

BREAKOUT SESSION 1C

**The Poconos Data Journey: Harnessing AI and AWS
to Attract the Next Wave of Visitors**

Presented by

Patrick Stewart, Tyler Sanders, & Raman Kadariya
Red Oak Strategic



RED OAK
strategic

The Poconos Data Journey:

Harnessing AI and AWS to Attract the Next Wave of Visitors



- AWS Glue Delivery
- Amazon Redshift Delivery

Meet the Red Oak Strategic Team



Patrick Stewart: Chief Revenue Officer



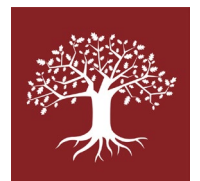
Tyler Sanders: Head of Engineering



Raman Kadariya: Solutions Architect



- AWS Glue Delivery
- Amazon Redshift Delivery



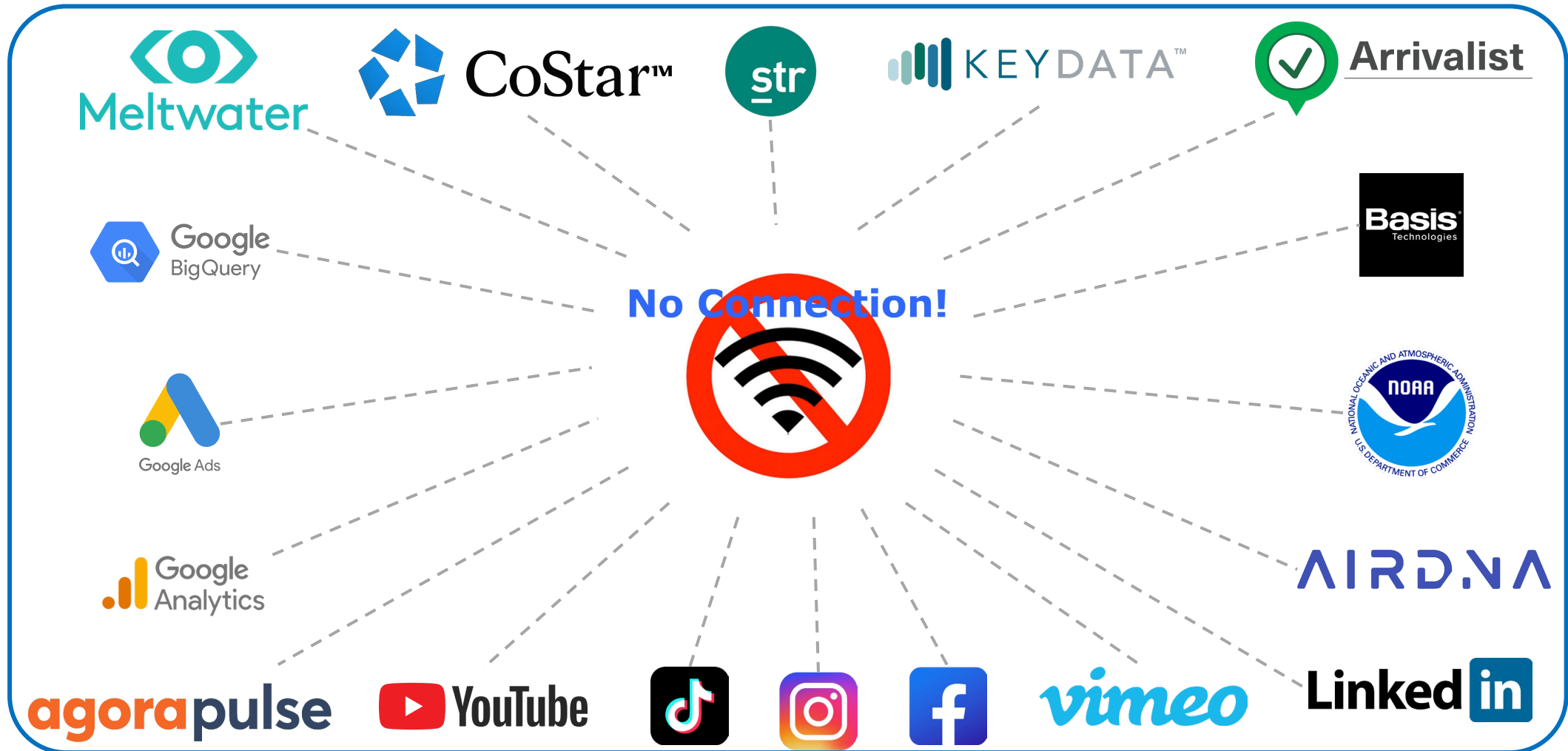
PMVB Data Lake Project Overview



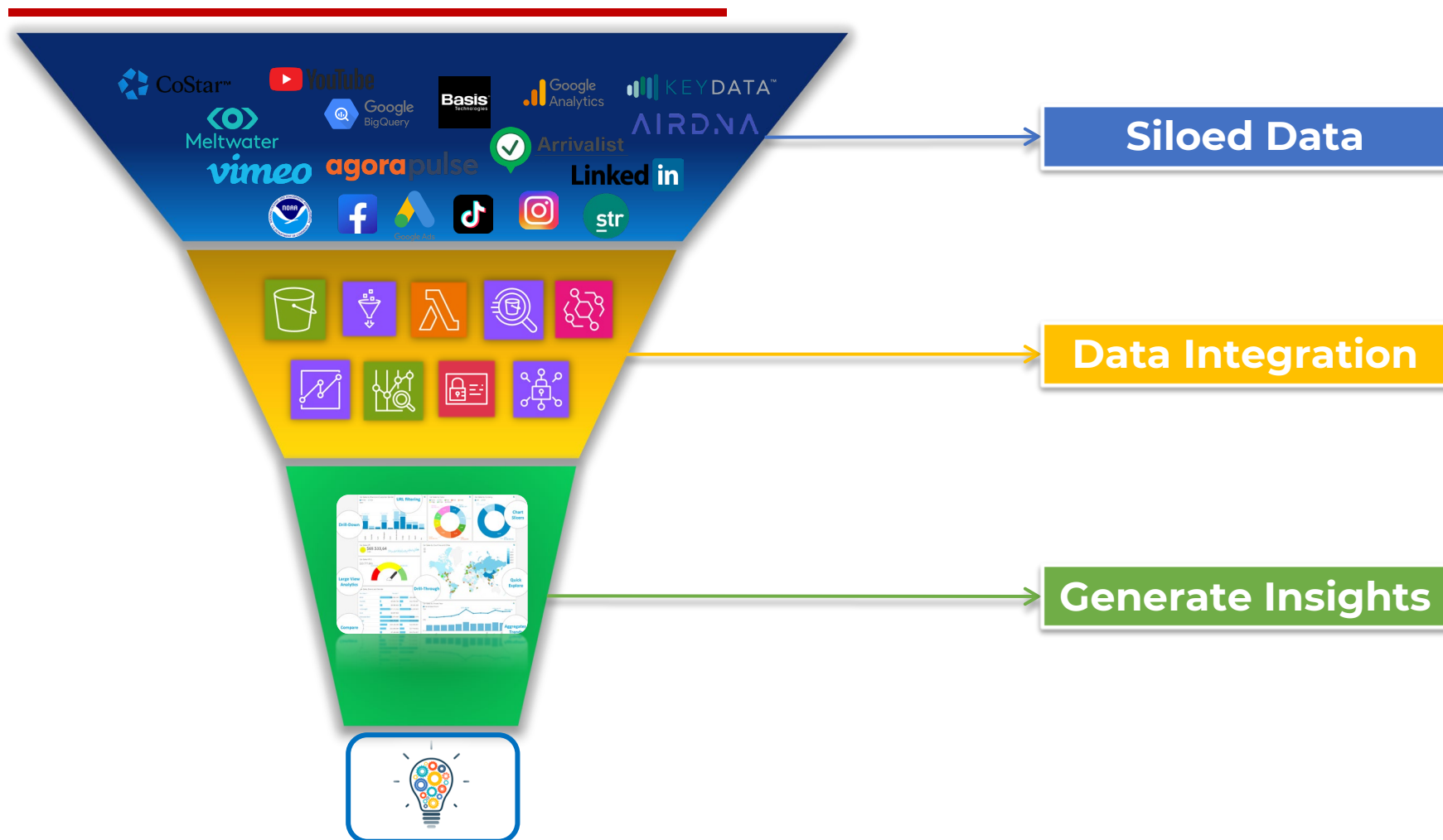
The **Pocono Mountains Visitors Bureau** (PMVB) collects data from more than 18 sources to help measure how marketing and outreach is driving tourism. **Red Oak Strategic** (ROS), a cloud and data analytics firm is supporting this mission by **centralizing these data sources**, onboarding critical new data sources through **strategic partnerships** and **secure data sharing**. Using modern cloud technologies, AI, and intelligent data solutions, we aim to **transform how data informs decisions across the Poconos region**.

Disconnected Sources, Missed Opportunities

PMVB faced challenges with disparate data sources and lacked a **centralized data lake** to **unify and connect insights** across tourism, marketing, social, and economic data.



Unifying Sources to Unlock Insights



Automated ETL process with **AWS services**, delivering high quality, clean, trusted datasets that fuel **SQL querying**, interactive **QuickSight dashboards**, and **Q data storytelling**

