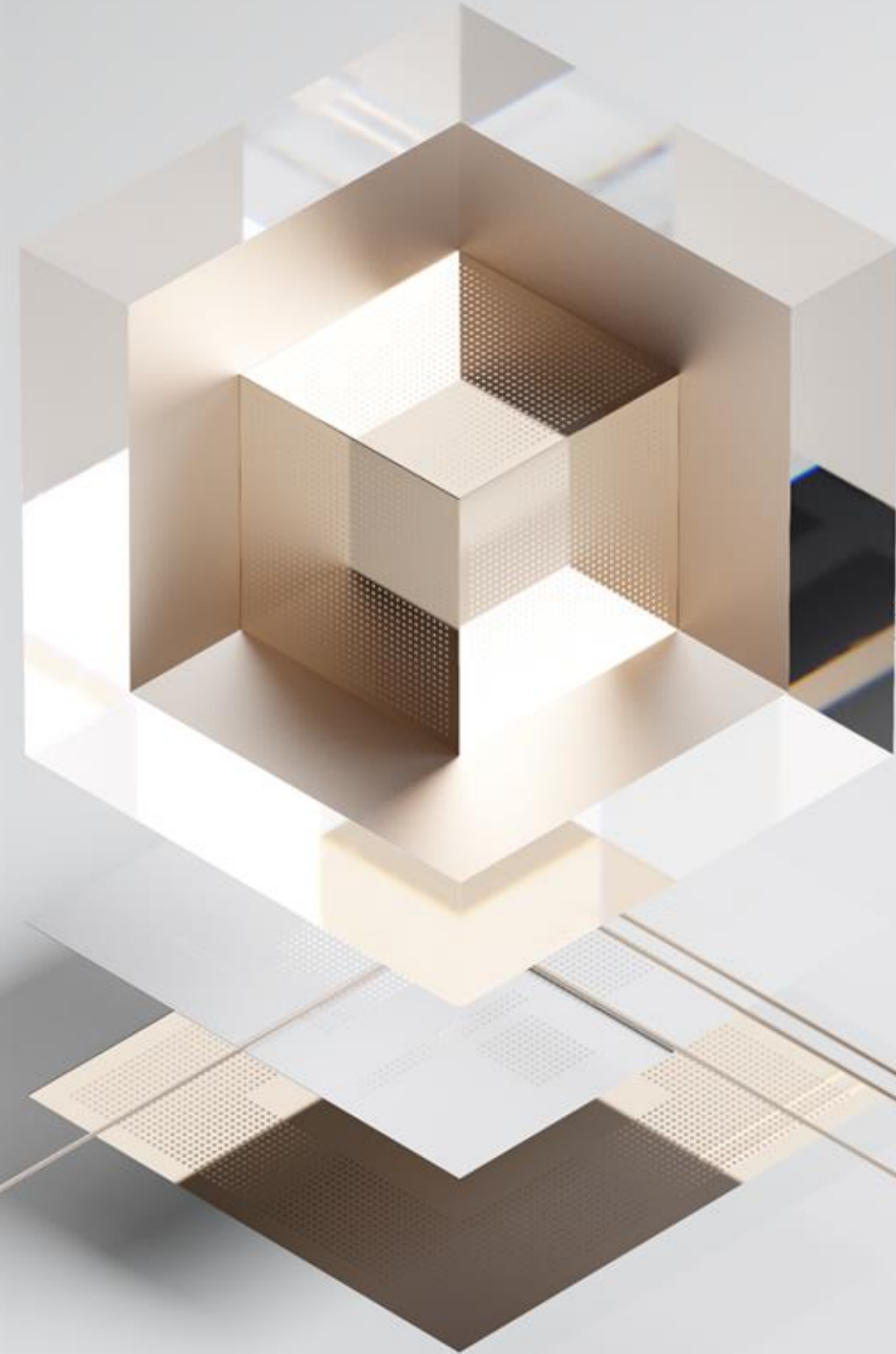March 18-22, 2024

Root Cause Analysis & Mitigation Plan

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Agenda

Incident summary

Incident impact

Root cause analysis

Incident timeline

Piano solutions

Summary

Incident date

March 18 – March 22, 2024

Affected software modules

DMP

Affected environment or location

All DMP clients using Lookalike modeling or Sociodemographic modeling globally.

Incident scope

Partial outage

Incident duration

Two days from the start of the issue to the deployment of the first fix.

Two additional days for job processing to return to a normal state.

Impact

Incident severity

High

Impact description

The affected DMP segments lost volume and matched no or very few users for the duration of the incident. This impacted campaigns where the segments were used as targeting criteria, severely reducing the reach of such campaigns. The duration of the outage differed for each affected segment, depending on when the backend processing jobs ran.

Root cause

On March 18th, a regular deployment to production in the DMP resulted in two bugs:

- The first bug caused lookalike segments to become empty when lookalike modeling uploaded fresh results to the segment.
- The second bug caused segments to only copy 10,000 users when copying across site groups, instead of the whole source segment.

These bugs started to affect segments on the next run of lookalike modeling and segment-copy backend jobs. For most segments, this started with the March 19th daily run of these jobs (early morning UTC).

The severely reduced segment volumes did not trigger our usual automatic alerts because the copy jobs and lookalike jobs completed successfully instead of throwing errors. That meant that the storing of users in segments in the DMP appeared to work as expected even though it did not actually store the results of lookalike processing or segment copying.

The lookalike-related bug was discovered and fixed on March 20th. The segment-copy related bug was discovered and fixed on March 21st. After fixing the bugs, a series of backend jobs had to be rerun in a particular order to recover the segment volume for each affected segment.

