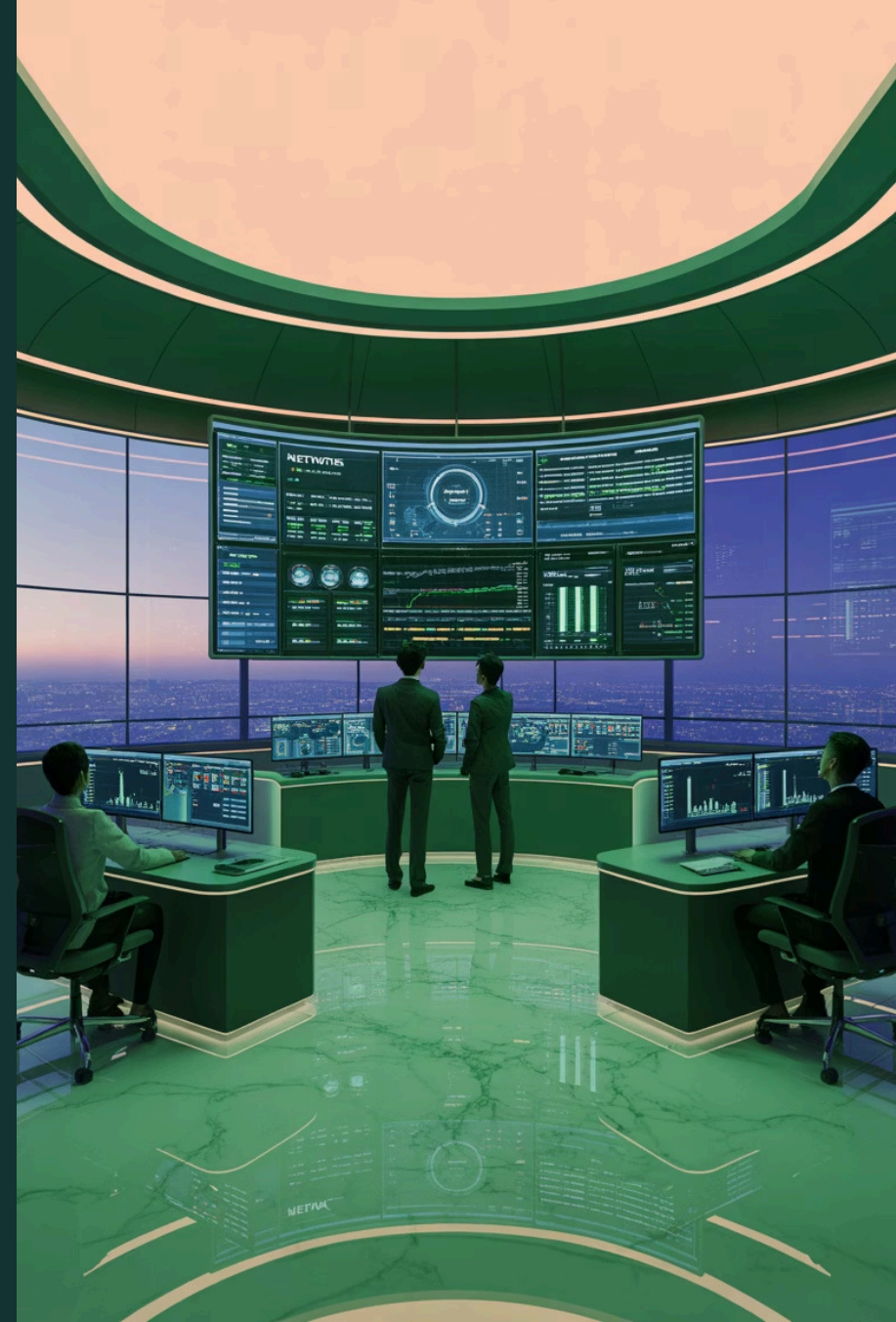# Observability-Driven Intelligence: AI-Powered Anomaly Detection for Telecom Service Reliability

Transform how you manage network reliability with AI-driven observability. Learn how to shift from reactive to proactive service assurance.

