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INCIDENT LOG ANALYSIS

Analysis of service incidents, SLA performance, and operational risk.

Dataset & Analysis (Excel)

1) ServiceNow Incident Log Analysis

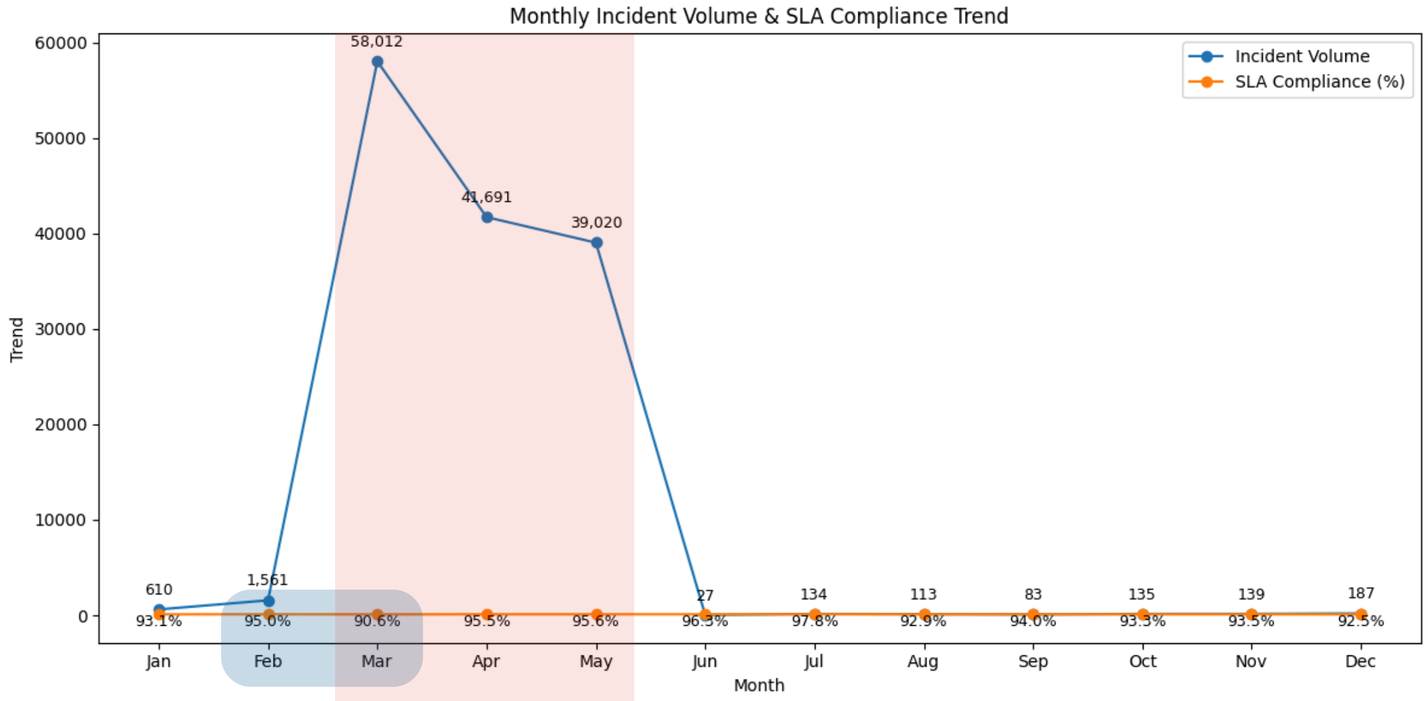
Analysis of service incidents, SLA performance, and operational risk.

Client Background
This incident management system comes from the ServiceNow™ platform used by an IT company to handle operational service disruptions. The dataset includes 24,918 incidents with 141,712 event logs, representing the entire incident lifecycle from opening to closure. This analysis was conducted to understand service stability, incident resolution effectiveness, and SLA compliance.

