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JIO PLATFORMS LIMITED

JPW Field AI Vision

Abstract

As India's demand for high-speed broadband and 5G connectivity accelerates, telecom operators must scale Fiber and AirFiber deployments while maintaining installation quality across geographically dispersed field operations. Jio Platforms Limited addressed this problem through JPW Field AI Vision, an AI-powered computer vision framework embedded in Jio Partner World (JPW), the company's Direct-to-Doer platform for nationwide field execution.

The solution uses fine-tuned LLaMA Vision models to evaluate installation images captured by field engineers during Fiber and AirFiber deployments. It turns manual audits into real-time AI-driven workmanship assurance, providing instant feedback, detecting deviations from installation standards, enforcing compliance and enabling immediate corrective action. Deployed across more than 50,000 field engineers and all Jio Circles, the system has achieved a 98 percent green installation rate, reduced installation time by 30 percent, cut onboarding time by 60 percent and enabled consistent quality assurance at national scale.

Introduction Jio Partner World (JPW) serves as the operational backbone for Jio's Fiber and AirFiber installation ecosystem. The platform manages work-order allocation, execution, quality monitoring, supervisor oversight and accountability across India.

As installation volumes increased, maintaining workmanship quality became increasingly difficult. Supervisors could review only a fraction of installations, audit processes were subjective and delays in identifying defects led to repeat visits, higher costs and inconsistent customer experiences. Jio introduced JPW Field AI Vision, an AI-powered quality assurance framework that evaluates installation images in near real time and helps ensure every installation meets defined standards before completion.

The Challenge For the business, poor-quality installations increased rework costs, delayed project execution and risked reputational damage that could affect future customer acquisition. For field engineers, installation defects often meant revisiting sites, increasing workload and reducing productivity. For customers, inconsistent installation quality affected service experience and trust in the brand.

Prior to AI adoption, quality assurance relied heavily on manual supervision. Engineers frequently uploaded incomplete or improperly framed images; supervisors could review only 10-30 percent of daily installations; validation standards varied by reviewer; and feedback frequently arrived 24-48 hours after installation completion. This resulted in repeat visits, inconsistent quality assessments and limited scalability.

JPW introduced guided camera interfaces, visual references, training videos and checklist-based validations.

Solutions Architecture

JPW Field AI Vision integrates AI-powered computer vision directly into installation workflows.

During Fiber and AirFiber installations, field engineers capture stepwise photographs through the JPW application. These images are uploaded to cloud-hosted LLaMA Vision models that have been fine-tuned using curated datasets of compliant and non-compliant installation images. The models evaluate workmanship quality against business-defined standards and generate results within two to three seconds.

The platform classifies each image into three categories:

- **Green:** Fully compliant installation requiring no action.
- **Red:** Non-compliant installation requiring immediate rework.
- **Yellow:** Low-confidence cases needing human review.

Following extensive model optimisation, the Yellow category has effectively been reduced to near zero, enabling highly automated decision-making. The solution evaluates multiple installation checkpoints,

including outdoor unit mounting, service loops, LED indicators, cable entry, POE placement, gateway placement, speed testing, power validation and equipment positioning across Fiber and AirFiber workflows.

The portals allow field supervisors to review uploaded images, analyse AI-generated reasoning, reject AI decisions where necessary and identify false-positive or false-negative cases. Samples are reviewed regularly with field teams and incorporated into subsequent model fine-tuning cycles.

The solution integrates with Tableau dashboards and Grafana-based monitoring systems, providing real-time visibility into installation quality, engineer performance, work-order trends and model effectiveness across all circles.

Strategic Vision

Jio envisioned transforming field quality assurance from reactive supervision to proactive, AI-driven workmanship validation. The objective was to create an expandable framework that automatically verifies installation quality, identifies defects, standardises execution practices and provides engineers with immediate feedback at the point of work.

The solution was designed around four strategic targets:

- Objective quality validation by AI-based image analysis.

- Real-time detection of variations from installation standards.
- Quicker execution through instant field feedback.
- Centralised monitoring of thousands of installations simultaneously.

The initiative aimed to ensure installations were completed correctly the first time, reducing rework while improving the customer experience and operational performance.

Implementation Journey

The transformation began in early 2025 with Jio's first AI pilot using OpenAI Vision models. Engineers uploaded installation images and the system generated automated pass/fail recommendations. High-confidence cases were processed automatically, reducing processing durations and validating the feasibility of AI-led quality assurance.

To address uncertain predictions, Jio introduced a human-in-the-loop review mechanism. Low-confidence cases were routed to experts for validation, ensuring operational reliability while building trust in AI-assisted decision-making.