The Data Challenge

25TB
Daily Data
Telecom networks generate massive operational data volumes each day
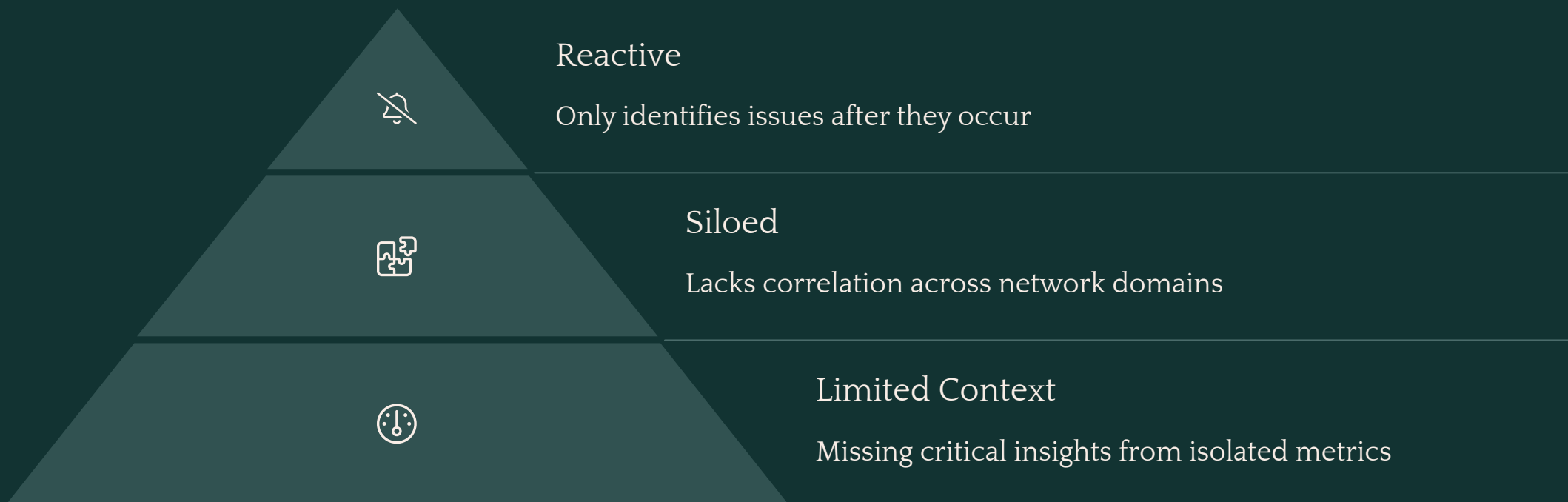
68%
Preventable Failures
Network failures that could be detected early with proper tools

41%
MTTR Reduction
Improvement in mean time to repair with AI-driven solutions

Traditional Monitoring Limitations

Reactive

Only identifies issues after they occur

Siloed

Lacks correlation across network domains

Limited Context

Missing critical insights from isolated metrics

The Observability Paradigm Shift

From Monitoring

- Siloed metrics without correlation
- Post-incident detection and response
- Static thresholds triggering alerts
- Limited to predefined failure patterns

To Observability

- Comprehensive data collection across domains
- Predictive anomaly identification
- Dynamic baseline analysis
- Self-learning pattern recognition