Northstar Metrics

- **Service Stability Trends** — Monitor service stability trends and identify periods with high incident risk.
- **Incident Concentration by Category** — Identify service categories that frequently experience issues and contribute to operational disruptions.
- **Resolution Efficiency by Priority** — Evaluate whether high-impact incidents are resolved more quickly.
- **SLA Risk by Priority** — Measure the risk of SLA breaches based on business impact levels.
- **Team Workload Distribution** — Assess uneven workload distribution across teams.
- **Team Performance & Bottleneck Risk** — Identify operational bottlenecks and risks of delayed response.
- **SLA Exposure by Service Category** — Determine service categories with the highest SLA risk exposure.

Executive Summary



Peak Incidents

March–May
especially high/critical priority

SLA Performance

Drops under peak load (~93% overall)

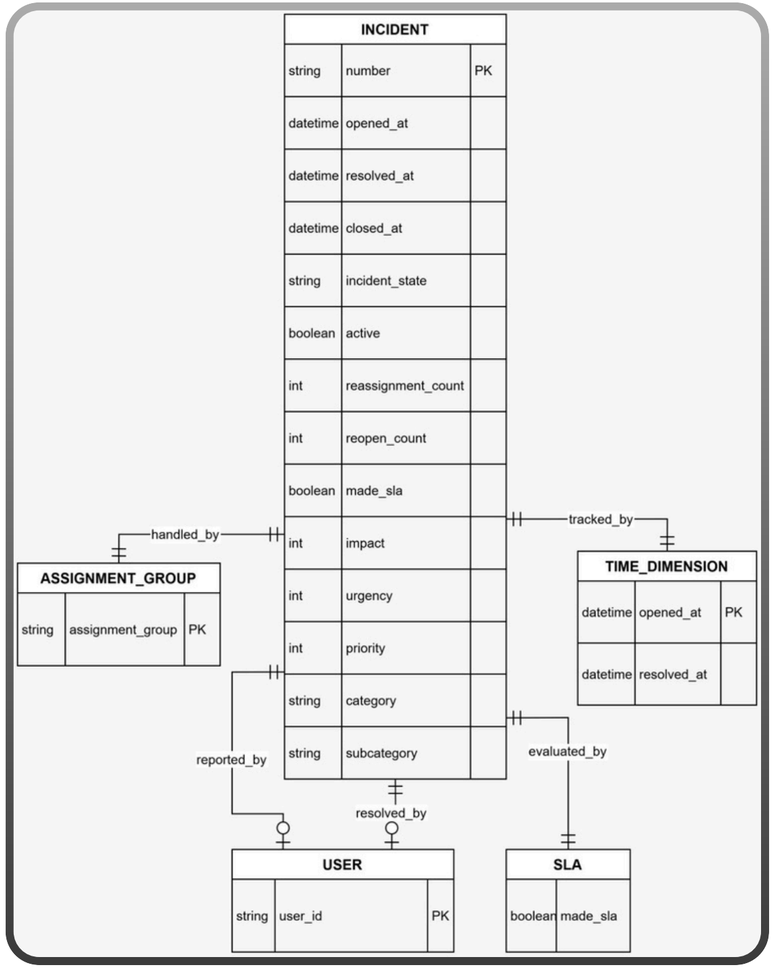
Recommendation

Prepare with capacity planning & stricter escalation.

Dataset Structure and ERD

The database structure consists of 141,712 event records representing 24,918 unique incidents, with 36 attributes describing the incident lifecycle, priority, assignment, and SLA performance.

