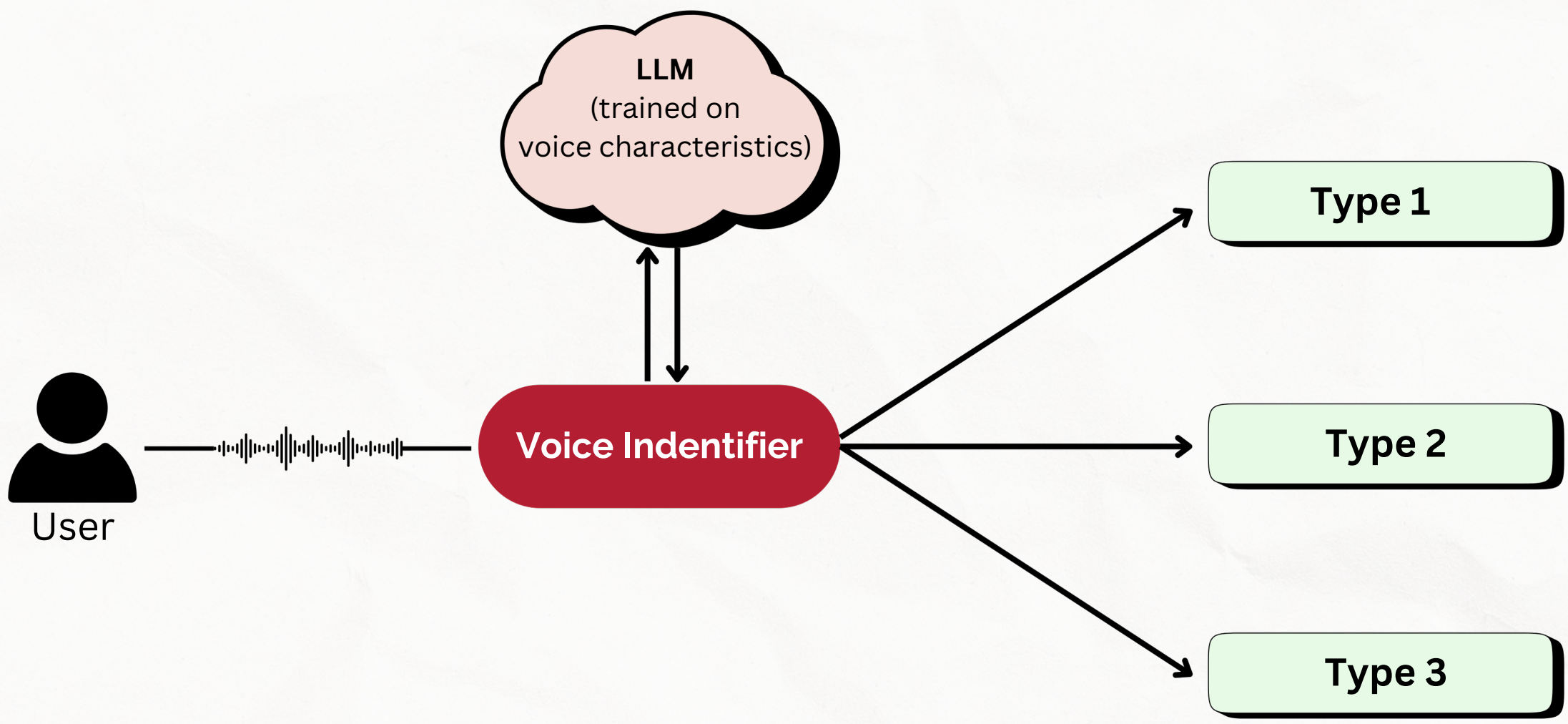
50 Use Cases of LLMS IN DIFFERENT INDUSTRIES

Bhavishya Pandit

1. Subscriber Identification

AI-driven **voice authentication** is enhancing customer service in telecom. **Telefónica** uses **Nuance Gatekeeper** to identify senior citizens calling for support, prioritizing them in service queues.

During COVID-19, traditional age-based screening failed as callers falsely claimed to be seniors. AI solved this by analyzing **voice characteristics**, ensuring only genuine seniors received priority assistance—eliminating queue jumpers and improving service efficiency.



LLM helps in identifying the voice characteristics of callers in order to prioritize assistance to senior citizens

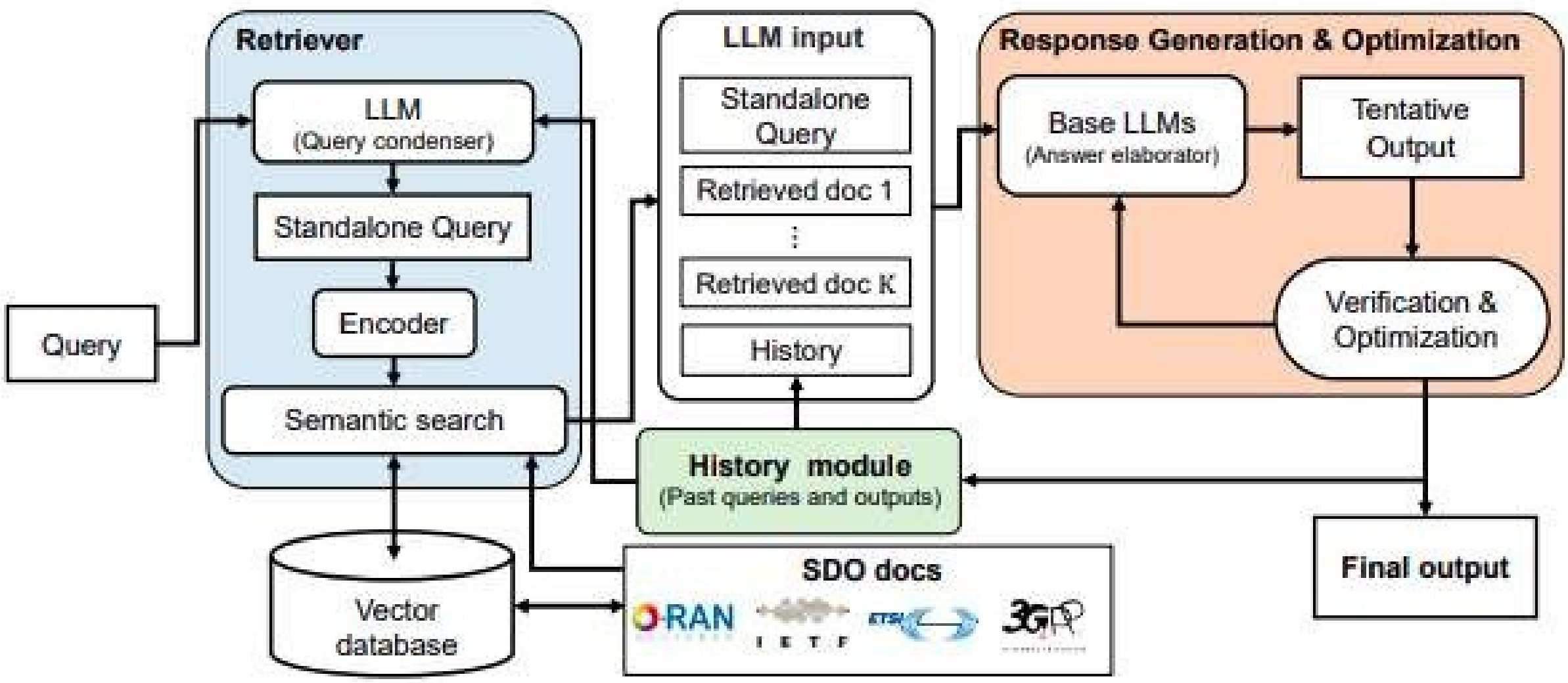
source: telcodr

2. 3GPP SPECIFICATIONS

The **3rd Generation Partnership Project (3GPP)** is an organization that creates global standards for mobile networks, including 4G, 5G, and future technologies.

A major application is **AI-powered chatbots** that answer 3GPP-related queries, reducing research time and improving accuracy. This allows engineers to implement new telecom technologies more efficiently.

TelecomRAG is one such system made for Q&A related tasks.

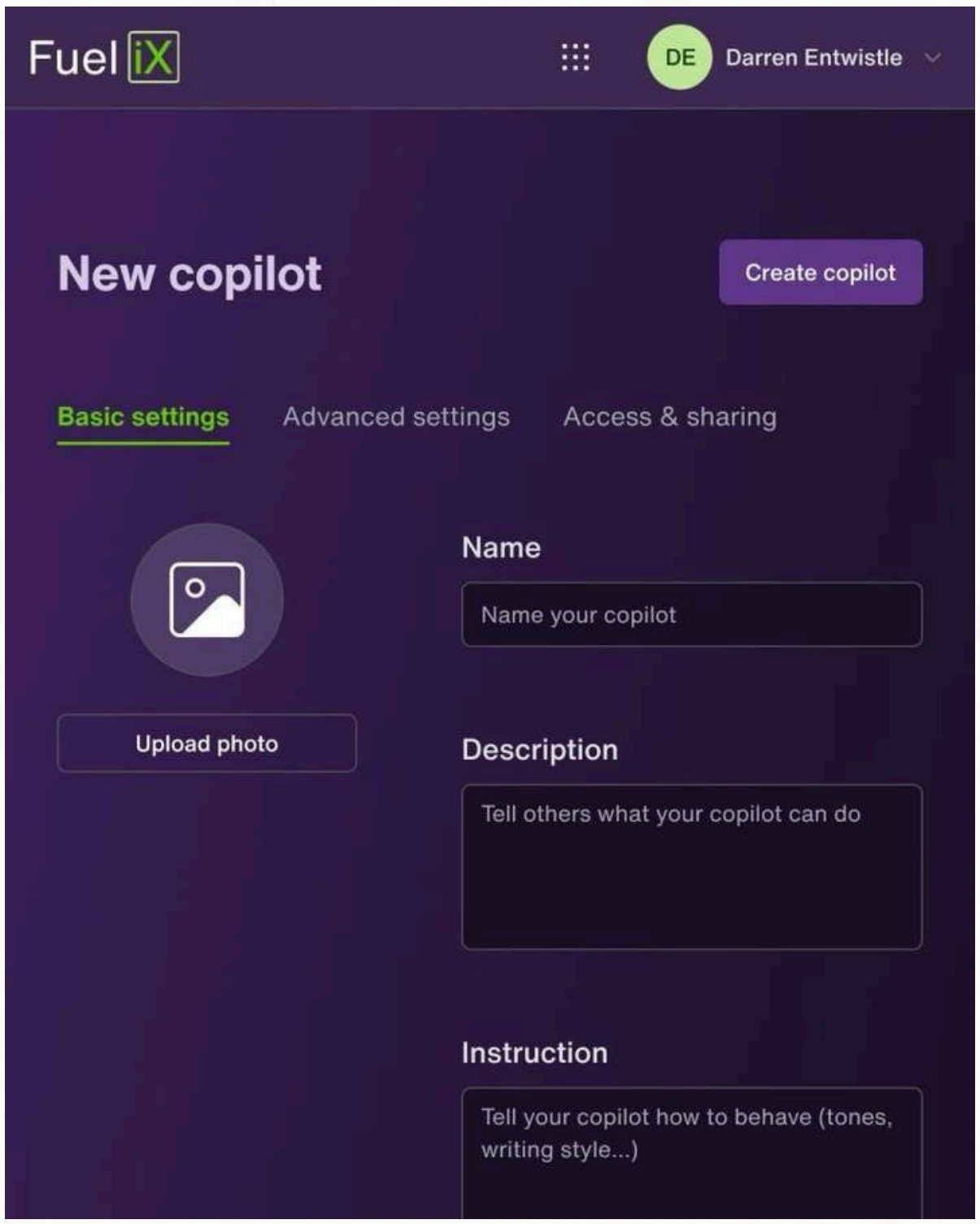


RAG based architecture of TelecomRAG

3. EMPLOYEE SUPPORT

AT&T's "Ask AT&T", built with **ChatGPT on Azure**, supports 68,000+ employees with coding, customer service, meeting summaries, and network analysis. The success has led AT&T to expand its capabilities and explore **autonomous assistants** for fraud detection and software development.

TELUS' Fuel iX utilizes **100+ LLMs** to predict network issues, improving forecasting accuracy from **69% to 89%** and cutting network operating costs by **$15 million**. AI is not just optimizing customer service but also **empowering employees** to work smarter.

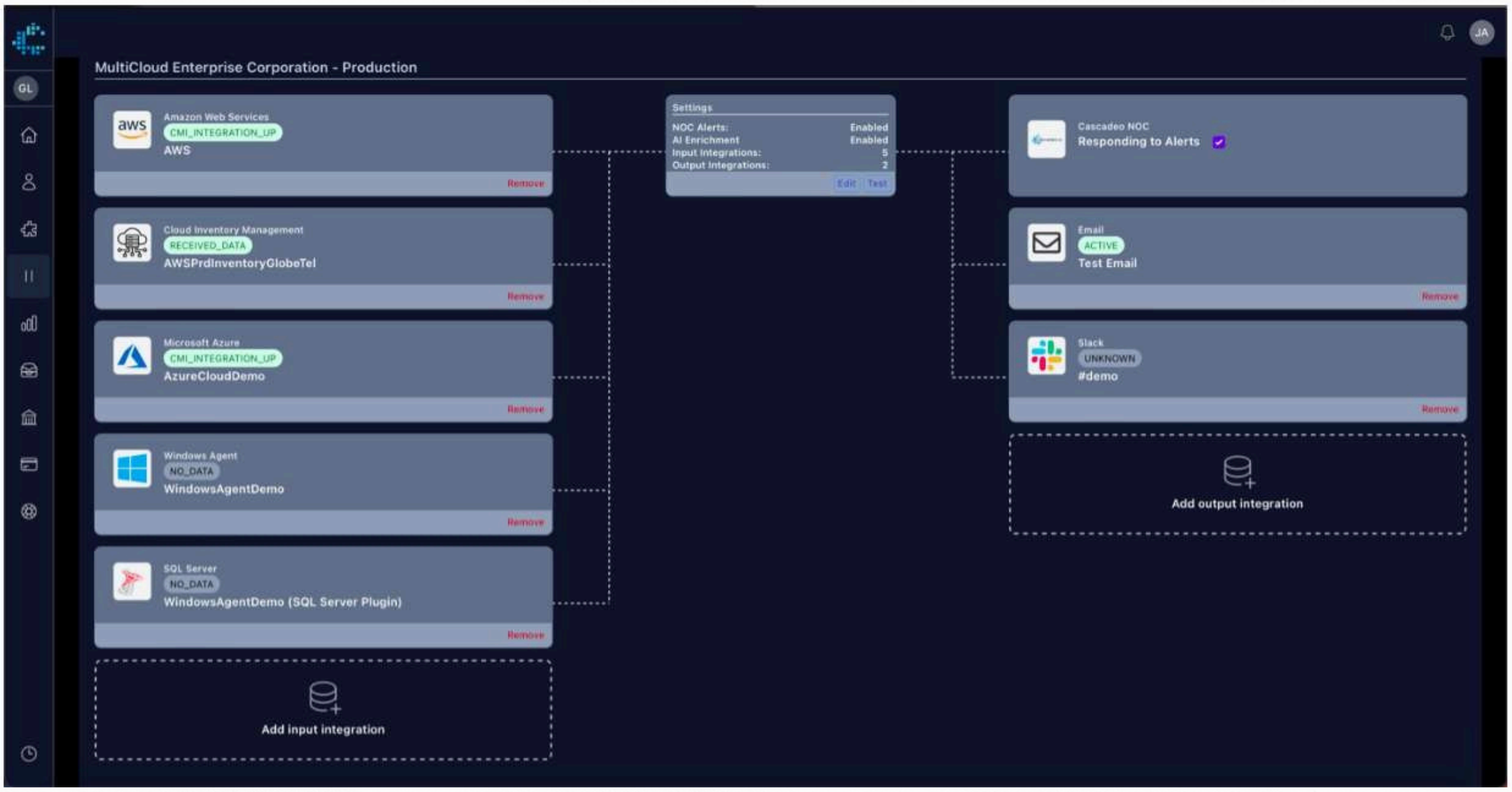


Fuel iX interface

4. Cloud Management

AI simplifies **cloud management**, acting like a virtual consultant to ensure smooth operations. Telecoms use cloud for deployments of their services.

Globe Telecom recognized the shift to **public cloud** early and acquired **Cascadeo** in 2019. In 2023, it launched **Cascadeo AI v3.0**, integrating **GPT-4, AWS SageMaker, AWS DevOps Guru**, and proprietary AI to **automate, monitor, and optimize cloud deployments**. This AI-powered approach helps enterprises **streamline cloud operations** in real time, making cloud management more efficient and hassle-free.



Cascadeo AI event pipeline

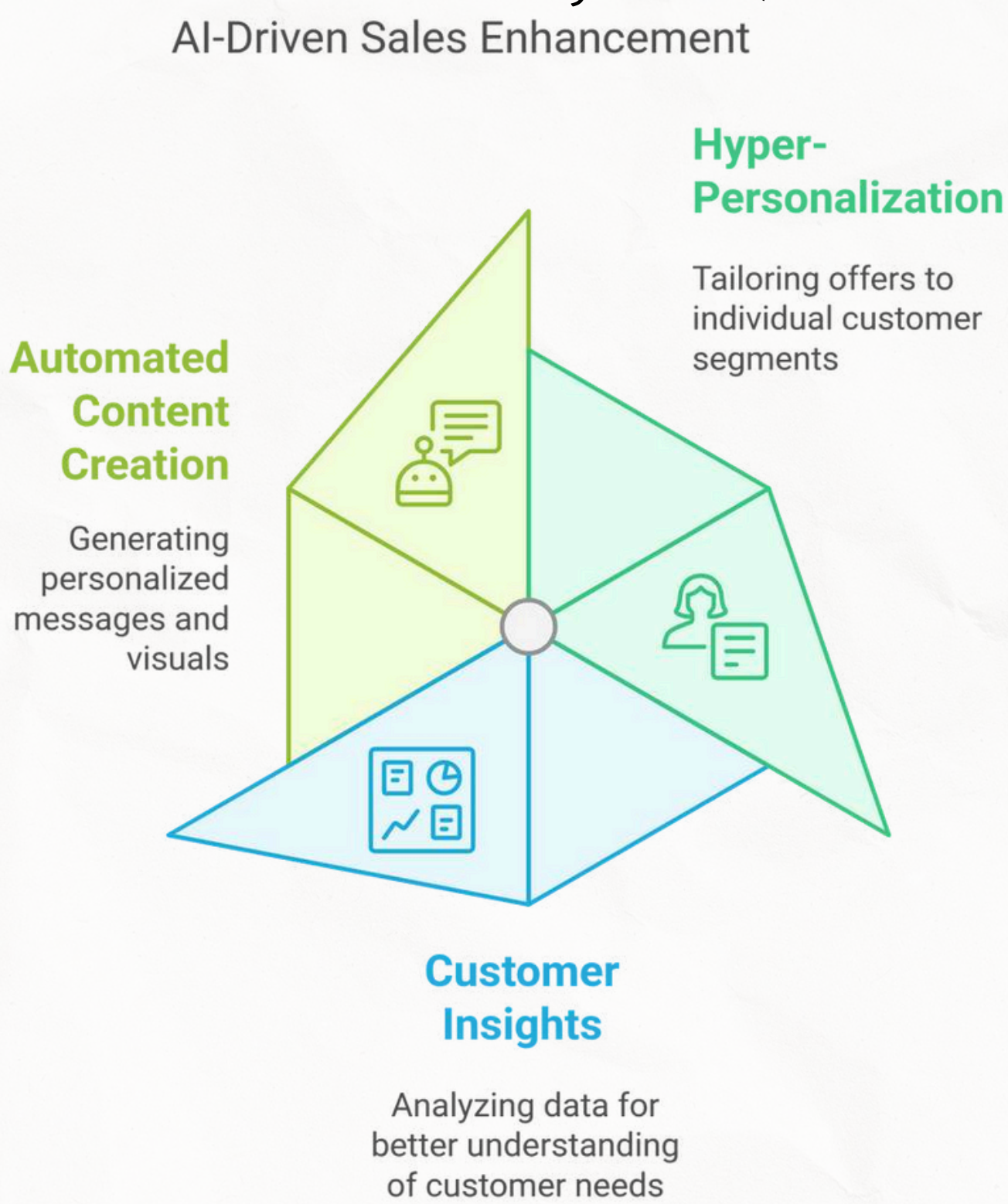
source: cascadeo

5. Sales Growth

LLMs drive sales growth by enabling **hyper-personalization, customer insights**, and automated **content creation**. They analyze customer data, past interactions, and behavioral patterns to craft targeted offers and recommendations.

For example, a **European** telecom company uses **generative AI** to identify potential sales leads from customer calls.

