

LLM-Powered Agentic System and Applications to Misinformation Detection & FinTech

INFINITY LAB

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Agentic Workflow for Fact-Checking

Background and Motivation

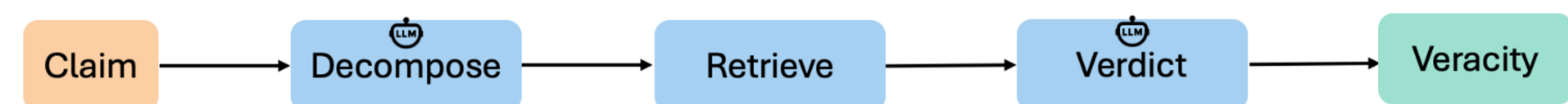
1) **Task Definition:** Fact-checking aims to assess the truthfulness of claims from online platforms and media source. The fact-checking is a complex and time-consuming task, involving the retrieval of relevant evidence and the verification of a claim veracity based on that evidence.

Output = Model ([claim; evidence])

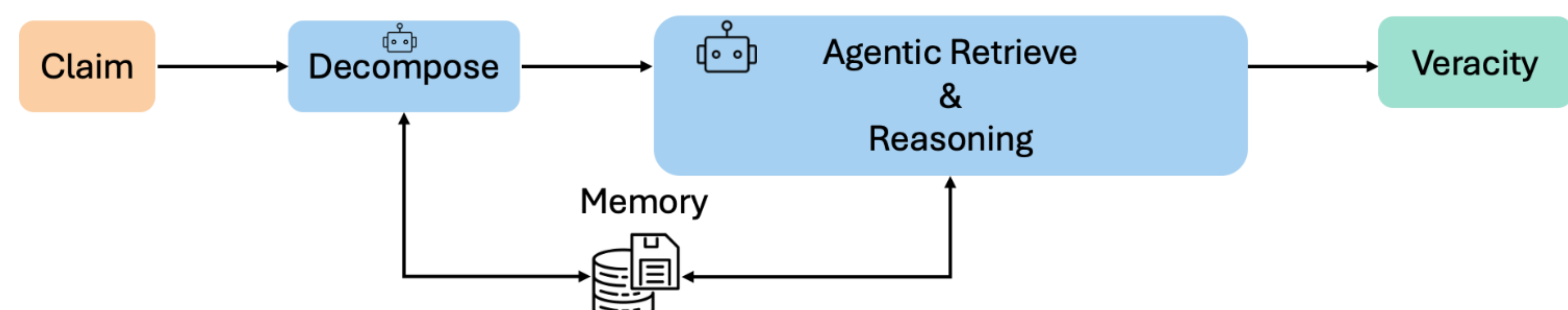
2) **Limitation:** Low searching efficiency; the retrieved evidence is often underutilize.

