

# BREAKOUT SESSION 2C

**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

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**Patrick Stewart: Chief Revenue Officer**



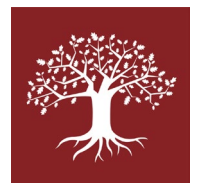
**Tyler Sanders: Head of Engineering**



**Raman Kadariya: Solutions Architect**



- AWS Glue Delivery
- Amazon Redshift Delivery



# PMVB Data Lake Project Overview

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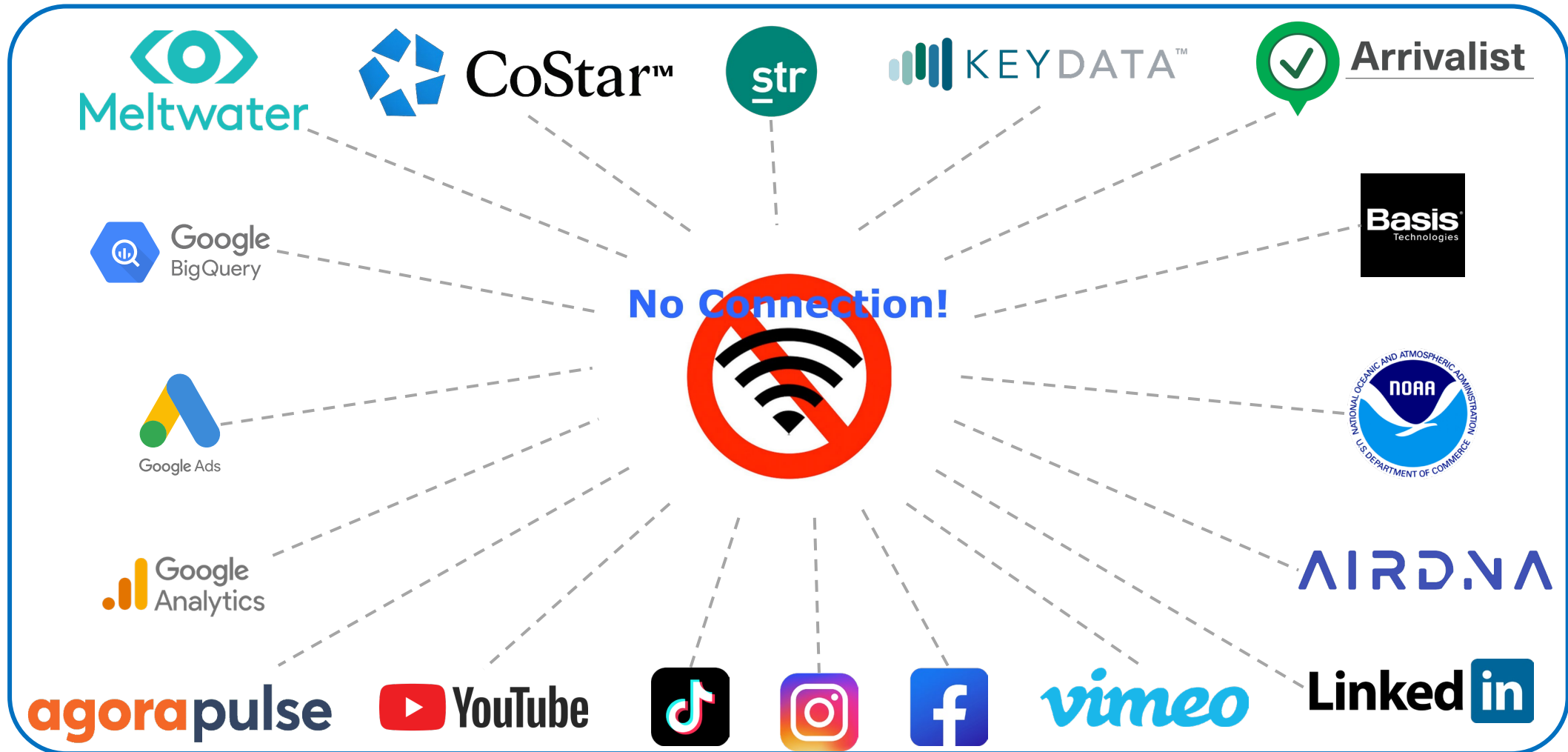
The **Pocono Mountains Visitors Bureau** (PMVB) collects data from more than 18 sources to help measure how marketing and outreach is driving tourism. **Red Oak Strategic** (ROS), a cloud and data analytics firm is supporting this mission by **centralizing these data sources**, onboarding critical new 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**.

