

# Aiding Humans in Financial Fraud Decision Making: Toward an XAI-Visualization Framework



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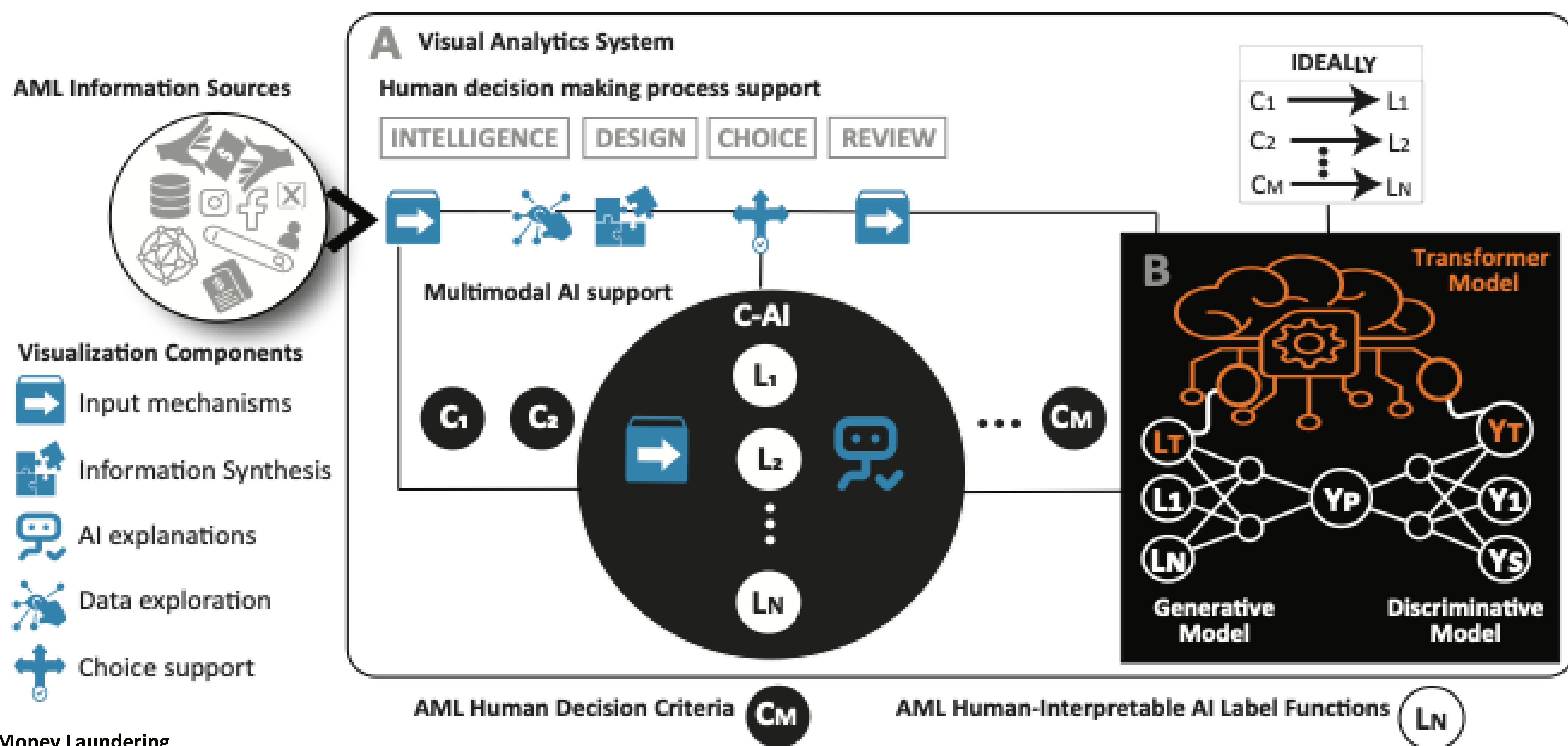
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**Context:** AI prevails in financial fraud detection decision making process. Yet, due to concerns about biased automated decision making or profiling, regulations mandate that final decisions are made by humans.

**Challenge:** Financial fraud investigators face the challenge of manually synthesizing vast amounts of unstructured information, including AI alerts, transaction histories, social media insights, and governmental laws. Current Visual Analytics (VA) systems primarily support isolated aspects of this process, such as explaining binary AI alerts and visualizing transaction patterns, thus adding yet another layer of information to the overall complexity.

**Our Working Solution:** A framework where the VA system supports decision makers through-out all stages of financial fraud investigation, including data collection, information synthesis, and human criteria iteration. VA can claim a central role in AI-aided decision making, ensuring that human judgment remains in control while minimizing potential biases and labor-intensive tasks.



Our multimodal framework features a VA system with eXplainable AI (XAI) methods to enhance decision making:

**Figure (B):** The XAI approach uses 3 deep learning models: a **generative** model that probabilistically labels client actions using white-box label functions (e.g., rules, keywords, heuristics); a **discriminative** model that generalizes the labels across the entire dataset with a noise-aware loss function; a **transformer** model that suggests new label functions and identifies conflicts for resolution.

**Figure (A):** The VA system supports 4 decision stages: transforming data (**intelligence stage**), synthesizing information and exploring scenarios (**design stage**), providing AI-driven decision support (**choice stage**), and refining models (**review stage**).

By leveraging weakly supervised learning, the system combines human expertise with AI to establish decision making guidelines, such as why certain client transactions are flagged as suspicious and how to learn from these fraudulent cases to refine the a priori AML strategies.