AI-Enhanced Observability Components

Metrics
High-cardinality time series data with AI-driven anomaly detection

Traces
Distributed transaction tracking across microservices and network layers

Logs
Contextual event records enriched with metadata for correlation

AI Analysis
Deep learning models identifying patterns and predicting failures

Our Implementation Journey

Data Collection

Unified 18 months of cross-domain telemetry data

Model Training

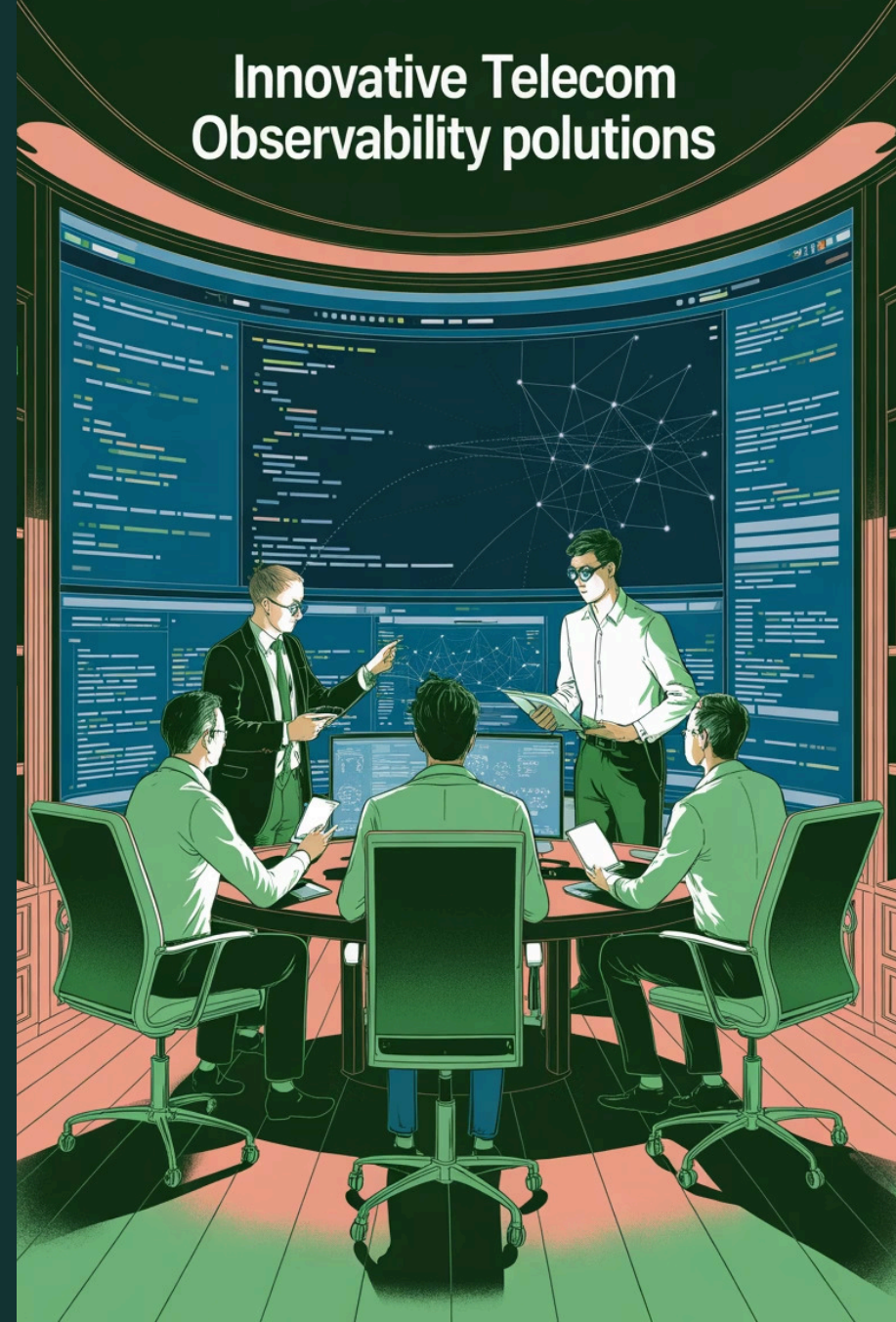Developed deep learning observability models