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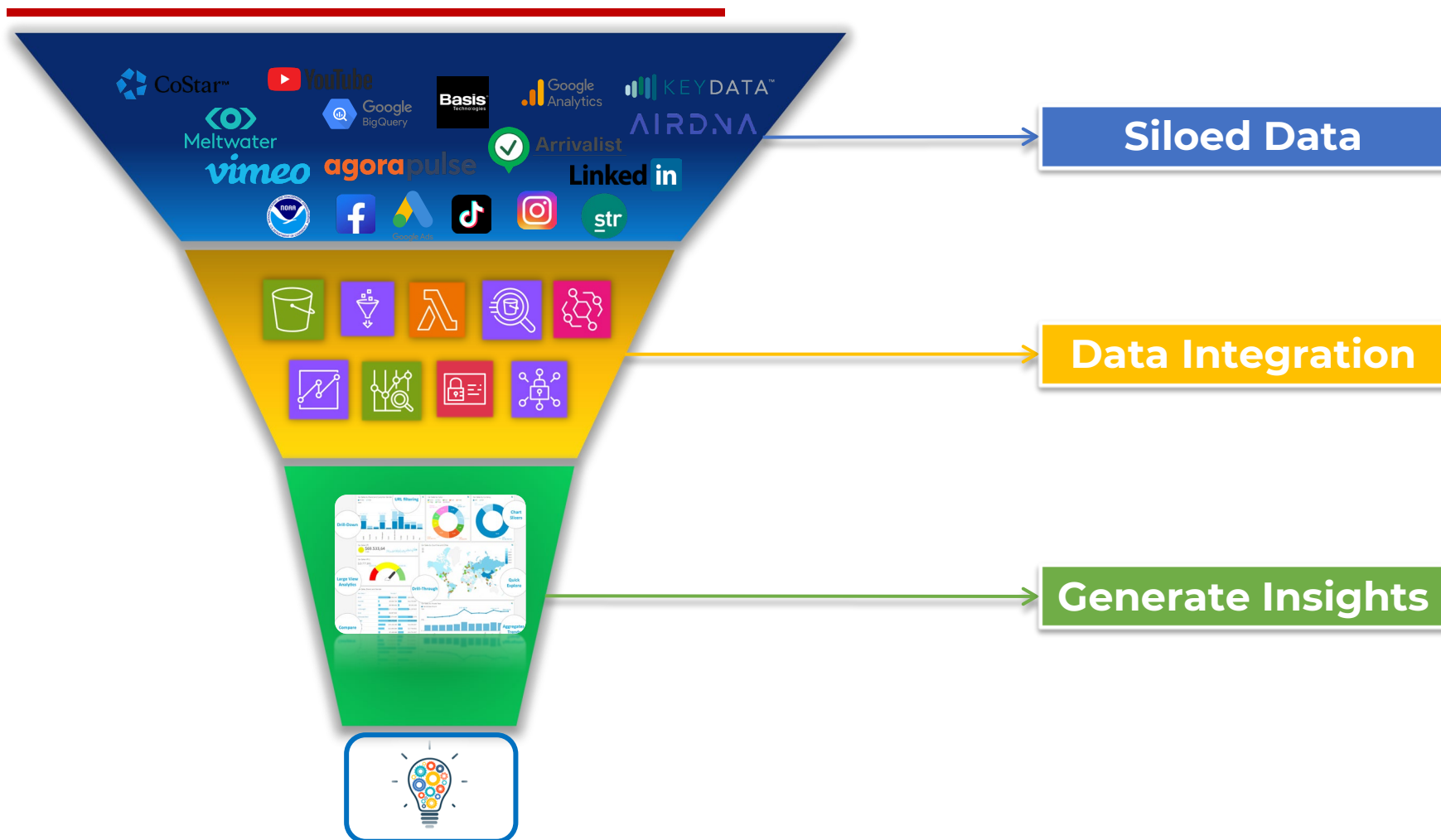


