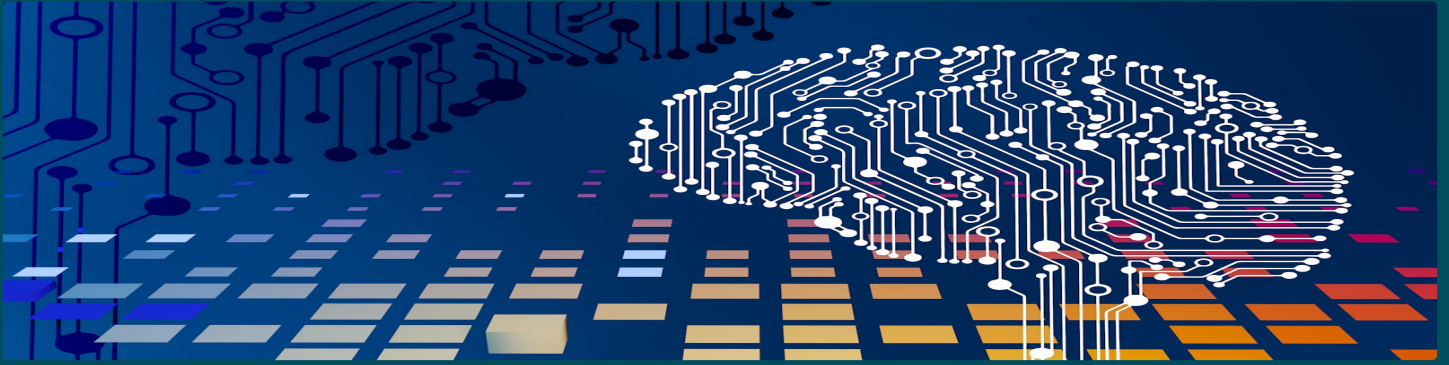




SECURITIES LAW

SEBI's Artificial Intelligence (AI) and Machine Learning (ML) Reporting Framework: Evolution and Harmonisation Across Indian Stock Exchanges

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Introduction

Artificial Intelligence (AI) and Machine Learning (ML) technologies are reshaping India's securities markets. From algorithmic trading and predictive analytics to risk management and investor servicing, intermediaries now operate in an ecosystem increasingly driven by data and automation. While these systems enhance efficiency and liquidity, they also introduce regulatory risks relating to systemic stability, algorithmic opacity, and potential market manipulation.

Recognising these challenges, the Securities and Exchange Board of India (SEBI) introduced a structured reporting framework in 2019 to bring AI/ML-based systems within a formal supervisory regime. The framework does not seek to restrict innovation; rather, it ensures that technological adoption in trading and intermediary functions remains transparent, auditable, and accountable. Over time, this structure has been progressively refined by the stock exchanges, culminating in a harmonised, cross-exchange mechanism in 2025.

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From SEBI's Directive to Exchange-Level Implementation

SEBI first laid the foundation for AI/ML oversight through Circular No. SEBI/HO/MIRSD/DOS2/CIR/P/2019/10 dated January 4, 2019, which directed all recognised exchanges, NSE, BSE, MSE, MCX, and NCDEX, to establish a uniform supervisory framework to track the use of AI and ML systems by intermediaries. This initiative formed part of SEBI's broader Enhanced Supervision Programme, which aims to strengthen technology governance, compliance transparency, and systemic risk management.

Following this directive, the Metropolitan Stock Exchange (MSE) issued two implementing circulars in February and April 2019. These established half-yearly reporting obligations for trading members covering the periods April–September and October–March each year. Members were required to disclose details of AI/ML systems used for trading, risk management, or investor servicing. Notably, even intermediaries not deploying AI/ML systems were mandated to file NIL declarations, ensuring universal compliance coverage. By April 2019, the process was fully digitised, requiring filings through the Exchange's Enhanced Supervision Portal with internal validation and approval before submission.

Expansion of Scope in 2023

The reporting framework was substantially broadened in December 2023, when MSE issued Circular No. MSE/MEM/14585/2023. The reporting template was updated to align with SEBI's enhanced supervisory requirements, and the definition of "AI/ML systems" was expanded to include predictive, analytical, and pattern-recognition algorithms used across front-office, mid-office, and back-office functions. This expansion recognised that AI/ML's influence extends beyond trading to decision support, surveillance, and operational control functions.

Greater emphasis was also placed on auditability and documentation, with members required to maintain comprehensive internal approval trails, validation reports, and system-level records for every declared AI/ML tool. The move represented a shift from basic disclosure to ongoing governance, embedding accountability into intermediaries' internal compliance systems.

Harmonisation in 2025

In July 2025, the National Stock Exchange (NSE) introduced a cross-exchange reporting mechanism under which trading members registered with NSE could make a single AI/ML disclosure filing, which NSE would then share with other recognised

exchanges, including BSE, MSE, MCX, and NCDEX. This harmonised model was formally adopted by MSE through Circular No. MSE/MEM/17921/2025 dated October 7, 2025, which consolidated all prior directions and clarified operational responsibilities for multi-exchange members.

The 2025 circular thus reduces duplication and simplifies compliance for firms operating across multiple trading platforms. Members not registered with NSE, however, must continue filing directly with MSE through its Enhanced Supervision Portal. The circular also reiterates that AI/ML reporting remains mandatory for all algorithmic trading members, including NIL submissions, for the half-year ending September 30, 2025, with the filing window open until October 15, 2025.

Core Compliance Obligation

Under the consolidated framework, every trading member using algorithmic software is required to report the use of AI or ML systems for each half-yearly cycle, regardless of whether such systems are developed in-house or procured from third-party vendors. Members who do not use AI or ML must still make a formal NIL declaration confirming non-use during the reporting period.

Submissions are made online through the Enhanced Supervision Portal, under the “Compliance Submission ? ML and AI Submission” tab. Members must either select the declaration option for NIL usage or complete detailed data forms specifying each AI/ML system’s purpose, operational scope, safeguards, and vendor details. In addition, trading members are expected to maintain full internal documentation supporting their filings, including system design approvals, audit logs, risk-control frameworks, and contractual information with vendors. These records must be readily available for inspection by the Exchange or SEBI during supervisory reviews.

In effect, the circular places equal weight on procedural compliance and substantive governance, requiring intermediaries to file accurately and to demonstrate ongoing control over the technologies they use.

Regulatory Philosophy

SEBI’s supervisory philosophy is anchored in technological neutrality with regulatory accountability. The regulator does not discourage innovation in algorithmic or AI-based trading but seeks to ensure that such tools operate within well-defined parameters that protect market integrity and investor trust. The framework is intended to enhance transparency by building a regulatory database of AI/ML systems across the market, to mitigate systemic risks arising from opaque automated strategies, to ensure auditability for post-event investigations, and to strengthen accountability by holding intermediaries responsible for validating and monitoring their systems, including those developed or managed by third-party vendors. This evolving architecture aligns India’s capital markets with global regulatory trends emphasising AI governance, explainability, and ethical automation in financial systems.

Conclusion

Since its inception in 2019, SEBI’s AI/ML reporting framework has evolved into a cohesive, harmonised model that balances innovation with oversight. By mandating consistent disclosures, reinforcing documentation standards, and simplifying compliance through cross-exchange coordination, SEBI and the stock exchanges have ensured that India’s capital markets remain both technologically progressive and regulatorily sound. The underlying message is clear: algorithmic progress is encouraged, but it must be accompanied by transparency, auditability, and accountability.

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