAL CRIME FIGHTING OPERATIONAL CHALLENGES

CHALLENGE	IMPACT
Ineffective surveillance systems	Often, rules-based transaction monitoring systems are ill-equipped to cope with the evolving business landscape and emerging financial crime threats. Too many false positives lead to unnecessary investigations and lengthy due diligence efforts, lower resource productivity, overlook unknown risks, and yield faulty decision-making.
Data shortcomings	Fragmented and incomplete data sets, driven by loosely connected systems, handcuff financial services organizations. Inferior data often precludes holistic views of customers and enterprise risk. Increasingly, firms must find new ways to connect the dots across disparate data systems and multiple business lines and channels.
Operational expense pressures	Executive management is pressing all leaders, including compliance and risk management executives, to rein in spending and do more with less to reduce operational overhead. However, a high number of surveillance alerts require extensive resources to investigate and make decisions. These activities can divert resources from higher value-added activities.

Source: Aite-Novarica Group

THE IMPERATIVE FOR A NOVEL APPROACH

In the face of mounting obstacles, financial crime leaders comprehend the imperative for novel approaches to transform risk-relevant information from diverse sources into actionable intelligence and deploy smarter and more agile detection systems. They seek capabilities to help them ingest greater amounts of data, build holistic risk views, and identify money laundering and terrorist financing risks and typologies more intelligently. Next-generation technologies have opened the door to new capabilities and an elevated way of thinking.

NEXT-GENERATION TECHNOLOGIES: INFINITE POTENTIAL

Breakthrough innovations in computing power, automation, and data analytics can help organizations tackle the increasingly complicated business and regulatory landscapes better and solve operational challenges by enabling them to maximize the value of their data and make smarter and faster decisions:

- **Advanced analytics:** Through iterative learning, advanced analytics, and machine learning, models can run across substantial data sets to sharpen risk recognition, hone customer monitoring, detect financial crime red flags, and minimize false-positive alerts. As data is processed, models can learn and detect highly suspicious activity more accurately. Models can be deployed across multiple use cases, which becomes imperative when mitigating the elevated risks due to the rapidly evolving business landscape and the accelerated speed, volume, and globalization of transactions.
- **Network analysis:** Network analysis creates a linked or "network view" of customers, locations, accounts, transactions, and any other objects where data exists. Network analysis technologies can ingest and analyze vast amounts of data, often in real time, and uncover linkages among different parties, accounts, and events. Payment flows and other financial transactions can be linked across common legal hierarchies or business groups. Frequently, these connections are unknown or hidden and go undetected by legacy surveillance systems and human analysts.
- **Cloud:** Cloud integration can increase solution scalability, adaptability, and configurability. Organizations can achieve quicker time to value and access upgraded functionality, reduced total cost of ownership, and augmented data governance, security, and privacy.

A NEW COLLABORATIVE AI INTELLIGENCE VISION

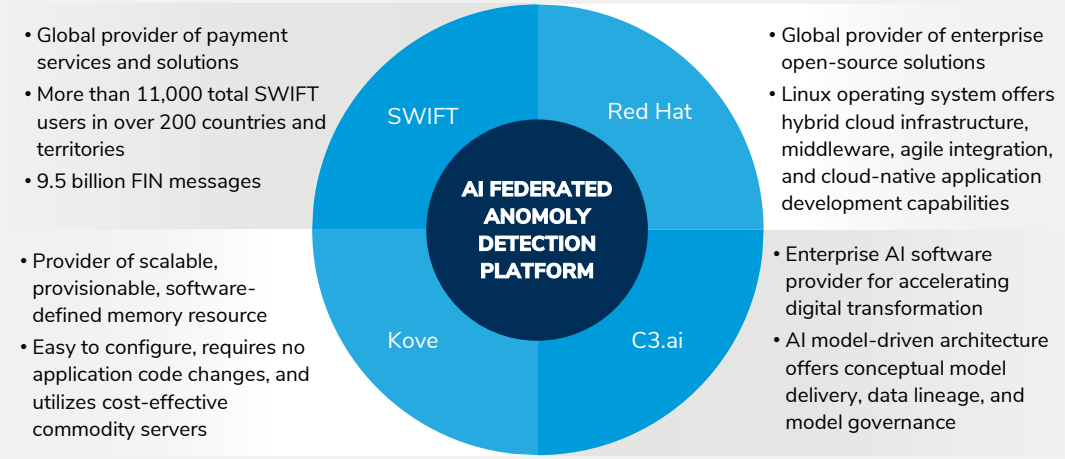
Founded in 1973 as a member-owned cooperative, SWIFT provides its community with a platform for messaging and standards for communicating, while offering products and services to facilitate access and integration, identification, analysis, and regulatory compliance. SWIFT has 11,000 members in over 200 countries and territories, supporting an average of over 40 million daily financial messages across its network. As an innovative and strategic organization for nearly five decades, SWIFT is committed to discovering more reliable and secure approaches for the global financial community that can be trusted completely.