Proposed Framework

Previous Approaches



Our Approach

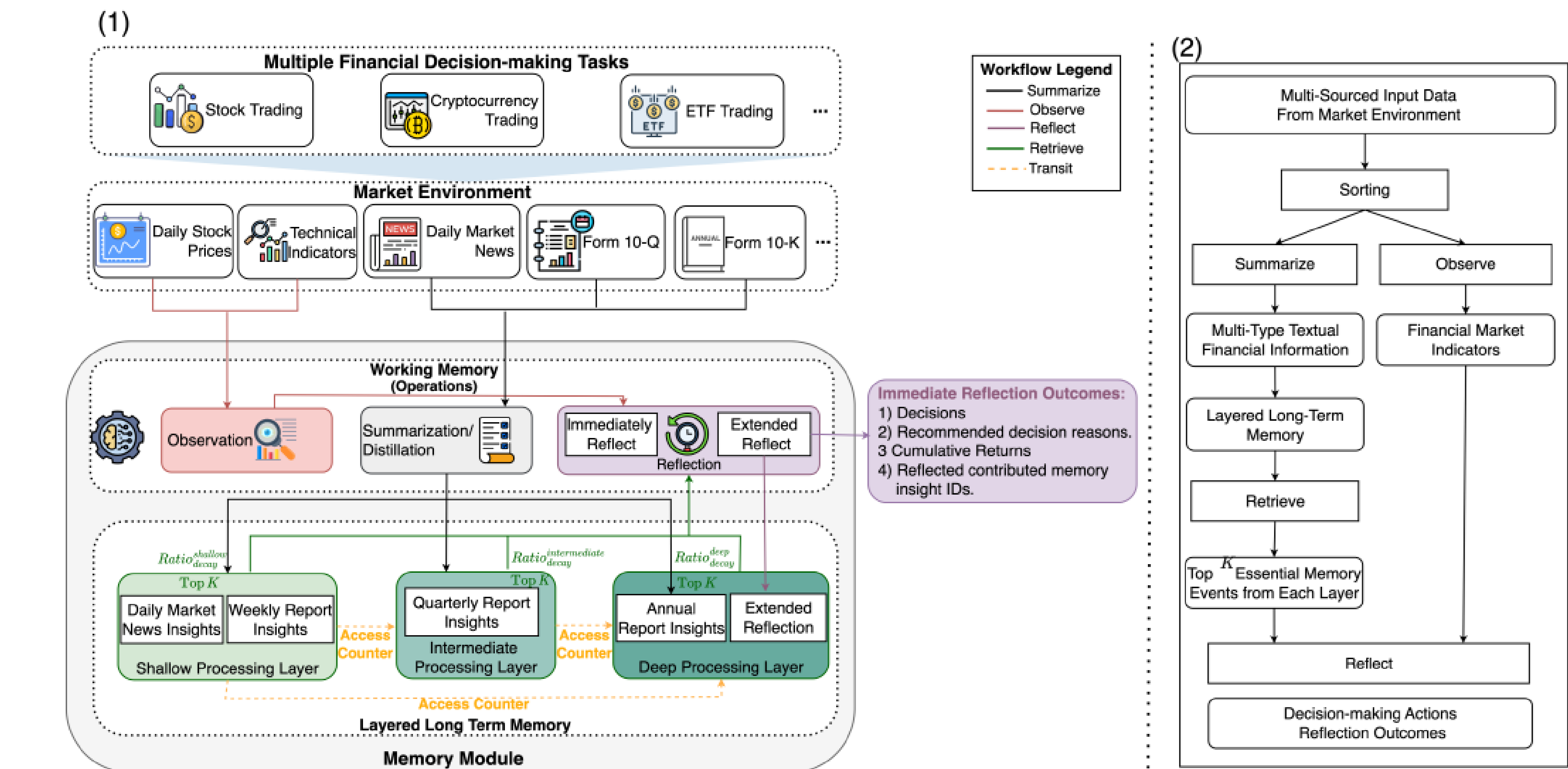
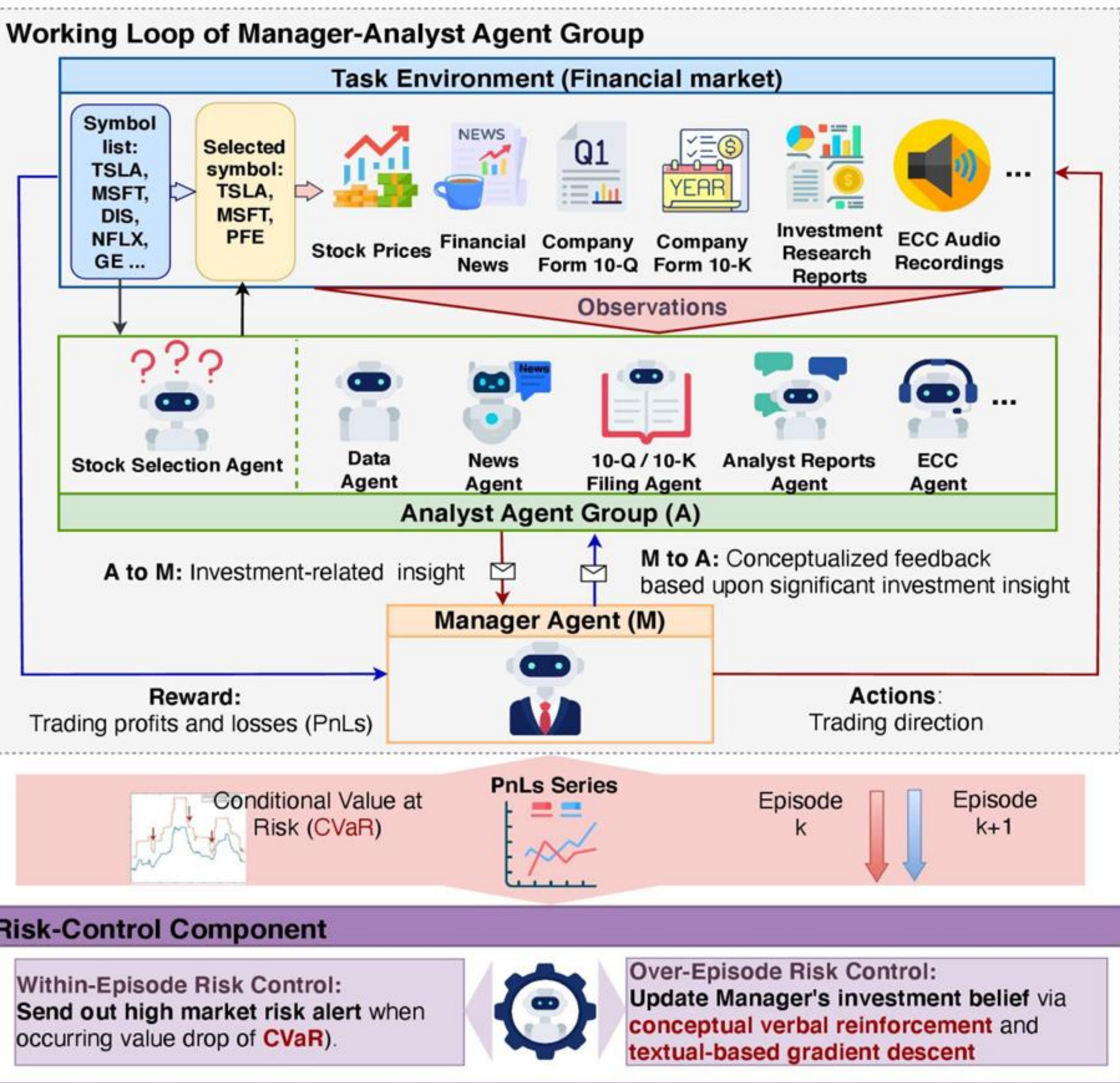


