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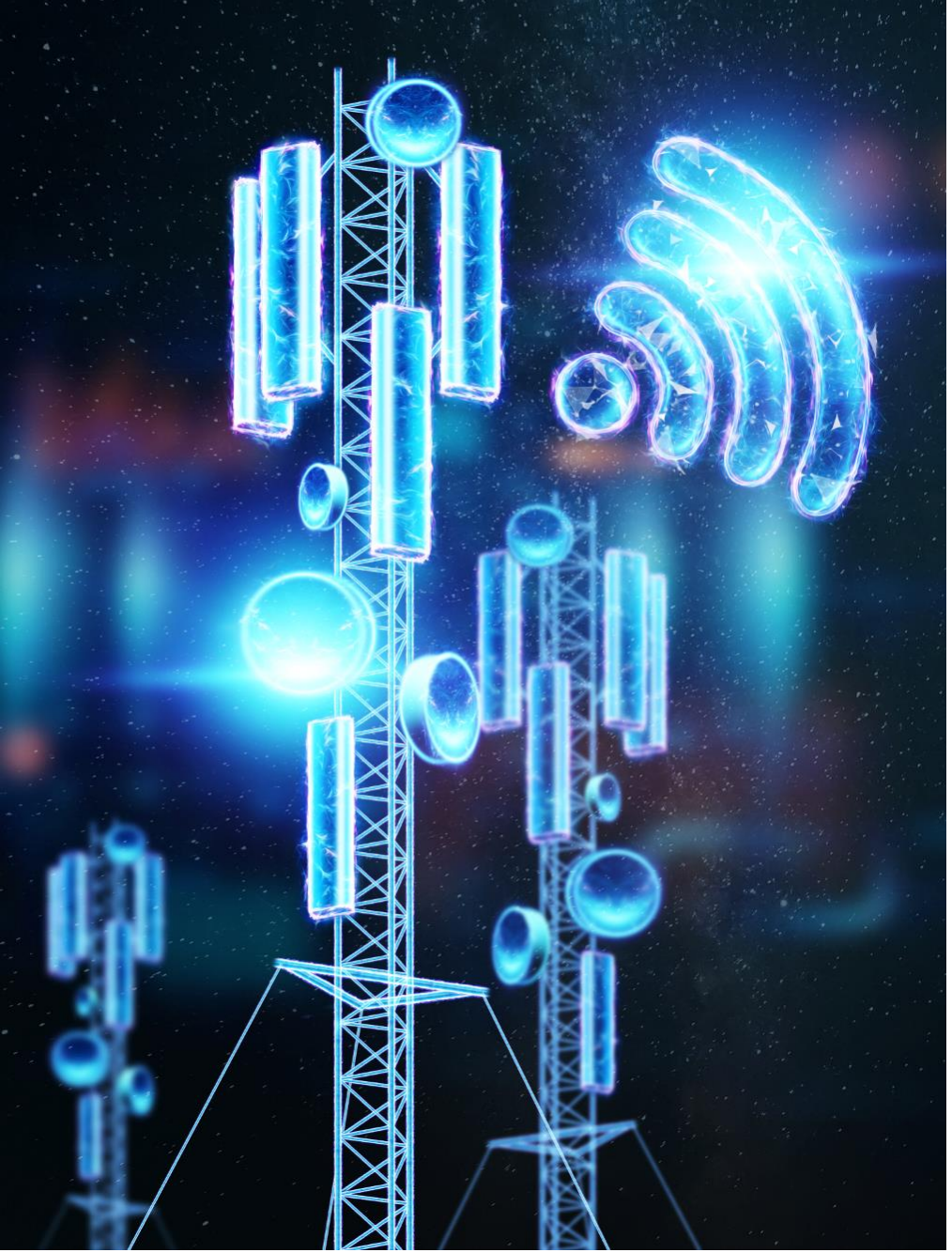
Optimize Telecom Network Management with Generative AI

