Dashboard Design for Monitoring Blocked URLs via Distributed Probes in Turkey

User-Centered Design | Information Architecture | Design System | Competitor Analysis

Problem Statement

Vodafone, as a leading telecommunications provider in Turkey, is responsible for ensuring open, secure, and regulation-compliant access to the internet for millions of users. However, URL-level internet restrictions are dynamic and often vary by region, making it difficult to monitor which websites are being blocked across different networks.

Core Challenges

Vodafone, as a leading telecommunications provider in Turkey, is responsible for ensuring open, secure, and regulation-compliant access to the internet for millions of users. However, URL-level internet restrictions are dynamic and often vary by region, making it difficult to monitor which websites are being blocked across different networks.

- **Lack of Visibility into URL-level blockages across diverse Turkish regions and ISPs.**
- **Inefficient Monitoring using outdated manual reporting or fragmented systems.**
- **Regulatory Pressure to comply with Turkish internet laws without over-blocking legitimate content.**
- **Delayed Response Times to detect, confirm, and report URL access issues.**

Objective

To design a real-time monitoring dashboard that uses geographically distributed probes to ping predefined URLs, detect blocking patterns, and visualize network health in an actionable, intuitive format for Vodafone's internal teams.

Data Analysis Method

Data Collection Pipeline

100+ Distributed Probes installed across Turkey in Vodafone data centers and key network points.

Each probe performs periodic HTTP/S, DNS, and TCP checks on a curated list of ~5,000 URLs.

Probes return data including:

- HTTP status codes (e.g., 200 OK, 403 Forbidden, Timeout)
- DNS resolution status
- Ping latency and route trace
- Region/ISP identifiers

Data Aggregation and Normalization

All responses are funneled into a centralized data lake using Kafka-based stream processing.

Data is normalized (timestamped, deduplicated, and geo-tagged).

Anomalies are flagged using:

- Time-series anomaly detection
- Pattern recognition algorithms (e.g. Isolation Forest, Z-score)

Analysis Outcomes

Real-time identification of regional URL blocking

Trend visualization of increased/ decreased blocking activity

Correlation with external events (e.g., political protests, regulatory updates)

Competitor Research

Competitor	Strengths	Limitations
NetBlocks	Global visibility, live outage maps	No ISP/probe granularity, limited drill-downs
Cisco Umbrella	Enterprise security & DNS filtering	Focused on threats, not URL freedom
Cloudflare Radar	High-level internet insights	No regional-level URL blocking view
RIPE Atlas	Probe-based performance data	Not designed for regulatory compliance or user-friendly dashboards

Key Differentiators in Vodafone's Dashboard

- Regional Probe-Level Monitoring - Each probe is geolocated and ISP-tagged.
- Smart Alerting System - Custom triggers based on region, URL type, or frequency.
- Integrated Compliance Panel - Aligns blocking data with local regulation flags.
- Auto-Generated Reports - One-click PDF reports for audits.

APPLICATION DASHBOARD

REGIONAL MONITORING

REPORTING

Impact of Dashboard Design

85% ↓

Detection Time Reduced by 85%

URL blocking issues now detected within 2-3 minutes, compared to 20+ minutes previously.

60% ↓

False Positive Reports Dropped by 60%

Due to more accurate probe triangulation and better anomaly handling.

40% ↑

Network Team Efficiency Increased by 40%

Reduced manual checks and faster incident triage.

70% ↓

Regulatory Reporting Time Cut by 70%

Compliance reports are now auto-generated within minutes of an incident.

Insights from 10M+ probe responses/week are now visualized and accessible in real time.

Conclusion

The Vodafone Blocked URL Monitoring Dashboard is a mission-critical system that combines real-time data analytics with intuitive UX to solve a national-scale visibility problem.

By enabling faster response times, accurate incident resolution, and better regulatory compliance, the dashboard not only enhances Vodafone's operational efficiency but also demonstrates its commitment to transparency and user rights.

This dashboard represents a powerful case of how smart design and data science can empower telecom operations at scale.