Result

Checking Process	Note	Accuracy
Subject → WikiData (KG) Subject → KG	Atomic Claim	36.28%
Subject → Wikipedia Search → Text	Atomic Claim	48%
Claim → Wikipedia Search → Text	Atomic Claim	49%
Claim → Wikipedia Search → Text	Atomic Claim	51.10%
Claim+Subject → Wikipedia Search → Text	Concatenate	62.23%
Claim+Subject → Wikipedia Search → Text	Prompt Fusion	63.27%
Claim+Subject → Tool-Use → Text	Prompt Fusion	70.18%
Claim+Subject → Tool-Use + ReAct (Multi-turn) → Text	Prompt Fusion	75.20%

Table 1: Performance of different search tools and prompting strategies.

LLM-Based Multi-Agent for Financial Decision Making



LLM-Based Multi-Agent System

Multimodal Market Environment

Manager-Analyst hierarchical communication structure

Long-term and Short Memory

Self-reflection by Verbal Reinforcement Learning

Single Asset Trading and Portfolio Management

Categories	Models	TSLA			AMZN			NIO			MSFT		
		CR% ↑	SR ↑	MDD% ↓	CR% ↑	SR ↑	MDD% ↓	CR% ↑	SR ↑	MDD% ↓	CR% ↑	SR ↑	MDD% ↓
Market	B&H	6.425	0.145	58.150	2.030	0.072	34.241	-77.210	-1.449	63.975	27.856	1.230	15.010
Our Model	FINCON	82.871	1.972	29.727	24.848	0.904	25.889	17.461	0.335	40.647	31.625	1.538	15.010
LLM-based	GA	16.535	0.391	54.131	-5.631	-0.199	37.213	-3.176	-1.574	3.155	-31.821	-1.414	39.808
	FinGPT	1.549	0.044	42.400	-29.811	-1.810	29.671	-4.959	-0.121	37.344	21.535	1.315	16.503
	FinMEM	34.624	1.552	15.674	-18.011	-0.773	36.825	-48.437	-1.180	64.144	-22.036	-1.247	29.435
	FINAGENT	11.960	0.271	55.734	-24.588	-1.493	33.074	0.933	0.051	19.181	-27.534	-1.247	39.544
DRL-based	A2C	-35.644	-0.805	61.502	-12.560	-0.444	37.106	-91.910	-1.728	68.911	21.397	0.962	21.458
	PPO	1.409	0.032	49.740	3.863	0.138	28.085	-72.119	-1.352	62.093	-4.761	-0.214	30.950
	DQN	-1.296	-0.029	58.150	11.171	0.398	31.174	-35.419	-0.662	56.905	27.021	1.216	21.458

Categories	Models	AAPL			GOOG			NFLX			COIN		
		CR% ↑	SR ↑	MDD% ↓	CR% ↑	SR ↑	MDD% ↓	CR% ↑	SR ↑	MDD% ↓	CR% ↑	SR ↑	MDD% ↓
Market	B&H	22.315	1.107	20.659	22.420	0.891	21.191	57.338	1.794	20.926	-21.756	-0.311	60.187
Our Model	FINCON	27.352	1.597	15.266	25.077	1.052	17.530	69.239	2.370	20.792	57.045	0.825	42.679
LLM-based	GA	5.694	0.372	14.161	-1.515	-0.192	8.210	41.770	1.485	20.926	19.271	0.277	67.532
	FinGPT	20.321	1.161	16.759	0.242	0.011	26.984	11.925	0.472	20.201	-99.553	-1.807	74.967
	FinMEM	12.397	0.994	11.268	0.311	0.018	21.503	-10.306	-0.478	27.692	0.811	0.017	50.390
	FINAGENT	20.757	1.041	19.896	-7.440	-1.024	10.360	61.303	1.960	20.926	-5.971	-0.106	56.882
DRL-based	A2C	13.781	0.683	14.226	8.562	0.340	21.191	-8.176	-0.258	49.579	-	-	-
	PPO	14.041	0.704	22.785	2.434	0.097	25.202	-33.144	-1.049	33.377	-	-	-
	DQN	21.125	1.048	16.131	20.690	0.822	21.191	21.753	0.687	39.733	-	-	-