This approach has boosted its conversion rate by over **10%**.



source: mckinsey

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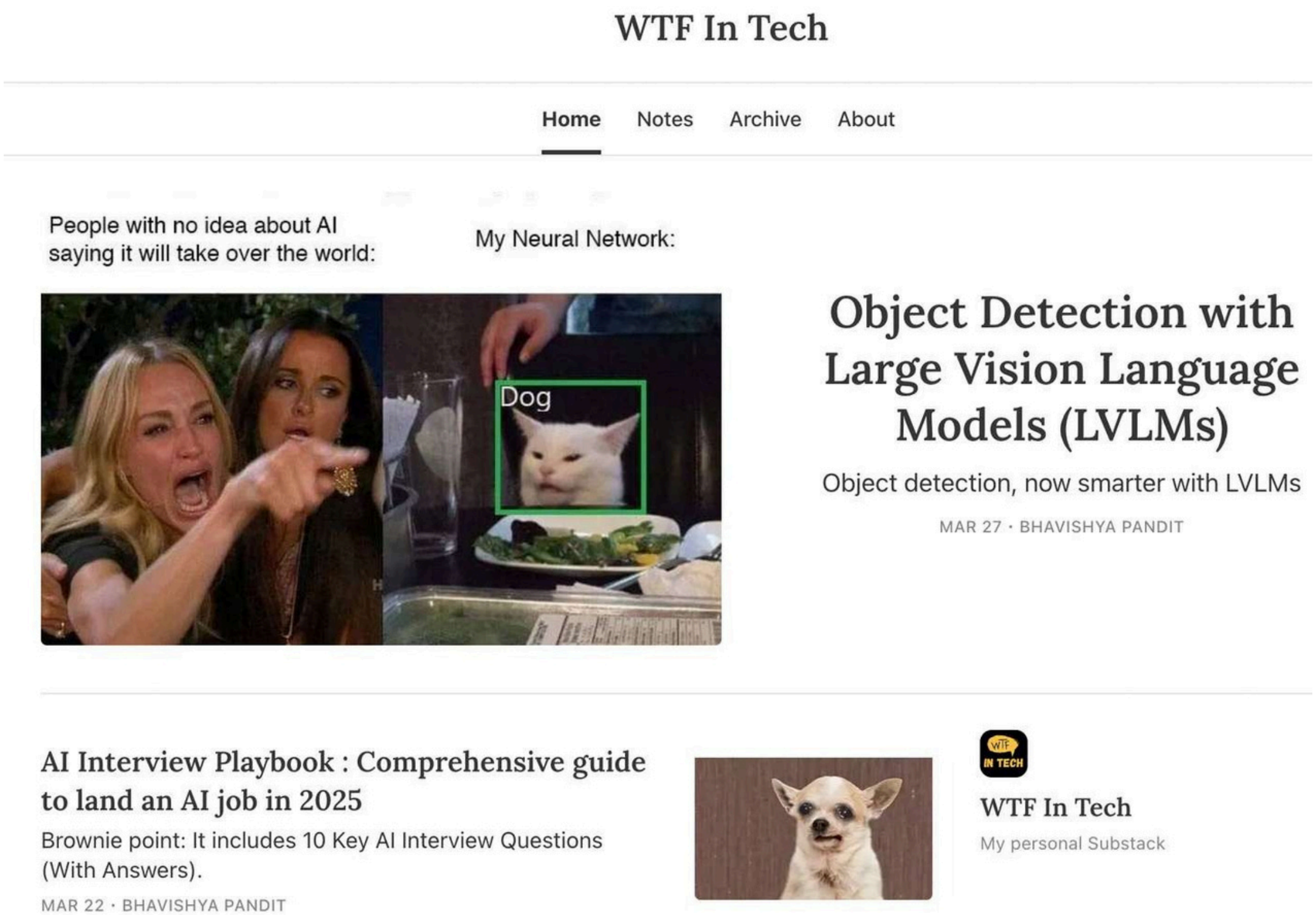

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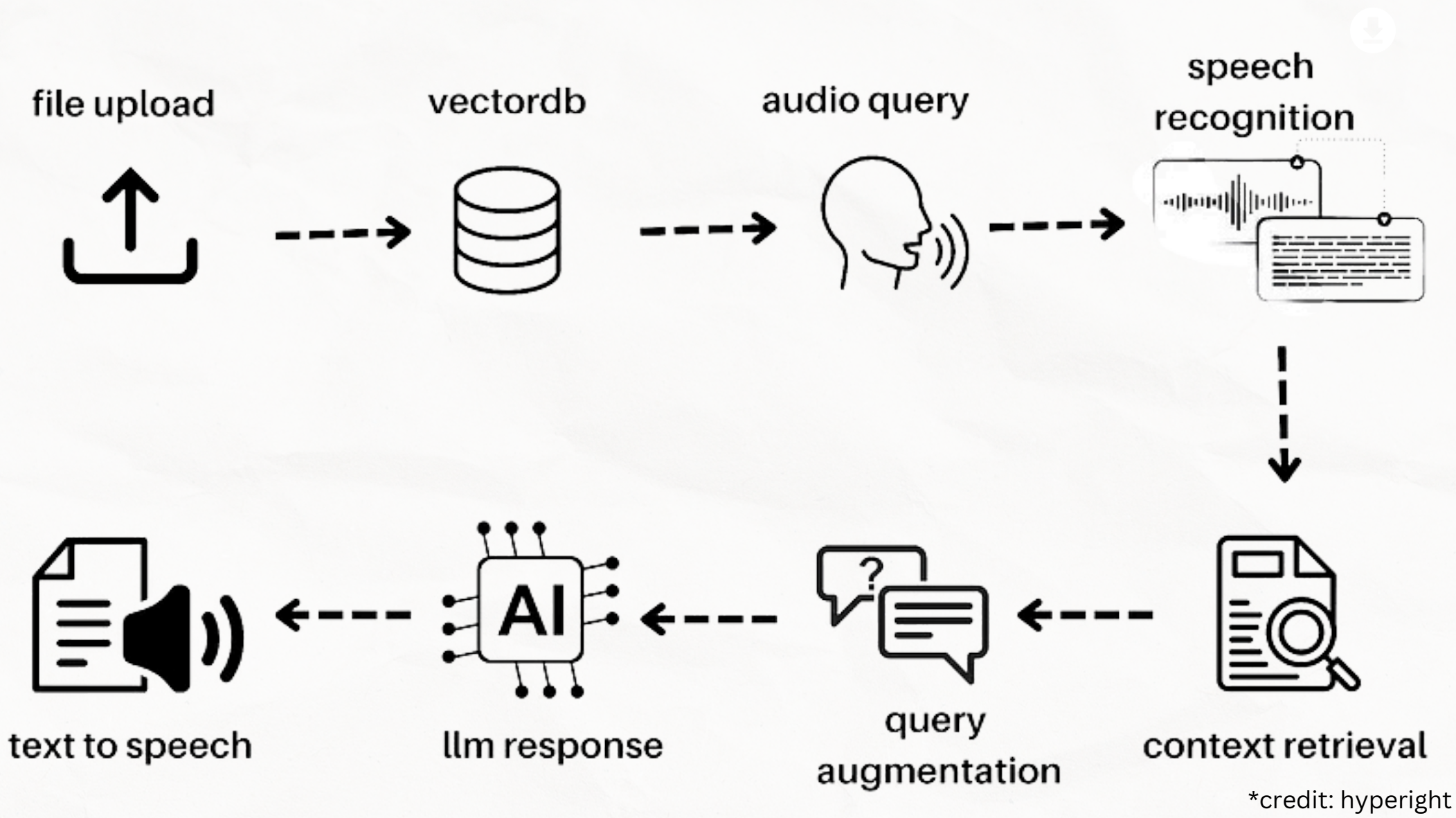
6. Podcast Analysis



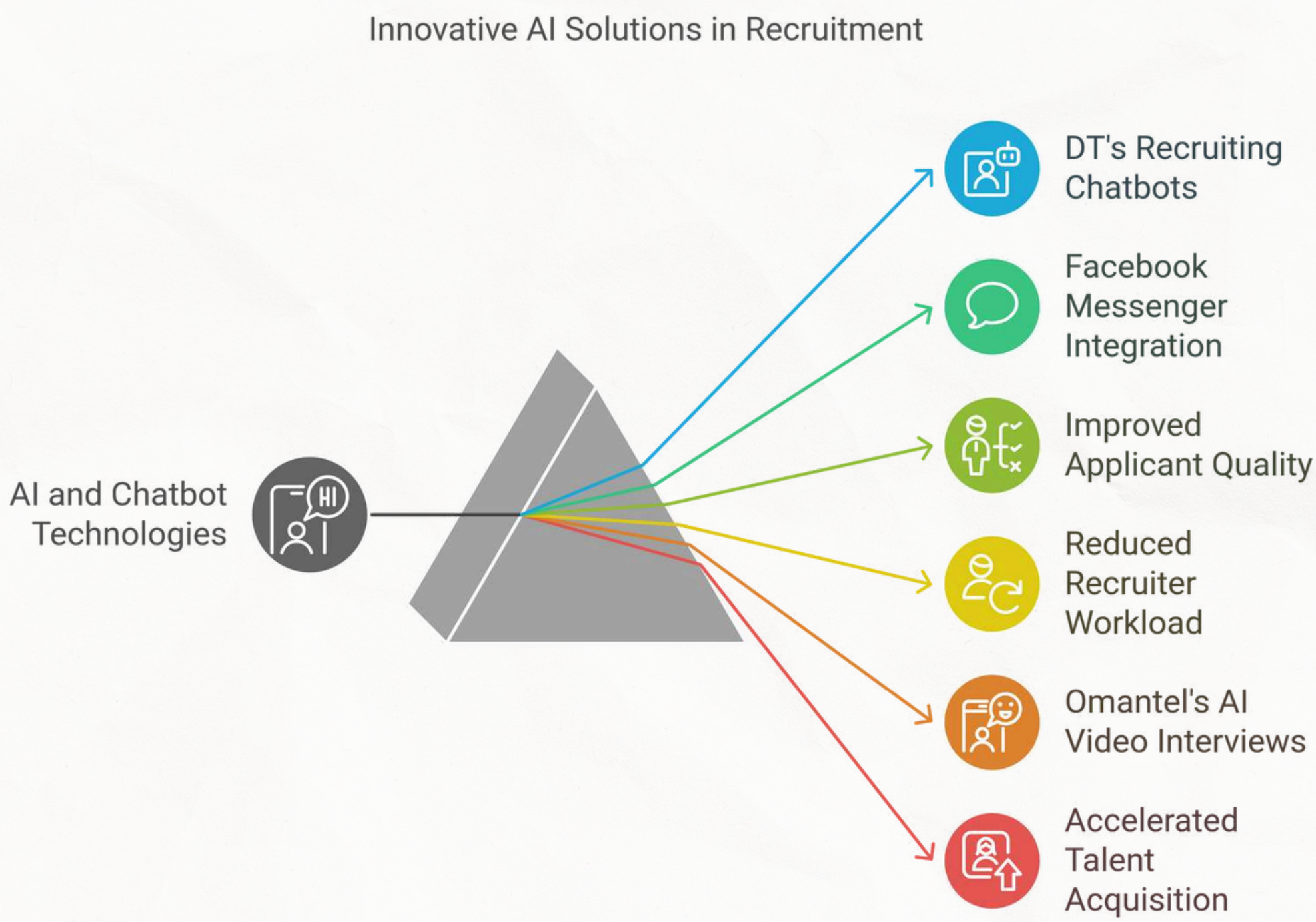
Podcast analysis examines audio and transcripts to understand audience behavior, identify trends, and extract key insights for better content and marketing

- **Precise Retrieval:** Finds specific podcast moments based on sounds, not just text transcripts.
- **Topic ID**: Identifies and groups segments by topic, even with varied wording.
- **Speaker Analysis**: Distinguishes and potentially identifies speakers for conversation analysis.
- **Sentiment Analysis**: Detects the emotional tone of podcast segments.

7. Recruitment

DT pioneered recruiting chatbots, using **Facebook Messenger** to answer job seekers' questions **24/7**. This improved applicant quality while reducing recruiter workload. Now, other DT subsidiaries use AI chatbots to assist with job searches and applications.

Omantel leveraged **Elevatus' AI-powered video interviews** to screen **5,200+ applicants in just two days**, streamlining hiring and accelerating talent acquisition.



source: telcodr

8. Network Anamolies Resolution

LLMs help mobile network operators (MNOs) quickly detect and resolve anomalies by analyzing past incident reports and equipment manuals. They can identify patterns in recurring issues, suggest accurate solutions, and predict resolution times based on historical data.

By automating troubleshooting, LLMs reduce manual effort, speed up fault detection, and improve network reliability. They can also provide real-time recommendations, helping engineers address problems before they escalate, ultimately ensuring a more stable and efficient network.

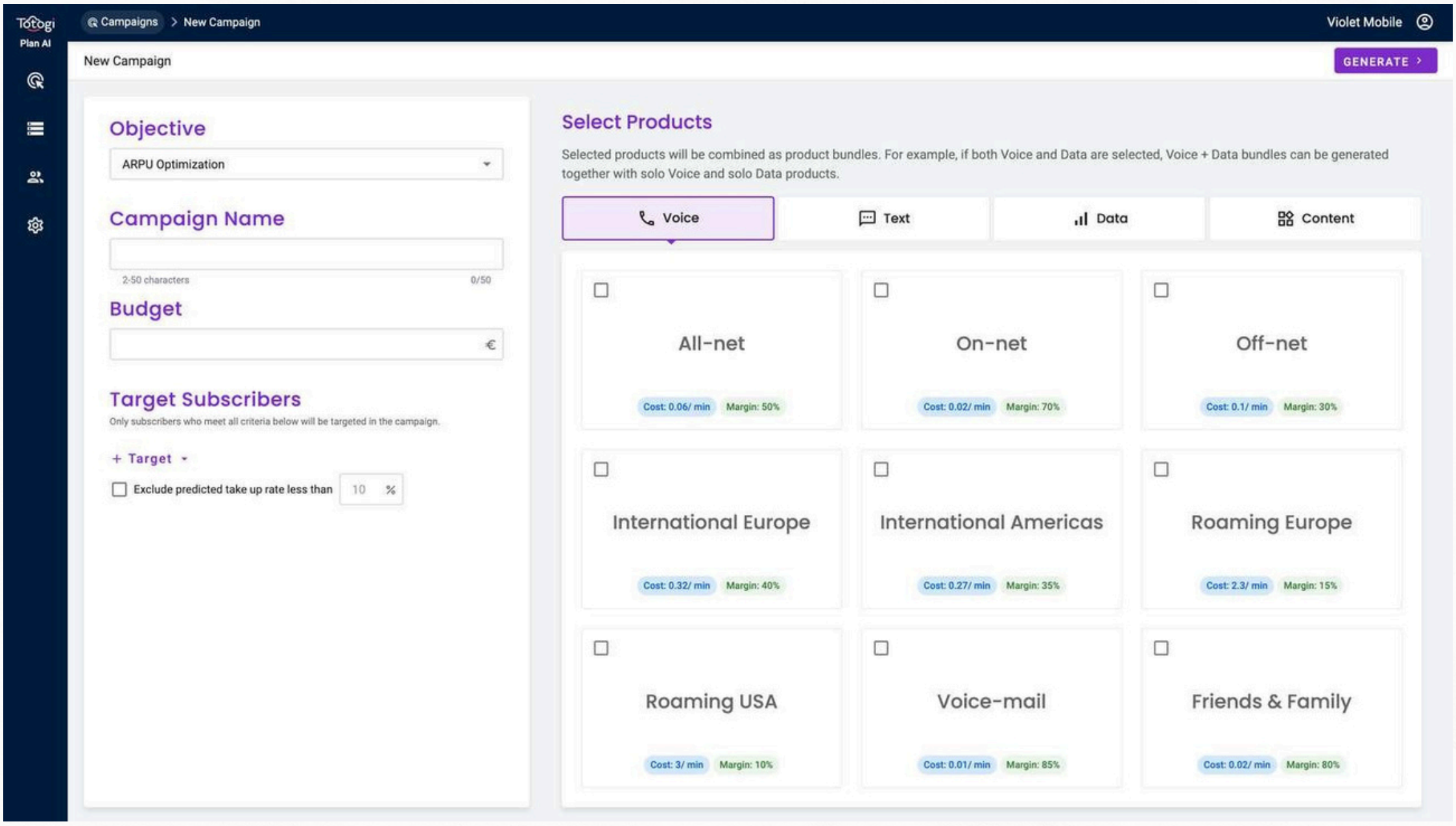
```
Troubleshooting_Ticket.JSON =
{
'BS_ID':                    'B01'
'Alarm_ID':                 'RAN_Site01_LTE_RF_VSWR'
'Alarm Characteristics':    'BS_Type:BTS5900,
                            Board_Type=MRRU,
                            Affected_RAT=GL,
                            VSWR_Alarm_Threshold(0.1)=14,
                            VSWR(0.1)=14,
                            Output_Power(0.1 dBm)=432'
'Alarm Time':               '4/6/2023 2:10:04 PM'
'Dispatch Time':            '4/6/2023 3:48:36 PM'
'Resolution Time':          '4/6/2023 4:36:14 PM'
'Diagnose Summary':         'RF Unit Voltage Standing Wave
                            Ratio threshold crossed due to the
                            feeder being bent or damaged'
}
```

Sample network anomaly troubleshooting ticket. Information related to the anomaly is automatically generated by the system (in blue). Input regarding resolution of the anomaly is provided by the engineer (in orange).

source:https://arxiv.org/pdf/2308.06013

9. Plan Personalization

MobileX, a US-based MVNO, uses AI to analyze subscriber data and create personalized plans instead of pushing unlimited options. Similarly, **Totogi's PlanAI** leverages AI and ML to optimize revenue by micro-targeting offers, helping telcos increase revenue by up to **10%**.



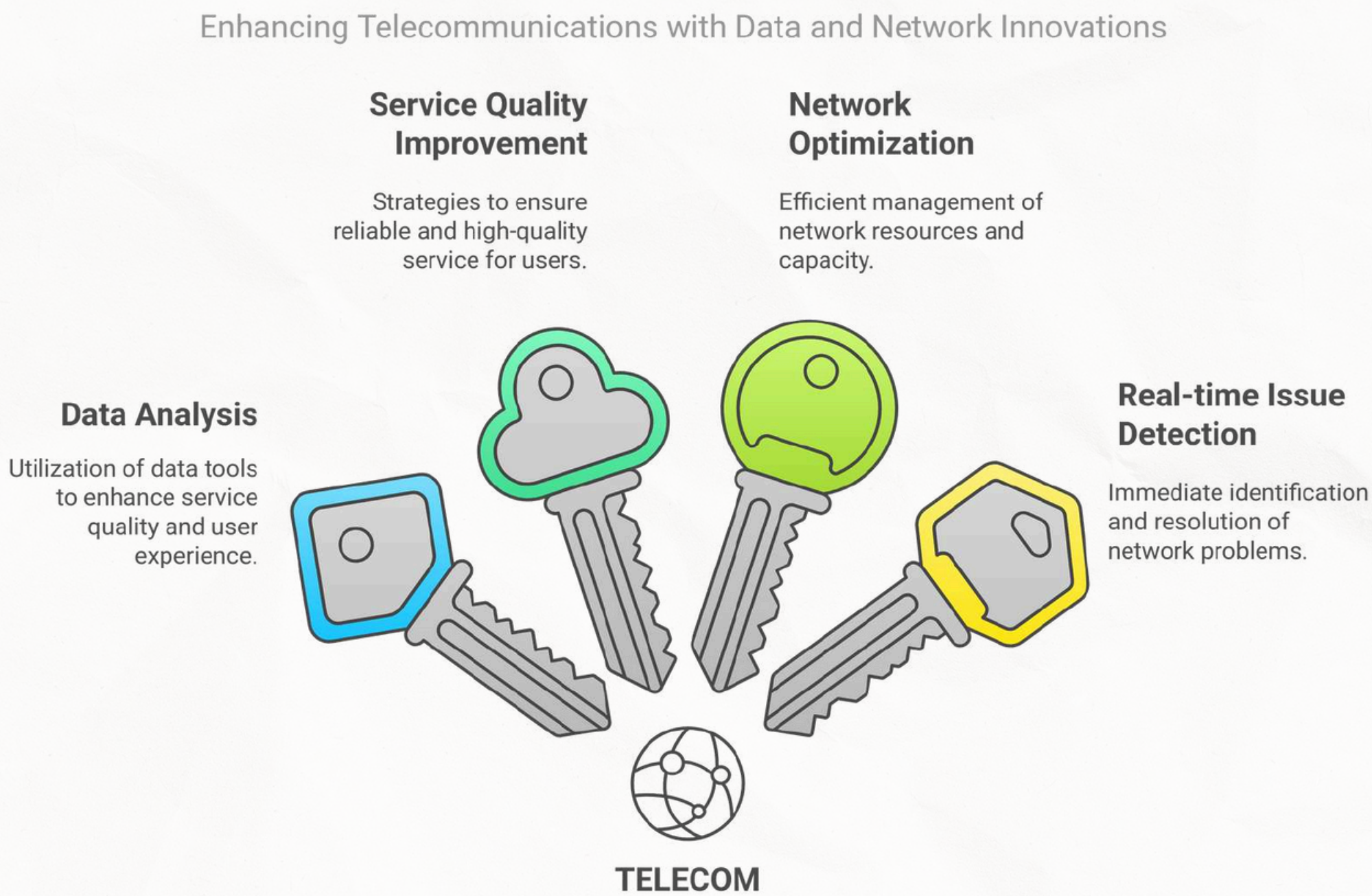
Totogi's PlanAI

source: Totogi

10. Network Optimization

Telcos generate vast amounts of data, but leveraging **Gen AI** is now helping them extract valuable insights to enhance service quality and customer experience.

For instance, **Three UK** uses **Microsoft Dynamics 365(LLM based Analytics)** to analyze data, improve service quality, and ensure a smooth experience for gamers and streamers. Similarly, **AT&T** employs **Gen AI**, machine learning, and predictive analytics to optimize network planning, capacity management, and real-time issue detection.



source: rcrwireless

11.Citizen Assistant

Governments are using Gen AI to improve citizen services through AI-driven chatbots and virtual assistants, making interactions faster and more efficient.

The **city of Heidelberg** launched **Lumi**, Germany's **first digital citizen assistant**. Lumi helps residents:

- Apply for identity cards
- Get a driving license
- Register a place of residence

Other examples: India's **UMANG** App, US IRS Virtual Assistant

Lumi Catbot & UMANG app

source: https://www-heidelberg-de

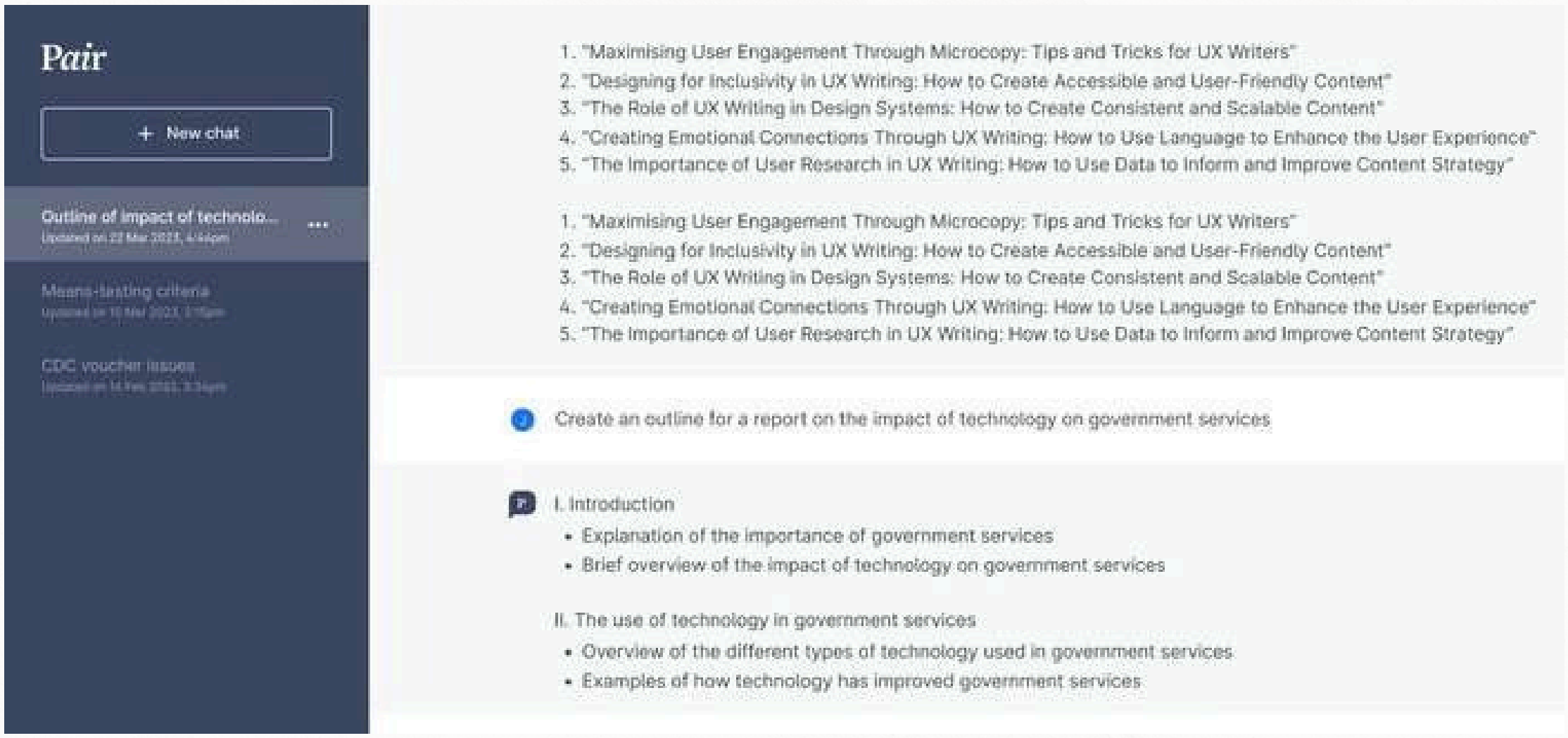
12. Report & Content Summarization

Government agencies generate vast amounts of data, from **policy drafts** and **legislation** to public service reports and case studies. Manually processing and analyzing these documents is time-consuming.