Leverage AskNetwork to improve customer experience and reduce OpEx by 30%

Credits
Karthik Subbaraman | Priyankaa A



Current state of Telco Network Management

- **Expansive infrastructure and complexity:** Telco networks encompass 5G, fiber, IoT, and Cloud, creating intricate topologies, diverse devices, and layered services.
- **Data deluge in modern networks:** Networks today produce vast data volumes, from call records to logs and user activity, requiring advanced analytics and processing
- **Evolving demands in network management:** Technological advancements and increasing complexity necessitate high-performance, secure network management solutions
- **Cost burden of legacy systems:** Telcos are spending **15-20% of revenue** on network operations, primarily due to **manual network management** and outdated systems

Major challenges faced by Telcos in managing complex networks

- Accessing multiple platforms, each housing a fragment of network data, is cumbersome
- Lack of technology to proactively determine the root cause and guided action for the issues in complex networks
- Lack of tools to build dynamic and intuitive visualizations that represent complex network structures and correlations present in the network topology

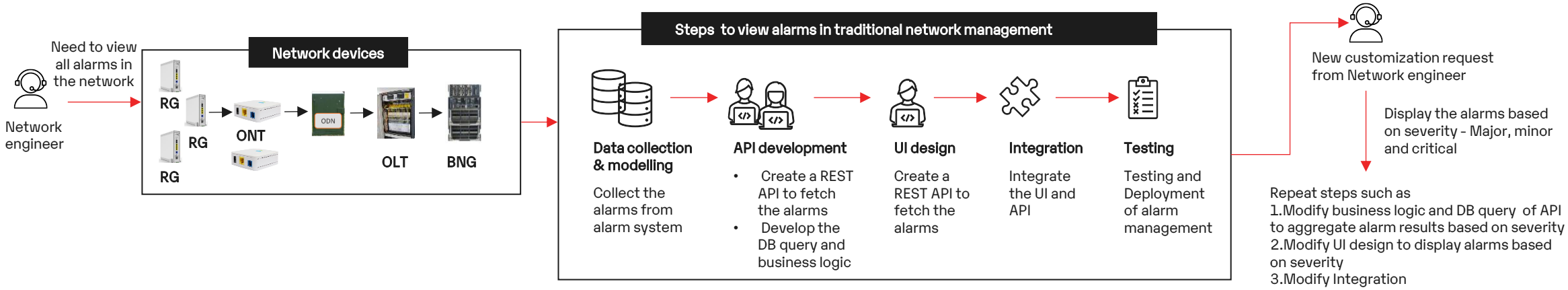
Impact of current network management systems

1. Increased development effort and cost
2. Reactive RCA and outage resolutions
3. Limited scope for customizations

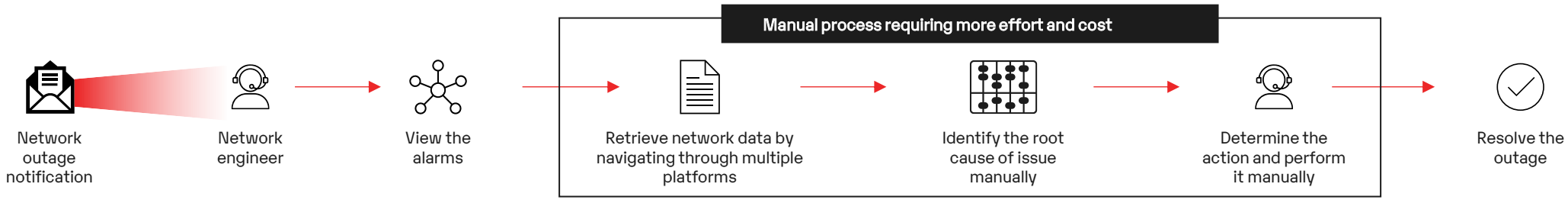
Traditional network management is cumbersome and time-consuming

Traditional network management has become increasingly cumbersome due to the evolving nature of networks, technology, and organizational demands. For example, viewing and managing alarms in a telco network is hampered by the network complexity, fragmentation of monitoring systems, and high volume of alarms. These challenges make it difficult to maintain a clear, real-time view of the network's health, leading to slower response times and a higher risk of outages.

