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CASE STUDY # 135

JIO PLATFORMS LIMITED

JioBrain Operations

Abstract

The exponential growth of 5G networks has introduced unprecedented operational complexity, generating vast volumes of telemetry, alarms, performance indicators and network events that exceed traditional human-led management capabilities. To address this challenge, Jio Platforms Limited developed the JioBrain Operations Use Case, an AI-powered operational intelligence ecosystem that transforms network management into predictive, autonomous and self-healing operations.

Built as part of the wider JioBrain initiative, the platform integrates artificial intelligence, machine learning, generative AI, conversational interfaces, anomaly detection, automated root cause analysis and predictive network intelligence across India's largest 5G standalone network. It processes more than 350 billion telemetry signals daily and supports network domains spanning RAN, Core, IMS, IPM, probes, OSS and BSS systems. By allowing predictive fault detection, cognitive alarm handling, automated troubleshooting and zero-touch operating workflows, JioBrain has delivered a 40 percent reduction in outages, 50 percent faster mean time to resolution, 30 percent operational expenditure savings and a 70 percent reduction in alarm noise, benefiting more than 500 million subscribers nationwide.

Introduction

Telecom operations are increasingly challenged by the scale and complexity inherent in modern networks. Traditional Network Operations Centers (NOCs) rely on manual monitoring, rule-based analysis and reactive troubleshooting, causing delayed fault identification, prolonged outages and inefficient resource utilisation. Jio Platforms recognised that managing India's largest 5G standalone network required a different approach.

The JioBrain Operations ecosystem was developed to create an AI-led operational system capable of autonomously detecting anomalies, correlating alarms, predicting failures, performing root cause analysis and supporting operational decision-making. The Operations AI suite includes 5G Network Pulse AI, 5G NeuralOps, Jio FluxOps, Network Sage AI, FortifiX AI, Jio Insights AI and Jio DBIQ, each tackling a particular operational challenge inside a unified intelligent platform.

As a result, the solution now handles more than 350 billion network signals every day and supports proactive operations at national scale, establishing an innovative benchmark for AI-driven telecom operations.

The Problem Statement

Telecommunications networks have become increasingly complicated due to the proliferation of 5G technologies, cloud-native architectures, multi-vendor ecosystems and massive volumes of live telemetry. As a result, Jio's operational teams faced various interrelated challenges.

Network operations remained largely reactive, with engineers responding to incidents only after subscribers experienced service deterioration or outages. Massive alarm volumes created signal overload, making it difficult for NOC teams to identify genuine incidents and determine root causes quickly. Limited visibility across network domains, including RAN, Core, IMS, IPM and probe systems, further slowed investigation and remediation actions. At the same time, the network generated more than 350 billion telemetry events daily, a scale far beyond human analytical capacity.

These problems threatened network dependability, customer experience, business efficiency and future scalability. Accordingly, the organisation identified an opportunity to replace manual troubleshooting with predictive, AI-led, zero-touch operations that can autonomously handle network complexity while improving service quality and functional performance.

Strategic Vision

Jio Platforms envisioned creating a sovereign AI-driven operations ecosystem capable of transforming India's largest 5G network into a predictive, autonomous and self-healing digital infrastructure. The objective was to reimagine telecom operations through artificial intelligence.

Building on this strategy, the focus was on replacing reactive processes with predictive intelligence, enabling AI systems to detect faults before they cause customer impact, automate root-cause analysis, reduce alarm noise and support automated decision-making. The vision reached beyond operational performance to creating an intelligent network capable of perpetual learning, self-optimisation and scaling across future technologies, including 5G, Fixed Wireless Access, IoT and emerging 6G environments.

In this model, JioBrain was designed as a basic AI layer providing end-to-end intelligence, data integration, automation and operational orchestration across all network domains. The initiative endeavored to establish a new operational paradigm in which artificial intelligence serves as the main mechanism for network management and recovery.

Solutions Stack

The JioBrain Operations ecosystem comprises a suite of AI-powered operational products designed to work together as a unified intelligence platform.

5G Network Pulse AI predicts failures before customer impact. NeuralOps automates root cause analysis and proactively resolves operational issues. Jio FluxOps enables operators to execute maintenance operations, upgrades, downgrades and network procedures through conversational interfaces. Network Sage AI introduces voice-enabled network operations, while FortifiX AI reduces alert noise across the cloud-native stack and targets actionable risks. Jio Insights AI delivers horisontally scalable analytics and Jio DBIQ integrates enterprise-wide data sources for end-to-end operational intelligence.