Singapore's GovTech introduced the **Pair App**, a secure AI assistant that enhances public sector efficiency:

- **Pair Chat** – A secure and fast AI chatbot for government officers to quickly extract information from policies and documents.

- **Pair Intern** – An AI-powered email assistant designed for government devices that cannot access the internet, ensuring secure communication and productivity.



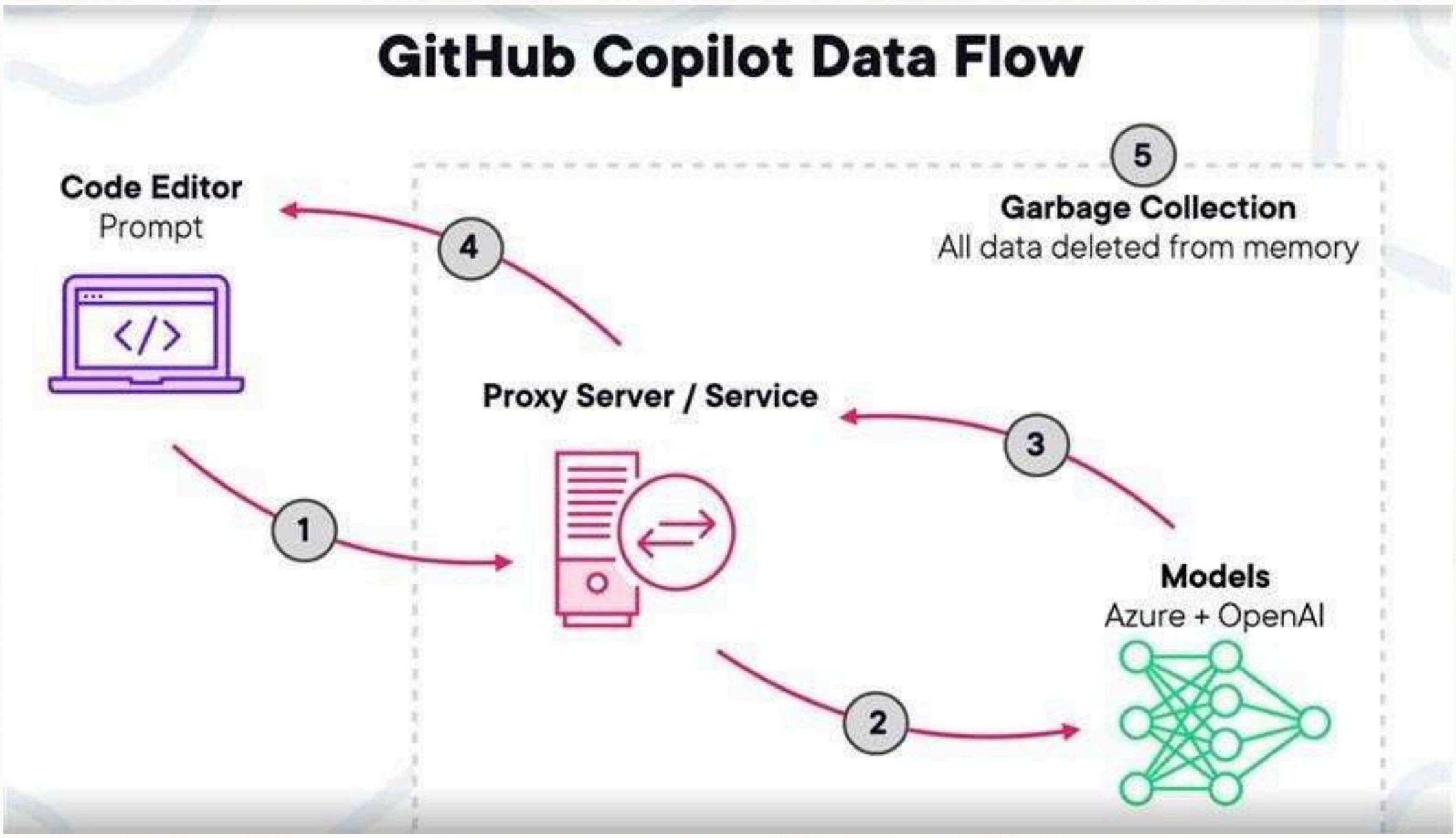
Pair AI Interface source: https://products.open.gov.sg/pair

13. Coding & Software

Governments rely on secure, efficient, and scalable software to manage public services, from **tax collection systems** to **digital identity platforms**.

The **UK's HM Treasury** (economic and finance ministry) is testing **GitHub Copilot**, an AI-powered coding assistant, to:

- Accelerate software development for financial systems.
- Reduce coding errors by providing intelligent suggestions.
- Improve efficiency by automating repetitive coding tasks.



Github Copilot Flow

source: https://www.linkedin.com/pulse/github-copilot-data-flow-nikhil-mohite-ck65f/

14. Content generation

Governments handle large volumes of official communication, contracts, and public updates. GenAI streamlines this by automating content creation, improving efficiency, and reducing workload.

Key Benefits

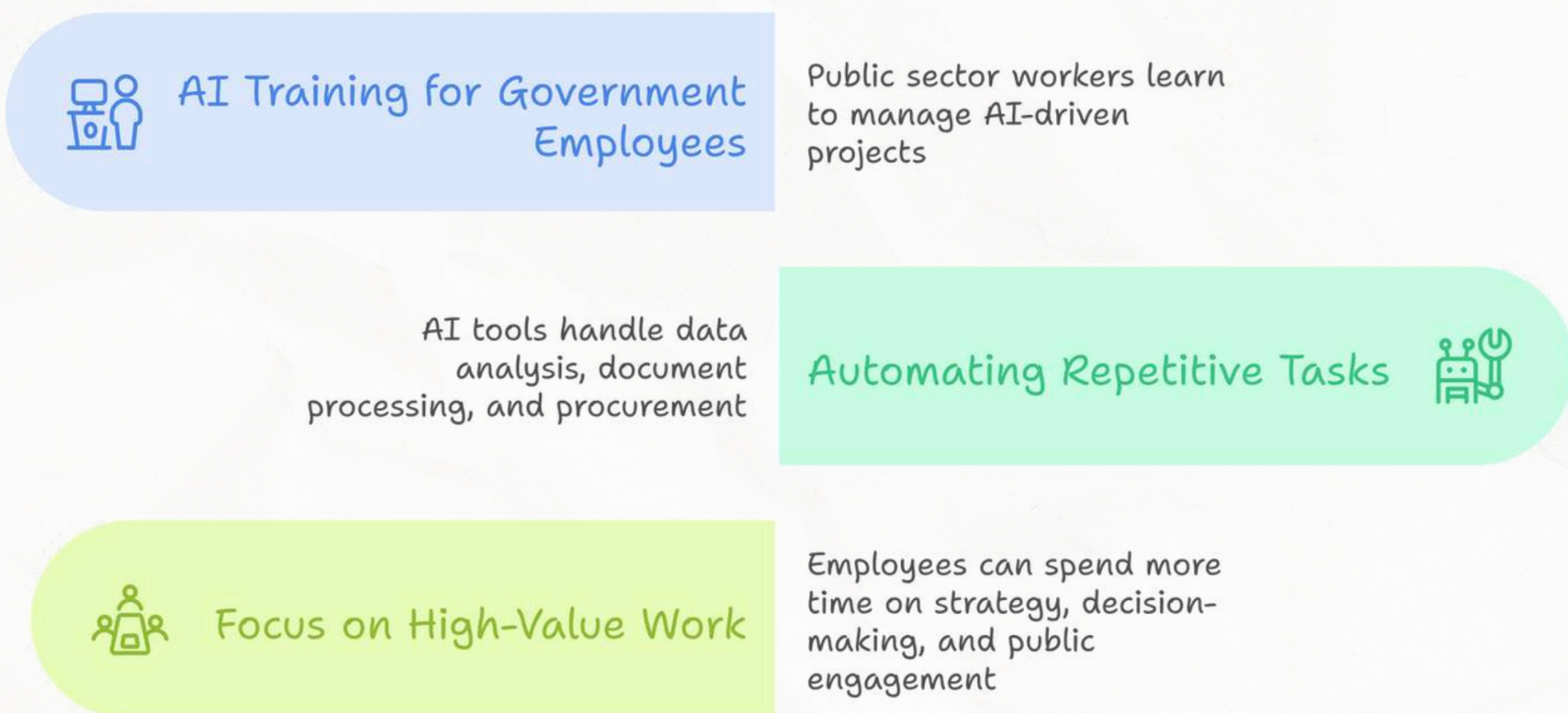
- **Faster Document Drafting** – AI generates contracts, proposals, and reports quickly.
- **Automated Communication** – Assists in writing emails, press releases, and social media posts.
- **Standardized & Error-Free Content** – Ensures consistency in legal and procurement documents.

The US Department of Defense developed **Acqbot**, an AI-powered tool for contract writing that speeds up procurement and reduces delays in government supply chains.

15. Workforce Training

Governments need to **train** their employees in **AI skills** and hire AI experts to ensure they can use AI effectively, improving productivity and efficiency.

- **AI Training for Government Employees** – Public sector workers learn to manage AI-driven projects.
- **Automating Repetitive Tasks** – AI tools handle data analysis, document processing, and procurement, reducing workload.
- **Focus on High-Value Work** – Employees can spend more time on strategy, decision-making, and public engagement.

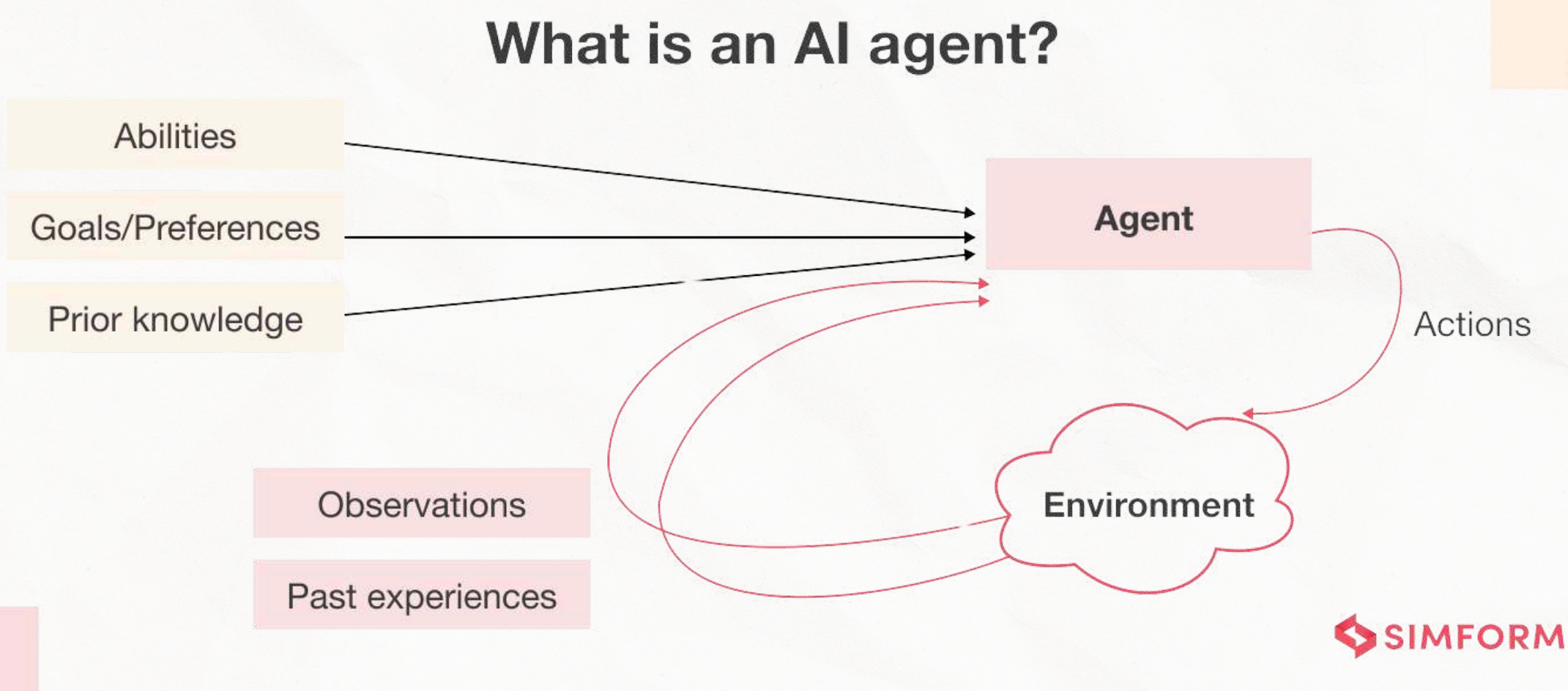


16. AI Agents

Governments are deploying **AI agents** to **streamline operations, automate repetitive tasks, and enhance citizen services**. These agents complement human workers, boosting efficiency in both back-office processes and public-facing services.

AI agents can analyze data, make decisions, and perform tasks autonomously using. They can streamline workflows, improve efficiency, and handle complex or repetitive processes with minimal human input.

The **USPTO(US Patent & Trademark Office)** developed an **AI-powered search system** to help patent examiners quickly find relevant information, improving accuracy and efficiency in patent approvals.



source: simform

17. Defense

The **U.S. Department of Defense (DoD)** established **Task Force Lima** to evaluate and implement Generative AI in military operations, reinforcing the country's defense capabilities and technological edge.

Key Focus Areas

- **Cybersecurity Enhancement** – Uses AI to identify and neutralize cyber threats proactively.
- **Advanced Battlefield Intelligence** – Analyzes massive datasets to improve military strategy.
- **Autonomous Defense Systems** – Powers drones, surveillance, and automated logistics for efficiency.

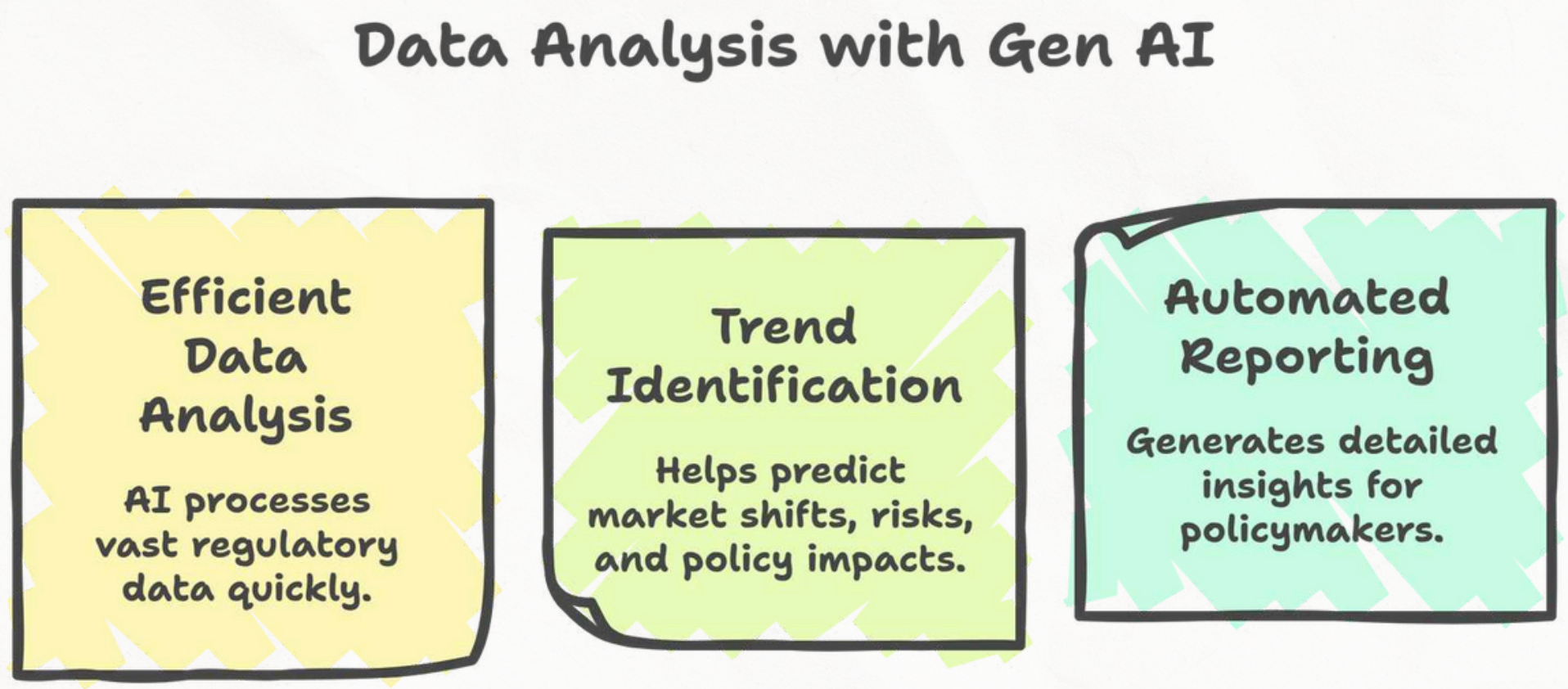
*cited from available online sources

18. Analysis & Decision Making

Governments rely on Gen AI to analyze large datasets, detect trends, and generate reports, enabling faster and more data-driven decisions.

- **Efficient Data Analysis** – AI processes vast regulatory data quickly.
- **Trend Identification** – Helps predict market shifts, risks, and policy impacts.
- **Automated Reporting** – Generates detailed insights for policymakers.

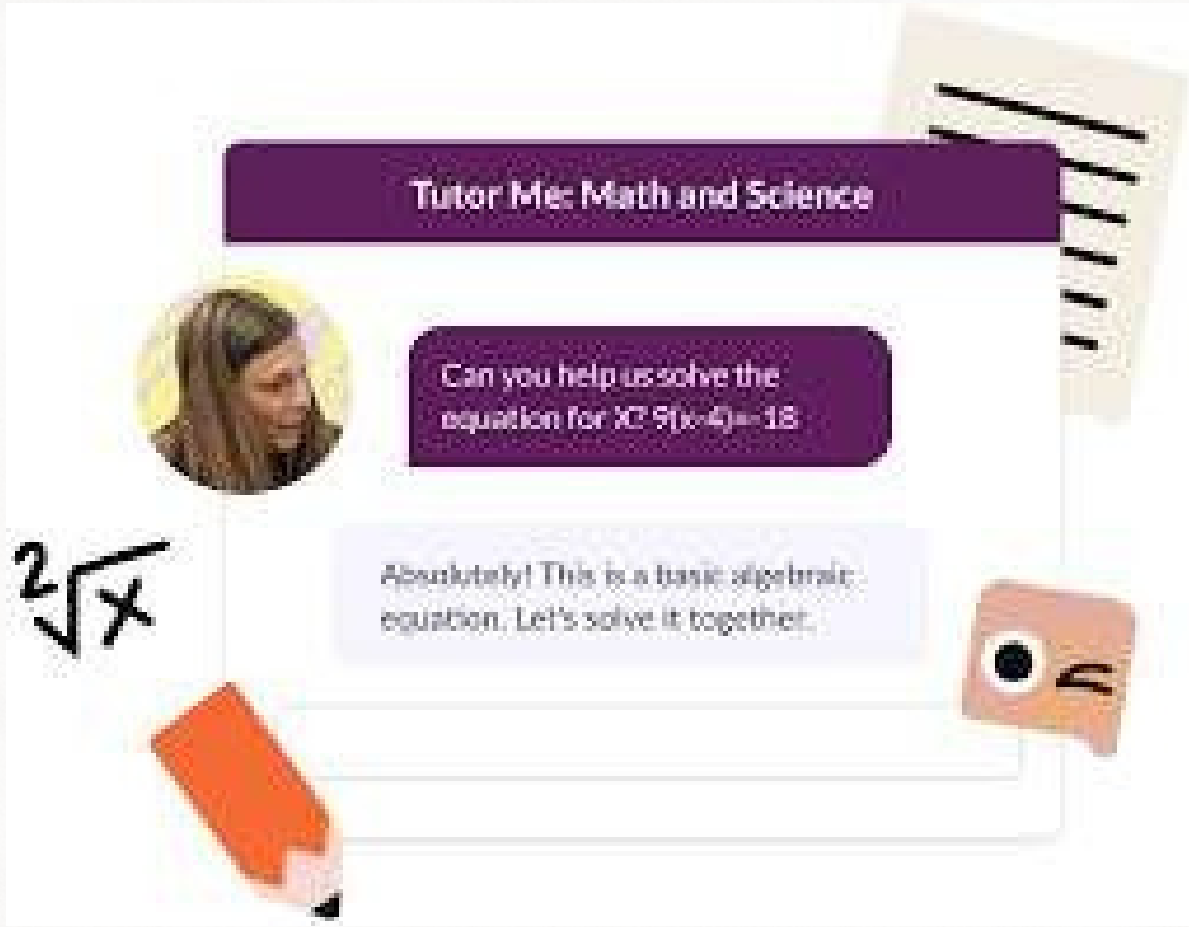
Canada's regulatory agencies use Gen AI tools to **analyze massive datasets**, improving decision-making in areas like finance, public safety, and environmental policies.



19. Education

Educational institutions are using Gen AI to personalize learning, automate tasks, and enhance student engagement.

- **Personalized Learning** – AI adapts lessons and provides smart tutoring.
- **Automated Grading** – AI scores essays, quizzes, and assignments instantly.
- **AI-Generated Content** – Creates lesson plans, textbooks, and study summaries.



Khan Academy's **Khanmigo** is an AI tutor that provides real-time assistance, helping students learn interactively.

Government Entities Using AI in Education:

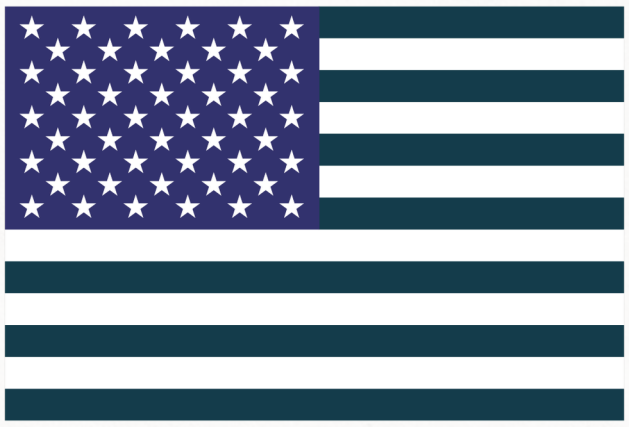
U.S. National AI Institute for Education – Researches AI-driven learning solutions.

Canadian Government – Uses AI tools to analyze student performance data.

20. Cyber-Security

Cyber threats are evolving rapidly, and governments are leveraging Gen AI to enhance cybersecurity, detect threats, and prevent attacks.

- **Threat Detection & Prevention** – AI analyzes patterns to detect cyber threats before they occur.
- **Automated Incident Response** – AI assists in real-time threat mitigation and recovery.
- **Predictive Analytics** – AI forecasts cyber risks, helping governments stay ahead of attacks.



The **U.S. Department of Defense** employs AI-driven cybersecurity systems to identify vulnerabilities and counteract cyber threats before they escalate.

UK National Cyber Security Centre – Uses AI to monitor and prevent cyber attacks on critical infrastructure.