Sample scenario 1: Rework in viewing and managing alarms increases development effort and cost



Sample scenario 2: Manual intervention and reactive outage resolution lead to extended downtimes and diminished customer experience



To overcome the challenges in traditional network management, Telcos should move towards a Generative AI (GenAI) - driven comprehensive solution. Without this shift, they risk **continued overspending on network operations**, leading to **higher OpEx** and increased customer churn due to subpar service quality.

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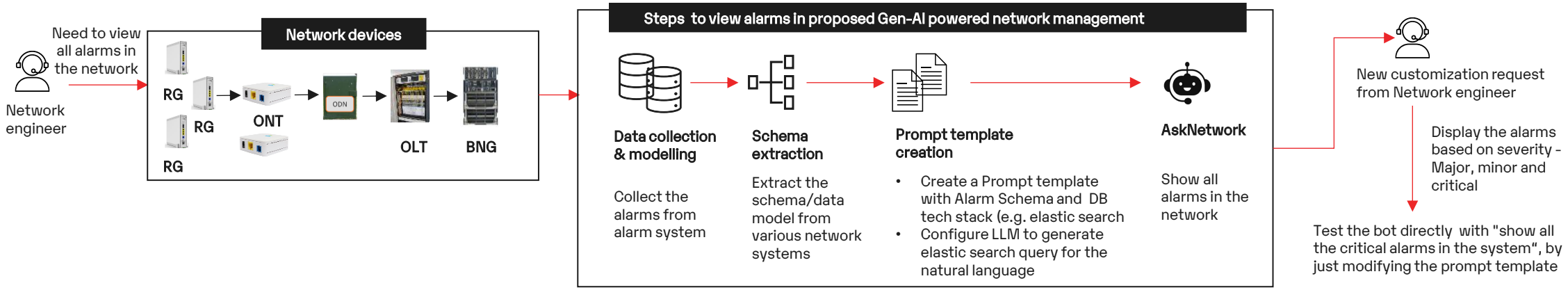
Leverage **AskNetwork**, a GenAI - powered framework for seamless interaction with your network data

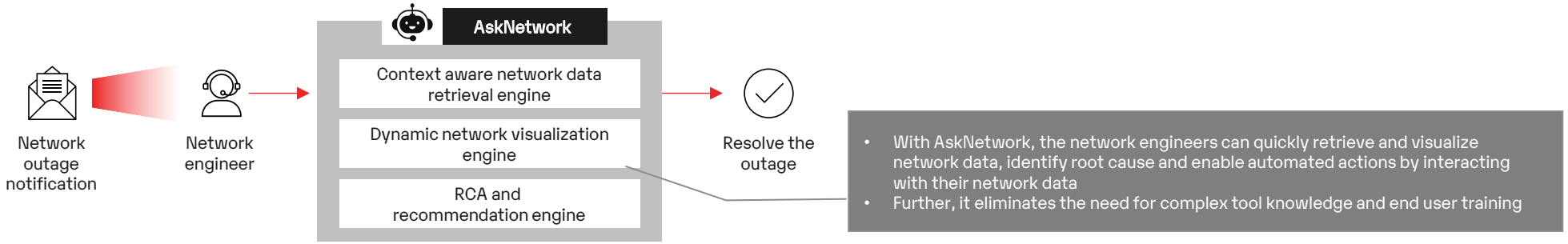
"**GenAI** in Telecom network management can significantly **reduce $20 billion**, spent annually on **network outages** and **service degradations**" - TM Forum

Implementing **AskNetwork**, a **GenAI-powered** framework, facilitates seamless, **real-time interaction with network data** through a conversational interface. It consolidates fragmented systems, simplifies alarm management, provides automated root cause analysis, and eliminates the need to maintain multiple dashboards, platforms, and integrations. By incorporating schema in prompts, this **network-agnostic** framework helps manage increasingly complex networks, leading to enhanced performance efficiently.