What We've Accomplished Together



Monthly S3 Cost
<\$7.0



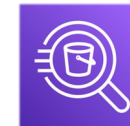
AWS S3 Storage
>243 GB



Total Data Points
3.35+ Billions

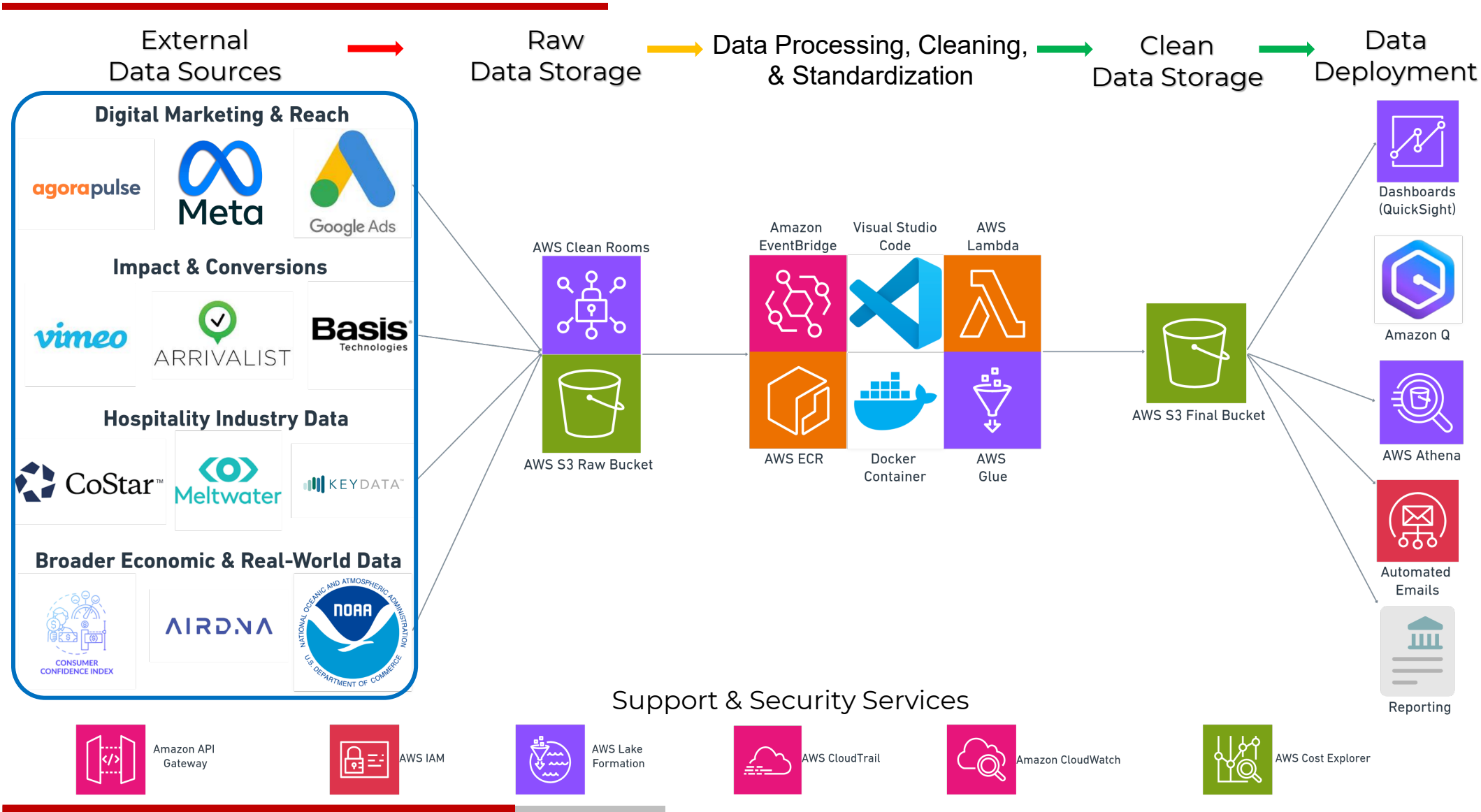


Unique Data Sources
20+

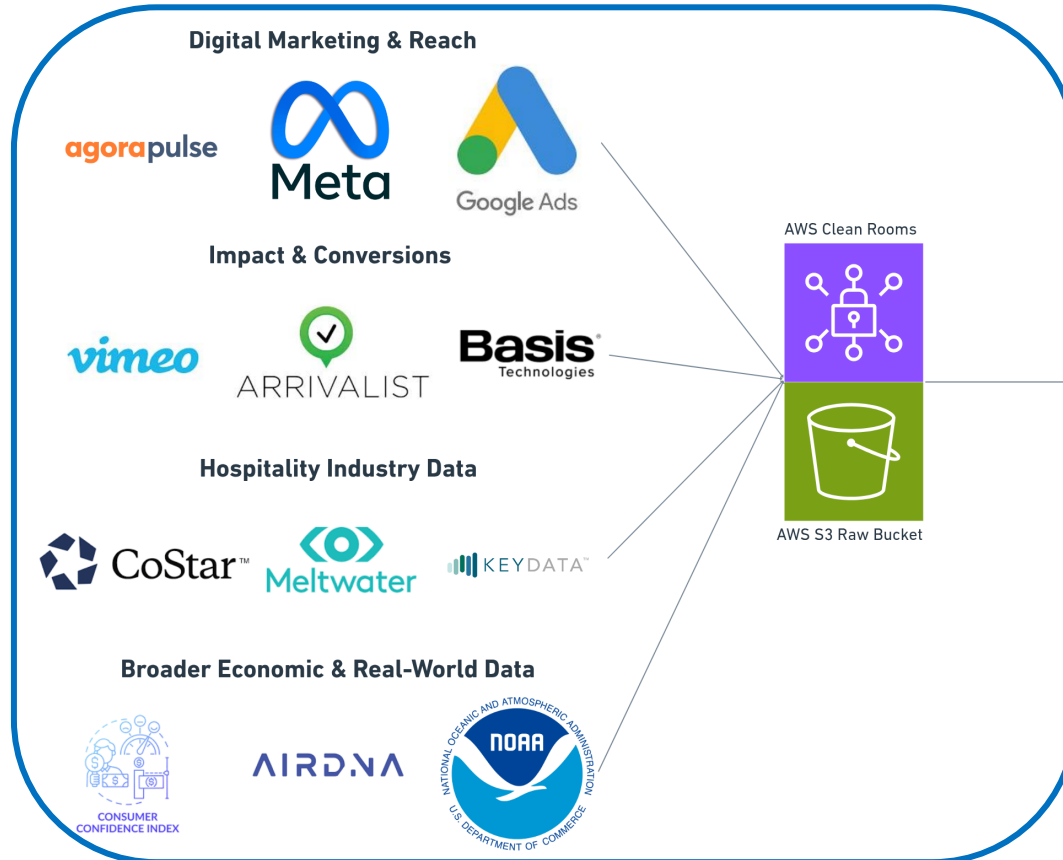


Athena Database Tables
>95

Data Lake Architecture & Roadmap



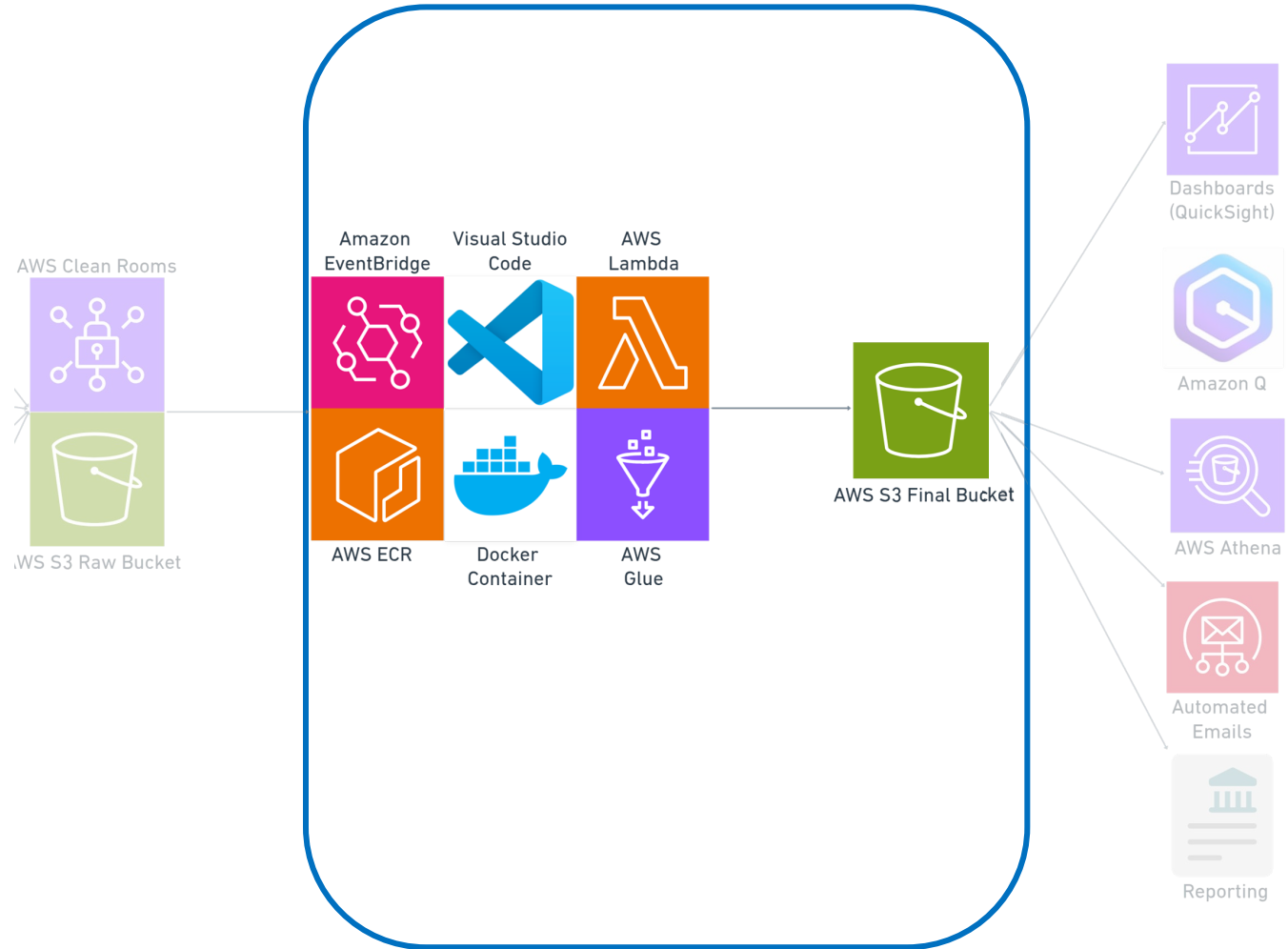
Raw & Sensitive Data Processing



- **Ingest** : APIs, SFTP, Emails, direct Amazon S3 drops
- **Storage** : Amazon S3

Data Cleaning & Standardization

- **Clean & Standardize:** AWS Lambda containers + Pandas
- **Catalog & Secure:** AWS Glue and AWS Lake Formation
- **Query & Analyze:** Amazon Athena



Amazon Athena Querying