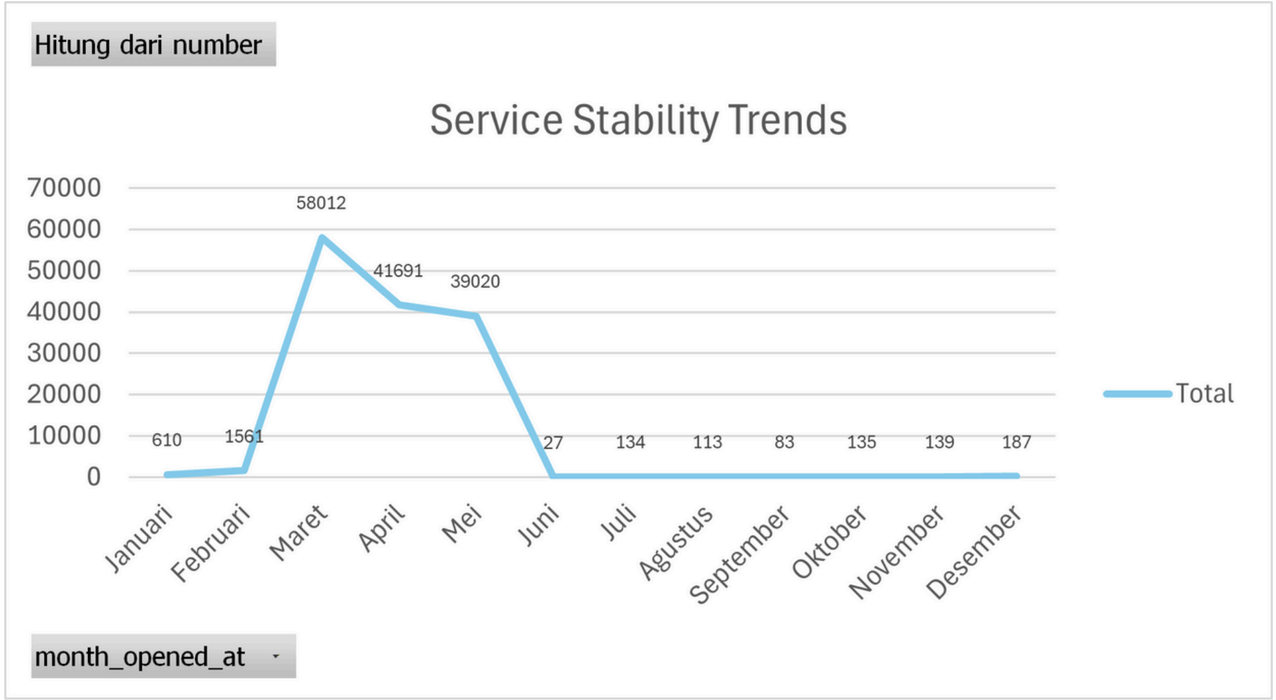
- INCIDENT: A single incident case including time, status, impact, priority, and service category.
- ASSIGNMENT_GROUP: The team or unit responsible for handling the incident.
- USER: User roles involved in incident reporting and resolution.
- SLA: Indicators of Service Level Agreement compliance.
- TIME_DIMENSION: Tracking of incident opening and resolution times.



