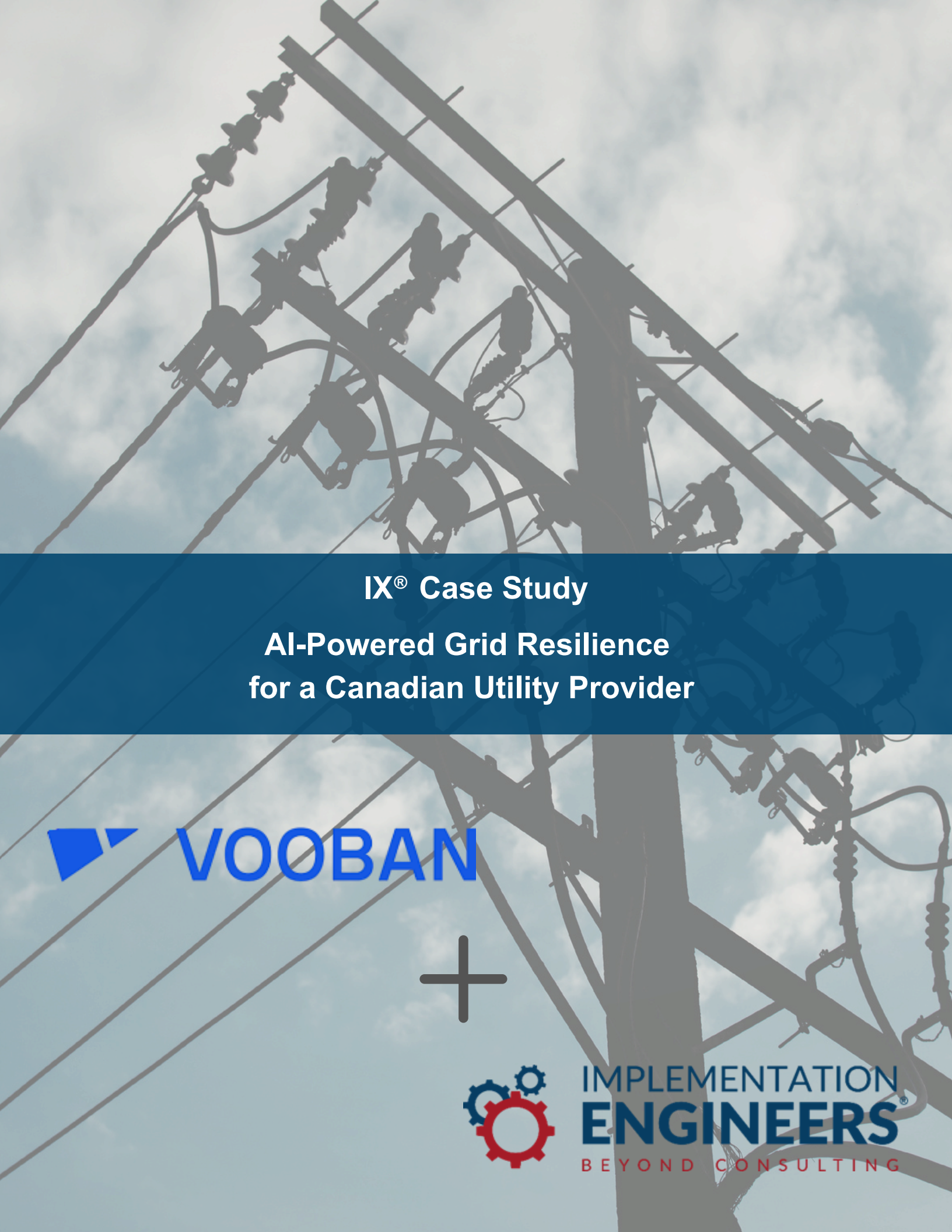

IX® Case Study

AI-Powered Grid Resilience for a Canadian Utility Provider

VOOBAN

+

IMPLEMENTATION ENGINEERS®

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IX® in Action

Electric utilities operate some of the most critical infrastructure in the economy, where performance is measured in reliability, response time, and public trust.

For this major Canadian utility serving over one million customers, maintaining service reliability was becoming increasingly complex. Aging infrastructure, growing demand, and rising climate volatility were driving more frequent and less predictable outages across the grid.

At the same time, operations were still largely reactive. Decisions on crew deployment, outage response, and customer communication relied on manual analysis of weather data, field reports, and historical averages. This created delays in response, inaccurate restoration timelines, and inefficient use of resources.

The data to improve these outcomes already existed across the organization, from weather patterns and vegetation risk to asset history and customer reports. The challenge was turning that data into real-time, operational decisions.

AI enabled that shift. By combining predictive models with operational systems, the utility could move from reacting to outages to anticipating them, improving response, optimizing resources, and restoring service faster.

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The Challenge

The utility was experiencing declining performance in critical operational areas.

- Emergency response within 60 minutes dropped from 95% to 88%
- Crew deployment decisions relied on manual analysis of weather and field data
- Estimated Time to Restoration was based on static rules, leading to 58% underestimation
- Inventory levels were inflated, with 84 million dollars tied up in unused maintenance parts
- Customer submitted damage images could not be processed in real time

These gaps created operational inefficiencies, increased costs, and risk of falling below regulatory performance thresholds.

AI Implementation

Four integrated AI models were deployed to address key operational bottlenecks:

Predictive Outage Mapping

- Machine learning models predict outage-prone zones using weather data, vegetation risk, and infrastructure conditions
- Enables proactive crew deployment before events occur

AI-Driven Estimated Time to Restoration

- Replaces static restoration estimates with dynamic models based on location, asset type, and historical patterns
- Improves accuracy and customer communication

Demand Forecasting for Maintenance Parts

- Predicts demand for critical components such as transformers and switchgear across locations
- Supports optimized inventory planning over a 12 month horizon

Computer Vision Damage Detection

- Processes field and customer submitted images to identify infrastructure damage
- Enables faster triage and improved response prioritization

These models operate together to provide real time visibility and decision support across operations.

How It Works in Practice

Before severe weather events:

- AI models identify high-risk outage zones
- Crews are pre-positioned based on predicted impact

During an outage:

- Damage is assessed using image-based AI
- Restoration times are dynamically updated based on real conditions

Across operations:

- Inventory levels are adjusted based on forecasted demand
- Control rooms operate with real time predictive visibility

Operations shift from reactive response to proactive management.

Results

Operational Performance

- Emergency response rate improved toward a 93 percent target
- Faster and more accurate outage response and restoration

Customer Experience

- Reduction in restoration time underestimation from 58% to 48%
- Improved accuracy and trust in customer communications

Cost and Efficiency

- Inventory reduced from $84M to $79M
- Over $1M in annual savings from reduced carrying costs and emergency procurement

Business Impact

- $6M in direct operational savings over five years
- $28M million dollars in projected economic benefits across the broader deployment

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Let’s Turn Your Vision Into Results

Implementation Engineers and Vooban deliver together — turning strategy into operational reality through AI-enabled execution.

Our proven **Align-Design-Execute** framework ensures your strategy doesn’t stall at planning. From aligning leadership around priorities, to designing AI-driven operating models, to executing change inside your operations, we work side-by-side to deliver results that scale.

Ready to Get Started?

Let’s explore how we deliver together. Contact us today to schedule a conversation. Together, we’ll chart the path from vision to execution.

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