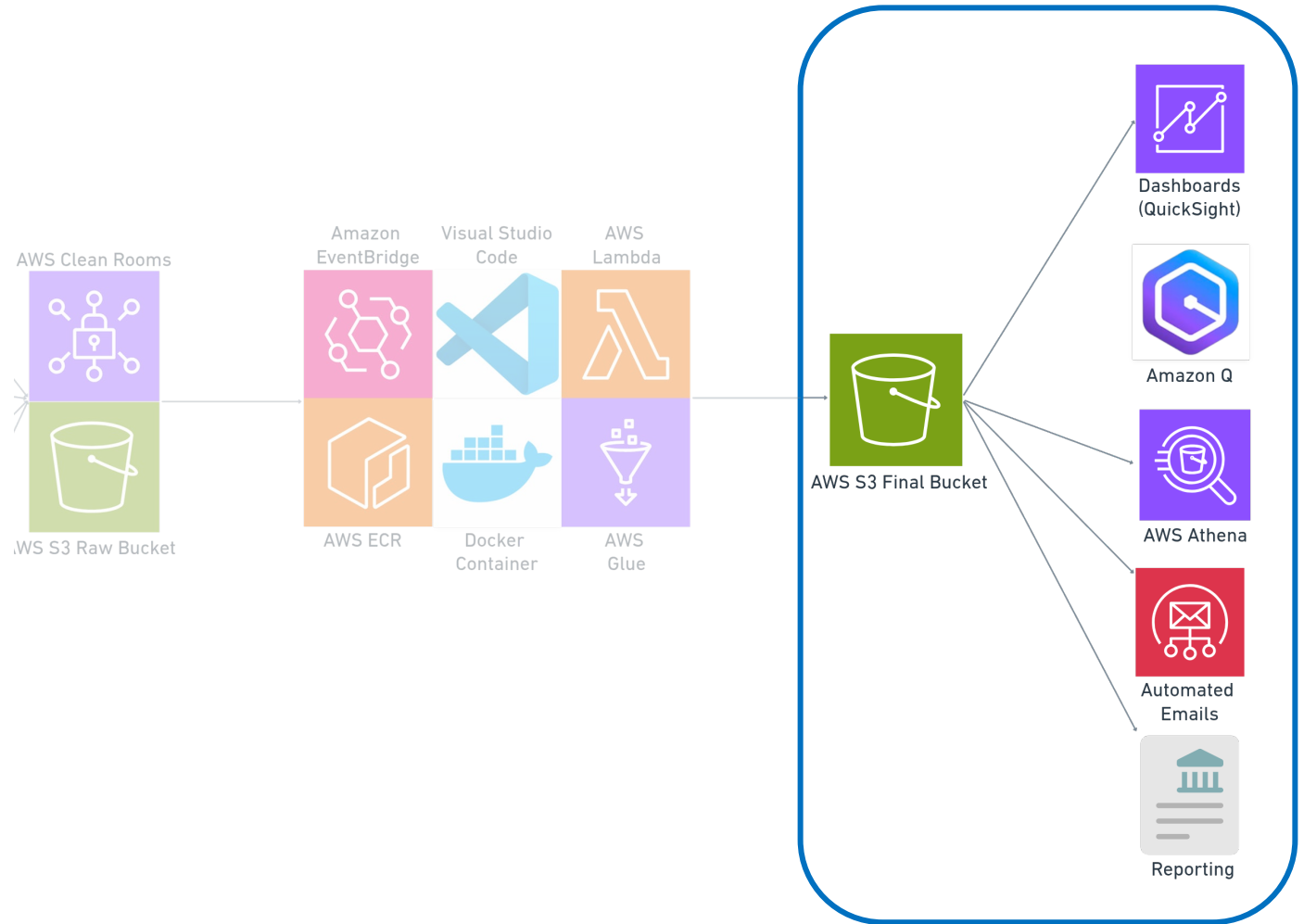
The screenshot displays the Amazon Athena Query Editor. On the left, the 'Data' sidebar shows the 'Data source' as 'AwsDataCatalog', 'Catalog' as 'None', and 'Database' as 'poconos-data-lake-final'. Below this, a list of 'Tables and views' is shown, including 'agorapulse_pmbv_content', 'agorapulse_pmbv_content_parquet', 'agorapulse_pmbv_global', 'agorapulse_pmbv_global_parquet', 'agorapulse_ptn_content', 'agorapulse_ptn_content_parquet', 'agorapulse_ptn_global', 'agorapulse_ptn_global_parquet', 'arrivalist_revenue_by_category', 'arrivalist_revenue_by_day_of_week', 'arrivalist_revenue_by_home_dma', 'arrivalist_revenue_by_home_zip_city', 'arrivalist_revenue_by_month', 'arrivalist_revenue_by_property_zip_code', and 'arrivalist_revenue_per_arrival_by_origin_mark'. The main editor area shows a SQL query: `SELECT * FROM "AwsDataCatalog"."poconos-data-lake-final"."weather_poconos" limit 100;`. Below the query, there are buttons for 'Run again', 'Explain', 'Cancel', 'Clear', and 'Create'. The 'Query results' tab is active, showing a 'Completed' status with 'Time in queue: 112 ms', 'Run time: 574 ms', and 'Data scanned: 174.86 KB'. The results are displayed in a table with 13 rows and 11 columns: #, station, name, latitude, longitude, elevation, date, awnd, awnd_attributes, dapr, and dap. The first row shows data for station 'US1PADP0014' and name 'MIDDLETOWN 2.9 NW, PA US'.