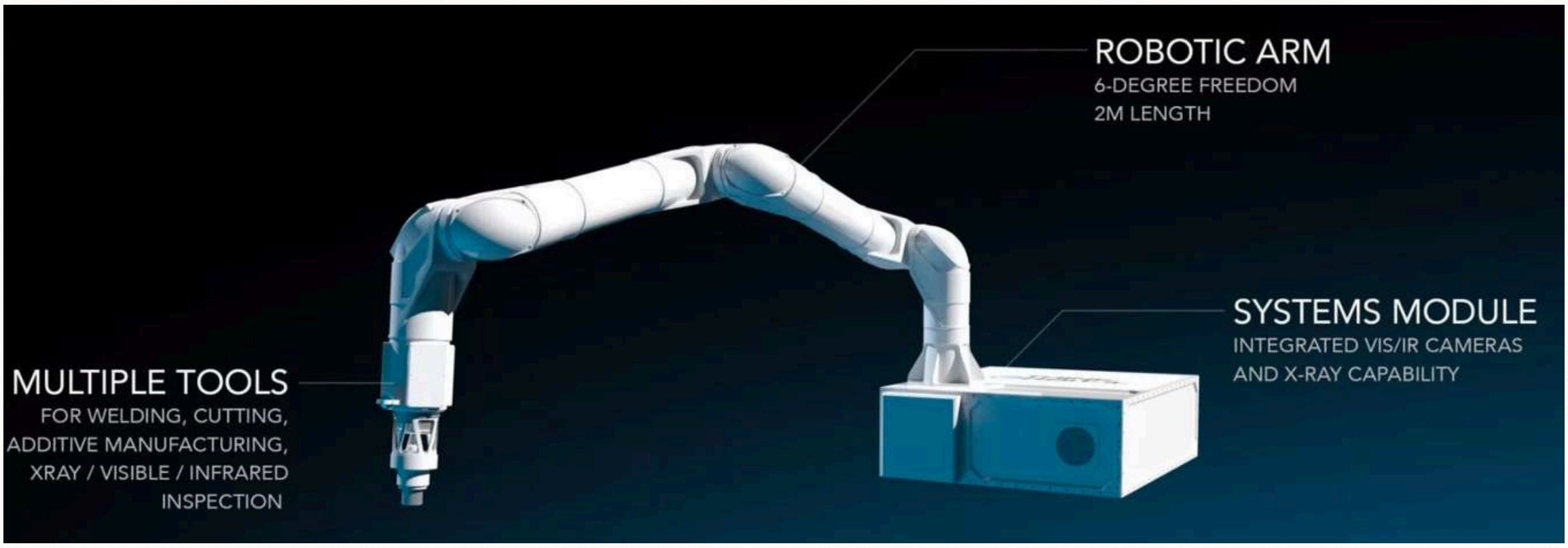
EU Cybersecurity Agency (ENISA) – Employs AI for real-time threat intelligence and mitigation.

21. In-Orbit Manufacturing

ThinkOrbital is developing **autonomous welding and assembly systems** for space manufacturing. Their GenAI-powered robotic arms can self-correct during welding, ensuring precise construction of space structures.

AI-driven predictive analysis helps detect anomalies and enables self-guided repairs, reducing astronaut intervention. Integrated with **Space Situational Awareness (SSA)** data, LLMs assist in **debris avoidance** by generating automated movement strategies.

These advancements aim to make in-orbit manufacturing fully autonomous, supporting future space infrastructure.



Think Orbital's Robotic Arm for In-orbital servicing powered by AI

source: thinkorbital

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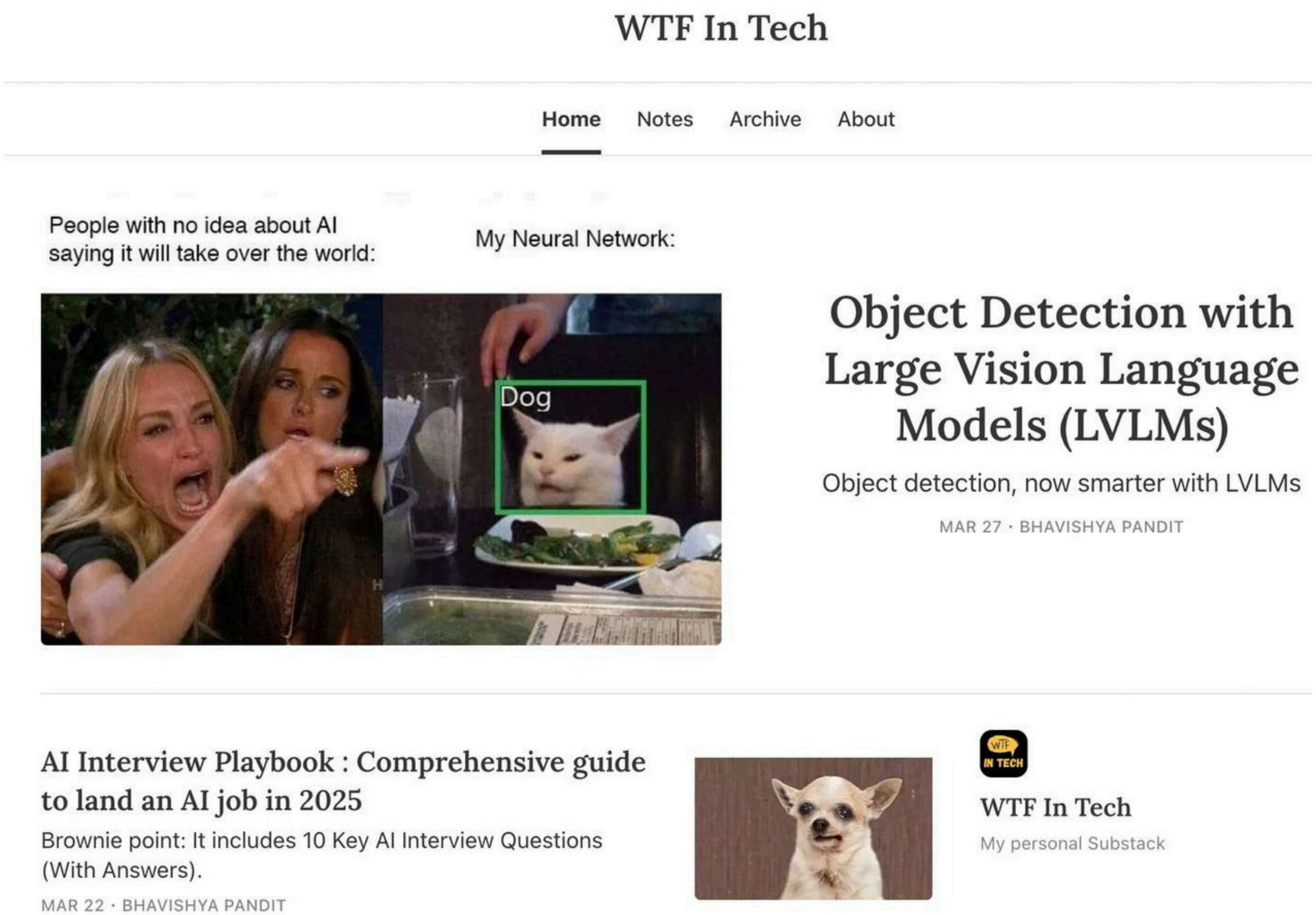

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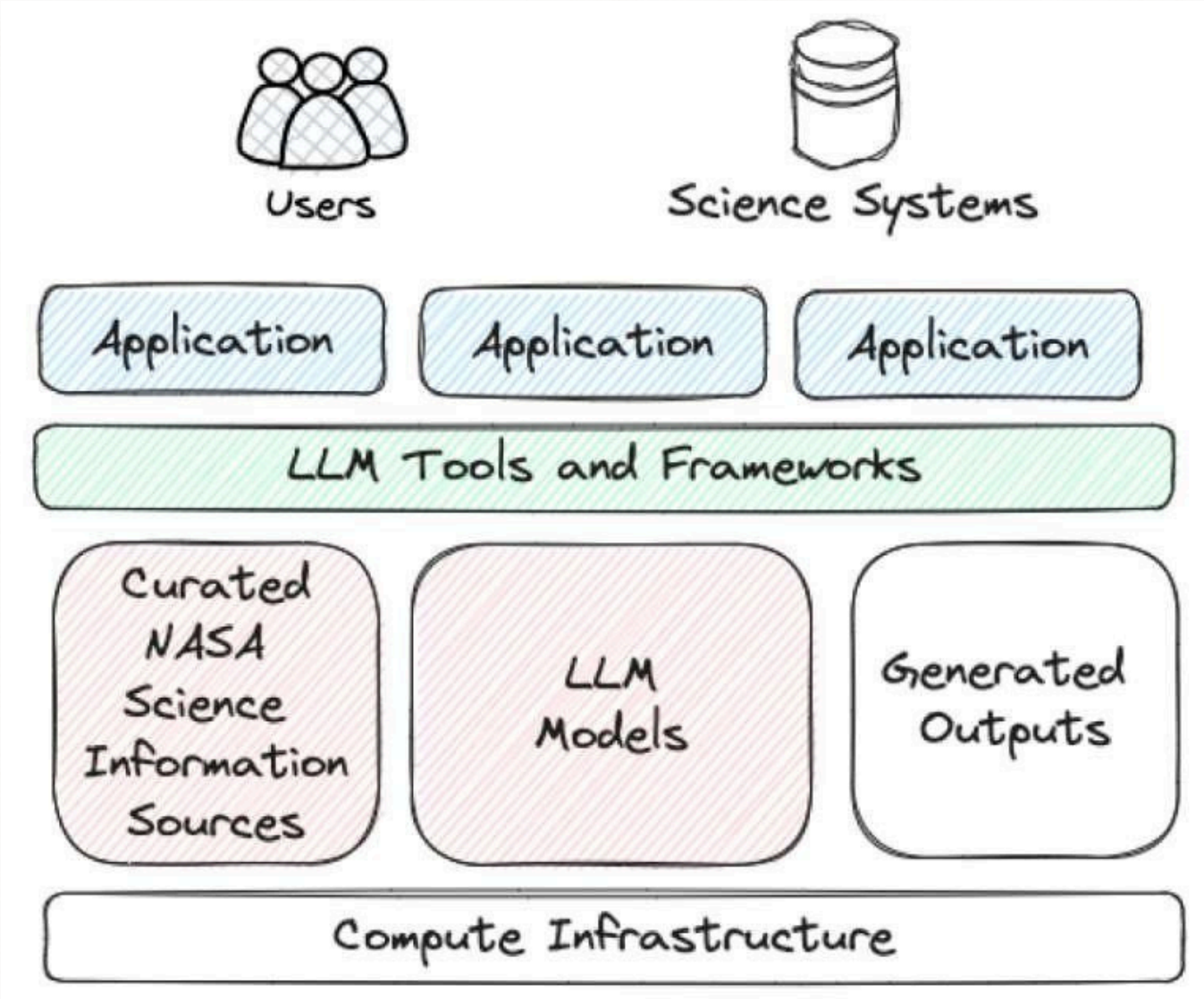
22. Simulation Training

LLMs enhance space mission simulations and training by generating realistic scenarios, predicting system failures, and assisting astronauts in problem-solving.

- **ThinkOrbital** uses AI to simulate in-orbit welding processes, helping refine autonomous robotic assembly.
- **NASA** integrates LLMs into training modules, allowing astronauts to interact with AI-driven virtual assistants for real-time troubleshooting.
- **Satellite operators** leverage AI for predictive modeling, simulating space weather effects and orbital adjustments.

These applications improve mission preparedness and operational efficiency in complex space environments.



LLMs in Open Science by NASA

source: nasa

23. AI-driven Assistants

Axiom Space, in collaboration with **AWS**, is developing AI-driven assistants to enhance human-machine interaction in space. During Axiom Mission 3 (Ax-3), Amazon's Alexa was tested aboard the ISS to evaluate its usability in microgravity environments.

By integrating **voice-enabled AI**, Axiom aims to improve **crew support**, **mission planning**, and **real-time data analysis**. These assistants will be deployed on Axiom Station, the first commercial space station, and could influence future Artemis missions.

Amazon Echo used in International Space Station

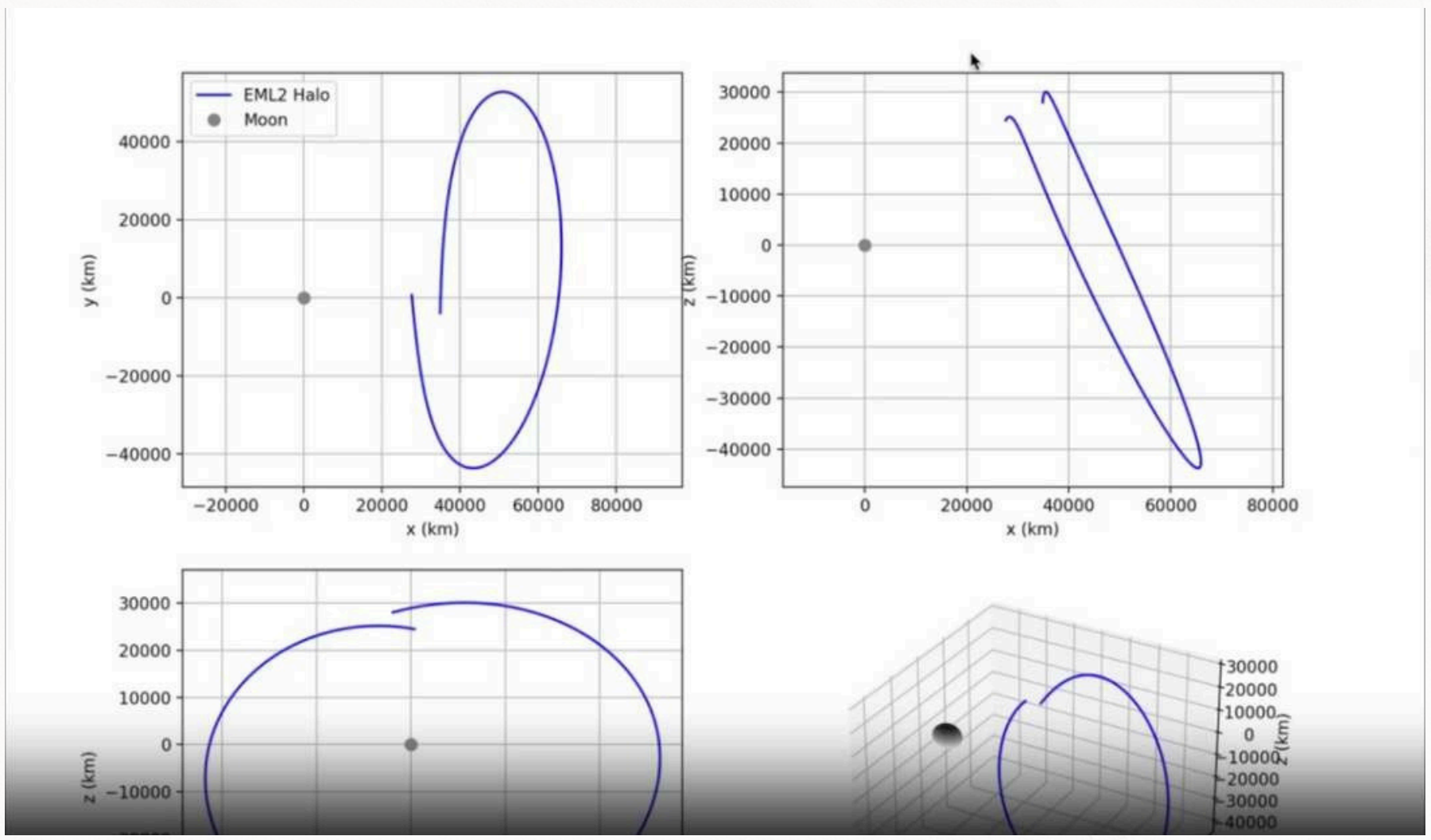
source: axiom

24. Space Traffic Management

Kayhan Space is exploring **GenAI** for space traffic management, focusing on areas where AI adds real value. While physics-based models handle object dynamics, AI excels at solving complex, large-scale problems.

- **Where AI Makes an Impact**
  - **Maneuver planning** for satellite constellations under strict constraints.
  - **Identifying uncorrelated objects** in massive datasets.
  - Detecting unexpected movements of non-cooperative satellites.

- **Broader Industry Applications**
  - Smarter satellite mission planning for resource efficiency.
  - AI-powered simulators for better testing.
  - Enhanced Earth observation with image processing and security features.



Kayhan's Moon-Earth Rotating Frame

25. LLM for Research

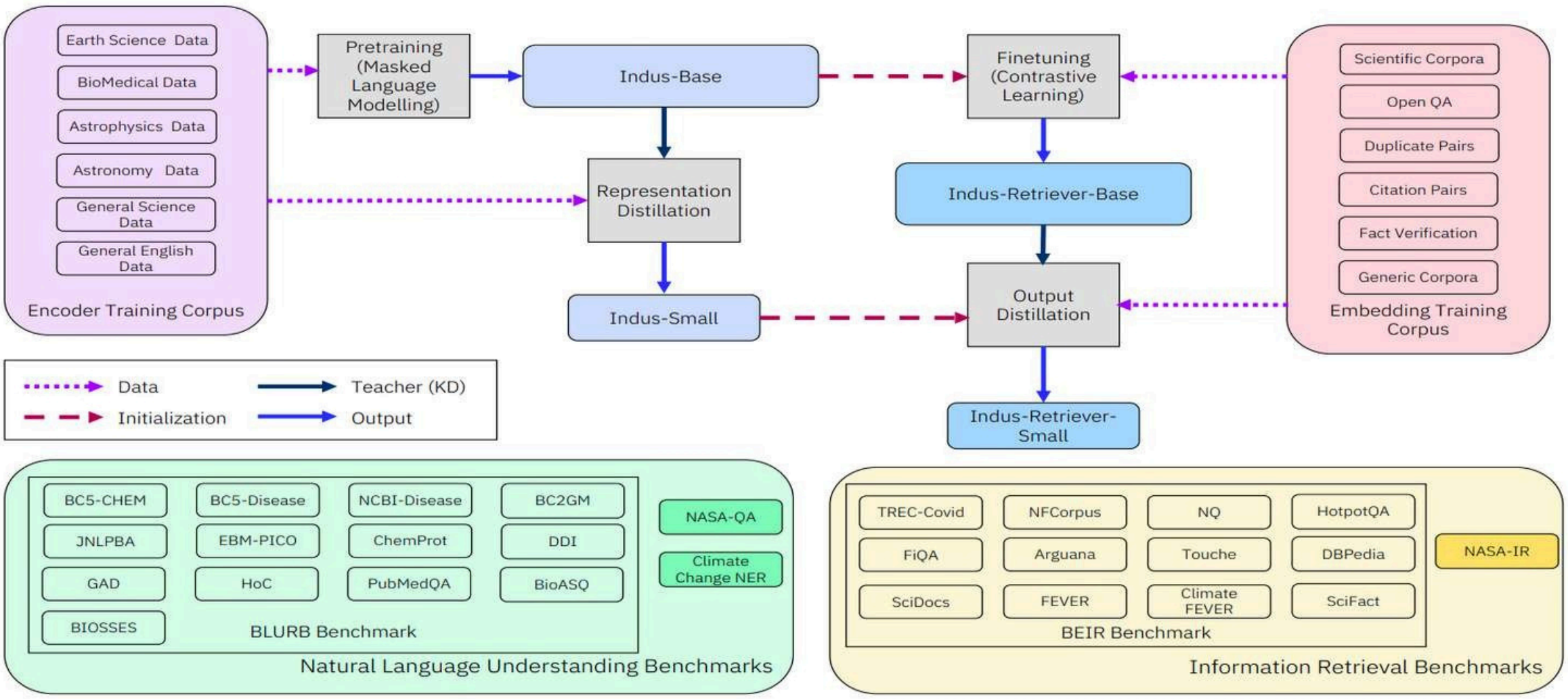
NASA and **IBM** developed **INDUS**, a specialized AI model trained on **60B+** scientific tokens to enhance research in Earth science, astrophysics, and biology.

Key Features

- Custom tokenizer for scientific terms.
- Encoders & sentence transformers for accurate text processing.
- 268M+ text pairs used for fine-tuning.

Real-World Use

- Better search & Q&A for NASA's datasets.
- Enhanced publication categorization at GES-DISC.
- Smarter dataset navigation in Open Science.



INDUS architecture

source: https://arxiv.org/pdf/2405.10725

26. Satellite Image Labelling

ARSIC is a novel approach to automatically generating captions for satellite images, addressing the lack of large-scale annotated datasets. It guides LLMs to describe object annotations instead of interpreting images directly, overcoming their limitations in handling visual data.

Key Features of ARSIC

1. **LLM-Guided Captioning** – LLMs like GPT-4 summarize object annotations instead of raw images, improving caption accuracy.
2. **Geospatial Analysis** – Uses external APIs to analyze object relations, clustering, and geographical context for better descriptions.
3. **Fine-Tuned Model** – Adapts a GIT (image2text) model trained on Xview and DOTA datasets to generate captions specific to aerial imagery.