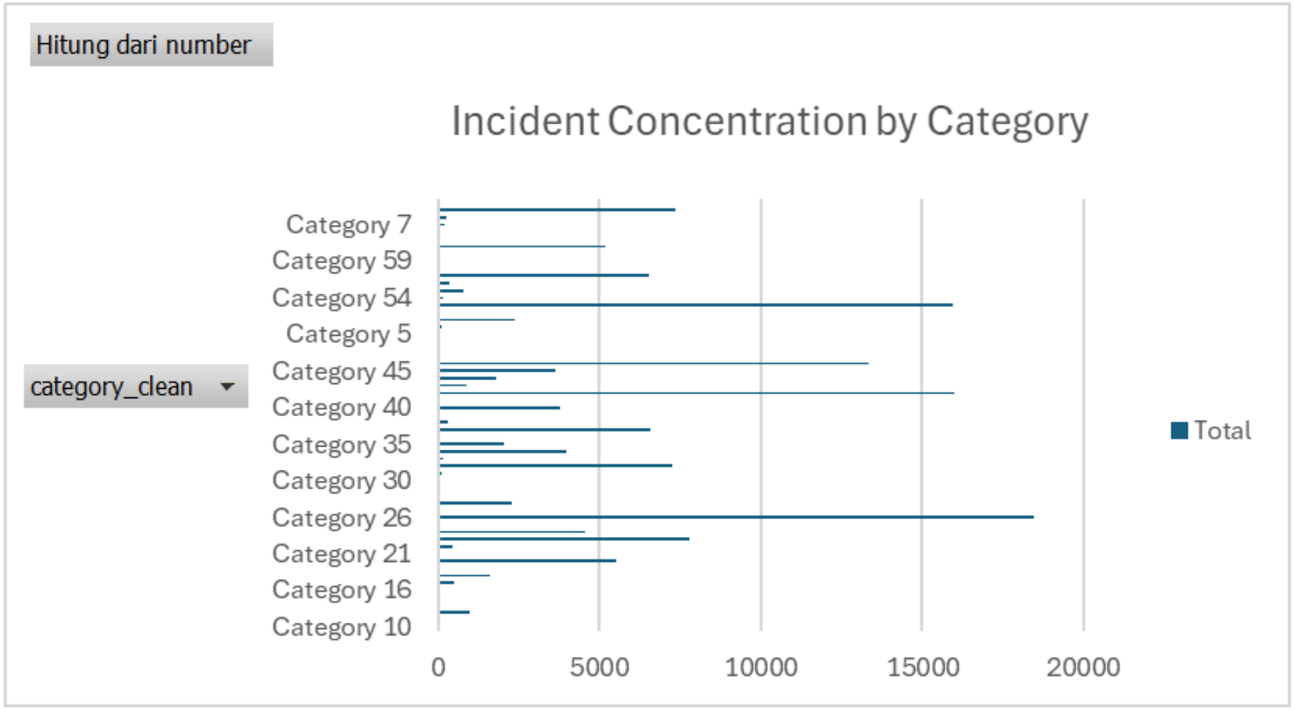
Insights Deep-Dive

[1] Service Stability Trends (Dimension: Incident Count / Month)

- Total monthly incidents: 141,712.
- Incident volume is uneven throughout the year, with **extreme spikes occurring only from March to May,** while other months remain relatively stable.
- This pattern indicates operational seasonality or the impact of system changes (e.g., major deployments, configuration updates, or demand surges).
- Without capacity adjustments and stronger change controls, **peak periods pose a high risk** of large-scale service disruptions.



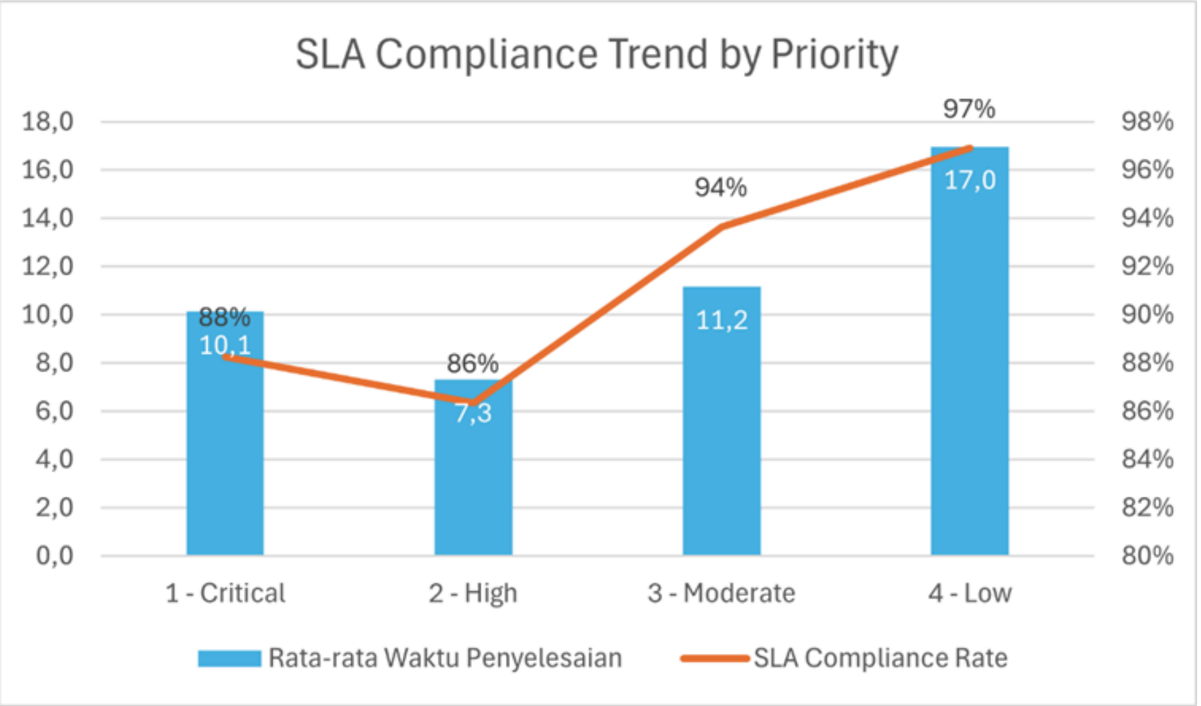
[2] Incident Concentration by Category (Dimension: Service Category)



