

LIVESTREAM SHOPPING: ANALYTICAL DASHBOARD DEVELOPMENT

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INTRODUCTION

ANALYTICAL DASHBOARD

What is the problem:

- Unified analysis that goes across livestream platforms is not available for livestream merchants and platform manager. They need to access multiple platforms to gather data.
- Lack of a tool to compare livestream campaigns among the other merchants and other platforms.

Why is it important:

- Live streaming is growing market and running an efficient campaign is critical for merchants.
- Providing attractive platform is important for platform managers.

OUR APPROACH

How does it Work:

- Load data from third-party live-commerce data agencies.
- Aggregate the data into Dashboard database
- Process data with SQL then Python
- Organize and visualize data in Tableau for Descriptive Analytics
- Predict campaign revenue via scikit-learn models & Flask

Why it solves the Problems:

- MERCHANTS can view all data on one dashboard
- User can compare different platforms

What is New:

- Visualized dashboard** that allows you to easily analyze your campaign, trend and products across platforms on one screen.
- Group the products** across all platforms and analyze its **attractiveness or profitability**.
- Estimate the Revenue** of marketing campaigns via Machine Learning

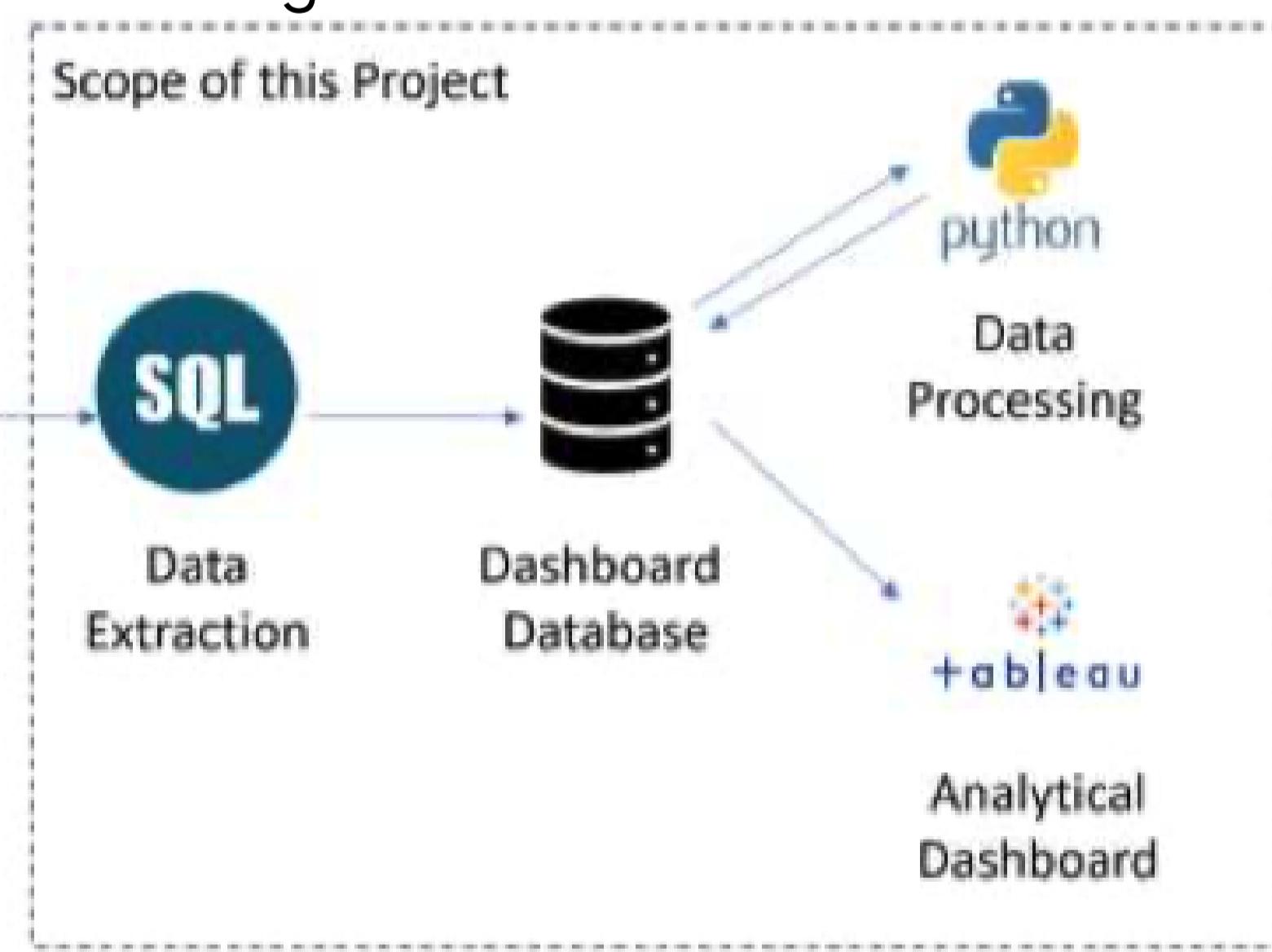
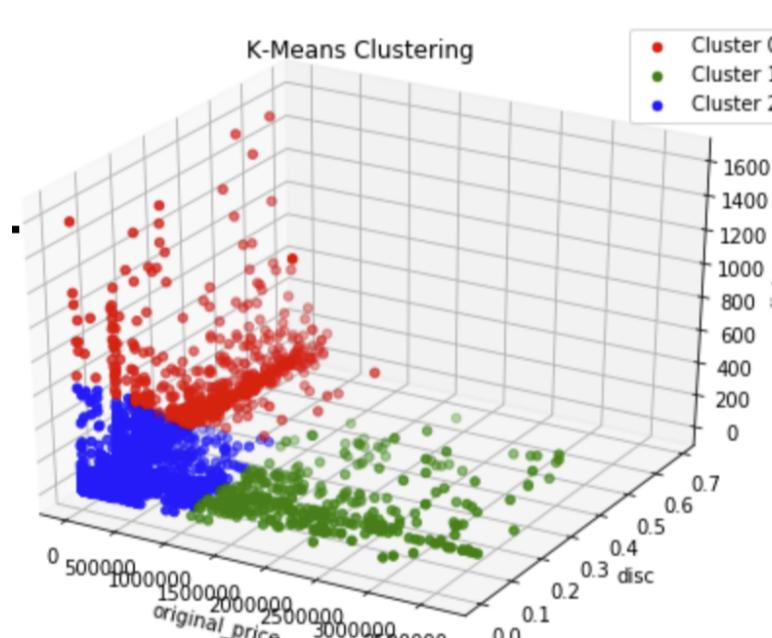