# Disconnected Sources, Missed Opportunities

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



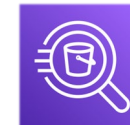
**AWS S3 Storage**  
>243 GB



**Total Data Points**  
3.35+ Billions

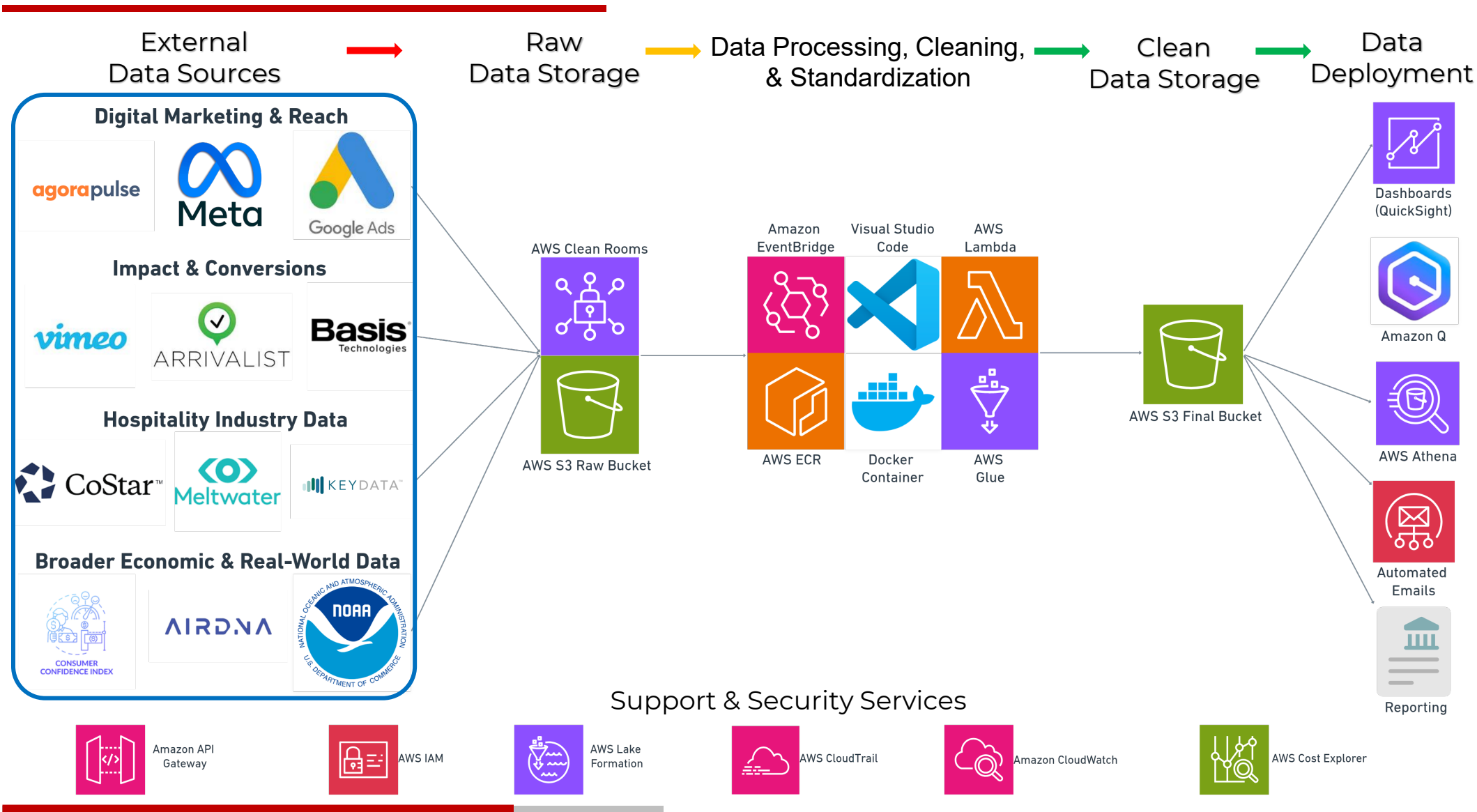


**Unique Data Sources**  
20+



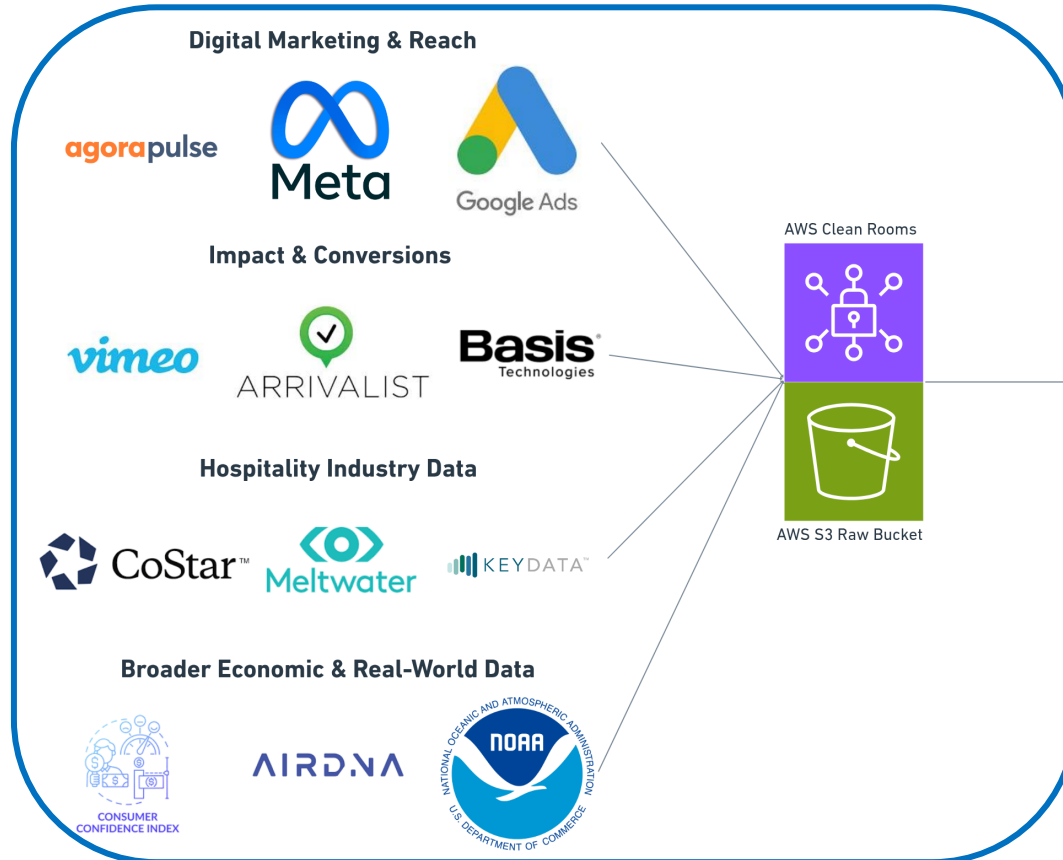