#	station	name	latitude	longitude	elevation	date	awnd	awnd_attributes	dapr	dap
1	US1PADP0014	MIDDLETOWN 2.9 NW, PA US	40.234858	-76.761678	155.4	2025-01-01	nan			nan
2	US1PADP0014	MIDDLETOWN 2.9 NW, PA US	40.234858	-76.761678	155.4	2025-01-02	nan			nan
3	US1PADP0014	MIDDLETOWN 2.9 NW, PA US	40.234858	-76.761678	155.4	2025-01-03	nan			nan
4	US1PADP0014	MIDDLETOWN 2.9 NW, PA US	40.234858	-76.761678	155.4	2025-01-04	nan			nan
5	US1PADP0014	MIDDLETOWN 2.9 NW, PA US	40.234858	-76.761678	155.4	2025-01-05	nan			nan
6	US1PADP0014	MIDDLETOWN 2.9 NW, PA US	40.234858	-76.761678	155.4	2025-01-06	nan			nan
7	US1PADP0014	MIDDLETOWN 2.9 NW, PA US	40.234858	-76.761678	155.4	2025-01-07	nan			nan
8	US1PADP0014	MIDDLETOWN 2.9 NW, PA US	40.234858	-76.761678	155.4	2025-01-08	nan			nan
9	US1PADP0014	MIDDLETOWN 2.9 NW, PA US	40.234858	-76.761678	155.4	2025-01-09	nan			nan
10	US1PADP0014	MIDDLETOWN 2.9 NW, PA US	40.234858	-76.761678	155.4	2025-01-10	nan			nan
11	US1PADP0014	MIDDLETOWN 2.9 NW, PA US	40.234858	-76.761678	155.4	2025-01-11	nan			nan
12	US1PADP0014	MIDDLETOWN 2.9 NW, PA US	40.234858	-76.761678	155.4	2025-01-12	nan			nan
13	US1PADP0014	MIDDLETOWN 2.9 NW, PA US	40.234858	-76.761678	155.4	2025-01-13	nan			nan