3 categories account for >33% of total incidents.

- Repetition indicates structural issues, not random events.
- Prioritizing these categories yields higher impact reduction.

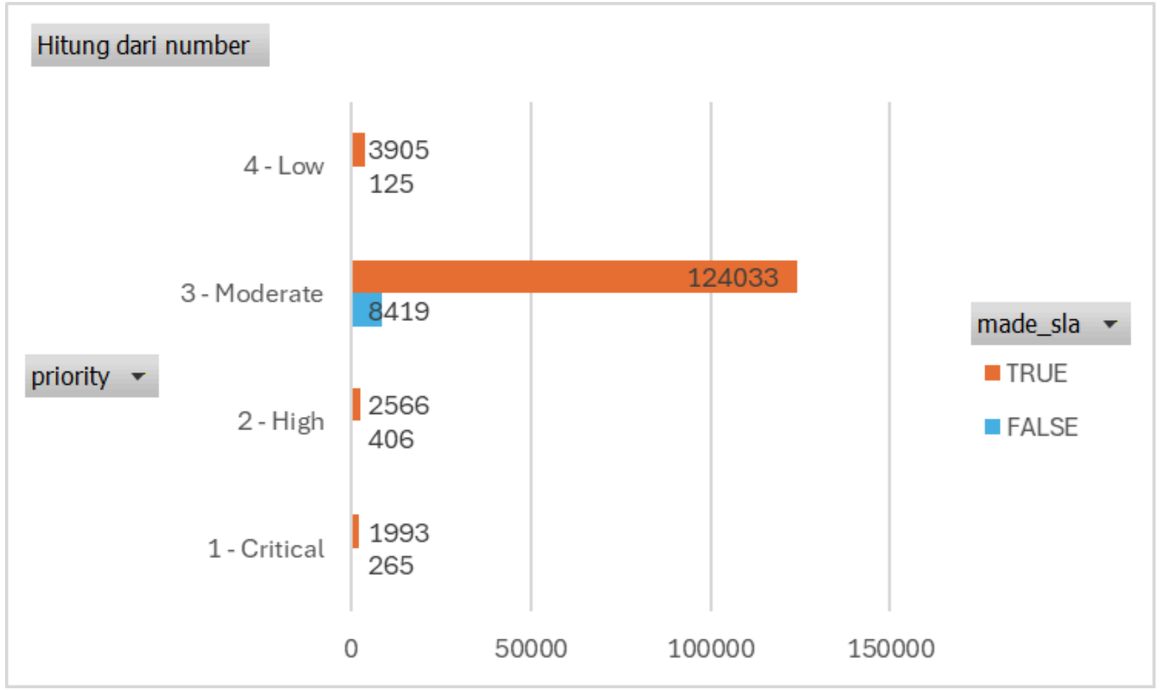
[3] Resolution Efficiency by Priority (Dimension: Priority)



93% of incidents are resolved within SLA.

