

Asian Paints automated defect detection with image processing using AI vision



Client profile

Asian Paints, founded in 1942 and headquartered in Mumbai, stands as a global leader and India's largest paint company, with operations spanning over 60 countries. The company offers a diverse range of home improvement products, including four types of interior wall finishes and a palette of over 2,200 colors, catering to varied design preferences. Beyond paints, their portfolio includes wall coverings, waterproofing solutions, adhesives and other services.

Traditionally, internal and external paint defect detection relied on manual inspections by skilled professionals. However, this approach proved to be time-consuming, resource-heavy and prone to errors, often resulting in delays in customer service. To overcome these challenges, Asian Paints sought to optimize this process and shorten delivery timelines.

NTT DATA developed a no-code AI solution on Google Cloud Platform (GCP) to precisely detect internal and external paint defects based on parameters like position, color, texture and types like algae, blisters and peeling. The solution ensured comprehensive coverage, streamlining the process and accelerating customer service.



Happy to announce that we have gone live with the autodetection of defect functionality. I want to thank all of you for your diligent support of the project and for your sincere efforts. We hope to expand this functionality into more defects in the future and look forward to continuing our partnership.”

Nandhini N, Systems Manager, Asian Paints Ltd.

93%

model
accuracy rate

150+

paint-related
defects detected

15

defect types accurately
detected

Business need

Reducing costs and boosting efficiency with AI

There were three key challenges in AI implementation:

- **Cost-effective automation**
Developing a scalable solution to accurately detect over 15 defect types without excessive expenditure
- **Optimized resource utilization**
Minimizing cloud resource consumption by avoiding simultaneous checks for all defect types
- **On-demand model activation**
Ensuring the deployed model operates only during specific time windows triggered by API requests

Solution

Automated, accurate defect detection with AI and cloud

NTT DATA developed an AI-driven solution with computer-vision and machine-learning capabilities, using Google Cloud Platform (GCP) to help Asian Paints visually identify internal and external defects with precision. The no-code platform eliminated the need for domain expertise, offering the flexibility and accuracy required for surface defect detection.

The AI model identified 150+ paint-related defects based on specific criteria, including their position (above, below or on the surface) and characteristics like color and texture. The solution covered various defect types such as algae, blisters, bubbles, sand particles, peeling, patchiness and shade fading, ensuring comprehensive defect detection across categories.

GCP's AutoML was used to build a low-code, multilabel classification model. This approach simplified the process, using a single model to detect multiple defect types while maintaining accuracy through confidence threshold clustering. AutoML was chosen for its ability to streamline model development without requiring in-depth machine-learning expertise.

Images provided by the client were categorized based on defect types and uploaded to Google Cloud Storage for training. Vertex AI was used to train and annotate the model, ensuring seamless tracking of datasets, models and deployments. Cloud Run was then utilized to deploy the model as an API, enabling the client to integrate it into their workflows easily.

This solution automated defect detection and provided a scalable and cost-efficient framework for improving paint inspection processes.

Outcomes

High accuracy, faster inspections, and smarter resource use

NTT DATA brought a comprehensive range of skills and expertise to this implementation, combining advanced knowledge of AI, cloud technologies and a deep understanding of the client's specific needs. Our team — consisting of seasoned data scientists, engineers and project managers— collaborated closely with the client at every stage of the project. We focused on technical execution and ensured that the solution was closely aligned with the client's business objectives, offering the right balance of scalability, efficiency and flexibility.

With our experience in implementing complex solutions, we were able to address the unique challenges of paint defect detection while keeping the client's long-term goals in mind. NTT DATA's ability to deliver high-quality results on time, along with our continuous support, ensured that the solution was successfully integrated into the client's operations. Our team's expertise in managing end-to-end project lifecycles, from strategy to deployment, helped facilitate a smooth and impactful transformation, showcasing the true value of collaboration and partnership.

Highlights:

- **93% model accuracy rate**
Achieved a 93% model accuracy rate for defect detection, resulting in high performance for detecting defects
- **150+ paint-related defects**
Detected over 150 paint-related defect types with precision
- **Improved efficiency:** Automated defect detection reduced inspection time and optimized resource allocation
- **Faster resolutions:** Early defect identification enabled quicker repairs, reducing delays and costs

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