**Athena Database Tables**  
>95

# Data Lake Architecture & Roadmap





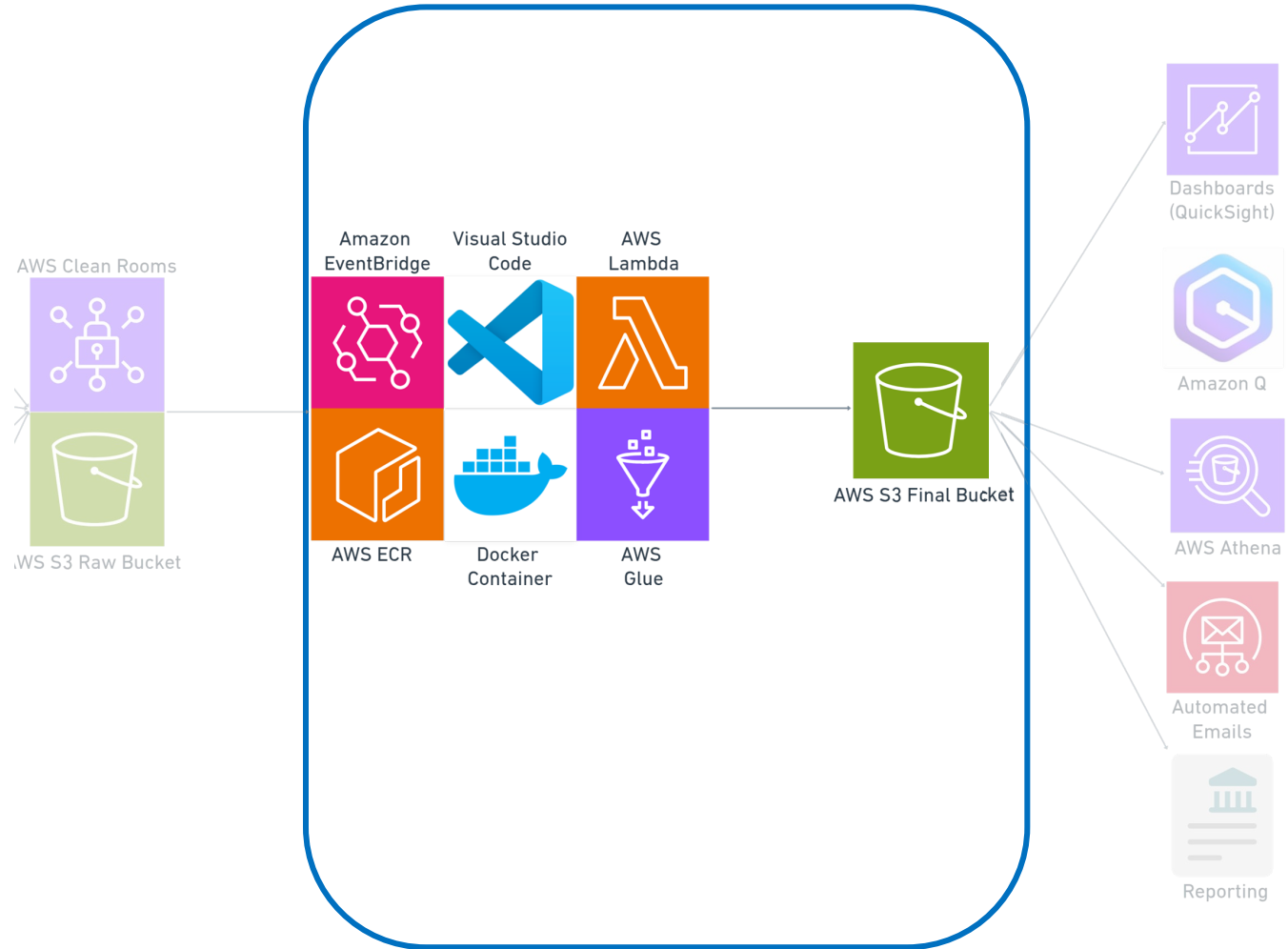
# Raw & Sensitive Data Processing



- **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

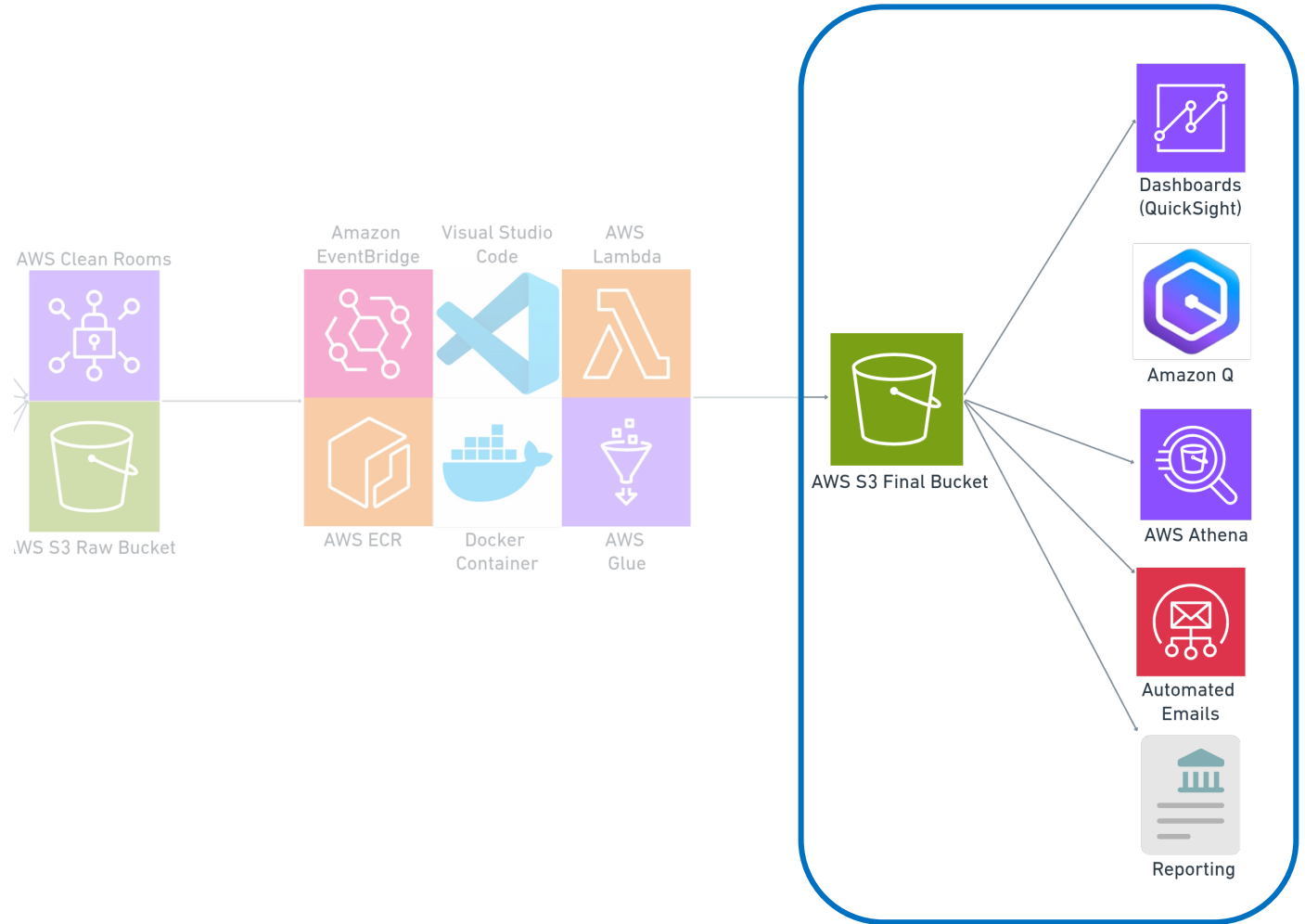
The screenshot displays the Amazon Athena Query Editor. On the left, the 'Data' sidebar shows the 'Data source' as 'AwsDataCatalog', 'Catalog' as 'None', and 'Database' as 'poconos-data-lake-final'. Below this, a list of 'Tables and views' is shown, including 'agorapulse\_pmbv\_content', 'agorapulse\_pmbv\_content\_parquet', '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



