CELEBAL TECHNOLOGIES

Bird Nest Detection

Microsoft Solutions Partner

Infrastructure (Azure)
Data & AI (Azure)
Digital & App Innovation (Azure)
Security
Biz Applications

Celebal Specialization and Strength

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Microsoft
AI Partner Of The Year 2023
Global

databricks
Partner Of The Year 2022 & 2023
Asia Pacific and Japan
2 YEARS IN A ROW

databricks
Migrations Partner Of The Year 2023
Asia Pacific and Japan

Partnerships

Microsoft Solutions Partner

databricks Elite Partner

SAP Silver Partner

Red Hat Ready Business Partner

Advanced Specialization

- AI & Machine Learning
- Analytics
- Infra and Database Migration
- Kubernetes
- Cloud Security
- Low Code No Code
- Intelligent Automation

INDIA | USA | CANADA | APJ | MIDDLE EAST | AUS

2800+ Employees

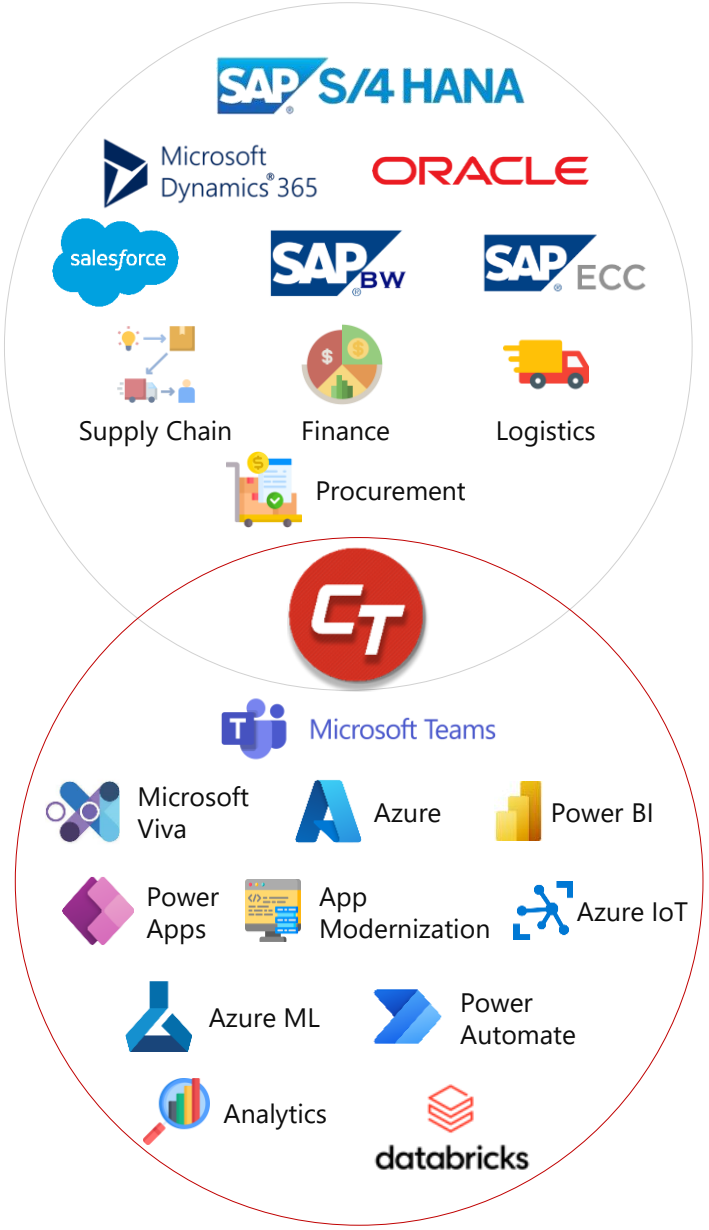
800+ AI experienced professionals

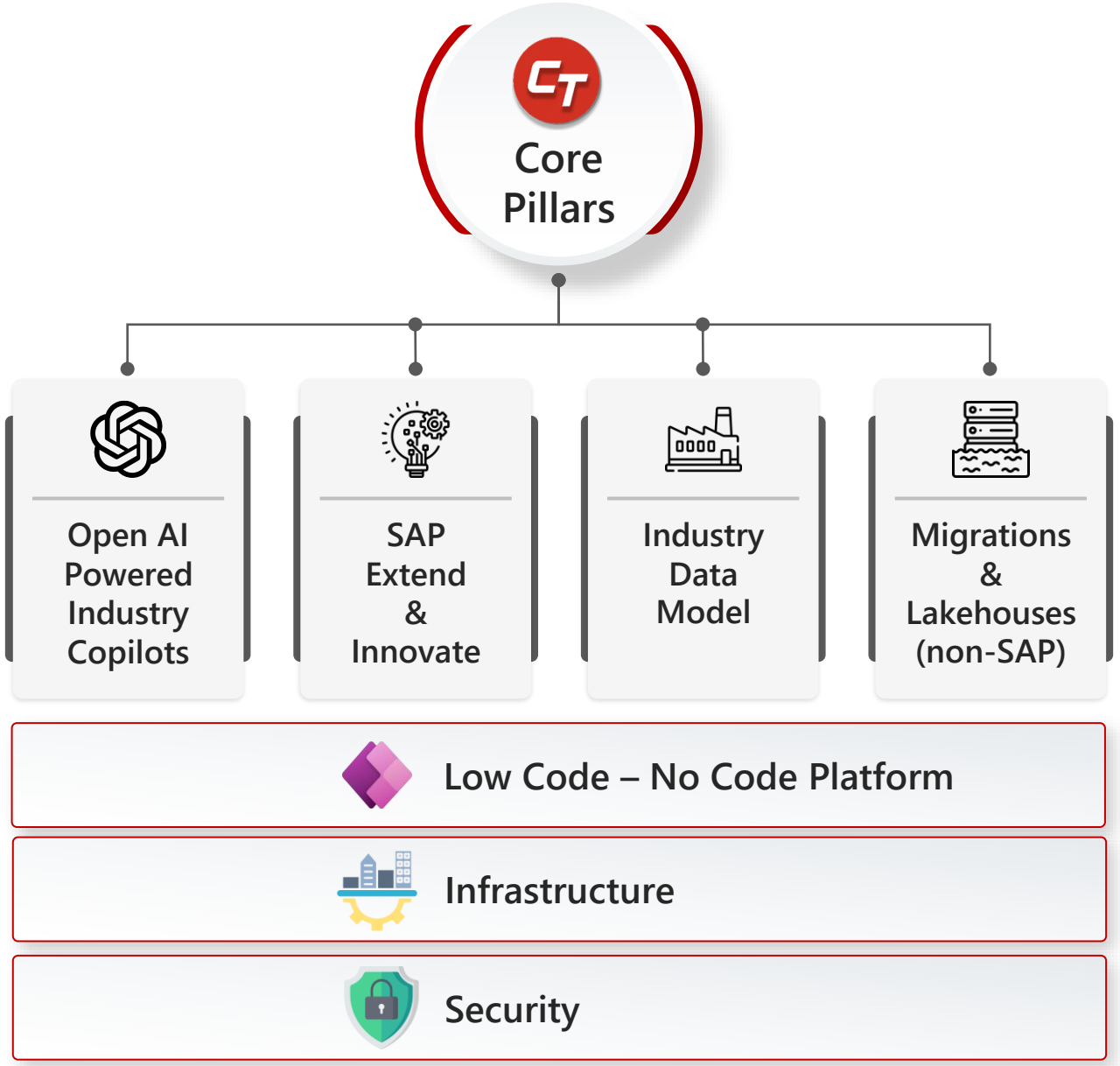
500+ AI Certifications

Industries We Serve

- Manufacturing
- Retail & CPG
- Financial Services
- Energy & Sustainability
- Healthcare & Life Sciences
- Media & Entertainment