- SLA compliance is high and stable, but recurring complex incidents persist.
- Repeated minor breaches can erode user trust and increase escalation risk.

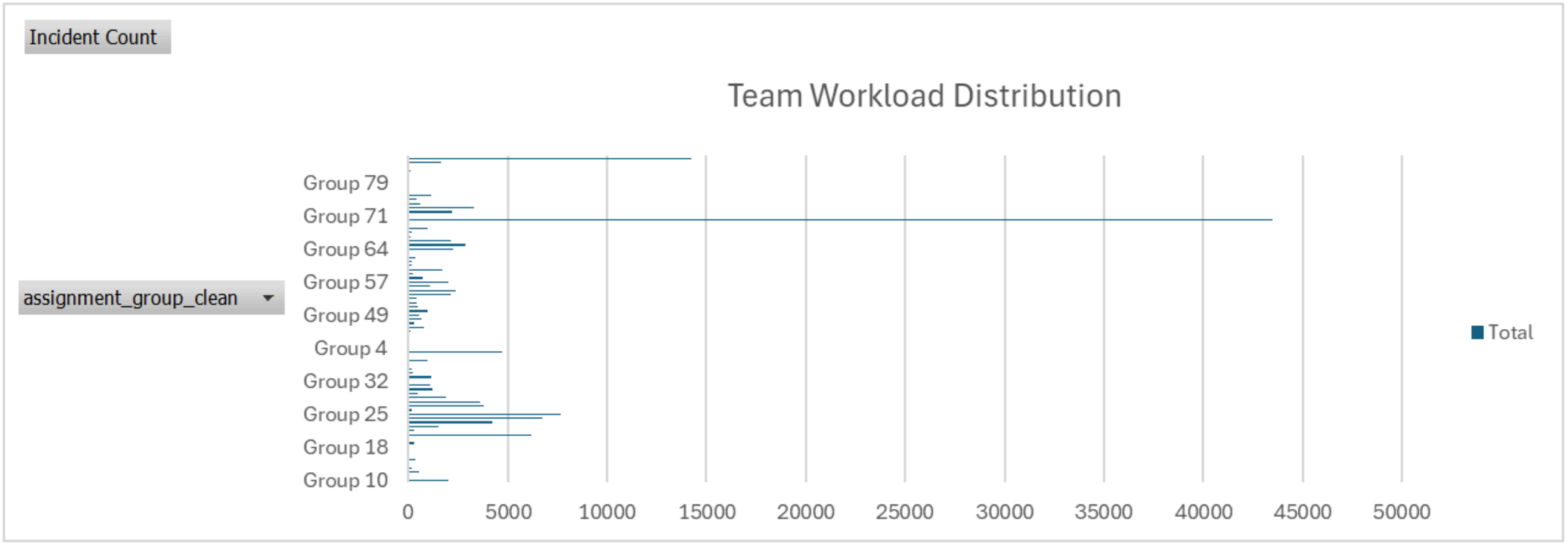
[4] SLA Risk by Priority (Dimension: Priority vs SLA)



Critical and high-priority incidents most frequently breach SLA.

- Higher impact consistently increases the risk of delayed resolution.
- Critical incidents can trigger major complaints, management pressure, and direct business disruption.