Sample scenario 1: GenAI-based approach of viewing and managing alarms in a Telco network



Sample scenario 2: Automated Root Cause Analysis (RCA) and network outage resolution by leveraging AskNetwork



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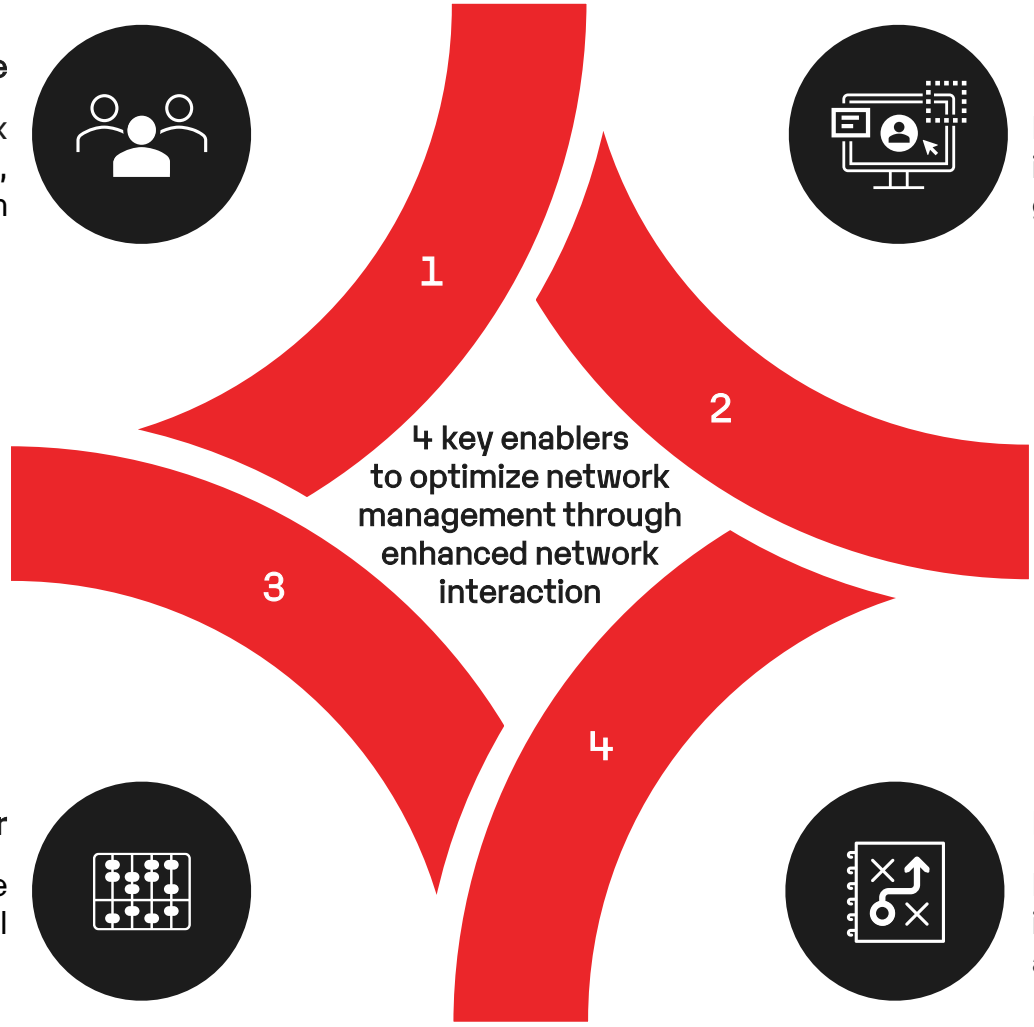
Key enablers of AskNetwork to redefine network management

Context-aware network data retrieval engine

Facilitates quick and easy access to network data, such as alarms, inventory, and outages, in a unified platform

Dynamic network visualization engine

Provides an end-to-end view of the network in different forms such as geo, topology and graphs from natural language



Context-aware root cause analyser

Identifies the root cause by drilling down the faults/issues to the device level

Recommendation engine

Recommends guided actions based on identified root causes and executes automated tasks as required