Data Visualization & Gen AI

- **Visualize & Report:**
Amazon QuickSight
Amazon Q Data Story

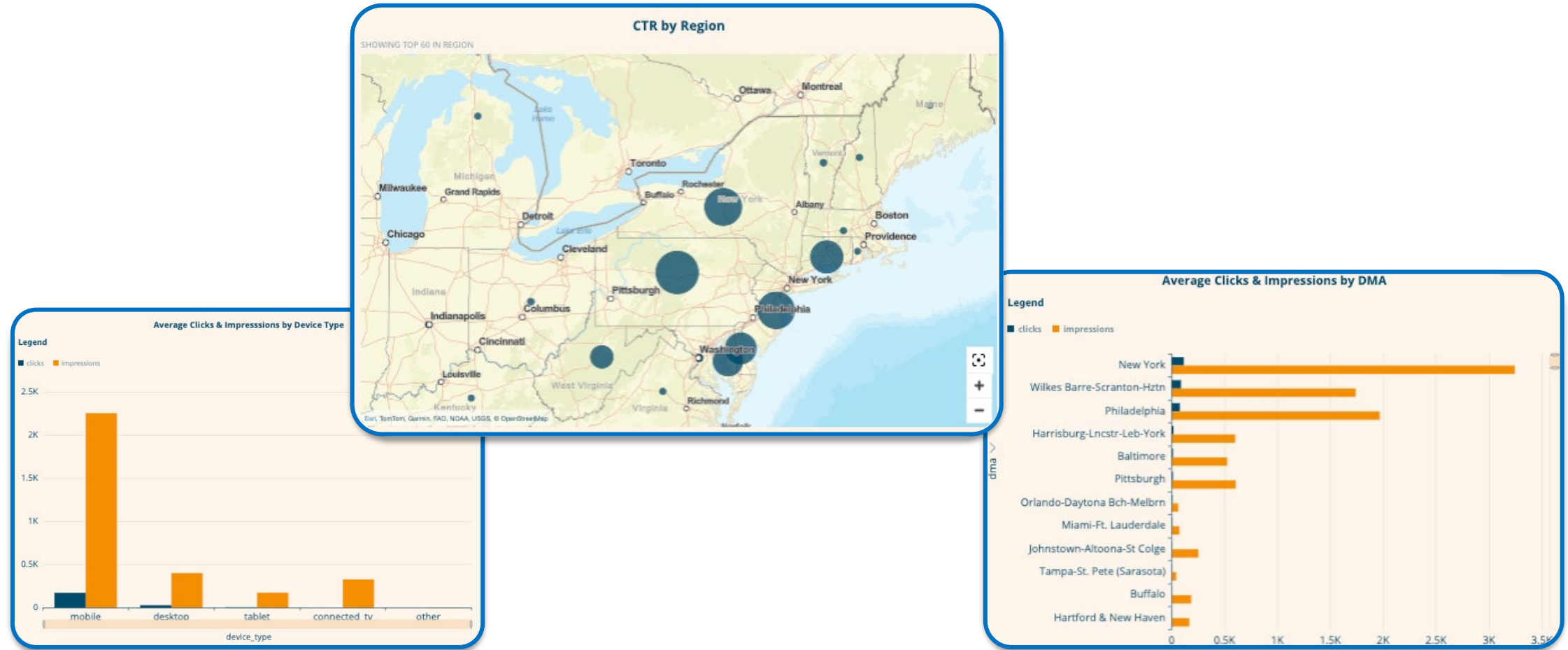


Unified Data Sources in Action



ROS is developing an embedded **dynamic AWS QuickSight dashboard** into PMVB website, providing continuously refreshed tourism and marketing performance insights to stakeholders.

Resort Occupancy Trends



By integrating structured, unstructured, and semi-structured data from diverse sources - we are enabling **PMVB** decision makers to **gain deeper insights, streamlined access, and improved collaboration opportunities.**

Empowering Faster, Smarter Decision-Making



Completed Time in queue: 111 ms Run time: 997 ms Data scanned: 28.00 KB

Results (10)

Search rows

rev_par_chg_yoy_costar	supply_costar	supply_chg_yoy_costar	demand_costar	demand_chg_yoy_costar	revenue_costar
-0.125579146313977	7529	-0.0266321913380737	4907.0	-0.0914645436030365	1556695.75
-0.125579146313977	7529	-0.0266321913380737	4907.0	-0.0914645436030365	1556695.75
-0.104912063528757	7529	-0.0197890899622445	3449.0	-0.0785403688264078	450966.69
-0.104912063528757	7529	-0.0197890899622445	3449.0	-0.0785403688264078	450966.69
0.261824840291122	7529	-0.0195337954626905	4106.0	0.157271702367531	631174.34
0.261824840291122	7529	-0.0195337954626905	4106.0	0.157271702367531	631174.34
-0.0019981872526067	7529	-0.0266321913380737	3573.0	0.0505733607762423	476255.55
-0.0019981872526067	7529	-0.0266321913380737	3573.0	0.0505733607762423	476255.55
-0.0583909329421501	7529	-0.0266321913380737	3441.0	0.138649900727995	459470.96
-0.0583909329421501	7529	-0.0266321913380737	3441.0	0.138649900727995	459470.96

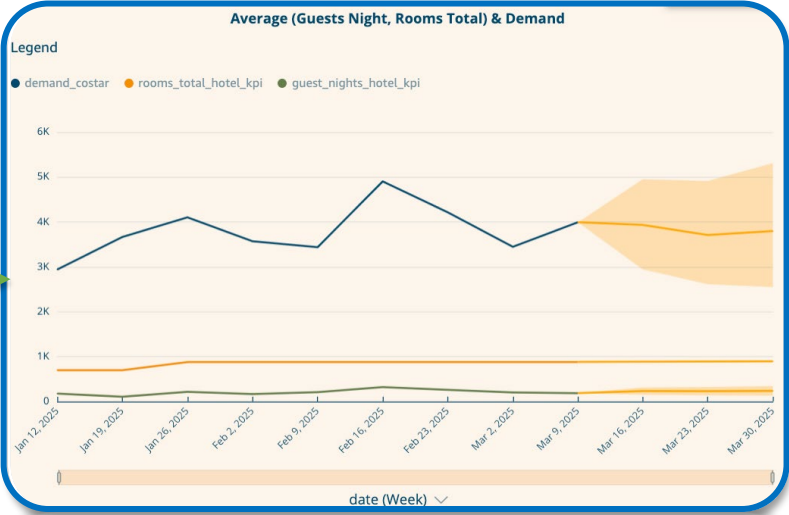


Completed Time in queue: 111 ms Run time: 997 ms Data scanned: 28.00 KB

Results (10)

Search rows

hotel_count_hotel_kpi	rooms_total_hotel_kpi	property_nights_hotel_kpi	guest_nights_hotel_kpi	guest_checks_hotel_kpi	marl
8	700	700	264	86	167
12	1062	1062	380	115	205
8	700	700	177	37	43
12	1062	1062	229	49	68
8	700	700	170	40	52
12	1062	1062	263	56	75
8	700	700	133	30	77
12	1062	1062	201	40	91
8	700	700	169	31	45
12	1062	1062	250	56	89



Equipping leadership with integrated, **accurate data** for visualization, **forecasting**, and strategic decision making.