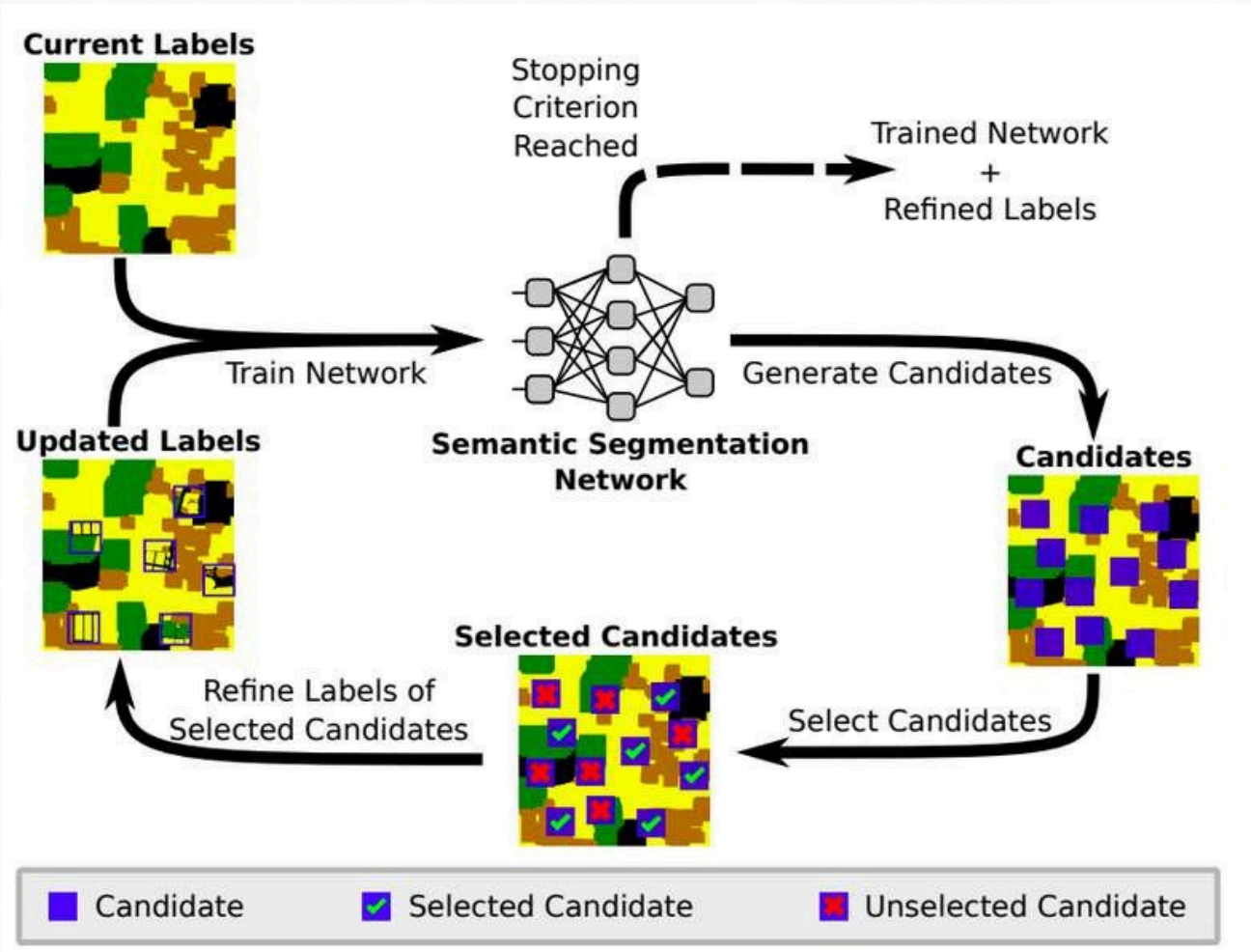


Illustration of Model Learning Cycle

source: https://arxiv.org/pdf/2309.06159

27. First LLM in Space

In 2024, **Booz Allen Hamilton** and **HPE** deployed an LLM on the **ISS**, running on Spaceborne Computer-2 (SBC-2). It helps astronauts:

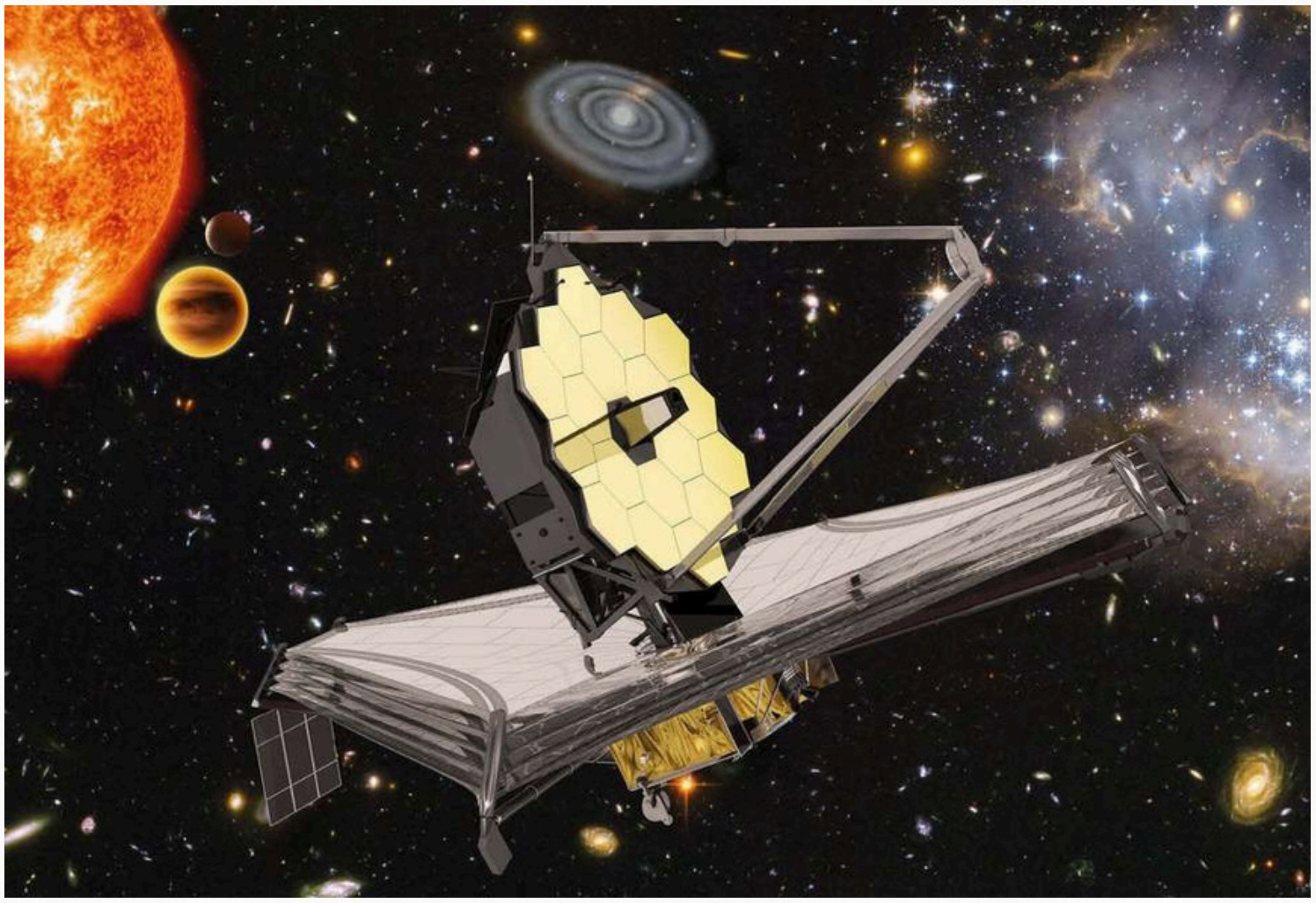
- **Find information** from manuals, procedures, and experiment data instantly.
- **Troubleshoot issues** by diagnosing problems in equipment and suggesting solutions.
- **Assist** in experiments with step-by-step guidance and automation of **repetitive tasks**.
- **Reduce data transfer delays** by processing queries locally instead of relying on Earth-based mission control.

Booz Allen

Hewlett Packard Enterprise

28. Predictive Maintainence

Spacecraft, satellites, and telescopes operate in harsh environments where equipment failures can be costly and mission-critical. LLMs can enhance predictive maintenance by analyzing logs, sensor data, and historical performance trends to detect potential failures before they happen.

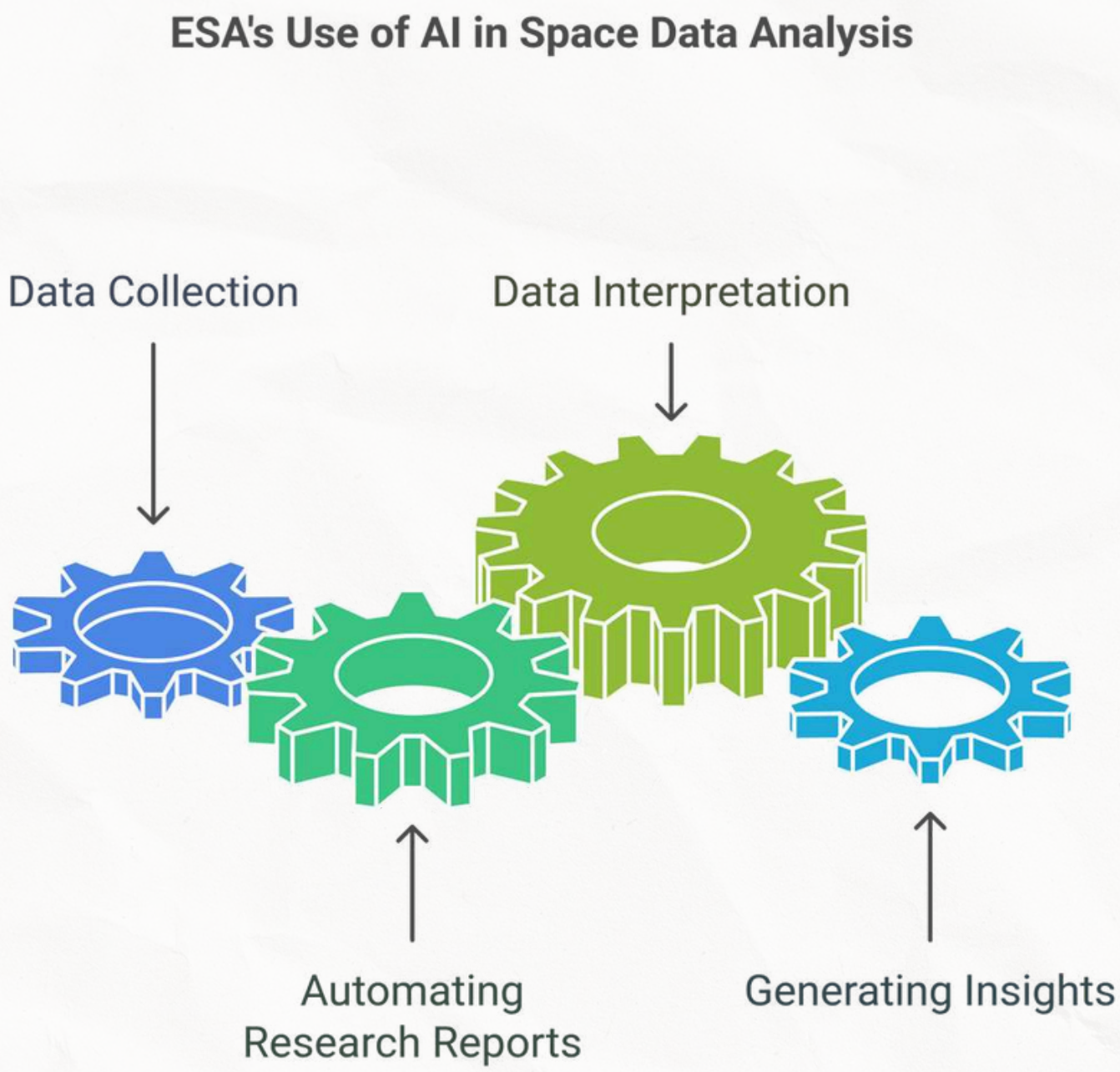


The James Webb Space Telescope (JWST) uses AI to monitor system health by analyzing vast amounts of telemetry data. LLMs can assist in:

- **Anomaly Detection:** Identifying unusual patterns in sensor readings that indicate hardware degradation.
- **Log Analysis:** Parsing mission logs to detect subtle signs of wear or potential failures in instruments like the NIRCam or MIRI.
- **Automated Alerts:** Providing early warnings to engineers, allowing proactive maintenance planning.

29. Research & Documentation

The **European Space Agency (ESA)** utilizes AI to handle vast datasets from missions like **Gaia** (which maps the Milky Way) and **Euclid** (which studies dark matter and dark energy). LLMs assist by:

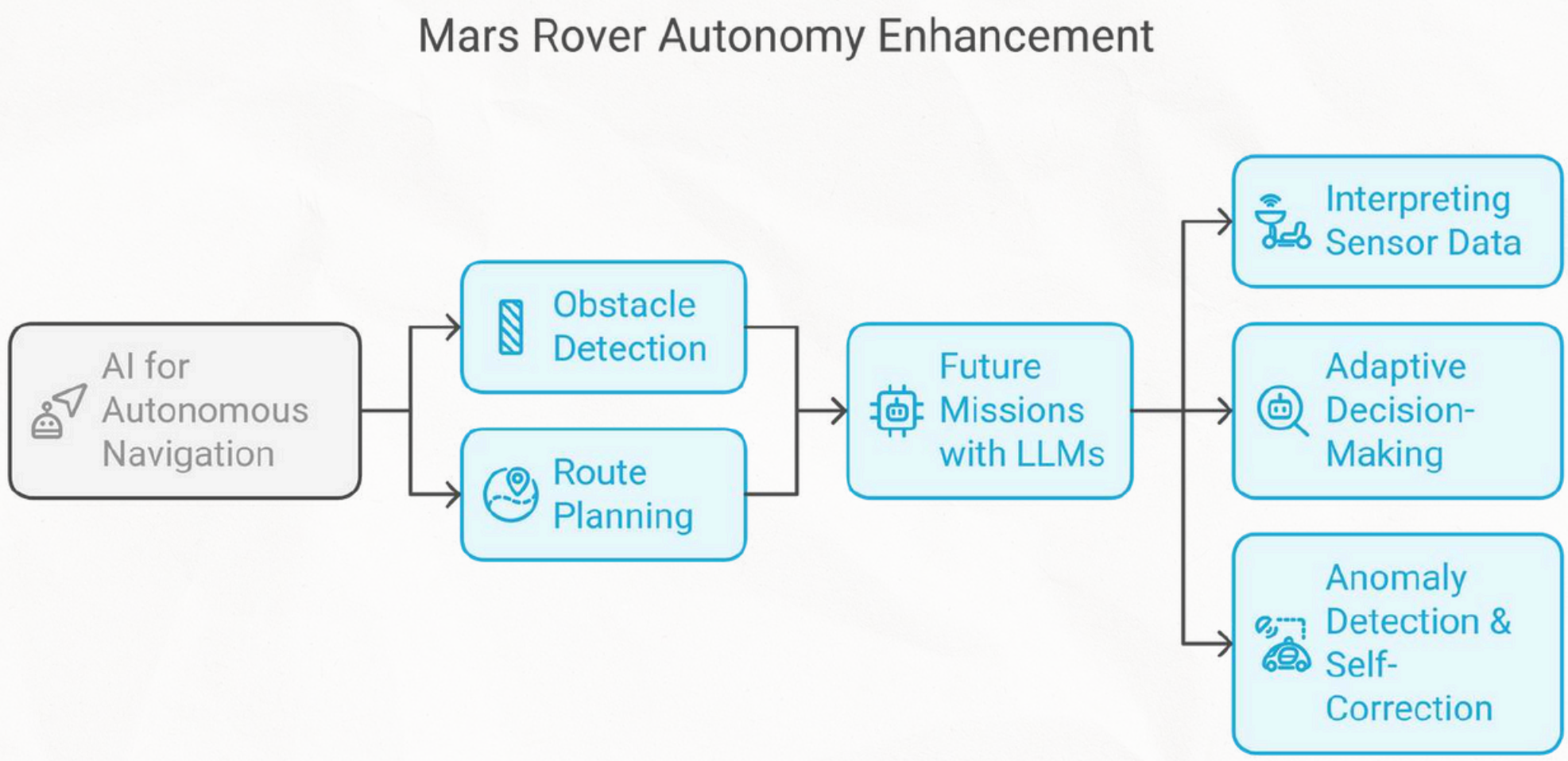


- **Automating Research Reports:** Summarizing observational data from deep-space telescopes into structured reports.
- **Data Interpretation:** Extracting key findings from complex datasets, helping astronomers identify patterns in celestial objects.
- **Generating Insights:** Assisting in hypothesis generation by correlating historical space observations with new discoveries.

30. Autonomous Spacecraft Operations

The Perseverance rover on Mars uses AI for autonomous navigation, allowing it to detect obstacles, plan routes, and adapt to terrain without waiting for Earth-based instructions. Future missions could leverage LLMs for even more autonomy by:

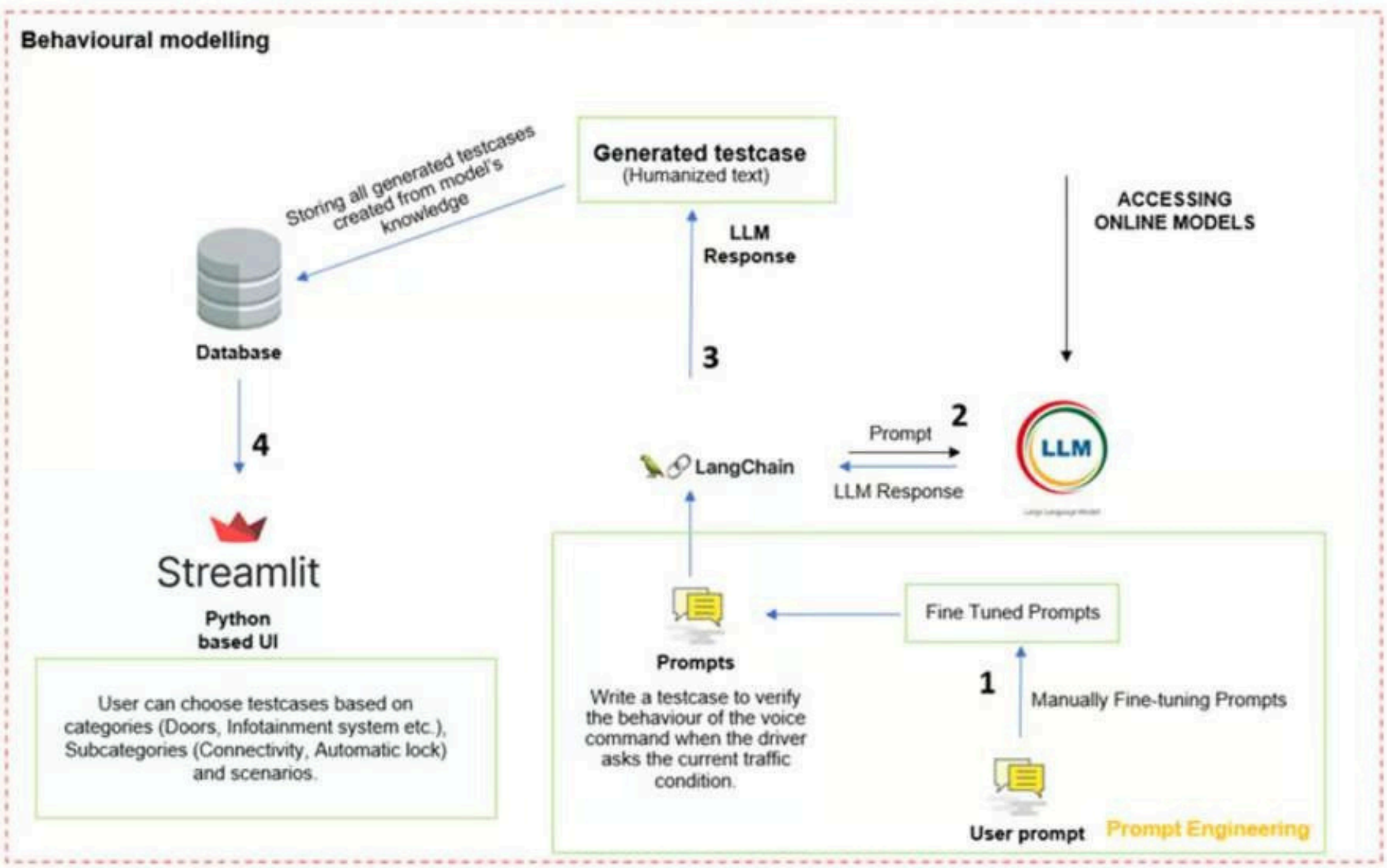
- **Interpreting Sensor Data:** Analyzing environmental conditions (e.g., atmospheric readings, radiation levels) to adjust mission strategies.
- **Adaptive Decision-Making:** Selecting scientific targets, adjusting instrument settings, or modifying experiments based on real-time data.
- **Anomaly Detection & Self-Correction:** Identifying issues in propulsion, power systems, or scientific instruments and applying corrective measures.



31. Human Behavior Modelling

TATA ELXSI has applied **GenAI** to model human behavior and interactions with vehicle electronic systems.

This approach creates realistic test scenarios that don't rely on specific vehicle hardware or software. Large Language Models (LLMs) play a key role here, as their innate understanding of human behavior eliminates the need for additional pretraining. This innovation helps refine automotive systems with greater accuracy and efficiency.



Flow diagram of Behavioral Modelling

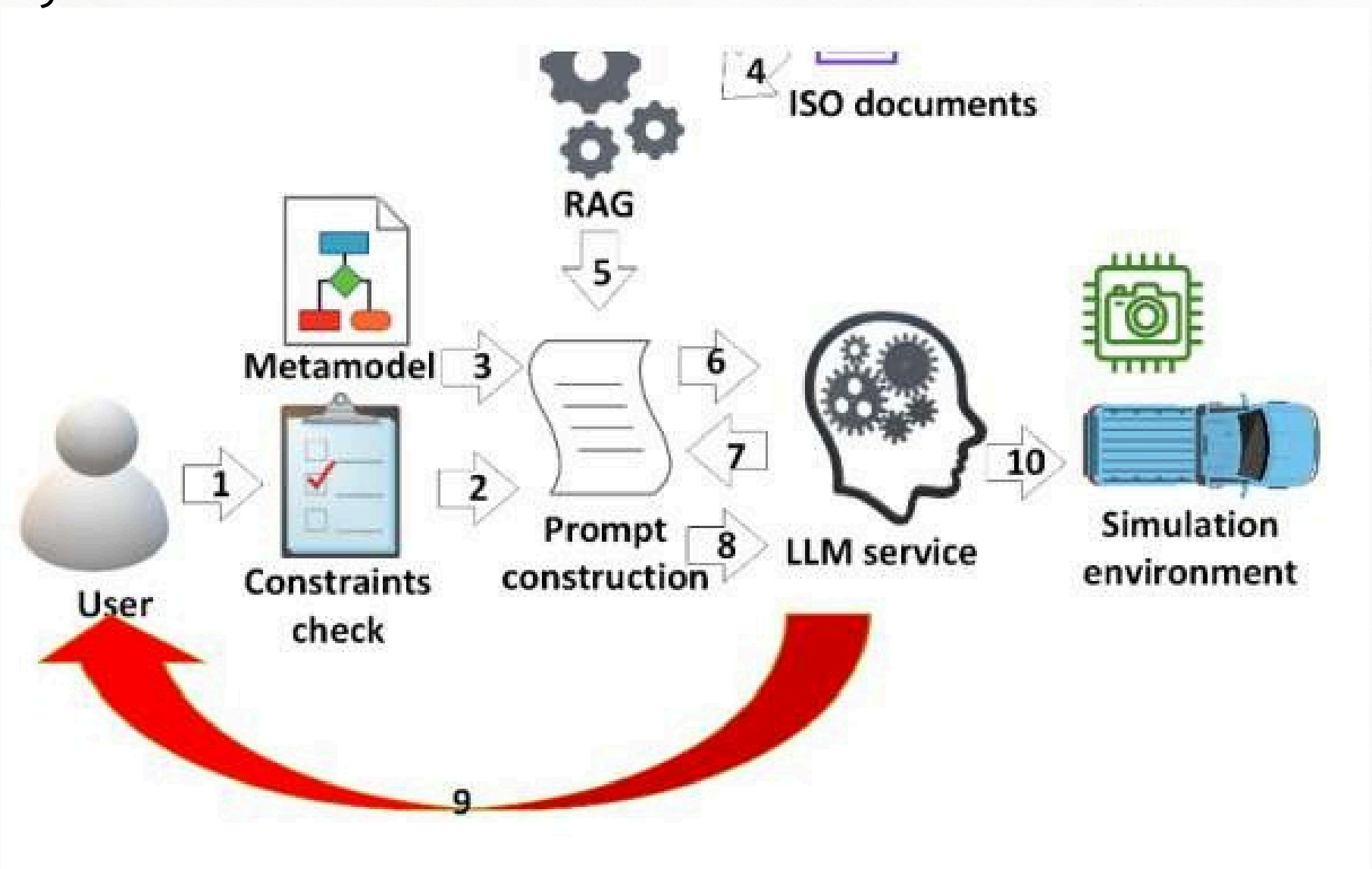
source: tata elxsi

32. Designing

One study examines the use of Large Language Models (LLMs) integrated with Retrieval-Augmented Generation (RAG) to improve design and software development in the automotive industry. Two case studies were presented:

1. **Compliance Chatbot:** Provides accurate, context-aware responses for standardization and regulatory compliance.
2. **Design Copilot:** Enhances design workflows with precise suggestions.

