

# Optimizing Advertisement Material Costs Through Data Analysis

**A Case Study in SQL and Python for Data-Driven Campaign  
Efficiency**

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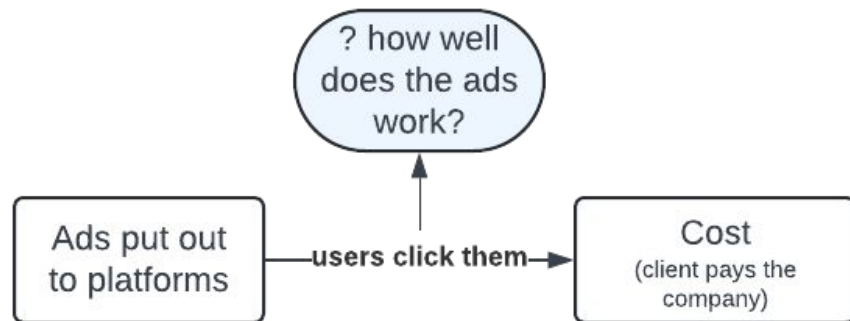
**Lessons Learned**



# 01 Introduction

## Context:

- Worked at Beijing EMAR, an Internet advertising company as Data Scientist Intern
- Clients pay the company for users clicking their ads



## Problem:

- Ad materials had **inconsistent cost tracking** over 4 platforms, and there was **no systematic way to evaluate ads put out efficiency** for optimization.

# 02 Objectives



## Streamline

Streamline data extraction and cleaning for cost analysis of advertising materials.



## Identify

Identify when does cumulative spending on specific ad materials reaches specific target.



## Summarize

Automate updates to the database with processed data for analysis by ad optimizers.

# 03 Data Overview

## Data

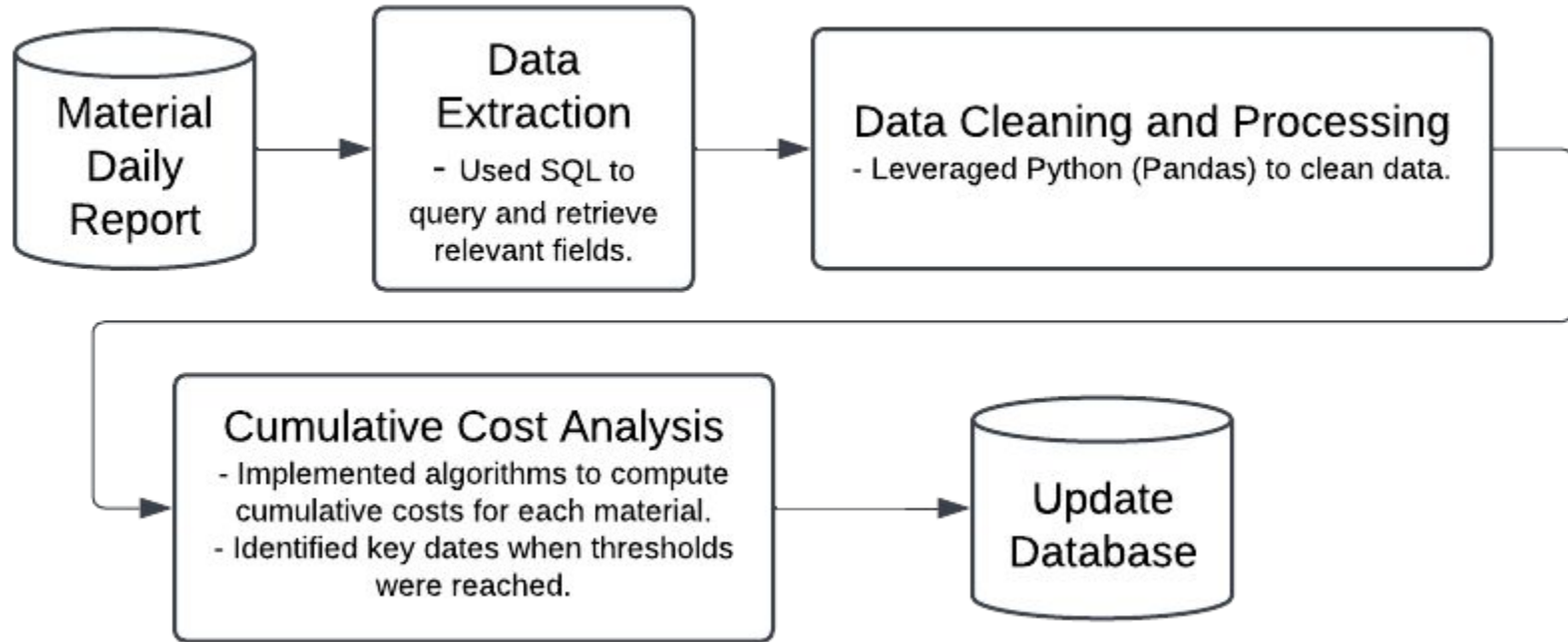
- Over 3 million database entries
- 6 tables [relational database]
- Variables
  - Material id
  - Cost
  - Date
  - Platform
  - Ad type