Gen AI-Powered Reporting

Unlocking the Potential of the Poconos Region: A Data-Driven Marketing Strategy

Red Oak Strategic

Introduction

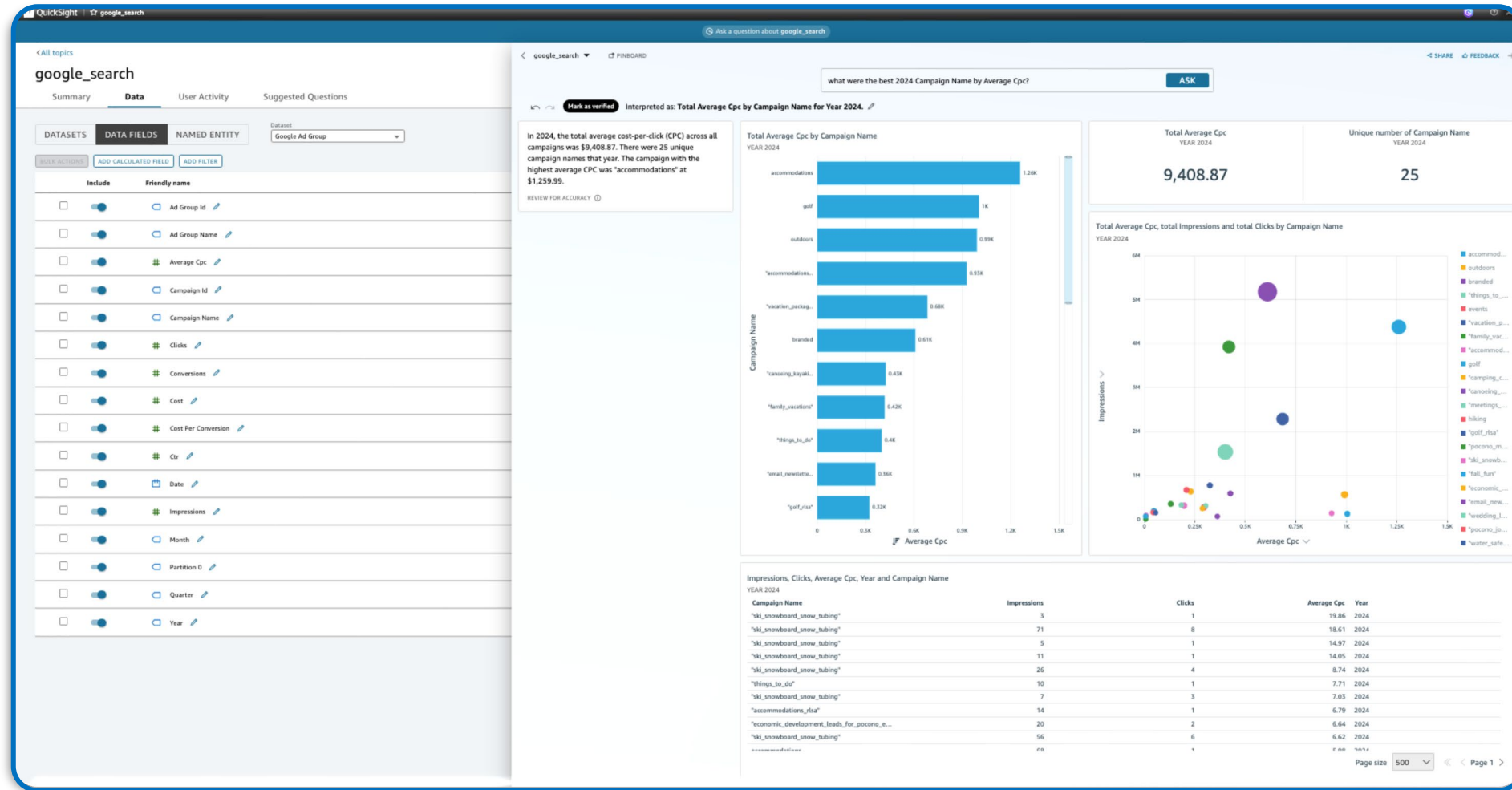
The Pocono Mountains region is a renowned and beloved tourist destination, offering visitors a diverse array of captivating outdoor activities, breathtaking natural landscapes, and charming, welcoming small-town experiences. By leveraging targeted, data-driven strategies, the Pocono Mountains Visitors Bureau (PMVB) can better understand the unique needs, preferences, and interests of potential visitors, allowing them to tailor their messaging and promotional campaigns accordingly. This will enable the Visitors Bureau to effectively showcase the region's many wonders, ultimately boosting tourism and ensuring the Pocono Mountains' continued status as a premier, must-visit tourist destination for years to come.

Sentiment Analysis & Hotel Insights



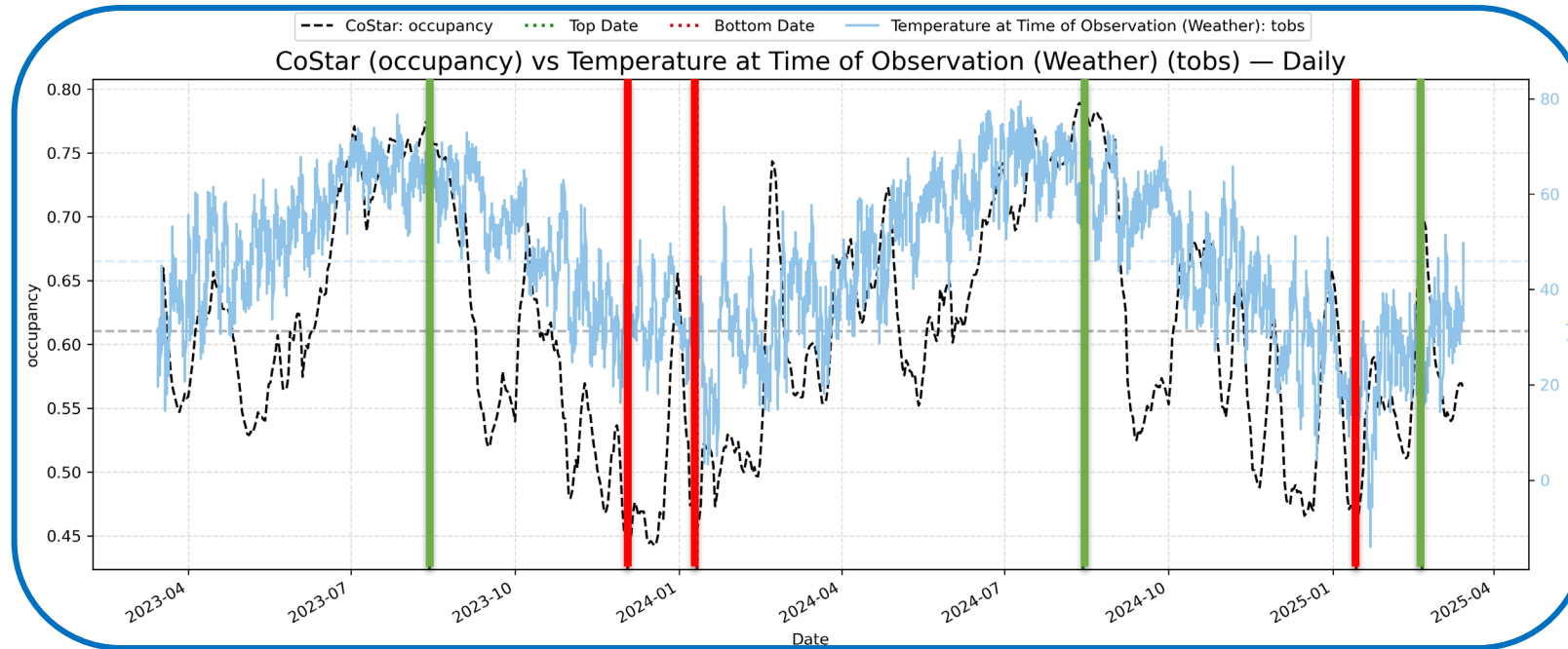
Leveraging **Amazon Q** to deliver automated, natural language narratives and **AI-driven insights**, making complex data accessible and actionable for broader audiences