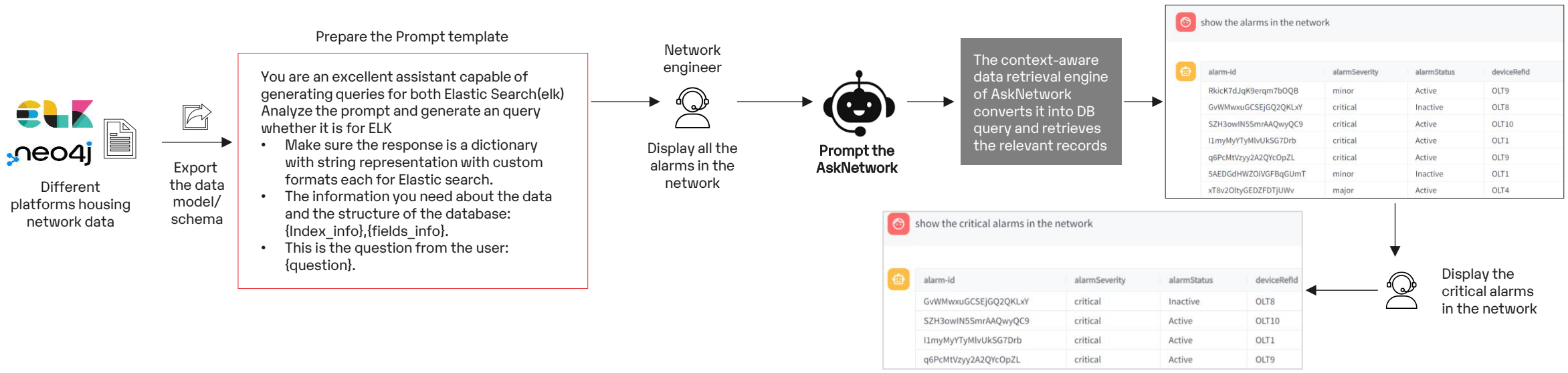
The following slides dive deep into the four key enablers for successful implementation of AskNetwork.

Context - aware network data retrieval engine for improved data accessibility

1 2 3 4

In modern network management, increasing network components and data distribution across multiple platforms make data retrieval cumbersome, as each platform often requires separate tools/services. Implementing a context-aware data retrieval engine provides **component-agnostic centralized data access**, significantly improving data accessibility across the entire network. As the **network scales**, it eases data retrieval with **minimal changes** in the **prompt template.**

Sample scenario: Retrieval of critical alarms in the network



Recommendations

- Plugin GenAI LLMs like **GPT-3.5 turbo, Llama,** and **Gemini** into AskNetwork for effective interaction with network data
- Maintain a standardized data model across inventory, fault, and performance systems to ensure efficient data retrieval
- Implement **prompt registry** and **prompt versioning** to control and refine the prompts as the network scales
- Automate hallucination detection to check the factuality of the response provided by the AskNetwork

Traditionally, a network engineer spends hours pulling data from different platforms. With the Context-Aware Data Retrieval Engine, a simple query brings all necessary network data within minutes, thereby **reducing data retrieval time** by up to **40%**.

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Dynamic network visualization engine for comprehensive network view and enhanced decision making

1 2 3 4

Modern networks have intricate topologies with diverse devices, making visualization challenging. The Dynamic Network Visualization Engine provides adaptive, real-time visual maps of complex, multi-layered network structures without manual intervention, thus ensuring the most current view of the network. It helps identify potential issues and bottlenecks, reduce network outages and resolution time, and accelerate decision-making.