Celebal Core Pillars





Bird Nest Detection

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1. Brief Description of the Solution:

Our advanced Bird Nest Detection solution protects critical energy infrastructure by accurately identifying nests near transmission lines, towers, and substations, minimizing damage and supporting uninterrupted enterprise operations. Using machine learning, real-time analytics, and technologies like Azure Container Registry, Azure Kubernetes Service, Azure Cosmos DB, and Azure Blob Storage, it delivers predictive monitoring, early alerts, and actionable insights to reduce risks, ensure compliance, and optimize performance. It integrates Azure Custom Vision for rapid model training, Segment Anything Model (SAM) for pixel-accurate segmentation, and OpenAI CLIP (Contrastive Language-Image Pre-training) for contextual visual understanding, with few-shot learning for fast adaptation.

2. Business Problem It Solves:

Energy infrastructure operators face significant challenges in maintaining the integrity, safety, and operational efficiency of their assets. Traditional methods of inspection and monitoring are often labor-intensive, reactive, and prone to human error. These limitations can lead to safety incidents, service disruptions, regulatory non-compliance, and increased maintenance costs. The solution addresses these challenges by automating detection processes, providing continuous monitoring, and delivering timely alerts and insights for proactive maintenance and risk mitigation.

3. Value Add for Customer:

- **Real-Time Monitoring:** 24/7 monitoring with actionable insights to keep your energy infrastructure continuously protected.
- **AI-Powered Detection:** Deep learning models accurately identify bird nests in real-time, even in complex settings.
- **Proactive Alerts:** Instant notifications enable timely action, reducing risks and preventing disruptions.
- **Scalable & Integrative:** Easily scales to handle data growth and integrates smoothly with existing systems for fast, disruption-free deployment.

Bird's Nest Detection on Transmission Lines

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Overview: Custom vision-based object detection & SAM based instance segmentation model that can accurately detect & segment bird's nest present on transmission lines. This use case has the potential to automatically detect, count bird nests, reduce maintenance costs for transmission lines.

Data & Domain Knowledge:

Nest Present

Nest Absent

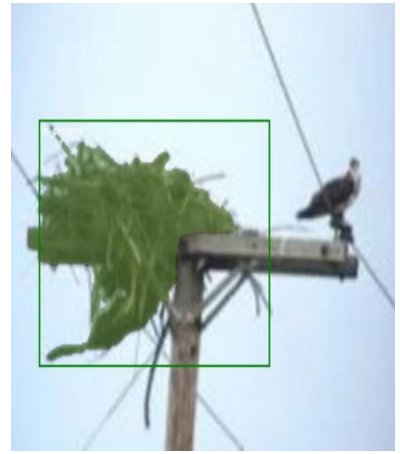
Approach:

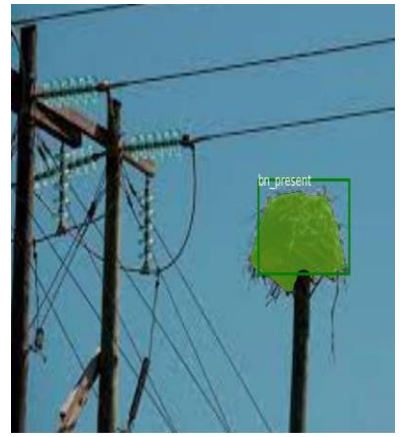
- Annotate bird nests from the scraped dataset on custom vision portal
- Set training time, box threshold & train the model in compact version
- Test the model and export the model for inference
- Segment the detected label using Segment Anything Model

Results:

Actual

Predicted





Conclusion: The model developed for detecting and segmenting bird's nest in images has shown promising results with excellent recall and precision. The model has a range of potential applications for improving the performance and maintenance of transmission lines.

Future Scope:

Automated Inspection → Predictive maintenance → Environmental compliance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Thank You