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Enhancing Procurement Fraud Detection with AI-Based Decision Intelligence by Merlynn

Introduction

Procurement fraud poses significant risks to large organizations, leading to substantial financial losses and reputational damage. Traditional controls often struggle to detect sophisticated fraudulent activities, particularly those involving collusion. To address these challenges, the Merlynn's TOM Digital Twins, an AI-based decision intelligence technology, offers a mechanism to enhance fraud detection and prevention within critical procurement processes.

Problem Statement

The procurement process in a large organization is complex, involving various strategies, cost and performance optimization requirements, and critical risk mitigation activities. Traditional procurement controls may not effectively detect several risk indicators that occur throughout the process. Controls are often reactive, applied at a static cadence to only a limited sample of transactions. The challenge is to provide real-time, expert-based procurement fraud detection to enable proactive identification of abnormalities within the procurement lifecycle.

Main fraud risk factors and indicators within procurement processes, as identified in the sources, include:

- Split Procurement: Dividing higher value purchases to bypass competitive sourcing requirements or splitting payments to bypass approval thresholds.
- Possible Fictitious Suppliers / Cover Quoting / Payments for Goods Not Received: Indicators such as shared bank accounts, addresses, telephone numbers, or emails between employees and suppliers; suppliers with only PO Box numbers; or payments to liquidated/deregistered companies.
- Interest in Suppliers: Potential undue influence due to employees or their family members having an interest in a supplier.
- Payments to Prohibited Suppliers: Making payments to suppliers listed on restricted databases.
- Transaction Anomalies: Unusual high number of awards or high volume purchases of similar items for a supplier; unusually high prices or unusual price fluctuations for goods.

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- Payment Anomalies: Large round amounts or fixed/regular payments that are unusual for the type of goods/services; changes in invoice frequency; above average payments; payments made before the invoice or PO date; payments made with a short turn-around time; payments exceeding invoice amounts; or payments released without all required documents (PO, Invoice, GRV).
- Contract or Invoice Price Issues: Contract prices exceeding tender price or invoice price exceeding quotation price.
- Unauthorized Access / Document Manipulation: Fraudulent approval of invoices, changes to supplier details (including banking details), amending invoice details, or using copied electronic signatures.

These risks can occur at any stage of the procurement process, from requisition to payment.

Solution

The proposed solution involves integrating Merlynn's TOM (Tacit Object Modeler) Digital Twin technology into the procure-to-pay process. This AI-based decision intelligence technology generates alerts at a transactional level by replicating the decision-making patterns of human experts.

Digital Twins are created by observing and learning from the decisions of subject matter experts (SMEs). These Digital Twins form a library of expertise that can be used as a decision-reference mechanism to adjudicate transactions. Transactions flagged by the Digital Twins can be directed to relevant forensic experts for review. This acts as an independent "second set of eyes" – a Digital Procurement Fraud Review Panel – to review transactions and reduce the risk of procurement fraud.

The technology supports real-time monitoring, continuously analysing procurement activities to detect irregularities promptly. It can identify suspicious patterns, such as repeated supplier recommendations or unusual pricing fluctuations. The technology is designed with integration capability, capable of seamlessly integrating with existing procurement systems.

Case study

Production data from a large mining organization over several months (April to September 2024) had been extracted, comprising a significant number of records (+300,000) and unique vendors (+3,000).

The Digital Twins processed the production data to identify 2 main risks:

Risk 1: Split invoicing

- Purchase requisitions (PRs) for more than **700 Vendors** were identified as potential for split invoicing.

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- For these vendors:
    - **More than 10,000 PRs** were flagged, with the majority valued below R1m.
    - The balance of the flagged PR's ranged in value **between R1m and R35m**

Risk 2 : Contract avoidance

- **428 Vendors** were flagged for potential bypassing the contracting requirements within the procurement process. With PR's amounting to a value in surplus of **R400m**. The top 10 vendors contributed **32%** of this total value (R152m). Most vendors flagged by this check were associated with PRs between **R150k and R1m**.

Digital Twins for other risk areas, like price variation, anomaly detection on price/product/supplier etc, have also be built and tested.

Benefits

Integrating Merlynn's TOM Digital Twin technology into the procure-to-pay process offers several key benefits:

- **Proactive Fraud Prevention:** Detect and prevent fraudulent activities before they result in financial loss.
- **Enhanced Oversight:** Independent monitoring reduces reliance on internal controls alone, especially in identifying sophisticated activities or potential collusion.
- **Operational Efficiency:** Automation of routine checks frees up resources for more strategic tasks.
- **Scalability:** The solution can adapt to organizational growth and evolving procurement practices.
- **Explainability:** The technology provides the rationale behind each decision generated by the Digital Twin, which can be crucial for investigations and compliance.

Conclusion

By deploying AI-based decision intelligence technology, organizations can move beyond reactive controls to proactively detect and prevent fraud, enhance compliance, improve efficiency, and strengthen overall control frameworks within their procure-to-pay processes.