Gen AI-Powered Search



Leveraging **Amazon Q Topic** to deliver dynamic, natural language search and **AI-driven insights**, making complex data accessible and actionable for broader audiences

Advanced Analytics & Visualization



CoStar Occupancy exhibits a clear seasonal pattern that closely aligns with **TOBS Temperature** trends, reinforcing **weather** as a key driver of tourism demand

- **Green lines** represent peak occupancy days. These align with warm-weather periods
- **Red lines** mark the lowest occupancy dates, which consistently occur in the coldest months

Weather Trends can help Poconos anticipate and plan for peak vs. off-peak demand while supporting data-driven marketing and pricing strategies

Building a Secure, Privacy-First Data Strategy



By integrating external data sources, the project provides a **360° tourism view** and enables secure, **insight-driven collaboration without requiring** partners to share or relocate any **sensitive data**.

Collaborate with Confidence

Purchased Goods Supplier

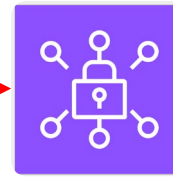
Item	S3_Upstream_Purchased_Good	Unit	Origin_Region
Raw Material 1	14.41	kg co2e/unit	North America
Raw Material 2	43.67	kg co2e/unit	Europe
Raw Material 3	10.25	kg co2e/unit	Asia
Raw Material 4	8.99	kg co2e/unit	Asia
Raw Material 5	1.53	kg co2e/unit	North America

Transportation Provider

Item	S3_Upstream_Transportation	Unit	Transportation_Mode
Raw Material 1	21.62	kg co2e/unit	Van
Raw Material 2	65.56	kg co2e/unit	PANAMAX
Raw Material 3	38.15	kg co2e/unit	ULVC
Raw Material 4	94.37	kg co2e/unit	PANAMAX
Raw Material 5	12.83	kg co2e/unit	Semi-Trailer

Reporting Company

Product	Ingredient
SKU A	Raw Material 2
SKU A	Raw Material 4
SKU A	Raw Material 5
SKU B	Raw Material 1
SKU B	Raw Material 4
SKU C	Raw Material 2
SKU C	Raw Material 3
SKU C	Raw Material 4
SKU D	Raw Material 1
SKU D	Raw Material 3
SKU D	Raw Material 4
SKU D	Raw Material 5



AWS Clean Rooms

The screenshot displays the AWS Clean Rooms interface. On the left, a sidebar lists data sources: 'reporting' (table), 'purchase' (table), and 'transportation' (table). The main area shows a SQL query for 'Query 1' with the following code:

```
1 SELECT
2   r.product AS "Product",
3   SUM(p.s3_upstream_purchased_good) AS "Scope_3_Purchased_Goods_Emissions",
4   SUM(t.s3_upstream_transportation) AS "Scope_3_Transportation_Emissions"
5 FROM
6   reporting r
7   INNER JOIN purchase p ON r.ingredient = p.item
8   INNER JOIN transportation t ON p.item = t.item
9 GROUP BY
10  r.product
11
```

The query results are displayed in a table with the following columns: 'product', 'scope_3_purchased_goods_emissions', and 'scope_3_transportation_emissions'. The results are as follows:

product	scope_3_purchased_goods_emissions	scope_3_transportation_emissions
SKU C	62.910000000000004	198.08000000000001
SKU B	23.399999999999999	115.99000000000001
SKU A	54.190000000000005	172.76000000000002
SKU D	35.180000000000007	166.97000000000003

With addition of **AWS Clean Rooms**, Poconos partners can more easily and securely analyze and collaborate on their collective datasets - **without sharing or copying** each other's **underlying data**.

Unlocking Next-Level Insights

- **Stays & Lodging Data** → Measure occupancy trends and revenue impact
- **Airline Bookings & Flight-Search Feeds** → Early demand signals
- **Streaming & Media Exposure** → Connect ad exposure to arrivals
- **Transportation & Mobility Data** → Optimize travel offers
- **Attraction & Events Ticketing** → Forecast visitor flows



With **AWS Clean Rooms** your sensitive data never leaves your control*

PMVB Data Lake Support & Security

- ❖ **Collaborate with AWS Clean Rooms:** Enable secure data collaboration across travel and hospitality brands - such as hotels, airlines, and restaurants - to unlock a unified view of travelers, enhance guest experiences, improve loyalty programs, and deliver dynamic, personalized offers.
- ❖ **Ensure Data Lake Security & Governance:** Implement robust access control, monitoring, and cost management using **API Gateway**, **Identity and Access Management (IAM)**, **AWS Lake Formation**, **CloudTrail**, **CloudWatch**, and **Cost Explorer** to secure and optimize the PMVB Data Lake environment.



Welcome To A More Connected Future



Red Oak Strategic aims to empower Poconos decision-makers and partners with **timely, actionable insights**; **foster deeper collaboration** across agencies, communities, and businesses, while **maximizing the long-term value** of Pocono's growing **data ecosystem**.

PMVB Dashboard & ROS Website



**Red Oak Strategic
Website**



**PMVB Quick Sight
Dashboard**



• AWS Glue Delivery
• Amazon Redshift Delivery





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THANK YOU!



- AWS Glue Delivery
- Amazon Redshift Delivery

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