Subsequently, the organisation launched a parallel evaluation of OpenAI and LLaMA Vision models. While the OpenAI pilot achieved approximately 85 percent accuracy, it continued to generate Yellow bucket cases and required longer inference times. The fine-tuned LLaMA Vision model achieved approximately 97 percent accuracy during pilot deployment, reducing inference time to 2 seconds and lowering Yellow bucket cases to below 1 percent.

In September 2025, Jio completed the full transition to LLaMA Vision. Additional fine-tuning increased model accuracy to 98 percent, virtually eliminated uncertain classifications and enabled deployment across all Jio Circles at scale.

A closed-loop quality assurance process was also introduced. Any installation receiving a Red classification required corrective action before workflow progression, ensuring adherence to quality standards and creating a continuous improvement mechanism across field operations.

The AI system was developed through a structured machine learning pipeline.

Training data sets were prepared using auto-annotation techniques based on PaliGemma and YOLO formats. Business rules were encoded into YAML configurations

to align AI evaluation with installation standards. Synthetic data generation was used to strengthen training coverage, while torchTune and transformer-based frameworks enabled automated model training and optimisation.

The model was specifically trained to detect installation defects, identify device placement errors, recognise "photo of photo" fraud attempts and validate compliance with workmanship standards. Jio further improved anomaly detection by using a self-trained YOLO model for device annotation, thereby increasing accuracy.

Performance benchmarking demonstrated that the fine-tuned LLaMA Vision model maintained throughput of 550,000 images per day while lowering latency from 4.44 seconds to 2.61 seconds compared with GPT-4o-based implementations. The production deployment operates across Azure A100 and Google Cloud L4 GPU environments to support nationwide scale.

Outcomes

The implementation of JPW Field AI Vision has produced quantifiable operational transformation.

The platform has achieved a 98 percent Green Installation Rate across Fiber and AirFiber deployments nationwide, demonstrating strong adherence to installation standards. On 13 October, analysis of 169,733 installation images showed 98.46 percent classified as Green and only 1.54 percent as Red, with negligible Yellow cases.

The AI-powered framework now provides real-time workmanship assurance, enabling instant feedback to field engineers and removing delays associated with manual inspections. Supervisors can remotely monitor installation quality across 100 percent of deployments, rather than relying on limited sampling.

The initiative has also generated considerable workforce and productivity benefits:

- 60 percent reduction during onboarding time for new engineers.
- 98 percent of home installations were completed the first time with AI supervision.
- Nationwide deployment across more than 50,000 field engineers and all Jio Circles.
- Continuous AI-based validation supporting uniform installation standards throughout regions.

The project currently impacts over 100,000 external beneficiaries through improved installation quality and customer experience.

Jio plans to expand the platform beyond image-based validation into video-based AI inspection scenarios, particularly for dynamic validation requirements such as LED diagnostics and live equipment verification. The roadmap also includes lower-latency inference, improved model performance and

enhanced field-user training to further reduce work-order completion timelines.

Because the platform has been designed as an industry-agnostic visual validation framework, it can be extended to telecommunications, manufacturing, retail, construction, utilities, logistics and facility management environments where compliance and quality verification depend on image-based evidence.

Highlights

- JPW Field AI Vision is an AI-powered computer vision solution developed by Jio Platforms and integrated into the JPW platform to help ensure quality in Fiber and AirFiber installations.
- The solution uses fine-tuned LLaMA Vision models to analyse uploaded installation images and validate workmanship against predefined standards.
- It addresses manual audit challenges, including limited supervisor capacity, inconsistent assessments, delayed feedback, repeat visits and rising operational costs.
- Installation images are classified as Green (compliant), Red (non-compliant) or Yellow (requires review), with Yellow cases reduced to near zero through model optimization.
- The platform evaluates critical checkpoints such as equipment placement, cabling, power validation, speed testing and installation compliance within 2-3 seconds.
- Deployed across all Jio Circles and 50,000+ field engineers, the solution achieves 98 percent installation compliance, 30 percent faster execution and a 60 percent reduction in engineer onboarding time, improving quality and reducing operational effort at scale.

Conclusion

JPW Field AI Vision demonstrates how artificial intelligence can transform large-scale field operations by embedding real-time quality assurance directly into execution workflows. By combining AI-powered computer vision, human-in-the-loop governance, continuous model learning and nationwide operational coordination, Jio has established a scalable framework for ensuring consistent Fiber and AirFiber installation quality.

With 98 percent installation compliance, 30 percent quicker execution, 60 percent quicker workforce onboarding and deployment across more than 50,000 field engineers, the initiative has successfully transformed quality assurance from a manual, reactive process into a proactive, data-driven and highly scalable operational capability that supports India's digital connectivity ambitions.



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