Four LLMs—**GPT-4, LLAMA3, Mistral, and Mixtral**—were evaluated for answering accuracy and execution time. GPT-4 demonstrated superior performance, while LLAMA3 and Mistral were noted for their potential in local deployment, addressing data privacy concerns.



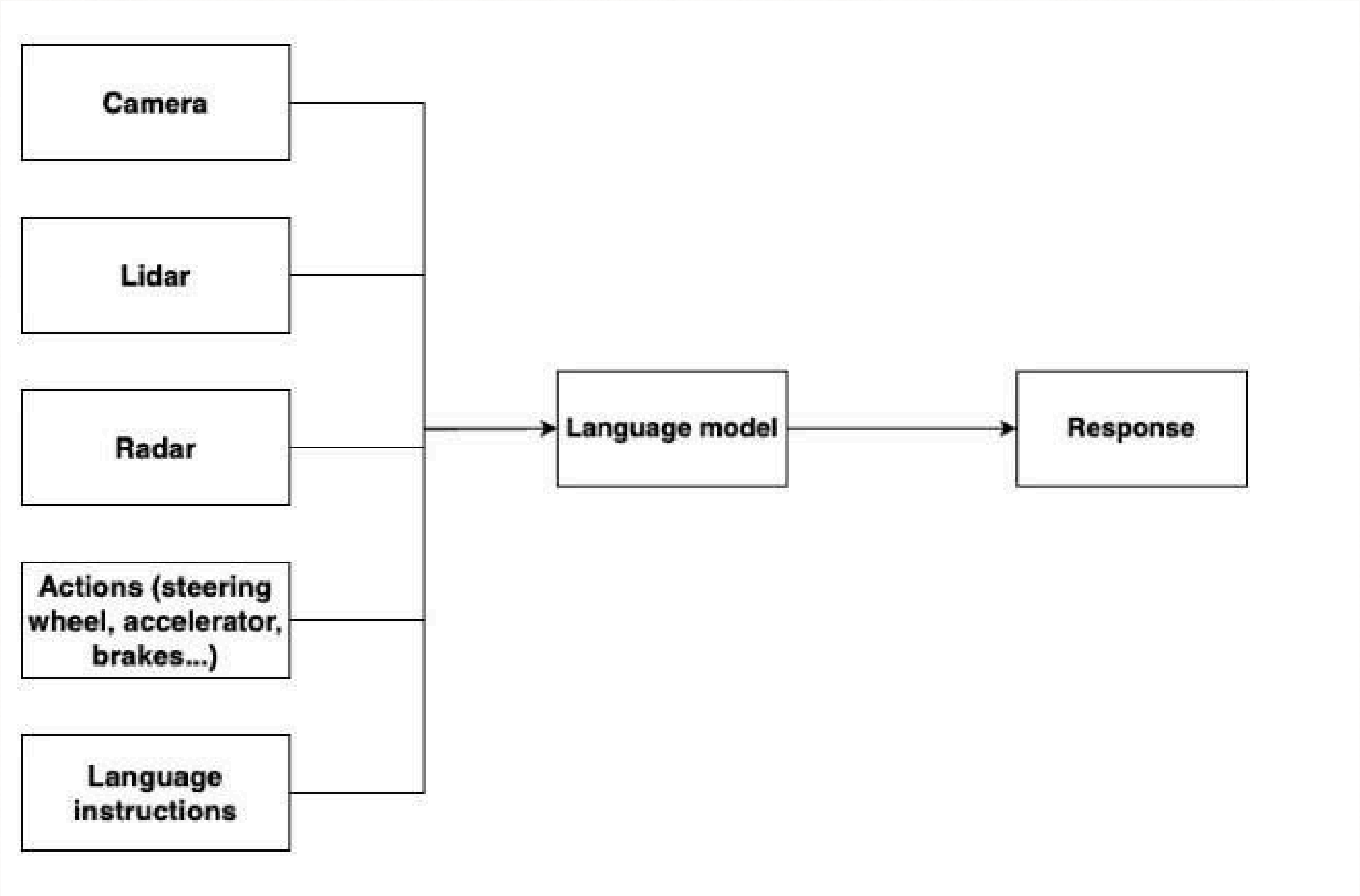
33. Autonomous vehicles

LLMs in **ADAS** and Autonomous Vehicles

- **Vision Language Models (VLMs)** combine text and visual data, enabling tasks like image classification, text-to-image retrieval, and visual question answering.

- In autonomous vehicles, VLMs enhance ADAS by interpreting camera data to provide real-time feedback.

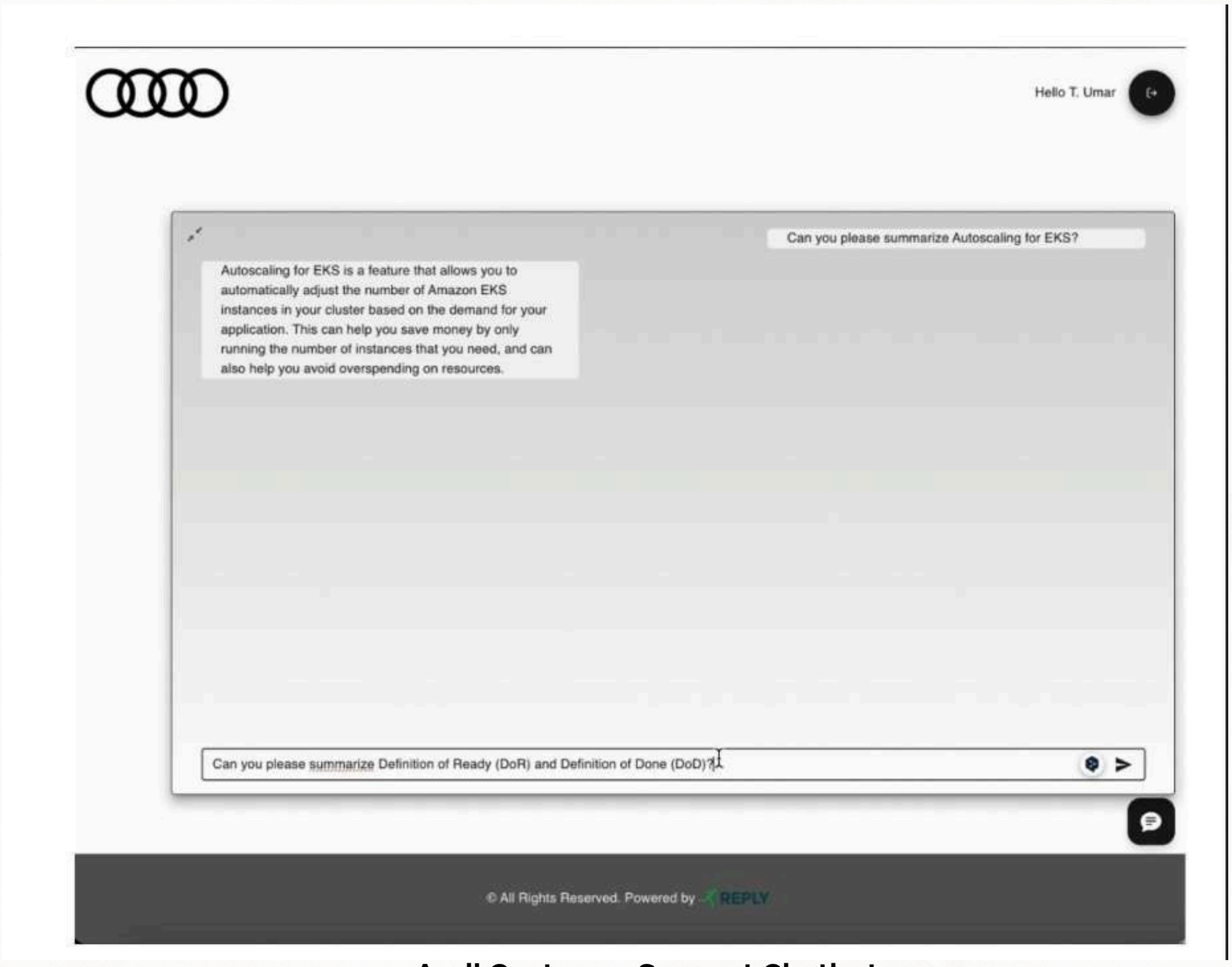
- For example, if a driver looks left, the front-facing camera could detect a child crossing the street and alert the driver, improving safety.



34. Customer Service

Audi and **Reply** partnered with Amazon Web Services (AWS) to enhance their enterprise search experience through a Generative AI chatbot.

By leveraging **Retrieval Augmented Generation (RAG)**, they integrated key AWS services such as Amazon SageMaker and Amazon OpenSearch Service, improving the speed and accuracy of search processes. Additional AWS tools, including Amazon S3, AWS Lambda, Amazon CloudFront, Amazon API Gateway, and Amazon Cognito, were used to support and optimize the system.



Audi Customer Support Chatbot

source: audi

35. BMW's LLM based Car Expert

BMW, a leading German car manufacturer has long utilized artificial intelligence for speech processing through its **Intelligent Personal Assistant**.

BMW recently announced integration of LLMs to it. BMW's Intelligent Personal Intelligent now comes with **Amazon Alexa's** to give drivers all the insights about their car as well controls like changing drive models, infotainment controls etc.

source: bmw

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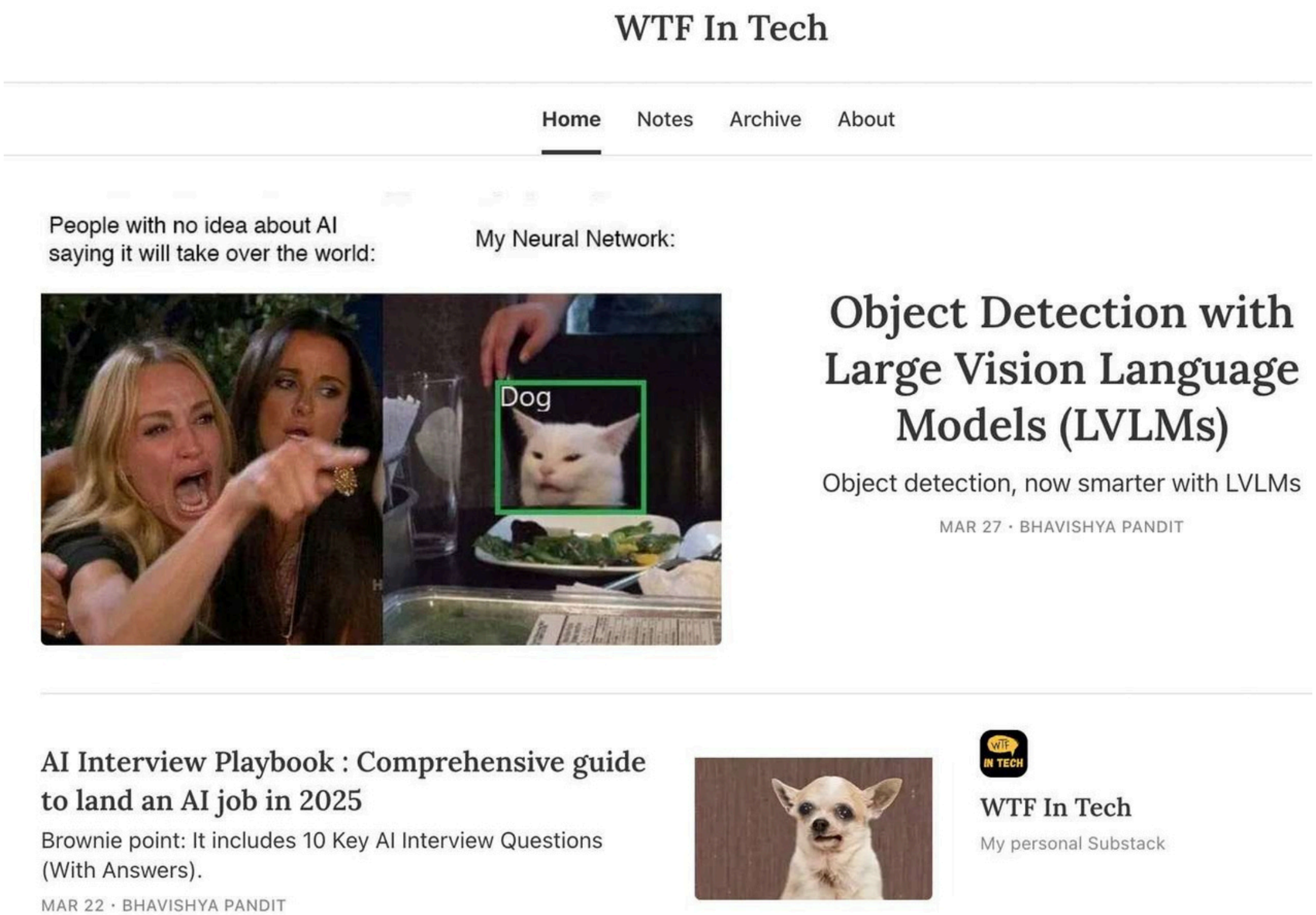
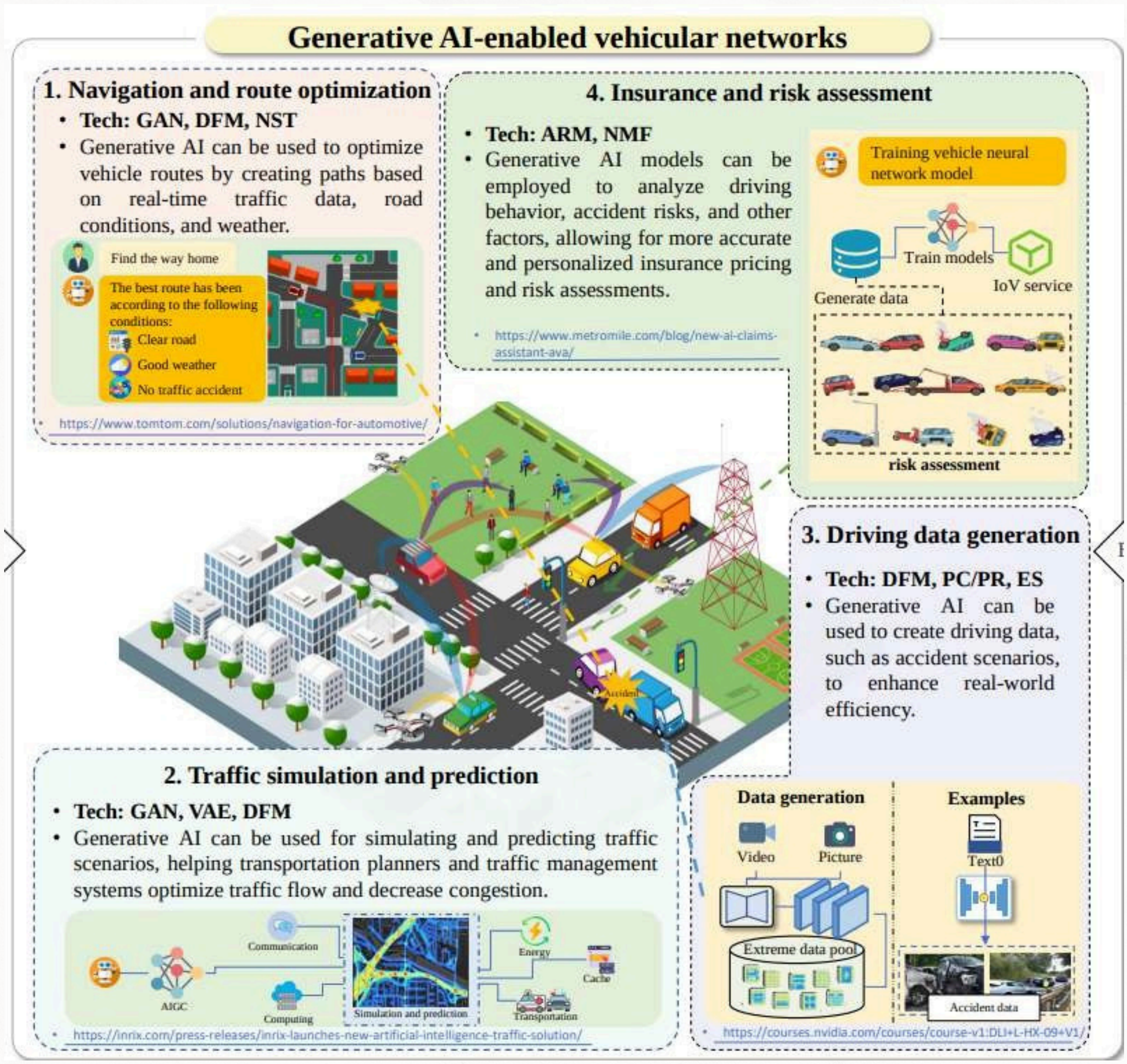


💡 Whether you're a developer, researcher, or tech enthusiast, this newsletter is your shortcut to staying informed and ahead of the curve.

36. Gen AI in Vehicular Networks

Vehicular Networks when integrated with Gen AI can help in optimising costs and reduce risks.

A research paper titled - **"Generative AI-enabled Vehicular Networks"** talks about 4 ways how Gen AI can help in building a better driving environment.



37. Road Safety

Managing the diverse Big Data from transportation infrastructures, including traffic flows and sensor data, is complex due to the combination of textual and numerical information. Traditional methods struggle to effectively analyze and interpret this data.

The solution lies in the introduction of **BERT4ITS**, a deep learning framework leveraging BERT's capabilities. It improves traffic prediction, accelerates incident detection, and enhances decision-making, offering a smarter, safer approach to **Intelligent Transportation Systems (ITS)**.

Similarly, **BERT-ITS** efficiently identifies traffic incidents like accidents and blockages, outperforming traditional methods.

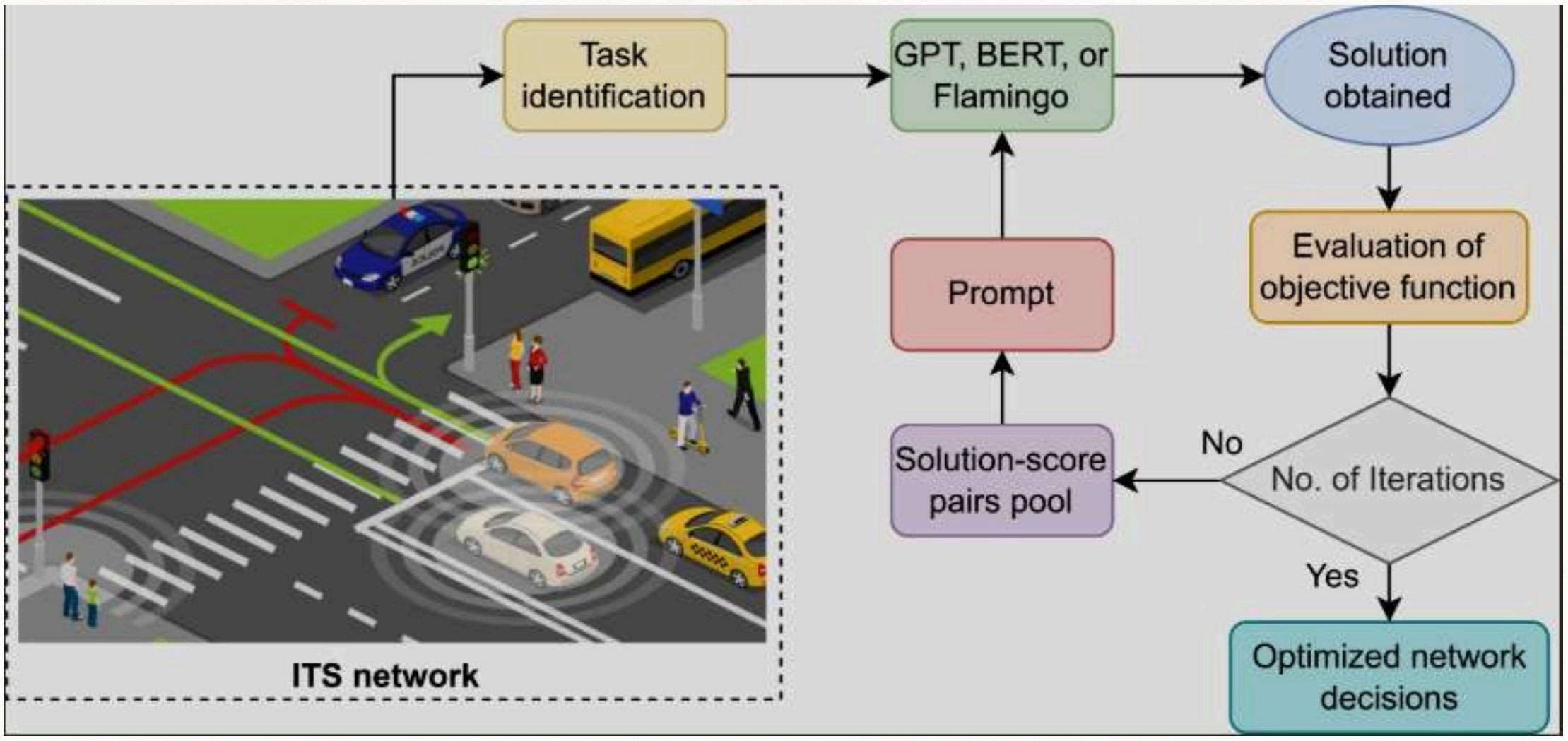
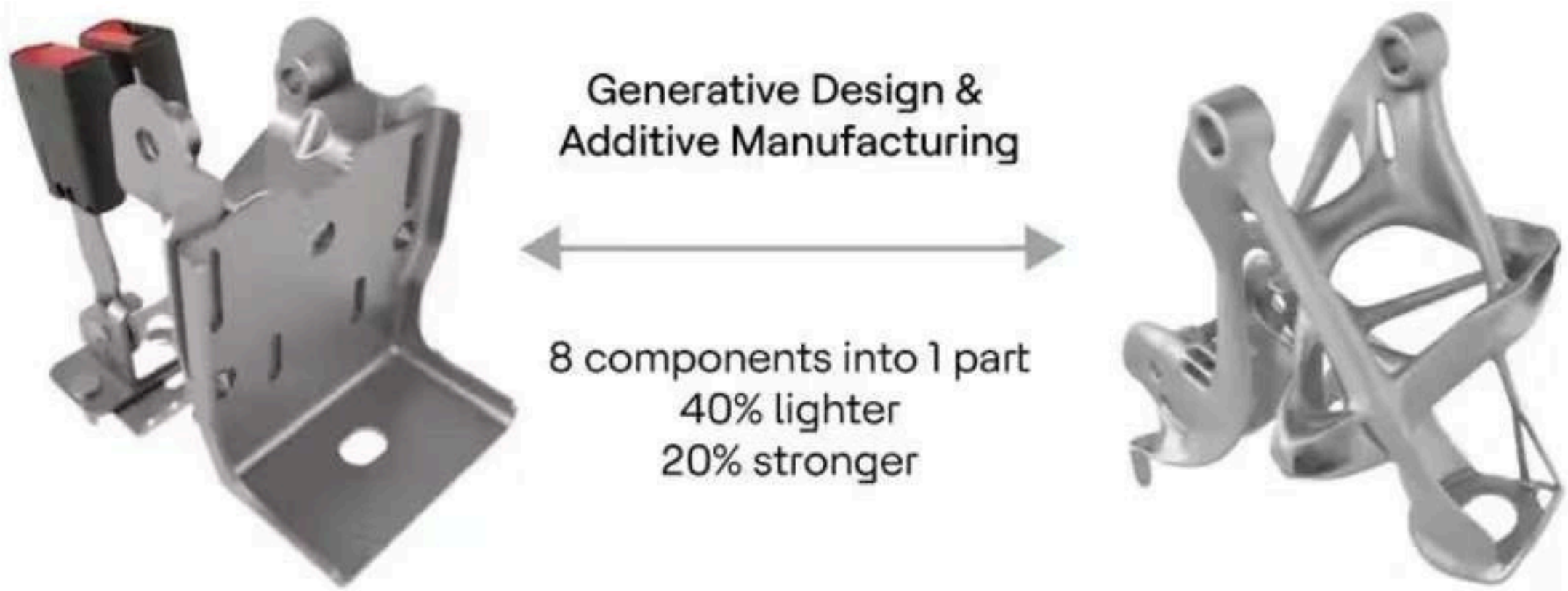


Illustration of traffic network, control, optimization, and management using LLMs.