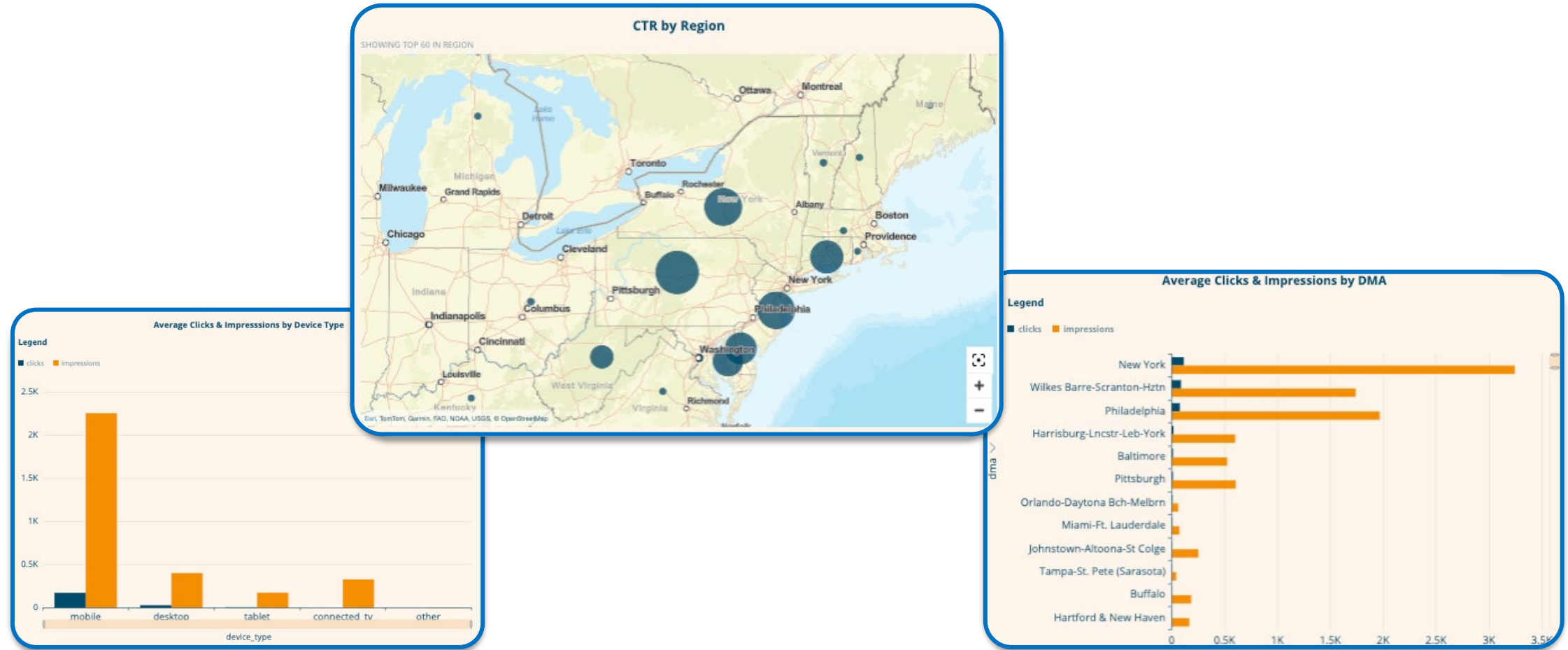


# Unified Data Sources in Action



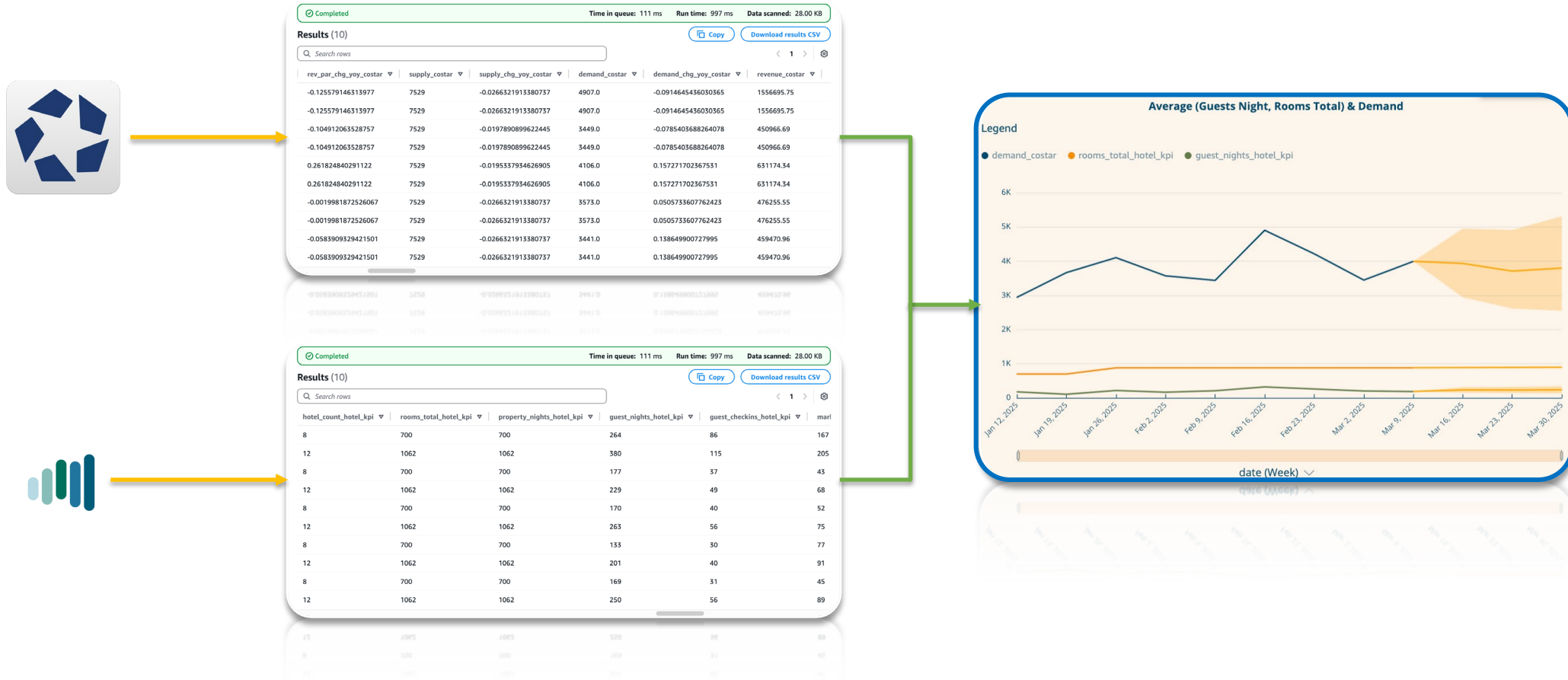
**ROS** is developing an embedded **dynamic AWS QuickSight dashboard** into PMVB website, providing continuously refreshed tourism and marketing performance insights to stakeholders.