Figure 1 - Project System Design

DATA WE USED

How Data was Collected:

- Sourced from diverse channels, encompassing third-party data agencies like live.ecomm-data.com
- Data includes prominent e-commerce platforms such as Naver, 11st Street, Kakao Shopping, CJ Onstyle, and H Mall.

Characteristics of the data:

- Viewer Activities**: Viewing time, likes, chat participation, and IP addresses, categorized by merchant, campaign, and user.
- Clicks**: Product clicks and banner activities
- Product information**: brand, price, discount, links etc
- Campaign information**: status, start time, run time, title etc



EXPERIMENTS

Evaluate our approach:

- Analytical Dashboard
 - Usability test - Total 10 respondents; User type of 3 platforms, 2 streamers, 2 merchants, and 3 streamers/merchants.
 - Received feedbacks through questionnaire.
- Revenue Prediction tool
 - Prediction Performance (MSE & r^2) - 7 models, 5-CV, Grid Search on 2+ hyper parameters per model
 - Usability - HCI Heuristics (Structure, Consistency, Minimalist, Instructions, Error Recovery)

Compare to other methods - Novel & Unique:

- Our method is unique in visualizing comprehensive e-commerce data across several platforms.
- No prediction or forecasting tools in existing streaming platform analytics dashboards. No prediction tools covering all platforms.

RESULTS

1. User testing :

- Overall usability was "Agreed" to be useful for all types of users.
- Key menus should be different depending on the user type.

2. Campaign Revenue prediction

- Models covering **ALL platforms**, rather than individual had better performance.
- 'Best' model for ALL platforms - **Random Forest**, $r^2 = 0.19$
- Further improvements → data lacks **other predictor variables** (audience demographics, streamer trust, product types) for models to distinguish between 'similar' campaigns.

Marketing Campaign Performance Prediction Tool - All Platforms

This model covers ALL streaming platforms. Random Forest, $r^2 = 0.191106$

INSTRUCTIONS:
1. Enter the values for the predictor variables below.
2. Click estimate revenue for a marketing campaign revenue estimate in USD

Viewers:
*typical range of viewers is 520 to 266270. Units = count

Pageviews:
*typical range of pageviews is 613 to 293050. Units = count

Viewtime:
*typical range of viewtime is 24.35238 to 960.02037. Units = seconds

Chats:
*typical range of chats is 0 to 105875. Units = count

Likes:
*typical range of likes is 0 to 225468. Units = count

Clicks:
*typical range of clicks is 17 to 150736. Units = count

Estimate Revenue

The estimated revenue of the marketing campaign is \$164735.53