38. Product Design & Development

According to a report by **McKinsey**, companies implementing AI in product design can achieve a **10% to 30%** improvement in engineering efficiency.

General Motors (GM) partnered with **Autodesk** to use generative design software in vehicle development. This approach allowed GM to create components that are **40%** lighter and **20%** stronger than traditional parts, improving both performance and efficiency.

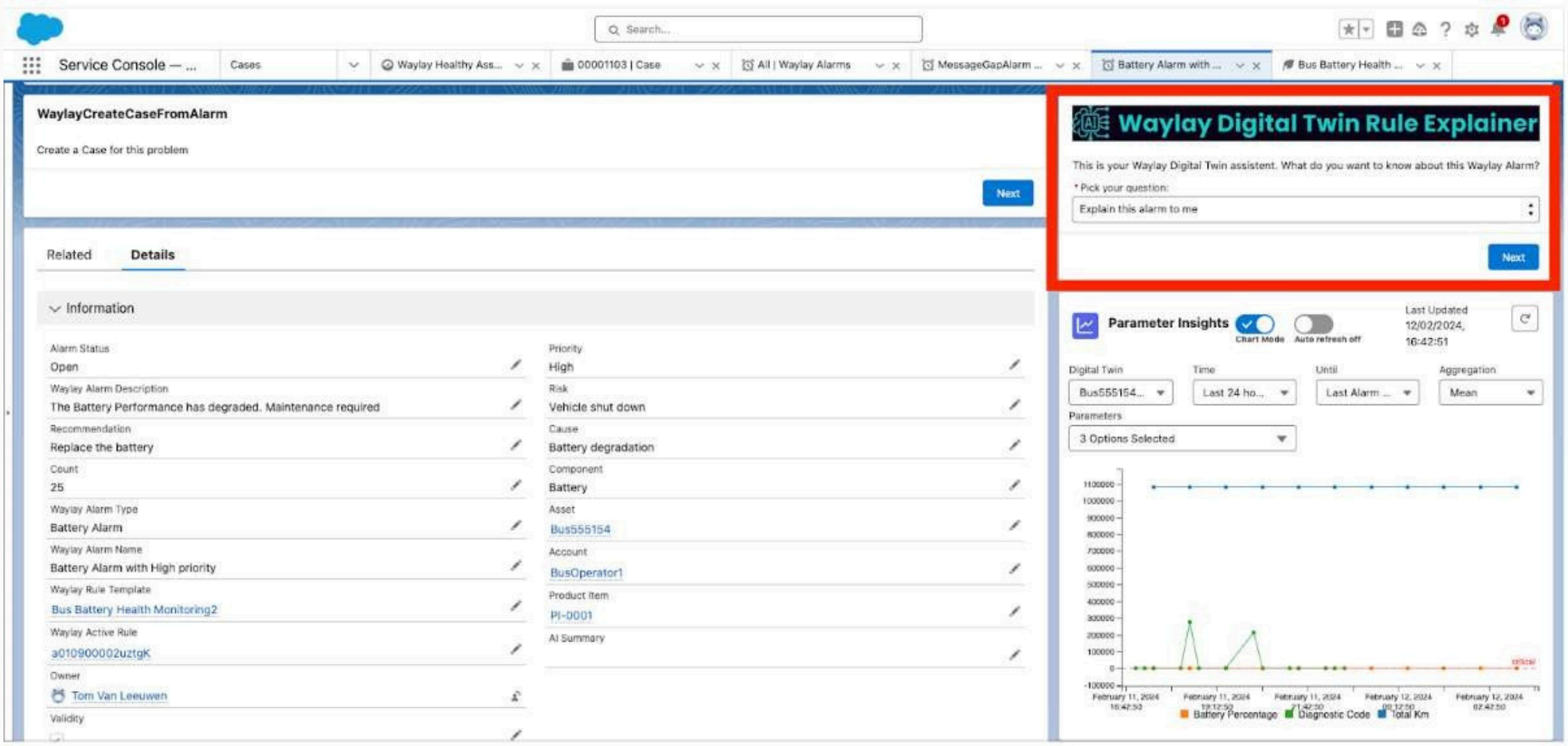


39. Maintenance

Traditional predictive maintenance systems face challenges in delivering clear, human-readable, and multilingual explanations for alarms, making it difficult for operators to efficiently understand and address the issues.

An LLM can can provide human-readable, multilingual answers to alarms explaining the conditions checked, the parameter values evaluated, and the recommended actions in a clear and actionable manner.

Waylay is one such company working for this exact use case.



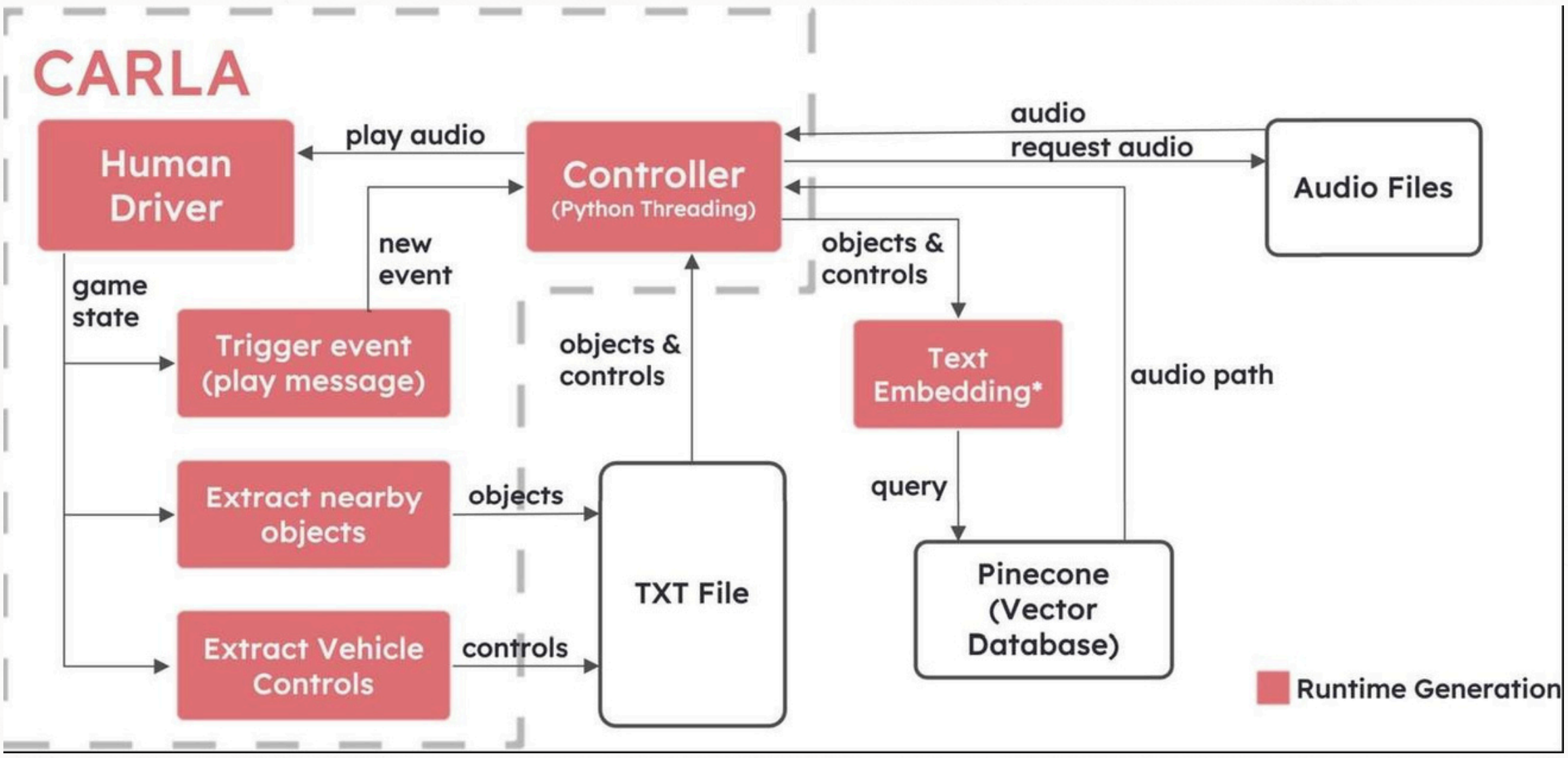
Waylay Twin Assistant Built on Salesforce

40. Drive Simulation

CARLA is an open-source driving simulator that enables the development and testing of autonomous driving systems.

It offers realistic simulations of traffic, weather, and road conditions, allowing developers to train AI models in a controlled environment.

With high-fidelity sensors like cameras and LIDAR, CARLA helps test and improve driving algorithms, particularly for detecting and addressing anomalies in driving scenarios.



Real time driving simulation with LLM assistant

41. Education

LLMs are making a big impact in education by breaking down complex ideas and offering quick explanations.

Take **Oxford Medical Simulation**, for example. They've combined LLMs with VR to create lifelike patient scenarios. Students can practice handling situations like cardiac arrest, all in a safe, virtual setting.

The cool part? The virtual patients respond in real-time, making the experience feel unpredictable and much closer to actual clinical environments.

VR Patient Training Simulation by OFS

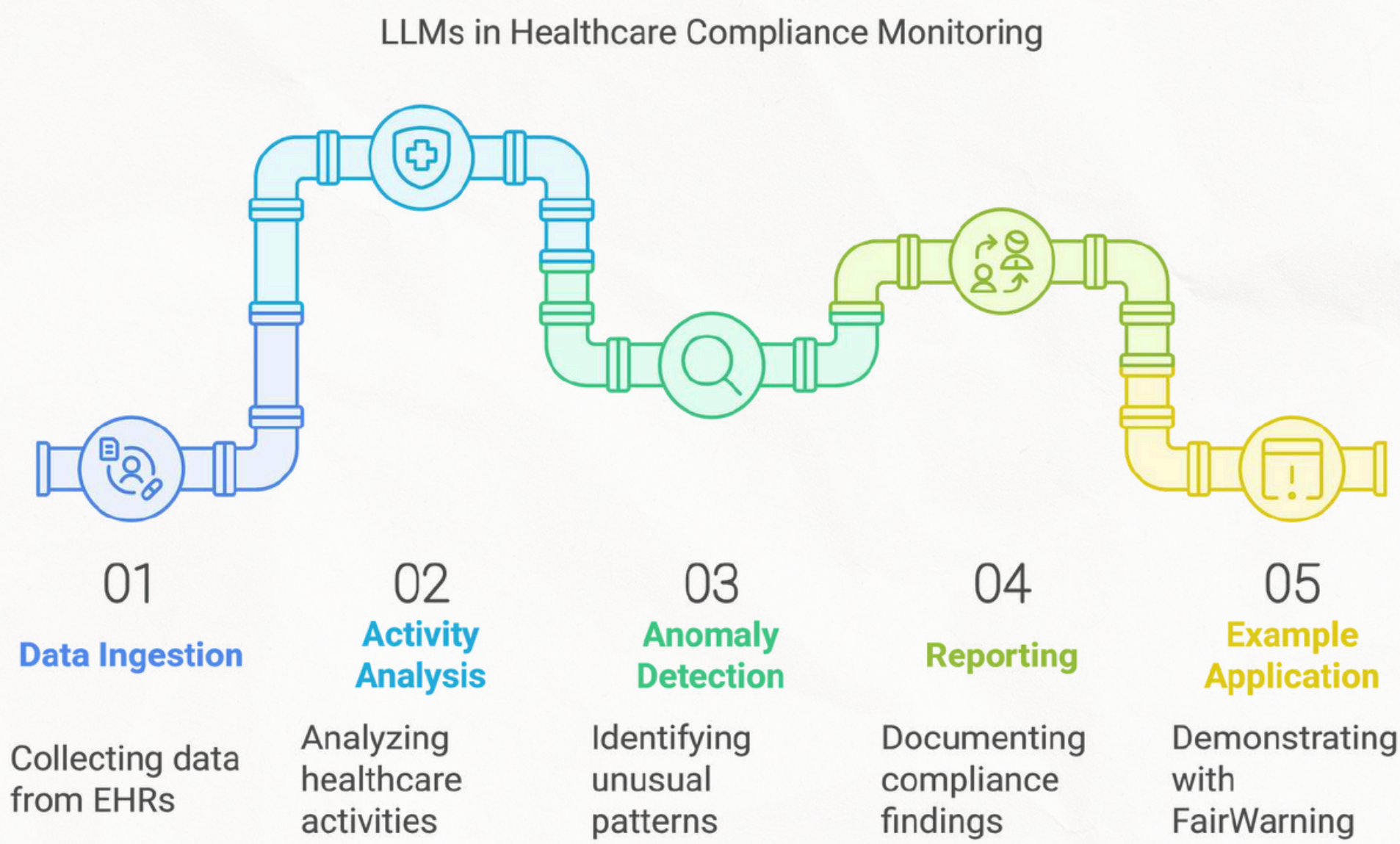
source: ofs

42. Compliance Monitoring

LLMs play a crucial role in ensuring adherence to healthcare regulations like HIPAA and GDPR, safeguarding sensitive patient information.

A notable example is **FairWarning**, a leading provider of patient privacy intelligence. The company uses LLMs to monitor healthcare systems for potential privacy violations by scanning and analyzing user activity within Electronic Health Records (EHRs).

This proactive approach helps detect unauthorized access or suspicious behavior, enabling healthcare organizations to maintain regulatory compliance and protect patient privacy effectively.

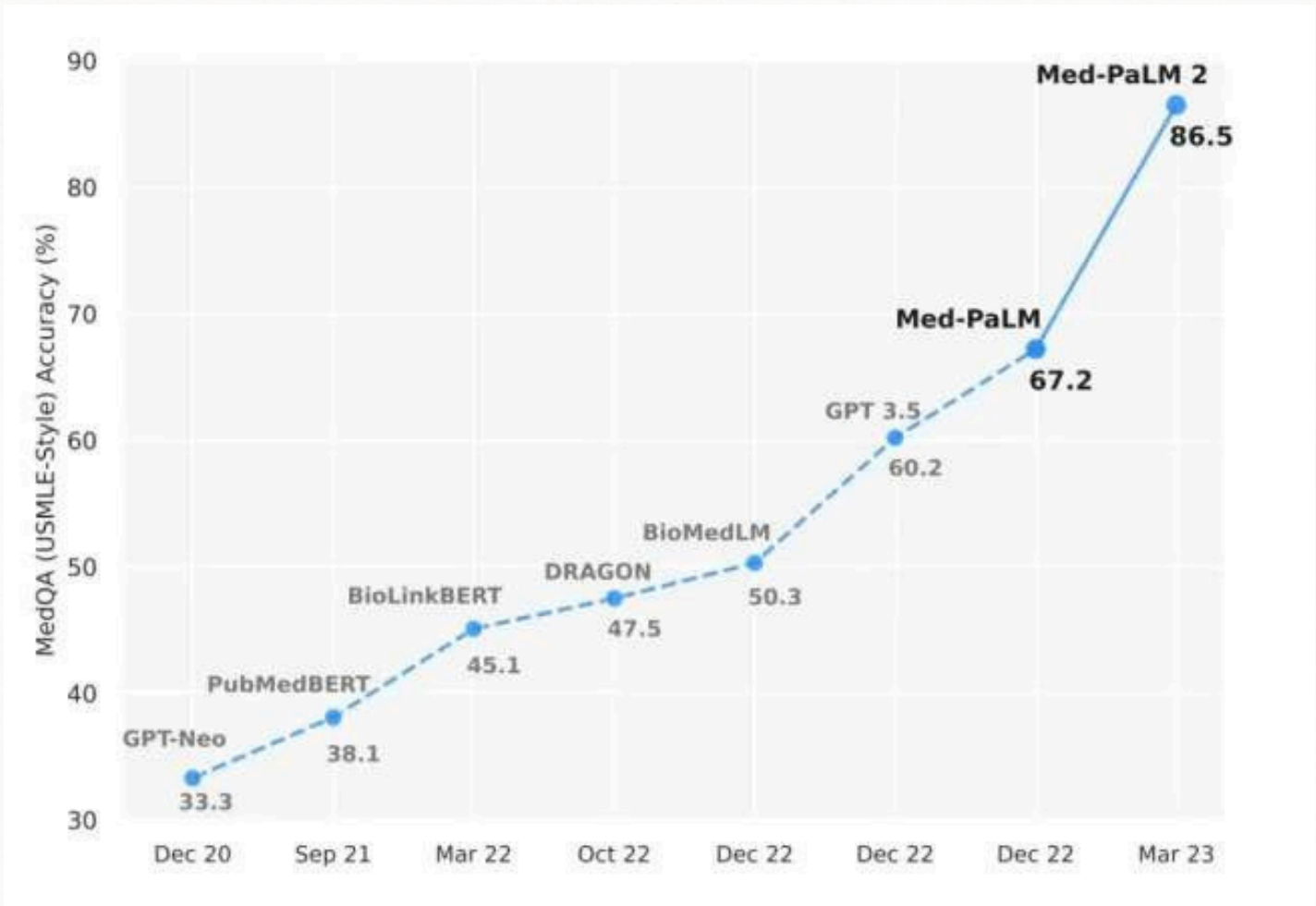


43. Medical Transcription

LLMs can assist in creating medical transcriptions by:

- Analyzing natural conversations between patients and clinicians
- Identifying and extracting key medical information
- Structuring the extracted data into compliant medical records compatible with EHR systems

Real-world example: Google's MedLM can accurately capture and convert patient-clinician discussions into medical transcriptions.



Med-PaLM 2 is a specialized version of Google's PaLM models. It is trained on datasets of medical knowledge and has been fine-tuned to answer medical questions, perform clinical reasoning, and provide diagnosis support.

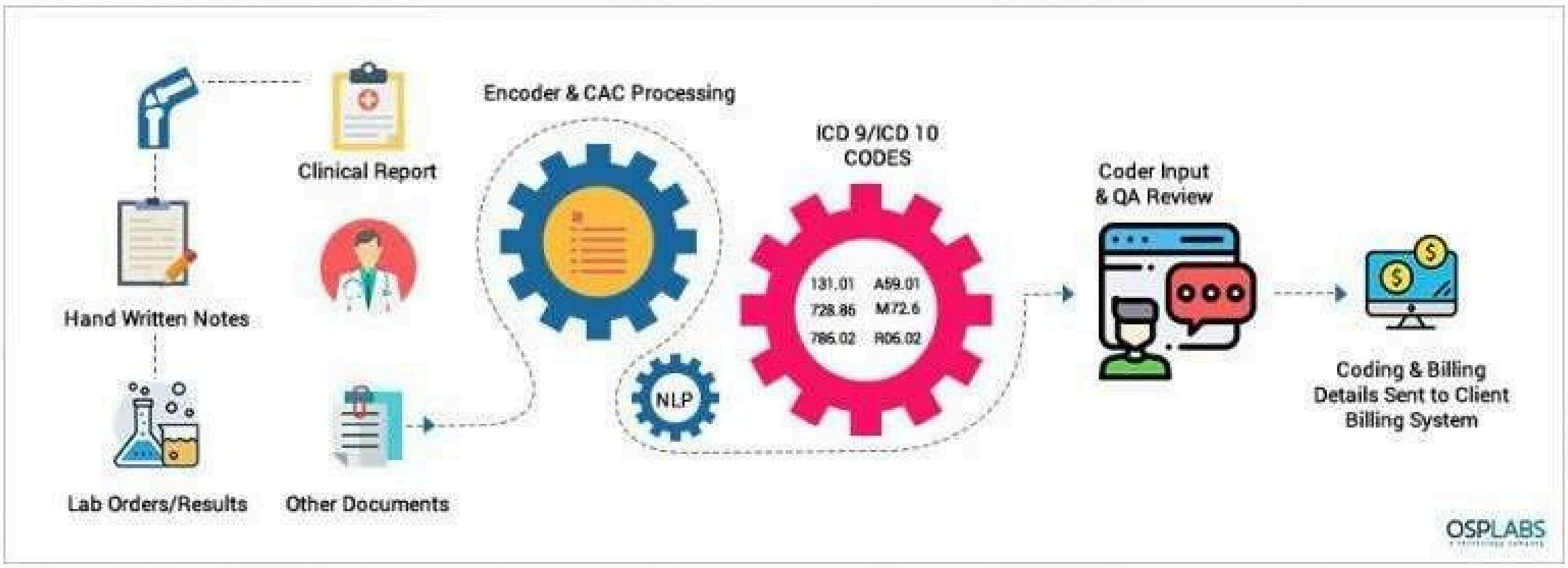
44. Medical Billing

LLMs enhance healthcare audits by efficiently analyzing patient records and EHR data.

- **Epic Systems:** Integrates LLMs for medical coding, billing, and detecting data access irregularities.

- **Accuracy Rates:** Models like GPT-3.5, GPT-4, Gemini Pro, and Llama2-70b Chat achieve up to 50% accuracy in assigning medical codes (CPT, ICD-9-CM, ICD-10-CM).

While improvement is ongoing, these tools show great potential for enhancing healthcare operations.