Full Stack Integration

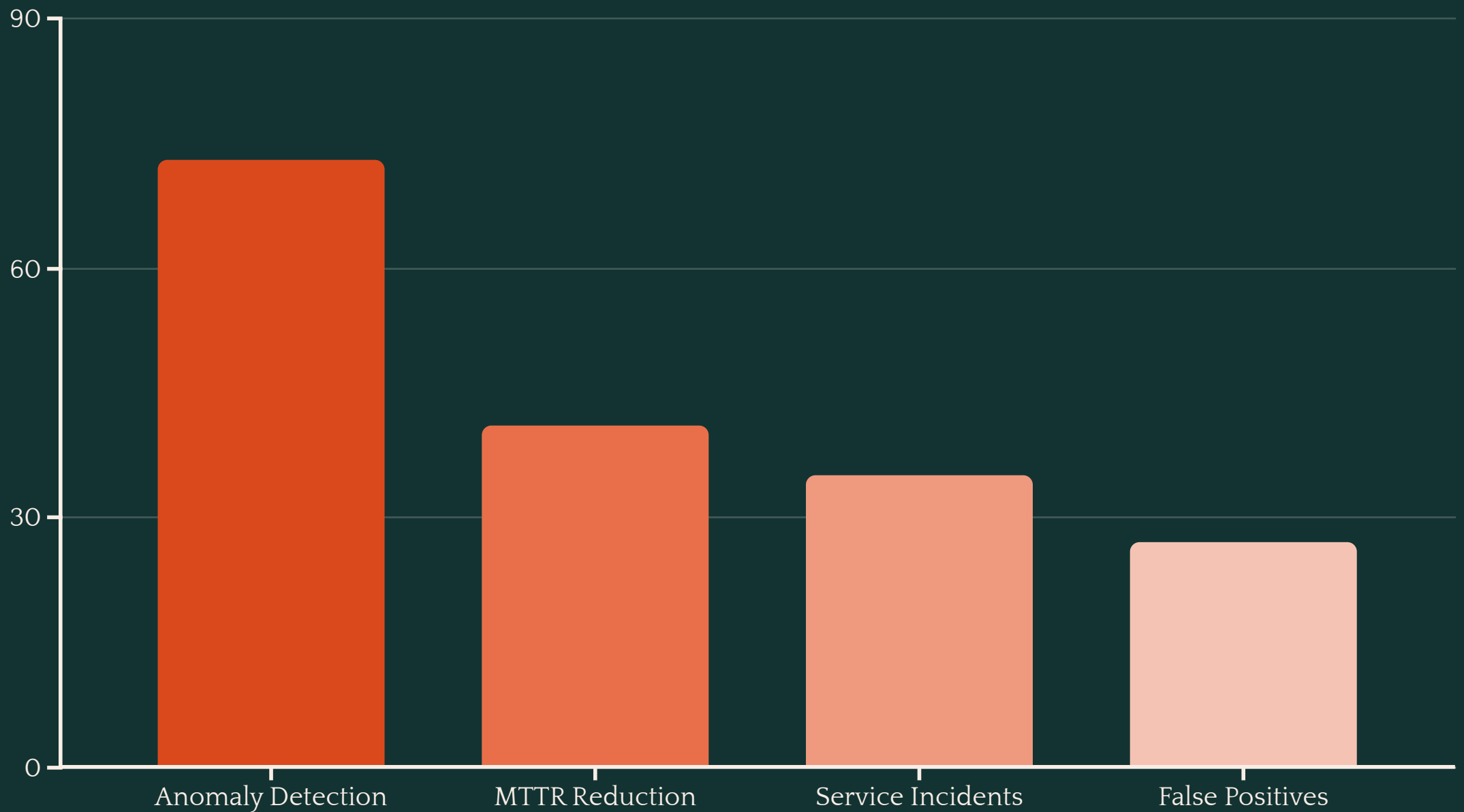Implemented tracing across all network layers

Continuous Improvement

Refined models with operational feedback

Innovative Telecom Observability polutions

Results: Performance Improvements

Addressing Key Observability Challenges

Data Volume Management

Implemented edge filtering and intelligent sampling to reduce storage requirements while maintaining analytical value.

Cross-Domain Correlation

Developed unified entity model that connects physical infrastructure, virtualized functions, and services.

Explainable AI

Created visualization tools that expose model reasoning, building operator trust and reducing false positives by 27%.
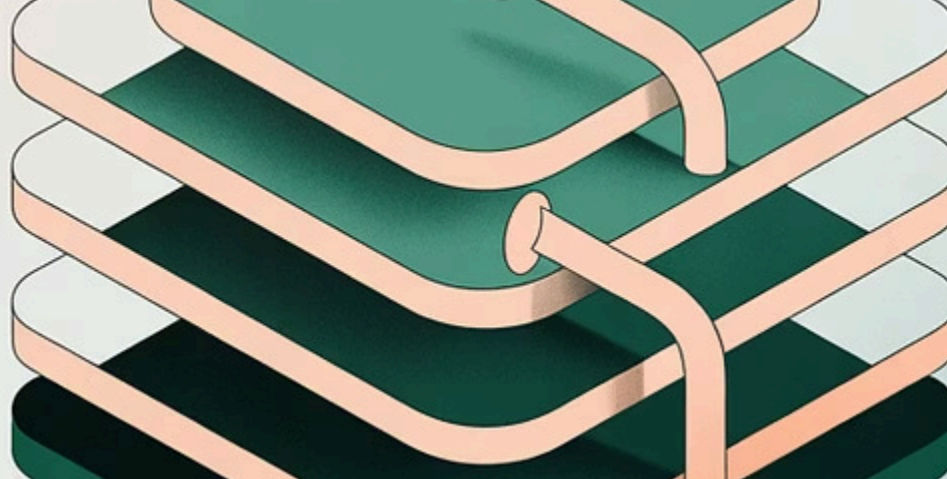
Architecture: End-to-End Observability