SWIFT recognized the countless benefits available through the advancements in computing capabilities, automation, AI, and cloud-based technology. The upside of shared intelligence and a federated anomaly detection model could be significant—elevated risk management, greater operational efficiency, reduced total cost of ownership, minimized customer friction, and boosted organizational growth. In the fight against financial crime, a solution built on federated learning and a modern cloud-based architecture would empower FIs to sharpen detection schemes, accelerate system deployment, and overcome the headwinds impeding successful innovation.

THE PARTNERSHIP

With its rich transactional intelligence, SWIFT has combined the advanced technologies of Red Hat, C3 AI, and Kove (Figure 1) to develop modern, data-driven, and predictive analytics-based solutions that will be open, scalable, and secure. This collaboration integrates advanced technologies and supercomputing to build powerful, feature-rich foundational systems with innovative capabilities, new forms of connectivity, eased consumption, and data security.

FIGURE 1: THE PARTNERSHIP



Source: SWIFT and Red Hat

THE RESPONSIBLE AI APPROACH

Achieving and sustaining true value from innovation mandates strong governance and robust model risk management practices. Vigorous governance guards against the model development process going off-track or introducing biases or other unintended consequences into production. It ensures that the design and ongoing execution remain fit for purpose and adapt to the ever-changing risk landscape. Their approach to model design, development, deployment, and maintenance is grounded on five core "responsible AI" principles (Table B).

TABLE B: RESPONSIBLE AI CORE PRINCIPLES

CORE PRINCIPLE	DISCUSSION
Accuracy	A responsible AI approach ensures the accuracy of model predictions and decisions. With an increased ability to process a larger volume of data, its machine learning analytical functionality will be able to automatically digest and learn from historical analysis of events and make recommendations for continual improvement of rules and modules. Successful execution will be able to yield higher alert quality and reduce false positives over time, reducing operational overhead.
Explainability	A responsible AI approach delivers clear and easy-to-understand explanations for the logic and rationale underlying the machine learning models. FIs will be able to fully understand the models they have in use as well as explain the models and illustrate their efficacy to risk governance, auditors, examiners, and regulators; model adoption will yield fully explainable, interpretable, and transparent results.
Fairness	A responsible AI approach ensures fairness, accountability, transparency, and ethics throughout the model life cycle. Designs should never inadvertently introduce biases and other unintended consequences.
Auditability	A responsible AI approach ensures that model design, development, and deployment follow strict governance and that models are verifiable. Executives adhere to a litany of relevant model risk management regulations and internal governance protocols. They will be able to clearly explain and evidence how surveillance programs function and how they have ascertained that these schemes impact ongoing financial crime risk.
Security and privacy	A responsible AI approach ensures models are constructed on privacy-preserving data and delivers formidable security and privacy protections throughout the model life cycle. Through a trusted computing environment for sensitive data and strong privacy and security controls, the underlying infrastructure will protect sensitive organizational and customer information and complies with relevant regulatory obligations. AI techniques are data heavy and process large data sets; safeguarding data is a major consideration.

Source: SWIFT, Red Hat, and Aite-Novarica Group

THE AI FEDERATED ANOMALY DETECTION PLATFORM

The partnership is building a high-performing, flexible, and future-ready AI platform that underpins accurate federated anomaly detection. It is designed to modernize financial crime detection and become a foundation on top of which FIs address other use cases and operational challenges in the future:

- The platform is constructed with modern processing power and complete memory. It will be able to process intelligence within huge data sets and handle over 10 trillion transactions annually.
- The platform's AI foundation will be able to link data points together and find clusters of activity as well as outliers and anomalies in transaction patterns. It will produce holistic risk profiles of customers, accounts, and transactions, delivering elevated intelligence dynamically.
- With cloud as a core capability, the technology will work with any hardware, system, or footprint. Its cloud-native development will accelerate and simplify application delivery, adoption, and integration. The cloud-ready platform will provide on-demand security and infrastructure resources to scale up and down in real time.
- C3 AI's model-driven architecture will support flexible deployments, shorten time to value, and reduce the total cost of ownership.
- All confidential data will be maintained in a highly secure environment across the data's life cycle from the time of its loading to its last use. The platform's architecture will support local data governance, privacy, and security obligations. Moreover, hybrid multicloud environments will preserve privacy.
- Multitenancy will enable segregated data environments, processing, and service delivery without added hardware or infrastructure. With diverse business lines, operations, products, channels, and customers, large and multinational organizations have unique needs that often benefit from multitenant capabilities.

LAUNCHING THE AI PARADIGM SHIFT: FEDERATED LEARNING

The financial community must evolve. New thinking and innovative capabilities are needed to tackle today's complex business challenges. SWIFT, Red Hat, and partners are embarking on a quest to lead the financial services industry into the future by coming together, unlocking the limitless power of AI, modern computing, automation, and collaborative innovation, and effecting meaningful change.