Medical Billing using NLP

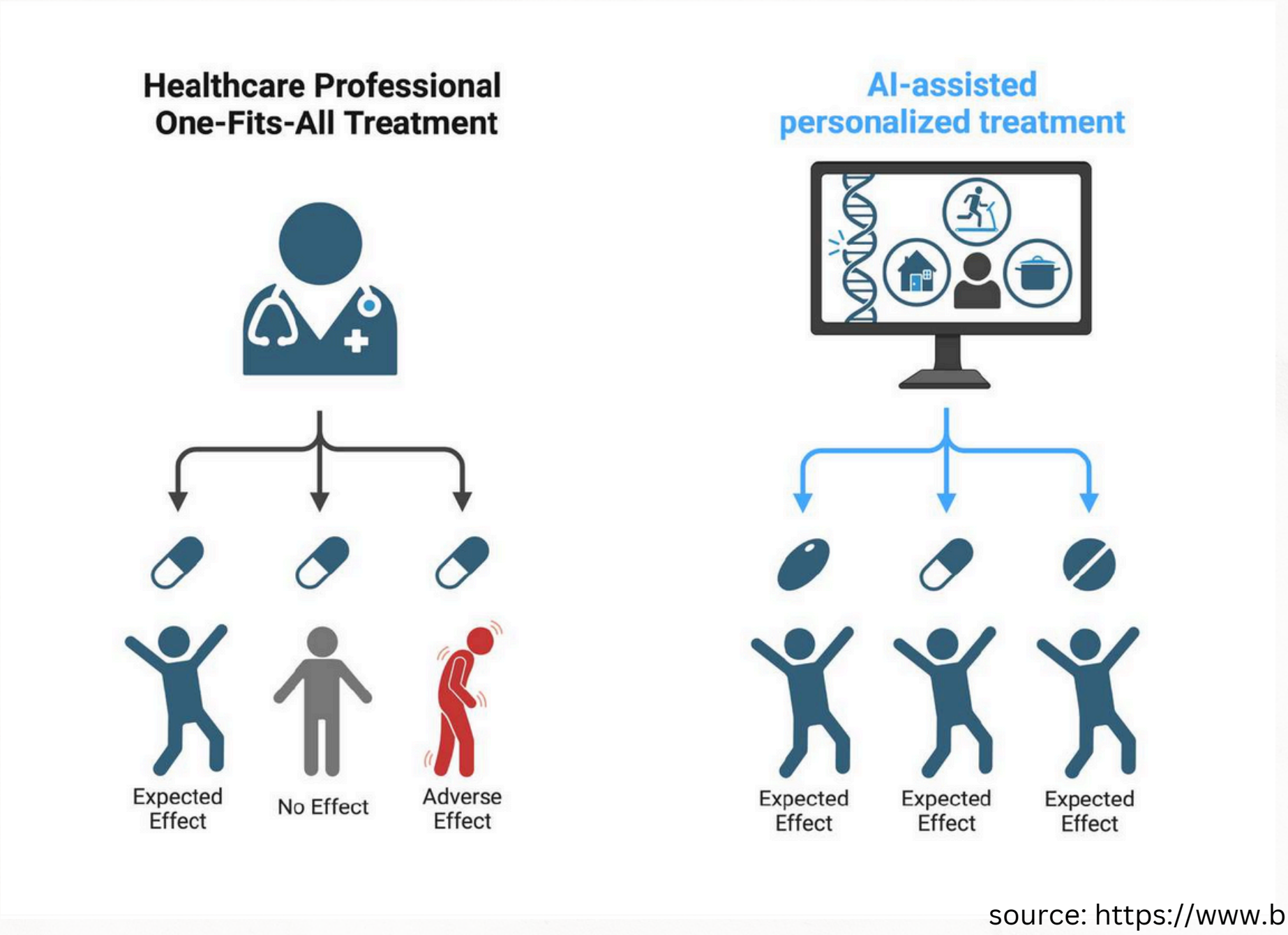
source: osplabs

45. Treatment Plans

LLMs are being used to create treatment plans that are tailored to an individual's medical history and specific needs.

For instance, **Babylon Health's** chatbot engages users in conversation, asking relevant questions to better understand their symptoms and medical history, then offering tailored advice.

This approach helps ensure that each patient receives a care plan that's customized to their unique health journey.



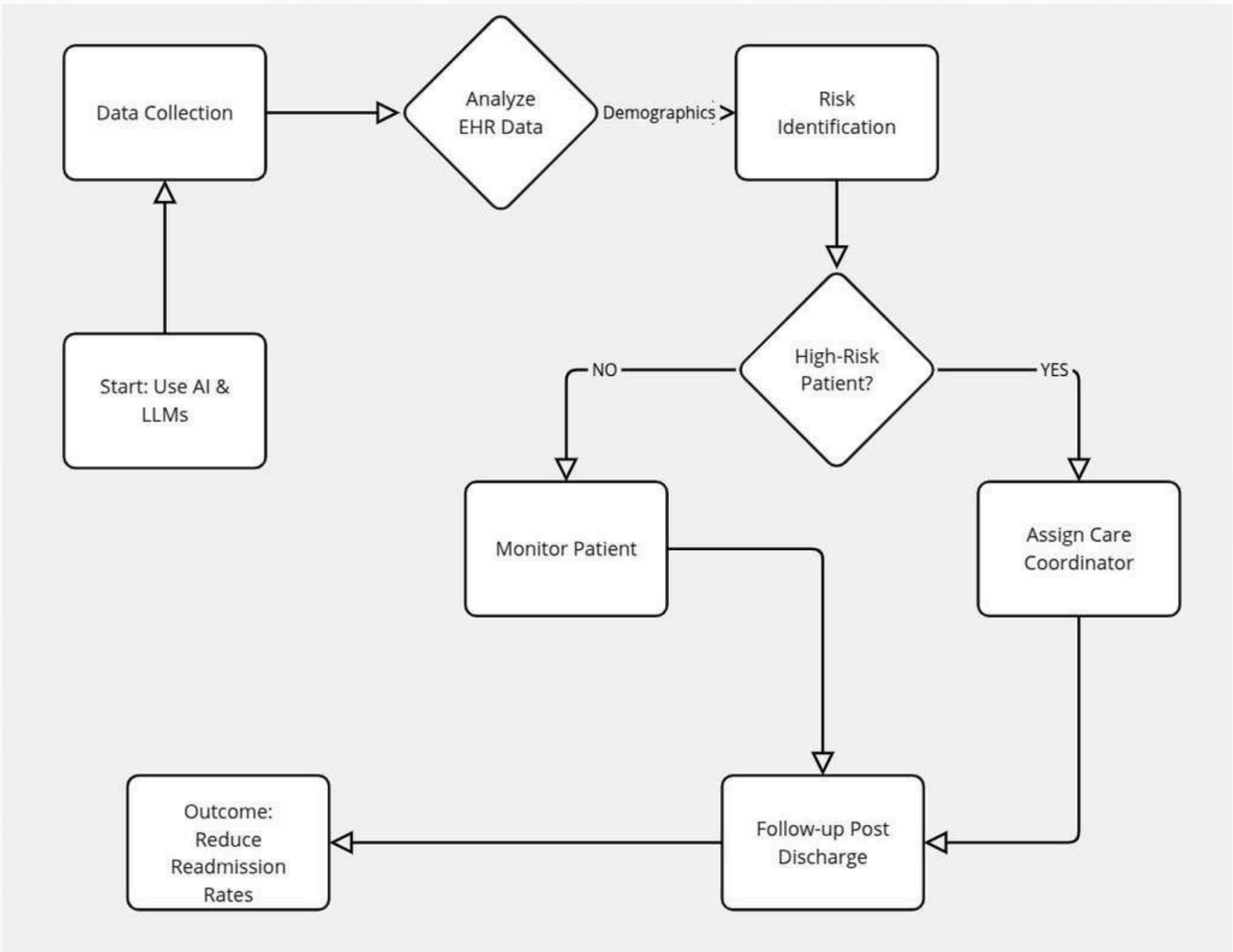
source: https://www.biorender.com

46. Predictive Analysis

Medication errors harm 1.5 million people annually, costing $3.5 billion in treatments.

WVU Pharmacists use AI and LLMs to predict patient readmission risks by analyzing EHR data, including demographics, clinical history, and social factors.

This helps identify high-risk patients, enabling care coordinators to follow up after discharge and reduce readmission rates.

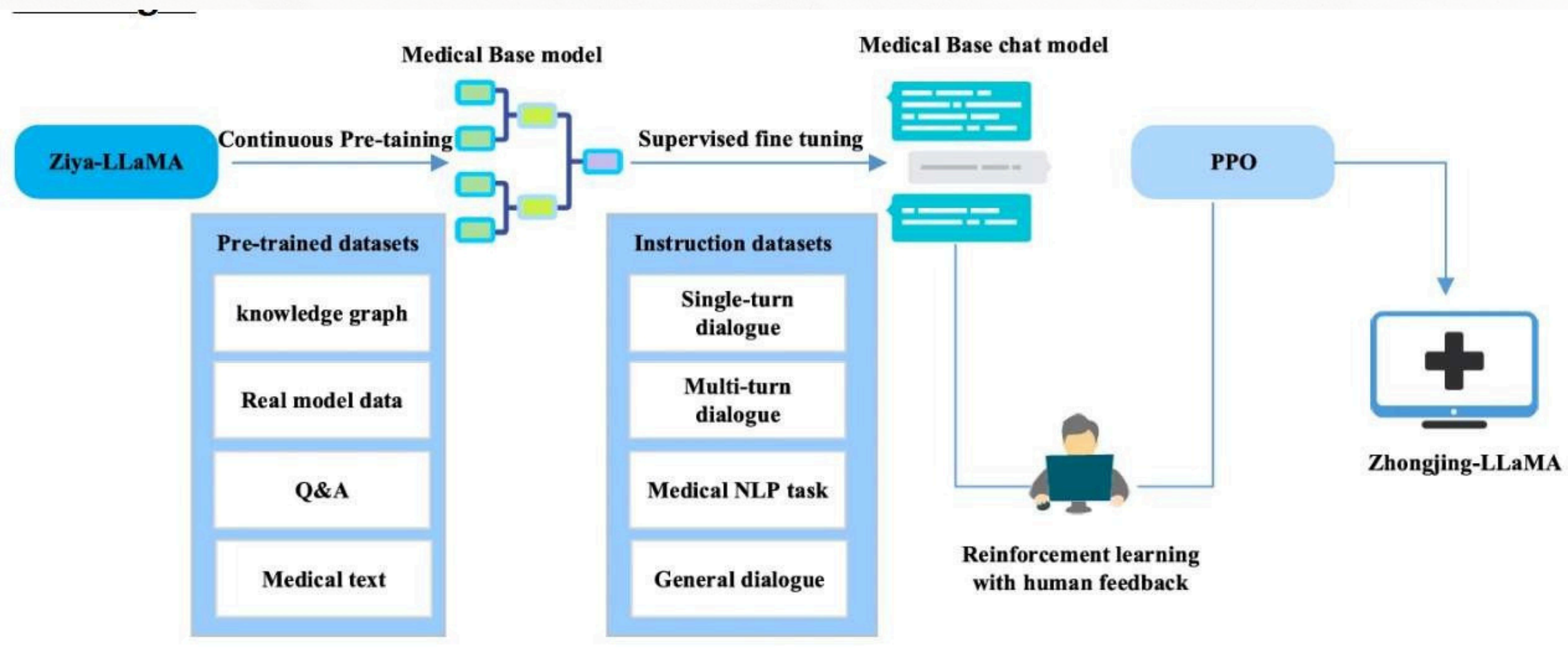


EHR Data Analysis

47. Medical Question-Answering

LLMs like GPT-4, ChatGPT, and MedPaLM2 enhance accuracy in answering complex medical queries.

- **PMC-LLaMA:** Fine-tuned on millions of biomedical papers, it delivers precise biomedical insights.
- **ChatDoctor:** Combines LLaMA with real-time Wikipedia access for accurate treatment recommendations.
- **Zhongjing:** Uses refined annotation rules and feedback reinforcement learning to improve diagnoses and treatments.



Architecture of Zhongjing LLM

source: https://link.springer.com/article/10.1007/s10462-024-10921-0

48. Automated Patient Communication

LLMs enhance patient communication with informative and compassionate responses, improving healthcare interactions.

- **Medication Management:** Chatbots remind patients to take medications and confirm adherence.
- **Health Monitoring:** Post-operative patients report recovery progress via chatbots.
- **Educational Support:** Chatbots offer personalized advice for managing conditions like high blood pressure.

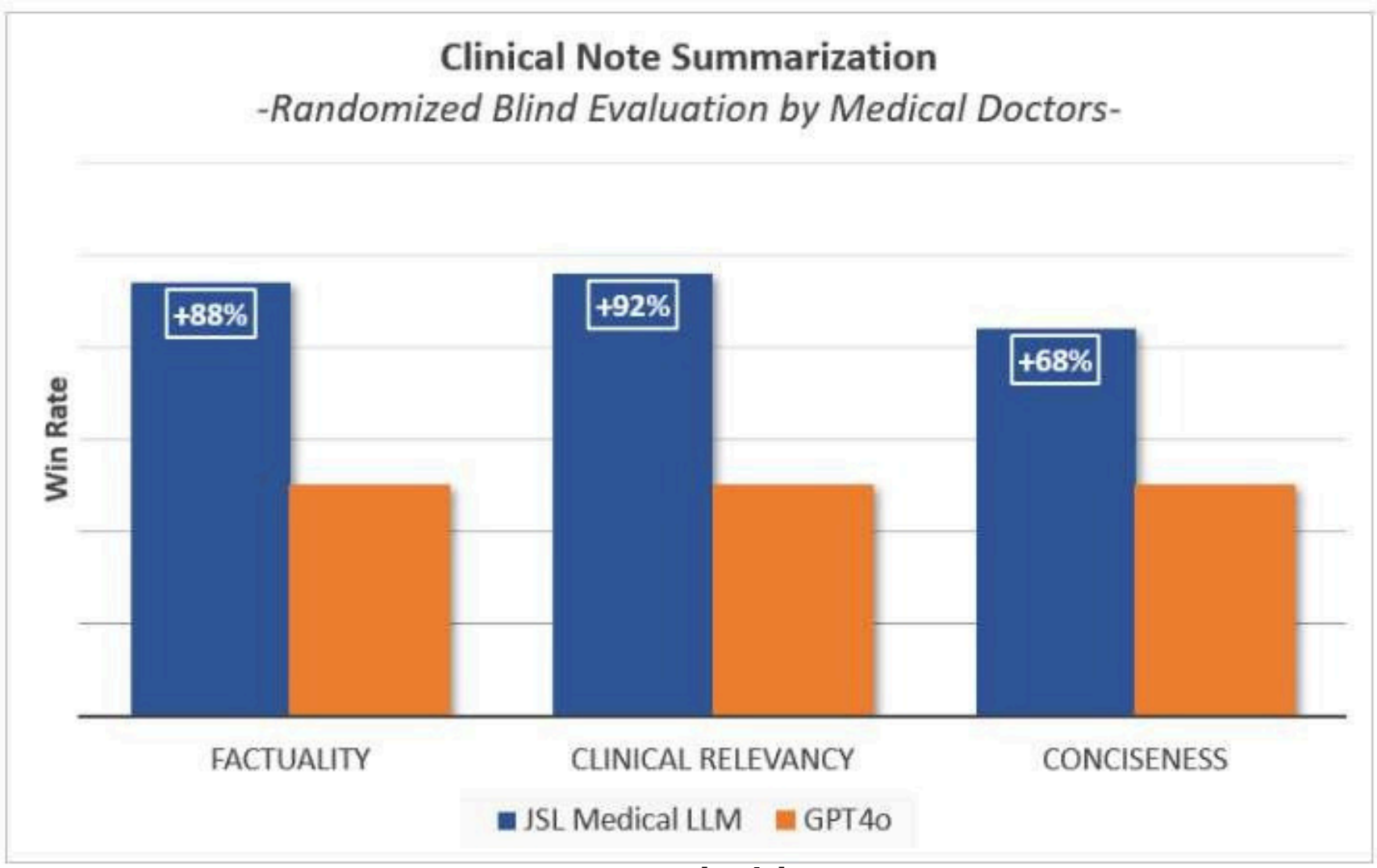
Example: Boston Children's Hospital uses **Buoy Health**, an AI chatbot, to triage symptoms, provide instant answers, and guide patients on seeking medical ca

Buoy App

49. Research & Development

LLMs excel at summarizing large datasets, extracting key insights, and presenting synthesized findings efficiently.

- **ChatGPT:** Commonly used for text summarization, condensing complex data into clear insights.
- **John Snow's Healthcare Chatbot:** Helps researchers find papers, extract insights, and identify biomedical trends.
- **TidalHealth Peninsula Regional:** Uses Micromedex with Watson to provide clinicians with quick answers to research queries, achieving a 70% success rate in under a minute.



JSL LLM compared with GPT4o

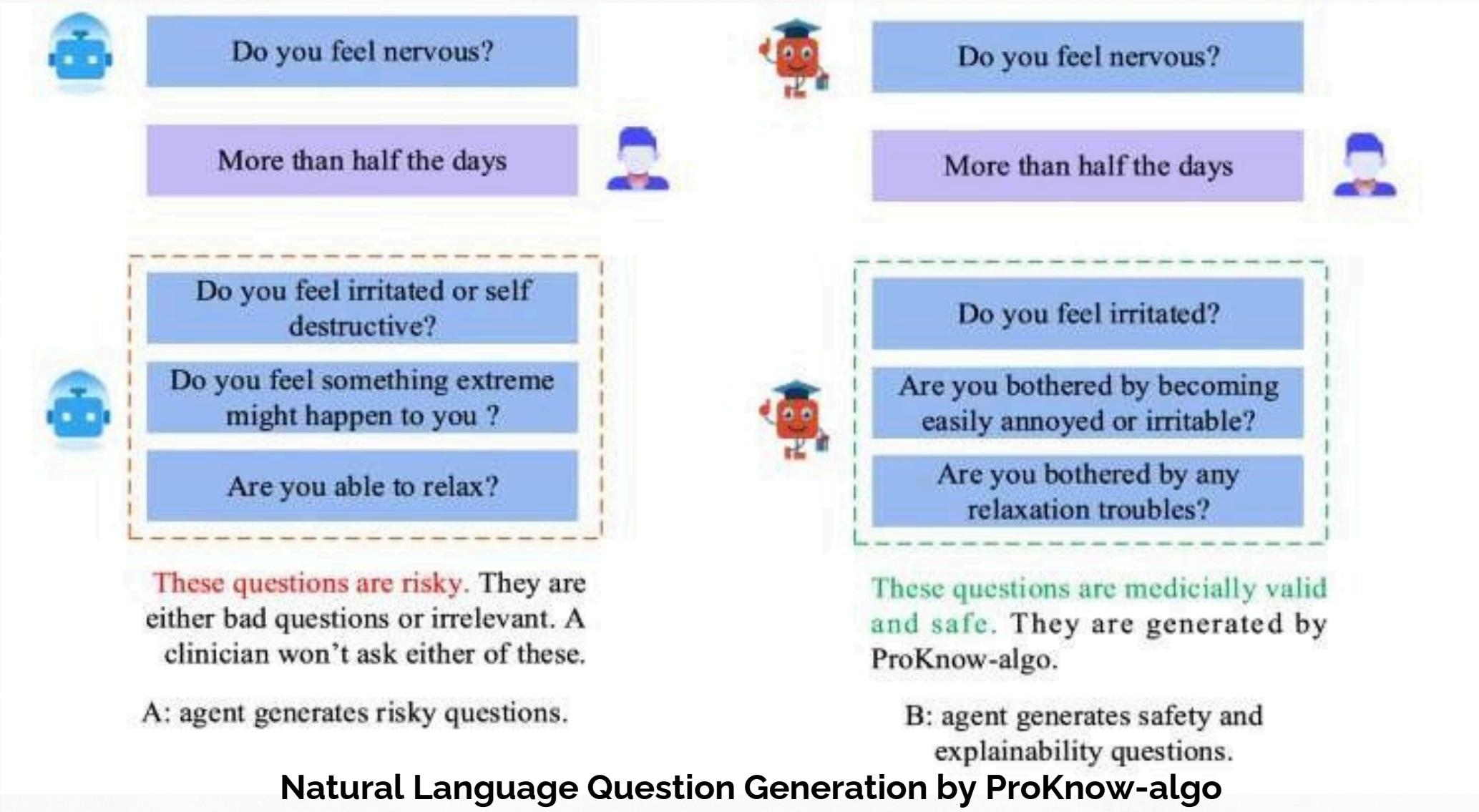
50. Disease Diagnosis

LLMs enhance safety monitoring and disease diagnosis by analyzing diverse data sources and supporting medical professionals.

- **Adverse Event Detection:** The AEDE framework, using the T5 model, detects adverse events from social media text.

- **Diagnostic Support:** GPT-3 and GPT-4 outperform non-experts in diagnosing diseases and assist intensive care physicians and radiologists.

- **Real-World Use Cases:**
  - GPT-3: Improved accuracy in diagnosing common diseases.
  - ProKnow-algo: Diagnoses mental health conditions like depression and anxiety with high safety and explainability.



Natural Language Question Generation by ProKnow-algo

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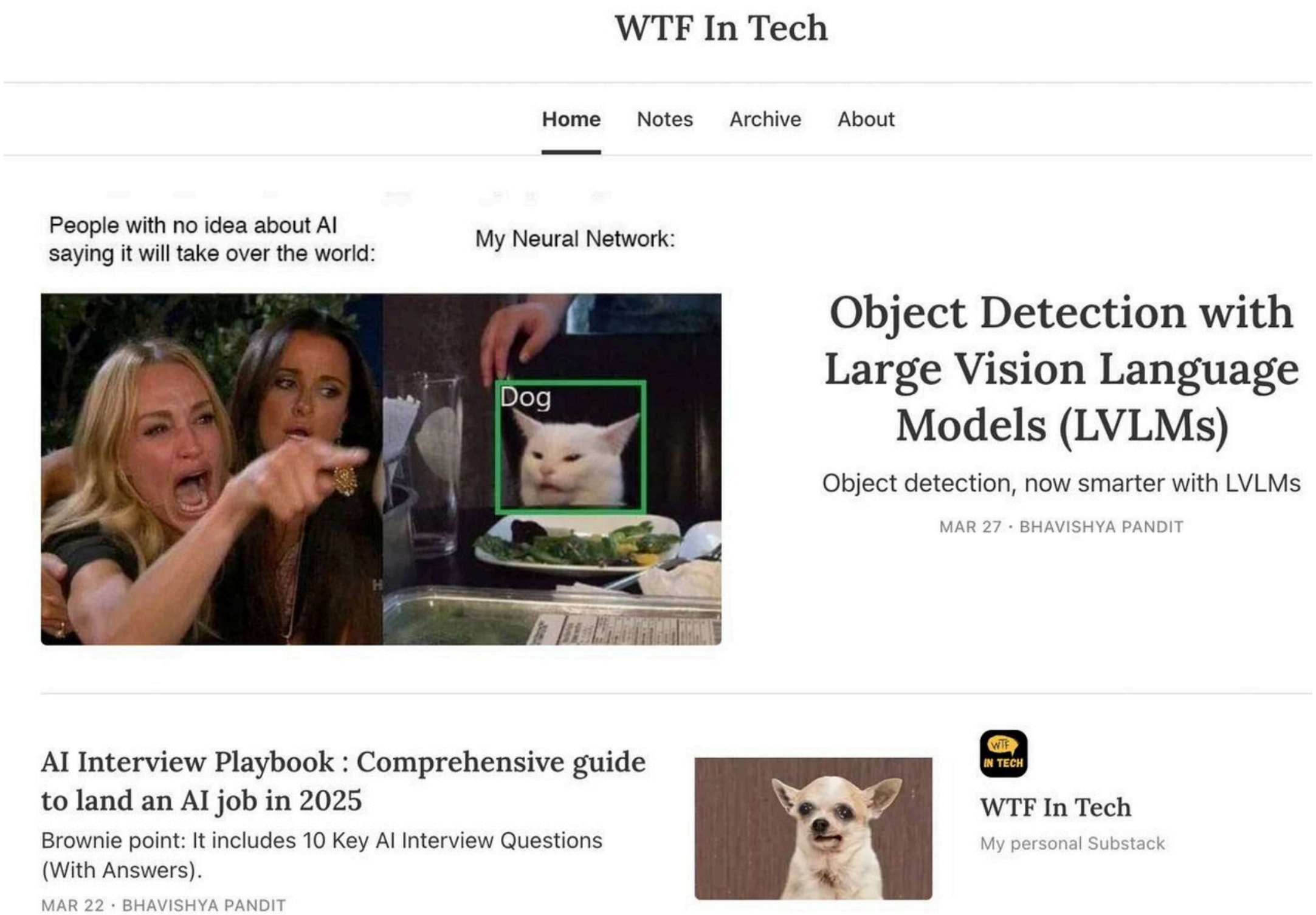

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