

The Role of Machine Learning in Enhancing Anti-Money Laundering (AML) Compliance

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Introduction

1. A sound financial system is key to economic stability and growth.
2. Global financial systems face persistent threats from money laundering and terrorist financing.
3. Pakistan has adopted customized regulatory practices to reduce risks.
4. AI and rule-based Transaction Monitoring Systems (TMS) are emerging tools to combat illicit activities.

Objectives

1. Compare the performance of AI driven vs. rule-based TMS in Pakistan.
2. Evaluate their detection abilities, operational efficiency, regulatory compliance, and implementation challenges.
3. Provide actionable recommendations for South Asian regulators and financial institutions.

Types of TMS

1. Rule-Based TMS: Simple, effective for known patterns; high false positives.
2. Risk-Based TMS: Tailored to customer risk profiles; requires ongoing updates.
3. AI-Driven TMS: Accurate and adaptive; costly and staff intensive

Importance of TMS

1. Detects and prevents financial crimes.
2. Ensures compliance with AML/CTF regulations.
3. Enhances transparency, accountability, and financial stability.
4. Supports RegTech and SupTech for better oversight.

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Methodology

Approach: Qualitative study using semi-structured interviews. Sample: 32 professionals from 4 Pakistani financial institutions. Analysis: Inductive coding, triangulation, and member checking for validity.

Results

1. Detection: AI systems outperform in complex case detection.
2. Efficiency: AI is faster but costly; smaller banks may struggle.
3. Compliance: Rule-based systems show better regulatory alignment.
4. Challenges: Shortage of trained AI personnel and scalability issues.
5. Training: Capacity building is critical for effective system use.

Recommendations

1. Adopt a hybrid model combining AI and rule-based systems.
2. Invest in staff training and capacity building.
3. Improve data integration and system scalability.
4. Work closely with regulators and promote innovation.
5. Implement risk-based frameworks and update systems regularly.

Conclusion

1. AI-driven TMS offer higher accuracy and scalability but require substantial investment and skilled staff.
2. Rule Based TMS remain reliable for compliance, especially when integrated with risk parameters.
3. A Hybrid Approach combining AI & Rules based system enhance detections and regulatory alignment.
4. Capacity Building and ongoing system updates are essential.