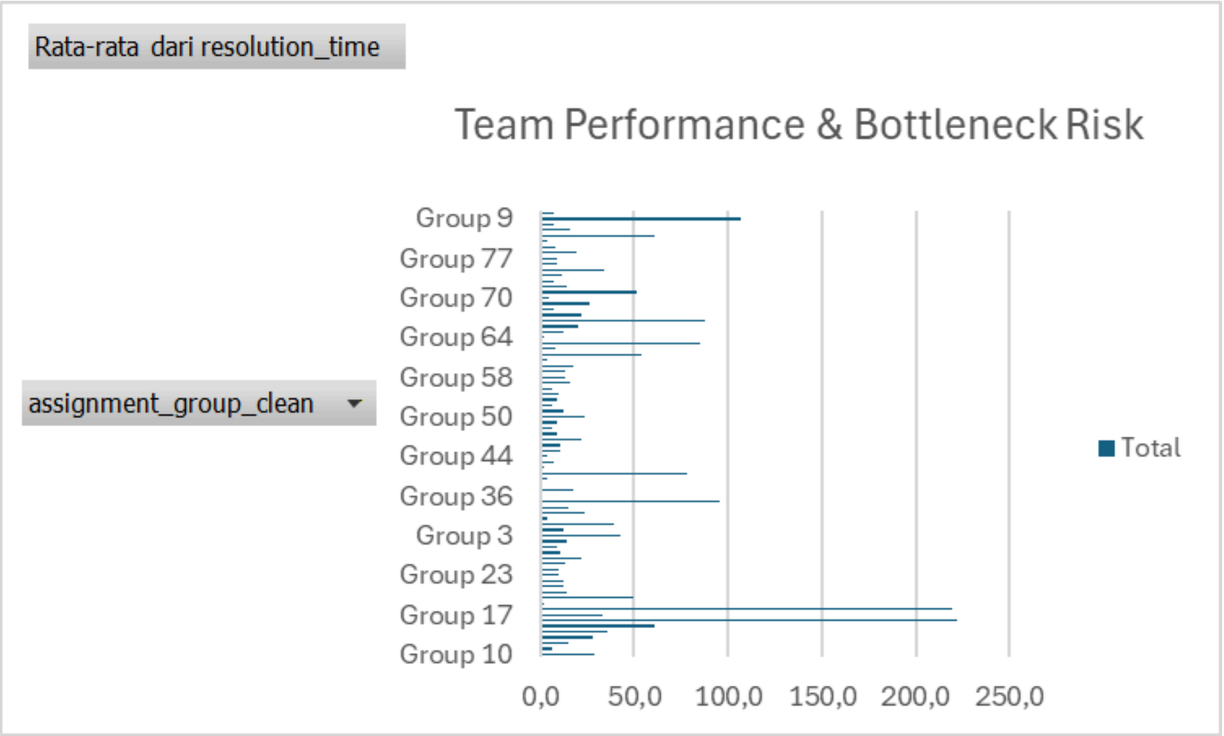
[5] Team Workload Distribution (Dimension: Assignment Group)



1 team handles ~33% of total incidents.

- Workload concentration creates a single point of failure.
- Imbalanced distribution increases service disruption risk and weakens long-term resilience.

