**Tool Application at each phase:**

**1. Data Enrichment**

The first and most foundational layer takes **raw, unstructured merchant descriptors** (e.g., “SQ \*JANE’S COFFEE”) from transaction feeds and transforms them into **structured, enriched merchant profiles**. Using AI models, web scraping, public registries, MCC decoding, and category classification, MerchSentAI identifies:

* The merchant’s real legal name
* Business type and industry
* Country of operation
* Merchant Category Code (MCC)
* Website, location, entity links

This makes the data **machine-actionable** and significantly more valuable for downstream analysis.

**2. Sanctions & Screening**

Once enriched, the merchant profile is passed through **compliance checks**, including:

* **Sanctions Lists** (OFAC, EU, UN, UK, Canada, etc.)
* **PEP Screening**
* **Adverse Media Monitoring**
* **Corporate Registry Watchlists**

Unlike static screening engines, MerchSentAI performs **ongoing, dynamic screening**, ensuring that merchant risk scores are updated as new media, enforcement actions, or global alerts are published.

**3. Fraud Analysis**

In the final phase, the system applies a combination of:

* **Velocity Rules** (e.g., # of transactions in a short window)
* **Behavioral Signals** (e.g., unusual patterns vs. industry peers)
* **Graph Network Detection** (e.g., linked merchants, duplicate identities)
* **Typology Matching** (e.g., refund abuse, bust-out merchants, synthetic merchant IDs)

This allows platforms to detect fraud **before financial damage occurs**, enabling either automated

alerts or manual escalations via dashboards.

**Additional Tools at Each Phase**

* **Enrichment Add-ons:**
  + Tag merchants by platform (e.g., Shopify, Square, Stripe)
  + Classify emerging categories (e.g., crypto exchanges, CBD, payday lenders)
* **Screening Add-ons:**
  + ESG or reputational risk filtering
  + Merchant category-based exclusions (e.g., gambling, adult, crypto)
* **Fraud Add-ons:**
  + Alerts based on peer benchmark comparison (i.e., merchant X’s behavior vs similar merchants in MCC 5812)
  + Labeling of suspicious merchant clusters using semi-supervised learning