In the days after the incident, Piano has been strengthening monitoring and alerting to catch issues like this more quickly.

Incident timeline

Hours	Date / Time (UTC)	Description
0	2024-03-18 10:44	Deployment to production that included the mentioned code bugs.
24	2024-03-19	Lookalike modeling and SegmentCopy jobs run for clients using these features, uploading empty or very small segments.
46	2024-03-20 08:17	First reports of empty segments. The issue was escalated to the backend team.
51	2024-03-20 13:25	Lookalike-related bug identified and bugfix deployed to production. Some Lookalike jobs are rerun.
63	2024-03-21 01:53	More client reports of empty and very small segments, which are escalated to the backend team. All Lookalike jobs get rerun.
74	2024-03-21 12:10	SegmentCopy-related bug identified and bugfix deployed to production
93	2024-03-22 07:37	Priority of SegmentCopy jobs raised to make them rerun for all clients faster. Within 2 hours all jobs had completed, restoring the volume of most copied segments.
145	2024-03-24 11:36	All affected segments confirmed to be back to expected volume. Segments that depended on both jobs (Lookalike first, then SegmentCopy) recovered at this point. There were also segments that needed SegmentCopy first, then Lookalike on the destination segment. Those also recovered at this point.

Piano solutions and corrective measures

Improved monitoring and alerting of segment volumes: Each segment will be monitored for its current size, historical size, and expected size (as determined by Lookalike or SegmentCopy). Deviations in the current size in the DMP will trigger alerts to the backend team, one per affected segment.

Status
In Progress

Estimated delivery date
April 10th, 2024

Improved incident handling process: there were notable delays in the timeline due to lack of widespread rerunning of backend jobs. Some jobs got triggered to run again, but not all. The incident handling process has been strengthened to reduce the time to recover in the future.
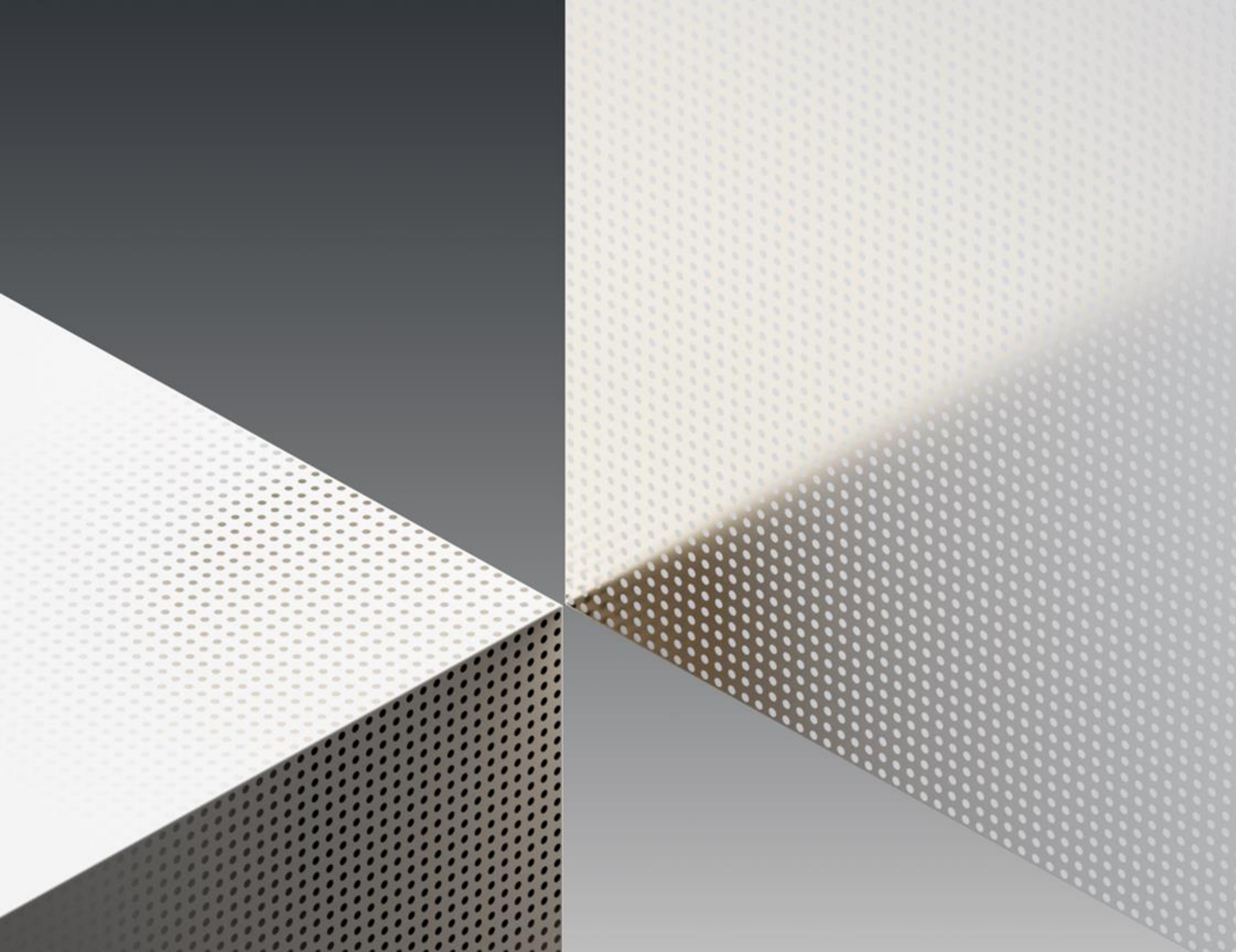
Status
Done

Delivery date
March 26th, 2024

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