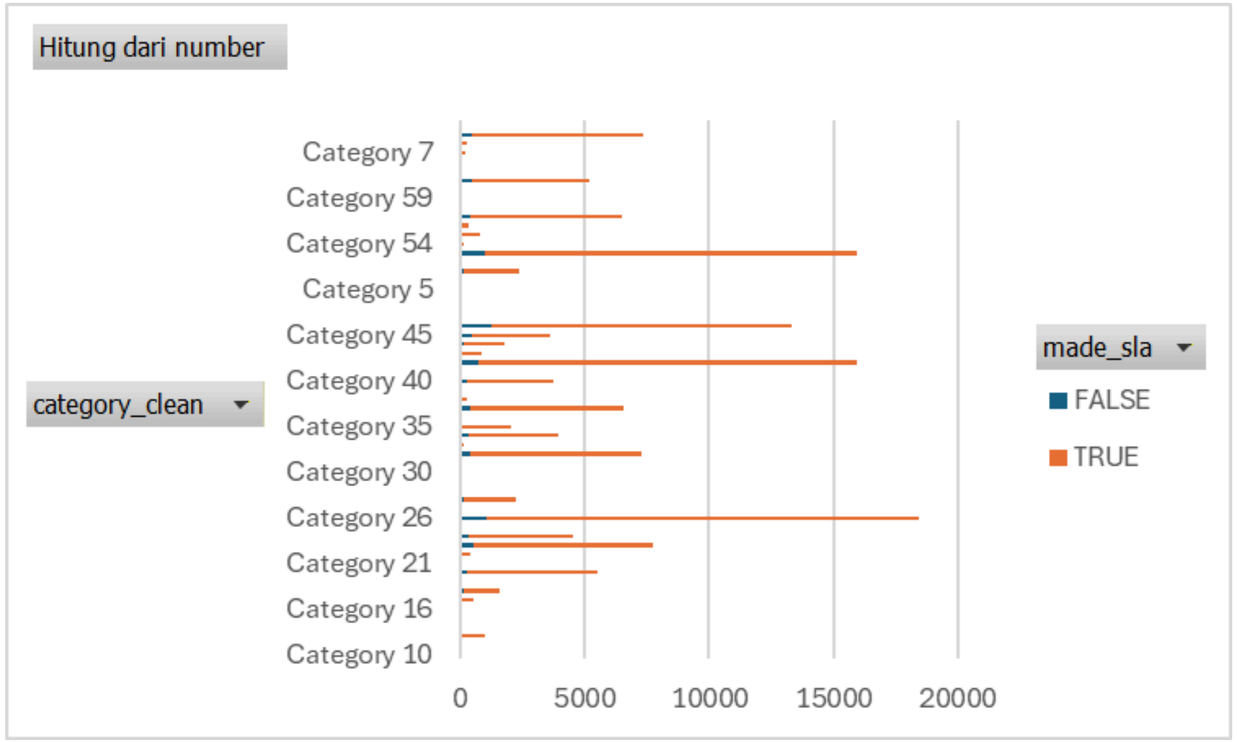
[6] Team Performance & Bottleneck Risk (Dimension: Group Performance)



Average resolution times are fast, but extremely long-resolution cases exist.

- Patterns suggest process constraints or insufficient support.
- Repeated extremes within specific groups indicate hidden bottlenecks, increasing operational costs and backlog risk.

[7] SLA Exposure by Service Category (Dimension: category vs SLA)



High-incident categories have the highest SLA breach risk.

- High incident volume consistently correlates with SLA failure.
- Improving these categories delivers the greatest impact on service stability.

Recommendation

1) Time-Based Stability (Incidents per Month)

Audit system activities and changes during March–May, and implement targeted capacity planning to anticipate seasonal incident spikes.

Priority: High | Owner: IT Ops Lead, Change Management

2) Service Concentration Risk (Incidents by Category)

Conduct focused RCA and build an improvement backlog for the top three incident-contributing categories to reduce recurring issues.

Priority: Critical | Owner: System Owner, Risk Management

3) Resolution Efficiency Control (Resolution Time by Priority)

Define SLA early-warning thresholds and perform regular monitoring to prevent unnoticed performance degradation.

Priority: Moderate | Owner: Service Delivery

4) Critical Incident Handling (SLA by Priority)

Strengthen escalation playbooks and resource allocation for Critical and High priority incidents.

Priority: High | Owner: IT Ops Manager

5) Workload Resilience (Incident by Assignment Group)

Redistribute workloads and implement cross-training to reduce dependency on a single core team.

Priority: High | Owner: Ops Head

6) Hidden Bottleneck Detection (Resolution Time by Group)

Add median and P95 resolution time KPIs and conduct deep dives on outlier groups with the longest resolution times.

Priority: Moderate–High | Owner: ITSM Lead, Process Improvement

7) SLA Exposure Hotspots (SLA by Category)

Prioritize automation and defect prevention for service categories with the highest incident volume and SLA breach rates.

Priority: Critical | Owner: Application Owner

Detailed dataset information and further analysis results can be accessed through the following link:

Dataset & Analysis (Excel).

Dataset by
Amaral, C. A. L., Fantinato, M., Reijers, H. A., Peres, S. M. (2019). Enhancing Completion Time Prediction Through Attribute Selection. Proceedings of the 15th International Conference on Advanced Information Technologies for Management (AITM 2018).

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