## Challenge

- Missing and inconsistent data [different material id]
- Large-scale data requiring efficient processing
- Complex table relation

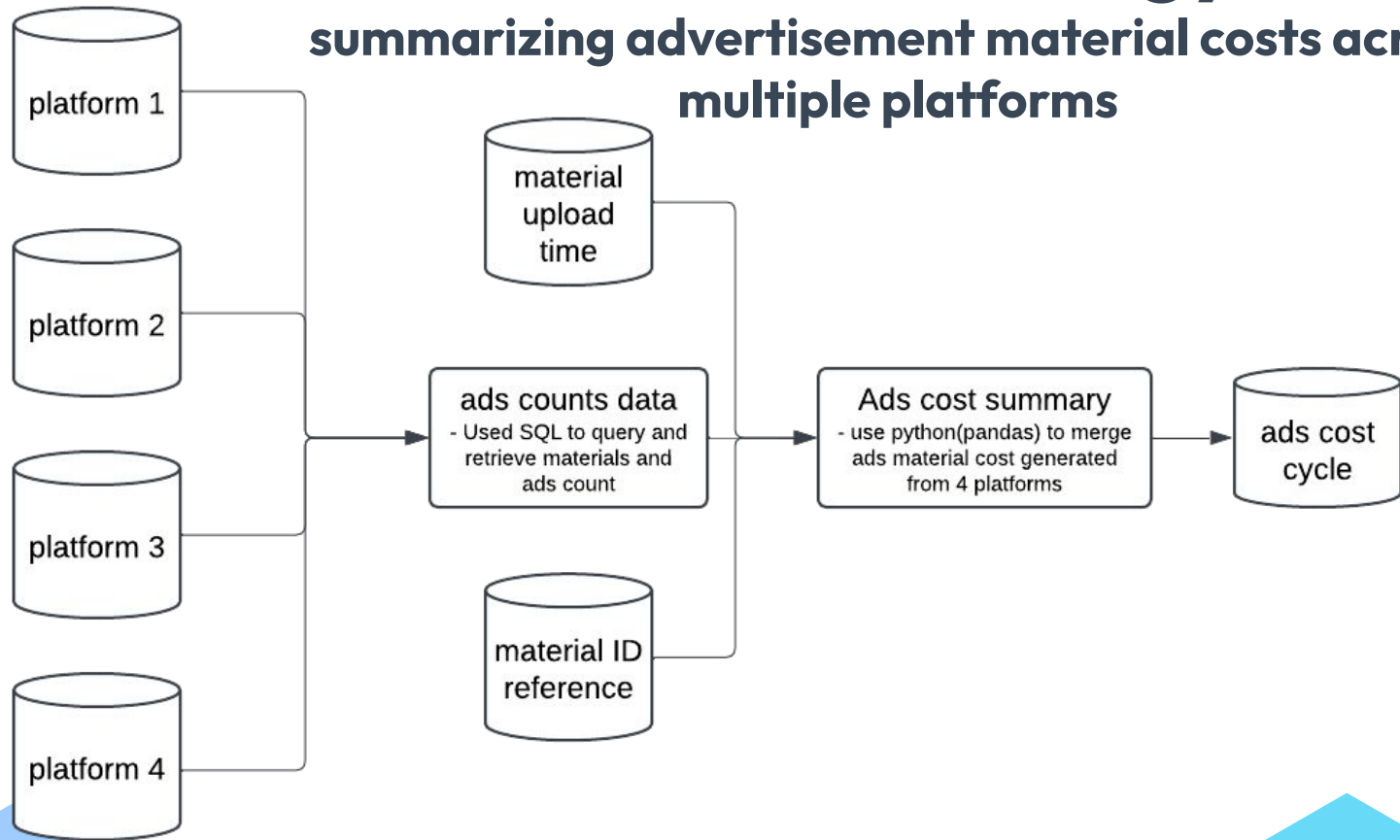
# 04 Methodology

Finding the date when material costs reach a certain target



# 04 Methodology

**summarizing advertisement material costs across multiple platforms**



# 05 Business Impact



## Efficiency Gains

- Reduced manual data entry by 40%, enabling faster decision-making
- Enhanced campaign efficiency through data-driven budget adjustments



## Actionable Recommendations

- Provide backend support for implementing automated cost monitoring dashboards for real-time insights





## 06 Lessons learned

- Importance of **clean and consistent data** for meaningful analysis.
- Hands-on experience using **SQL and Python** to handle large datasets
- Bridging **technical insights** with **actionable business strategies**
- Transparent and timely **communication** with teams

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# Thanks!

Do you have any questions?

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# Dashboard Demo

- Cost
- Cost by each optimizer/department
- Gross margin
- Material counts
- Trend (over day/week/month/quarter)