Data Collection Layer

Distributed agents capture metrics, logs, and traces from all network elements

Processing & Analytics Layer

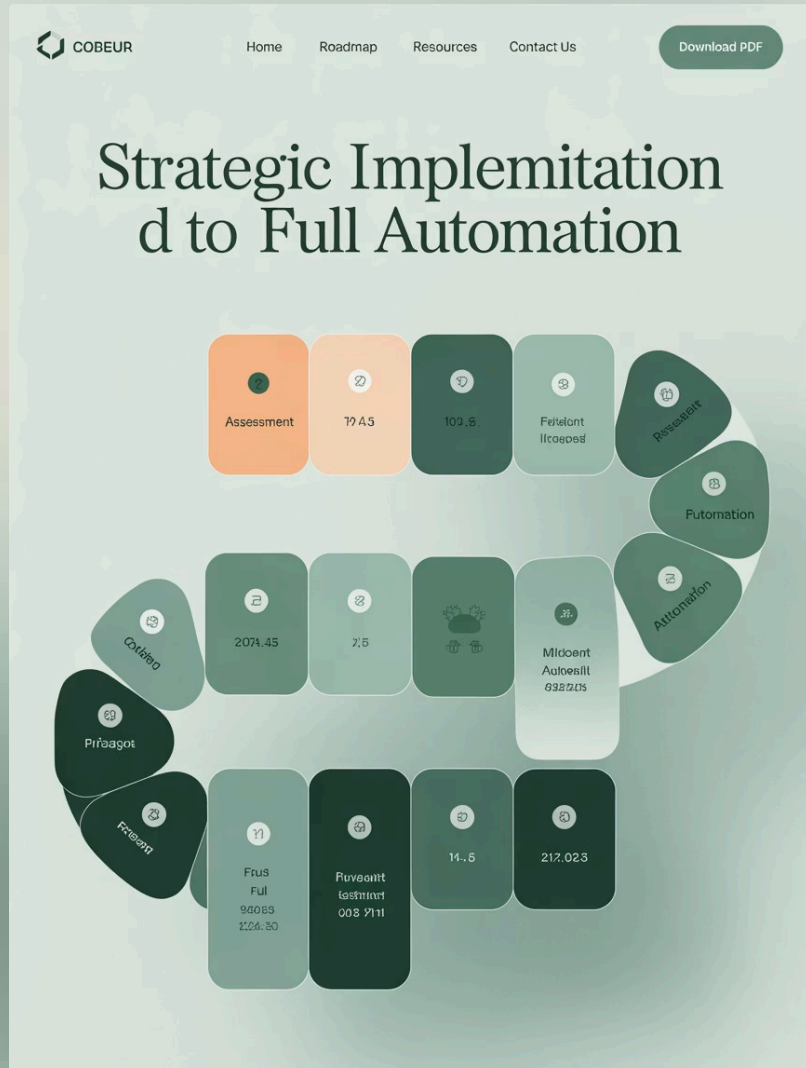Stream processing pipeline applies ML models for real-time analysis

Knowledge & Automation Layer

Insights drive automatic remediation and continuous improvement

Achieving Five Nines Reliability

Detect

Advanced AI algorithms identify potential anomalies before they impact system performance

Analyze

Cross-domain contextual correlation pinpoints precise root causes within complex environments

Learn

Self-improving system continuously enhances detection models from each incident response

Remediate

Intelligent automated actions swiftly resolve issues based on learned resolution patterns

Implementation Roadmap

Assessment

Conduct comprehensive analysis of existing monitoring infrastructure and identify critical observability gaps

Pilot

Deploy targeted observability solution within a single network domain to validate architecture and establish baseline metrics

Scale

Systematically expand implementation across all network domains while ensuring cross-domain data correlation and unified visibility

Automate

Integrate advanced AI-driven remediation workflows for autonomous issue detection, root cause analysis, and predictive maintenance

Thank you