Sample scenario: Real time visualization of network topology

alarmSeverity	alarmStatus	deviceRefId
critical	Inactive	OLT8
critical	Active	OLT10
critical	Active	OLT1
critical	Active	OLT9

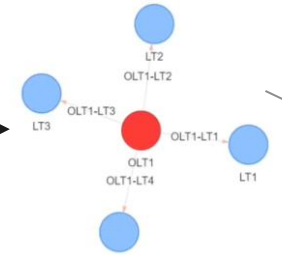
Critical alarms from data retrieval engine

Network engineer

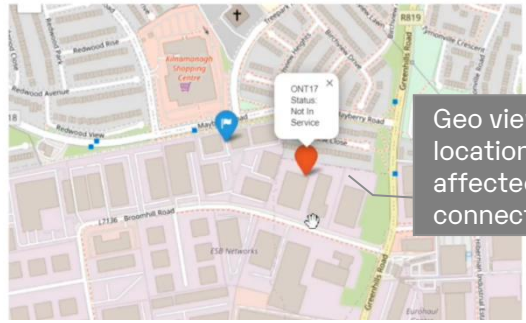
Show the cards & devices associated with device ID:OLT1 (Lets zoom into device OLT1 as an instance)

Dynamic network visualization engine provides the real-time view of cards and devices

Prompt the AskNetwork



Network Topology view showing cards associated with ID "OLT1 "



Geo view showing the location and status of the affected devices connected with OLT1

OLT	name	bponOntSerialNumber	location
OLT1	ONT1	ALCLWVALPTF1	52.84153877,-6.90627531
OLT1	ONT9	ALCL9BYAEZE4	52.662979768146,-8.592992025737
OLT1	ONT11	ALCLOV787891	53.32294501,-6.39535855
OLT1	ONT15	ALCL84SCXK2S	53.176984213612,-6.811854806599

Tabular view showing inventory information of Customer Premise Equipment (CPE)s associated with device OLT1

By leveraging the network visualization engine, Telcos can quickly visualize the networks in real time. This eliminates the need for individual dashboards, thus reducing the development cost.

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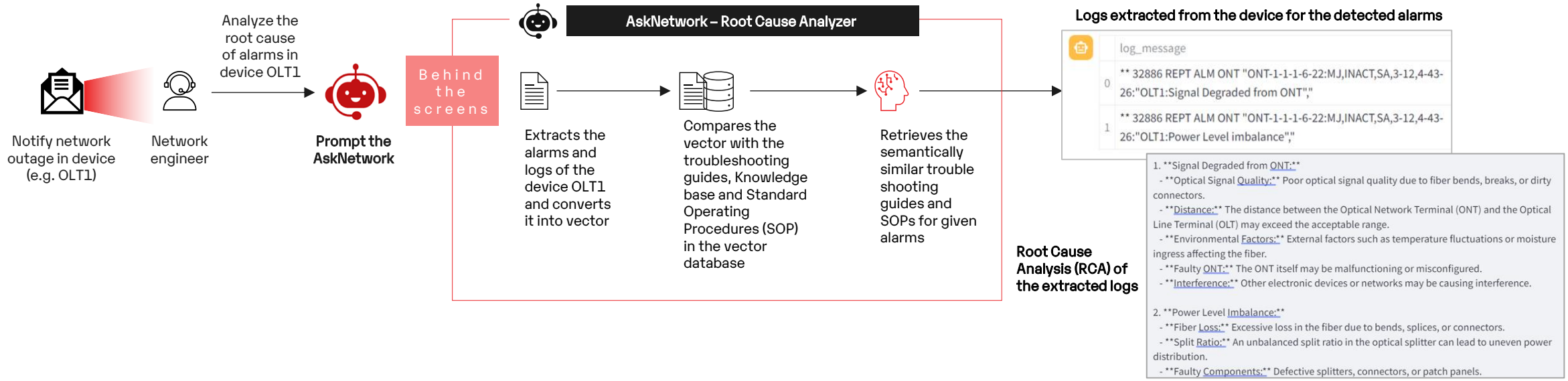
Context-aware root cause analyzer for automated root cause analysis and enhanced customer experience

1 2 3 4

Networks have become more intricate with various devices and protocols, making it hard to trace issues to their root cause. Additionally, knowledge bases have grown increasingly complex, making it challenging for network engineers to navigate and pinpoint the root cause. Implementing a context-aware root cause analyzer enables automated and proactive analysis of potential issues by quickly retrieving the relevant trouble-shooting guides for the specified alarms.

