# **Technical Approach**

1. **Data Profiling**

* Row count, column data types, date checks, missing values.
* Distribution checks for numeric fields.
* Categorical consistency checks (campaigns, locations, devices, keywords).

1. **Data Cleaning**

* Standardized text categories (campaign names, devices, keywords, locations).
* Imputed missing numeric values (set null counts to zero where appropriate, recalculated conversion rate).
* Flagged suspicious records (e.g., conversions > 0 but Sale Amount = 0).
* Built a **Data Quality Dashboard** inside SQL to monitor issues such as:
  + Sale\_Amount < Cost
  + Clicks > Impressions
  + Conversions without revenue

1. **Data Enrichment**

* Used systematic partitioning to create multiple synthetic campaigns from one campaign.
* Randomly redistributed locations across four cities (Hyderabad, Bengaluru, Gurgaon, Mumbai) to simulate real-world variation.

1. **Analysis**

* Campaign performance (clicks, conversions, revenue, conversion rate).
* Location effectiveness (ROAS by city).
* Device insights (conversion efficiency, CPC, CPA).
* Keyword performance (CTR, conversions).
* Time trends (daily impressions, clicks, conversions, revenue).
* Portfolio-level metrics (CTR, CPC, CPA, ROAS).
* Created a **Performance Dashboard View** in SQL for ongoing monitoring.