The deployment architecture includes GPU-based servers deployed centrally and at super core and edge locations. Real-time information pipelines integrate telemetry from RAN, Core, IMS, IPM, NMS, probes, OSS and BSS environments, enabling ingestion and analysis of more than 350 billion daily signals. Machine learning models support predictive failure detection, anomaly detection, alarm clustering, KPI prediction, automated RCA, maintenance procedure generation and voice-based network operations.

Generative AI capabilities additionally enhance the platform by enabling conversational operations, operational assistance, intelligent search and autonomous workflow orchestration. Together, these technologies create an AI-led operating framework capable of supporting zero-touch network management at national scale.

Implementation Journey

The initiative began during the fourth quarter of 2023 when Jio identified growing operational problems associated with increasing network complexity, alarm volumes and telemetry scale. Leadership recognised that traditional operating models could no longer meet future network demands and initiated the development of a sovereign AI layer focused on automation, anomaly detection, root-cause analysis and troubleshooting.

During the first quarter of 2024, operational and engineering teams across NOC, RAN, Core, IMS, IPM and JioBrain collaborated to define the architecture. As part of this effort, large-scale data pipelines were developed to ingest billions of alarms, counters, probes and network signals in real time.

In the second quarter of 2024, machine learning models for anomaly detection, alarm clustering, KPI analytics, fault prediction and probe-based root cause analysis were developed and tested within controlled settings. In parallel, dashboards and functional workflows were refined to support NOC requirements.

The third quarter of 2024 saw pilot deployments across selected circles. During this stage, components such as Pulse AI, NeuralOps, FluxOps, Cognitive Alarm Handling and Probe-AI were tested to validate predictive performance, accuracy and operational impact. Following successful pilot outcomes, the solution was integrated with Jio's Network Management Systems, OSS/BSS platforms, 5G Core, IMS, probes and RAN infrastructure and rolled out nationwide in November 2024.

Throughout 2025, the platform expanded across all circles with the addition of zero-touch workflows. As it matured, the AI platform now processes more than 350 billion daily signals while continuously learning and optimising operational outcomes.

Outcomes

The implementation of JioBrain Operations has generated measurable improvements across network performance, operational efficiency and customer experience.

Through predictive anomaly detection, proactive remediation and automated root-cause analysis across RAN, Core, IMS and IPM environments, the platform has achieved a 40 percent reduction in outages. Mean Time to Resolution has improved by 50 percent because of cognitive alarm handling, automated clustering and AI-assisted troubleshooting workflows.

Operational expenditure has decreased by 30 percent through reductions in field visits, fewer escalations, optimised workforce utilisation and more efficient resource planning. At the same time, alarm noise has declined by 70 percent, enabling operations teams to focus on genuine incidents instead of processing thousands of redundant alerts.

Most significantly, JioBrain autonomously analyses more than 350 billion network signals daily, delivering nationwide reliability improvements that support better service quality and customer experience for more than 500 million subscribers.

The initiative has transformed telecom operations from reactive firefighting into proactive, AI-driven orchestration, demonstrating how artificial intelligence can enhance reliability, scalability and operational excellence in one of the world's largest communications networks.

Highlights

- JioBrain Operations is an AI-powered operational intelligence platform for telecom network management, enabling predictive, autonomous and self-healing operations.
- It combines machine learning, generative AI, anomaly detection, predictive analytics and automated root-cause analysis to improve network reliability and efficiency, while conversational interfaces support operations.
- The solution enables predictive fault detection and automated troubleshooting, with cognitive alarm handling, voice-enabled operations and zero-touch workflows.
- Results include a 40 percent reduction in outages, a 50 percent faster mean time to resolution, a 30 percent reduction in operational expenditure and a 70 percent reduction in alarm noise.
- By benefiting 500+ million subscribers and thousands of operational teams, JioBrain Operations establishes a scalable foundation for AI-driven telecom management and positions future autonomous networks for greater impact.

Conclusion

JioBrain Operations represents a landmark achievement in AI-powered telecom transformation. By combining machine learning, predictive analytics, generative AI, conversational interfaces, anomaly detection and autonomous workflows, Jio has built an operational intelligence ecosystem capable of managing India's largest 5G standalone network.

Processing more than 350 billion telemetry signals daily, the platform enables predictive fault detection, automated root-cause analysis, cognitive alarm handling and self-healing operations, considerably boosting network performance and operational efficiency. The measurable outcomes are: 40 percent fewer outages, 50 percent faster resolution times, 30 percent OPEX savings and 70 percent alarm reduction, demonstrate the value of embedding artificial intelligence at the heart of telecom operations.

As networks evolve toward increasingly autonomous architectures, JioBrain establishes a scalable foundation for next-generation AI-led operations, positioning Jio at the forefront of intelligent network management and digital infrastructure innovation.

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