Sample scenario: Root Cause Analysis (RCA) of device with critical alarm



Recommendations

- Implement a **Retrieval-Augmented Generation (RAG)** framework to fetch the relevant troubleshooting guides and SOPs
- Leverage **vector database** to store and facilitate efficient search and retrieval of data
- Continuously monitor the responses from the context-aware root cause analyzer, **BLEU,** and **ROUGE** scores to evaluate whether AskNetwork retrieves relevant information from the provided troubleshooting guides. This also aids in the **quick detection** and **reduction** of **hallucinations**
- Update the data sources used by the RAG framework by scheduling regular data refreshes
- Design the RAG system architecture to handle scaling up of the network, considering factors like increased data volume and user load

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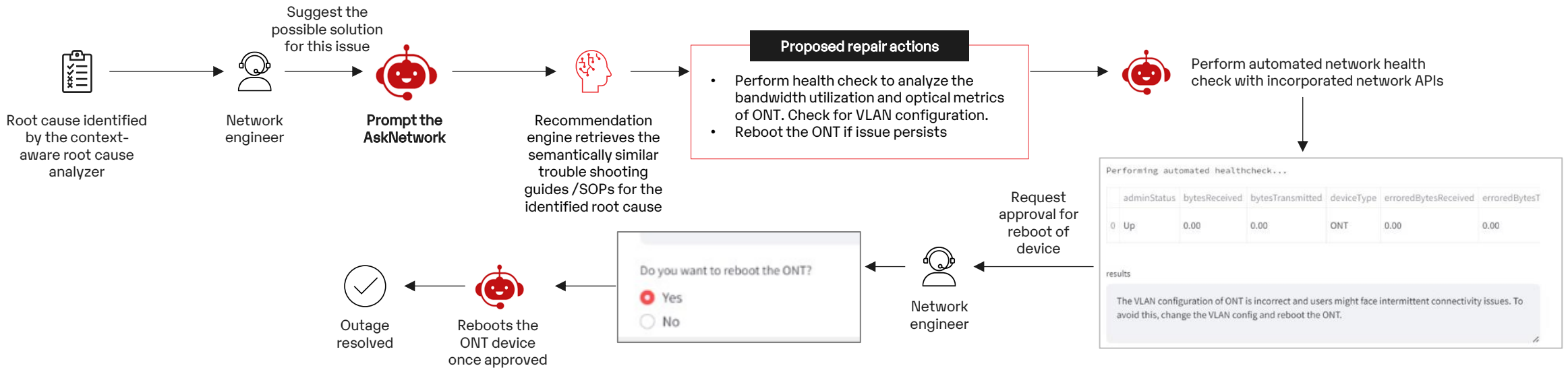
Recommendation engine for automated network outage resolution and reduced Mean Time To Resolve (MTTR)

1 2 3 4

Traditional network management has reactive outage resolution, which includes manually diagnosing and fixing network issues after an outage occurs. This results in slower response times, high downtime costs, and increased manual effort for troubleshooting and fixing issues. Implementing a recommendation engine helps with possible solutions for the issue and performs automated actions wherever required, thereby reducing network downtime.

Sample scenario: Proposed and automated network actions by AskNetwork



Recommendations

- Leverage the power of AI agents to automate network actions like health checks and diagnostics, thus enhancing network reliability, performance, and security
- Incorporate a **Human-in-the-Loop (HITL)** approach for critical network actions like **reboots** and **configuration changes.** While AI and automation can handle routine and repetitive tasks efficiently, specific network actions require human intervention to ensure safety, precision, and context-aware decision-making

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Business benefits achieved by a leading Telco after successful implementation of AskNetwork

Implementing the key enablers as discussed in this insight resulted in the following benefits

2x faster and efficient network management

30% reduction in OpEx

Enhanced decision-making with efficient network data retrieval

Improvement in customer experience with automated network outage resolution

Thank you

insights@prodapt.com

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