# 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



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.

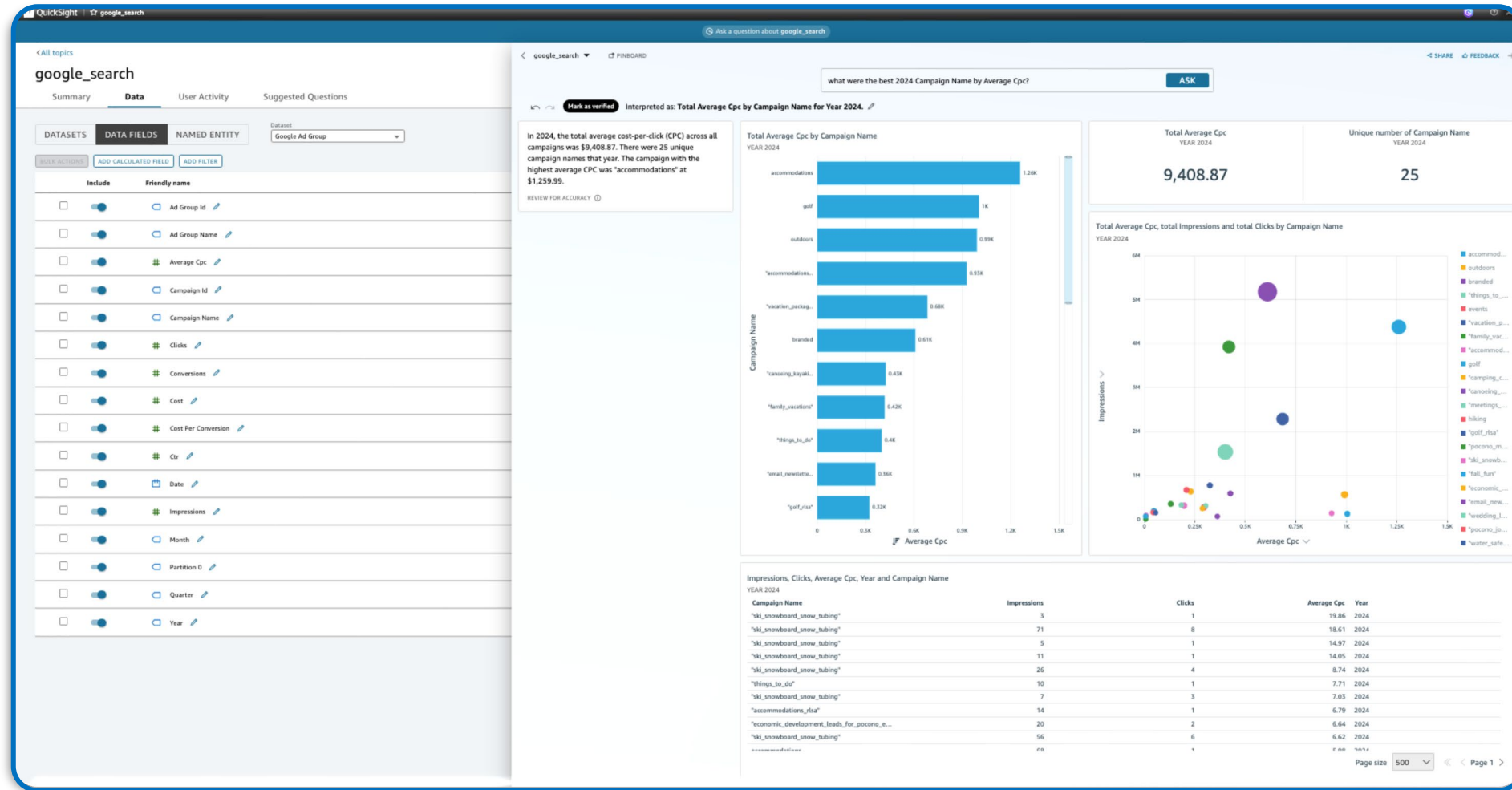
### Sentiment Analysis & Hotel Insights



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

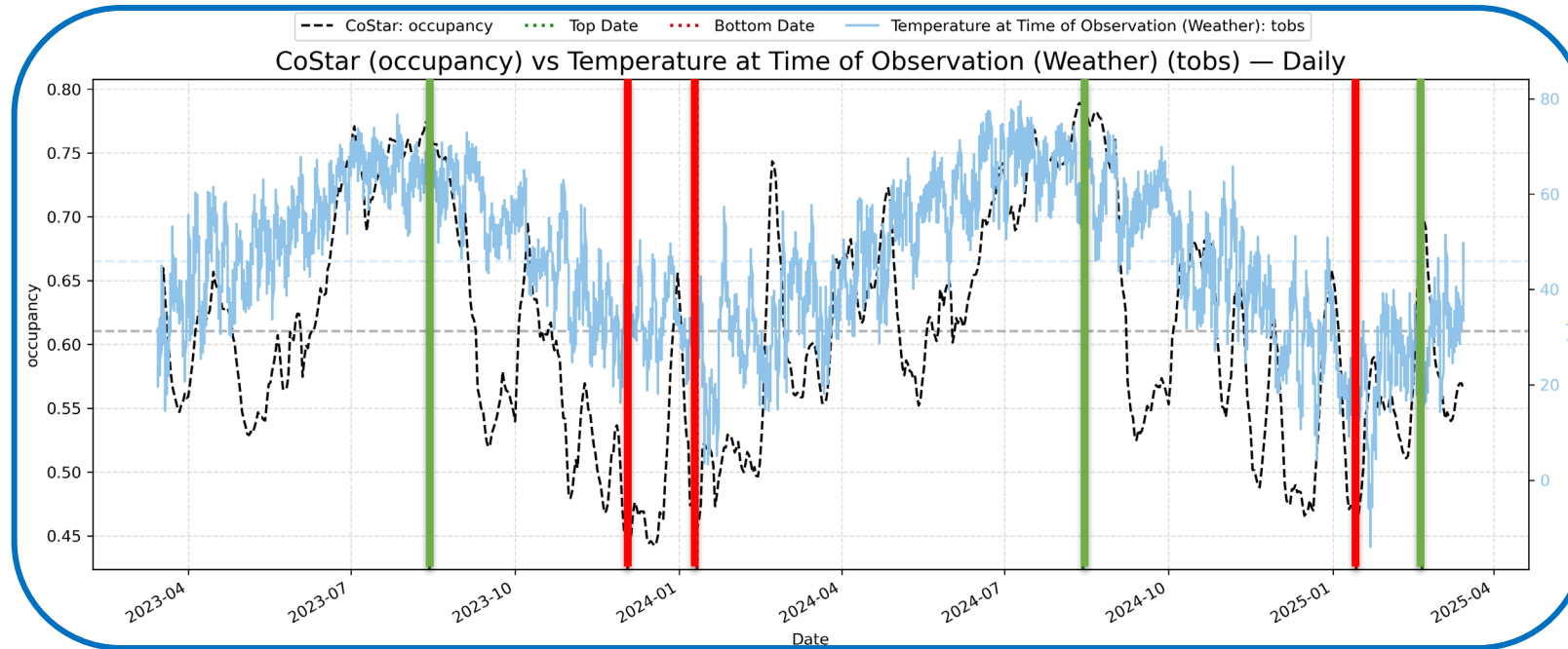


# Gen AI-Powered Search



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

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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**.

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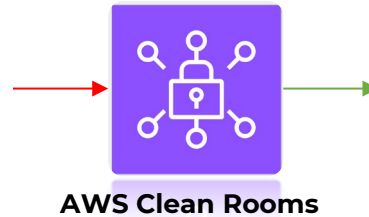
# Collaborate with Confidence

Purchased Goods Supplier		2	1
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		4	3
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



The screenshot shows the AWS Clean Rooms console interface. On the left, there's a sidebar with 'Data that can be queried' and a list of tables: 'reporting', 'purchase', and 'transportation'. The 'reporting' table is selected. In the center, a SQL query is displayed: 

```
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
```

 On the right, the query results are shown in a table with columns 'product', 'scope\_3\_purchased\_goods\_emissions', and 'scope\_3\_transportation\_emissions'. The results are for SKUs C, B, A, and D.

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

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- **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\*

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# PMVB Data Lake Support & Security

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- ❖ **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.



Amazon API  
Gateway



AWS IAM



AWS Lake  
Formation



AWS CloudTrail



Amazon CloudWatch



AWS Cost Explorer

# Welcome To A More Connected Future

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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**.

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# PMVB Dashboard & ROS Website

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**Red Oak Strategic  
Website**



**PMVB Quick Sight  
Dashboard**



• AWS Glue Delivery  
• Amazon Redshift Delivery





**RED OAK**  
strategic

**THANK YOU!**



- AWS Glue Delivery
- Amazon Redshift Delivery



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