The vision is to build and deliver a state-of-the-art, high-performing AI platform that solves problems, breeds confidence and trust, and works anywhere, securely. It will uplift core capabilities, deliver accurate intelligence, improve risk appreciation and management, promote the customer experience, transform businesses and operations, and better protect the global financial system.

The AI federated anomaly detection platform for financial crime is just the beginning of an ambitious and bold journey to help FIs work together, harness data, and build for the future. SWIFT, Red Hat, and partners seek others in their quest to explore the possibilities and shape the future of finance.

ABOUT THE PARTNERSHIP

SWIFT is bringing together the technologies of Red Hat, C3 AI, and Kove to build modern, cloud-ready anomaly detection solutions built on AI and federated learning.

ABOUT SWIFT: BRINGING A WEALTH OF RICH FINANCIAL INTELLIGENCE

SWIFT is a global member-owned cooperative and leading provider of secure financial messaging services. SWIFT provides its community with a platform for messaging and standards for communicating, and it offers products and services to facilitate access and integration, identification, analysis, and regulatory compliance.

Its messaging platform, products, and services connect more than 11,000 banking and securities organizations, market infrastructures, and corporate customers in more than 200 countries and territories. While SWIFT does not hold funds or manage accounts on behalf of customers, it enables its global community of users to communicate securely, exchanging standardized financial messages in a reliable way, thereby supporting global and local financial flows, as well as trade and commerce all around the world.

As a trusted provider, SWIFT pursues operational excellence. It supports its community in addressing cyberthreats, and it continually seeks ways to lower costs, reduce risks, and eliminate operational efficiencies. Its products and services support its community's access and integration, business intelligence, reference data, and financial crime compliance needs. SWIFT also brings the financial community together—at global, regional, and local levels—to shape market practice, define standards, and debate issues of mutual interest or concern.

Headquartered in Belgium, SWIFT's international governance and oversight reinforces the neutral, global character of its cooperative structure. SWIFT's global office network ensures an active presence in all the major financial centers.

CONTACT

For more information, please go to www.swift.com.

ABOUT RED HAT: DELIVERING HYBRID CLOUD CAPABILITIES

Red Hat is a leading global provider of enterprise open-source solutions, including high-performing Linux, cloud, container, and Kubernetes technologies. Red Hat Enterprise Linux, its operating system, offers a broad portfolio, including hybrid cloud and multi-cloud infrastructure, middleware, cloud-native application development, and management and automation solutions. Red Hat delivers hardened, open-source solutions that make it easier for enterprises to work across platforms and environments, from the core data center to the network edge. Red Hat builds flexible, secure, and powerful IT infrastructure solutions by operating transparently and responsibly. Linux containers are now the preferred deployment option for cloud-native apps, and the open-source Kubernetes platform is the industry standard for managing and orchestrating those containerized workloads. A hybrid cloud strategy enables the optimal solution for each task or workload.

CONTACT

For more information, please go to www.redhat.com.

ABOUT C3 AI: CHAMPIONING AI EXPERTISE

C3 AI is a leading enterprise AI software provider for accelerating digital transformation. The C3 AI Suite uses a unique model-driven architecture to accelerate delivery and reduce the complexities of developing enterprise AI applications. The C3 AI model-driven architecture provides an “abstraction layer” that allows developers to build enterprise AI applications using conceptual models of all the elements an application requires instead of writing lengthy code. This approach can improve the adoption and understanding of AI across the enterprise, scale AI, deliver faster results, unlock insights and value, and reduce costs. C3 AI’s unified platform offers data lineage and model governance.

CONTACT

For more information, please go to www.c3.ai.

ABOUT KOVE: FURNISHING SCALABLE MEMORY ON DEMAND

Kove delivers a scalable, provisionable, software-defined memory resource that is easy to configure, requires no application code changes, and uses cost-effective commodity servers. Provisionable memory unlocks CPU potential, giving organizations the same results with less infrastructure. Kove can reduce latency, increase workload, and reduce the total cost of ownership.

CONTACT

For more information, please go to www.kove.net.

ABOUT AITE-NOVARICA GROUP

Aite-Novarica Group is an advisory firm providing mission-critical insights on technology, regulations, strategy, and operations to hundreds of banks, insurers, payments providers, and investment firms—as well as the technology and service providers that support them. Comprising former senior technology, strategy, and operations executives as well as experienced researchers and consultants, our experts provide actionable advice to our client base, leveraging deep insights developed via our extensive network of clients and other industry contacts.

CONTACT

Research and consulting services:
Aite-Novarica Group Sales
+1.617.338.6050
sales@aite-novarica.com

Press and conference inquiries:
Aite-Novarica Group PR
+1.617.398.5048
pr@aite-novarica.com

For all other inquiries, contact:
info@aite-novarica.com

Global headquarters:
280 Summer Street, 6th Floor
Boston, MA 02210
www.aite-novarica.com

AUTHOR INFORMATION

Charles Subrt
+1.617.338.6037
csubrt@aite-novarica.com