Development Process

Planning and Analysis

Project Initiation

The project is aim to design a real world application that perform sentiment analysis and market research base on social media data.

The goals are increase the productivity of individuals and SMEs by reducing the resources they need for product and market research.

For the timelines, there are 3 stages of the project. First, research and implementation of LLM for sentiment analysis .Second, develop the high level architecture of the platform, including UX and UI design. Third, implementation and testing of the platform.

Regarding the stakeholders and corresponding role, Jeffery responds for market LLM research, Hayden responds for UX and UI design and Chevy responds implementation.

Feasibility Study

Tech Stack

Overview

- Backend: Flask, SQLAlchemy
- Frontend: HTML, CSS, JavaScript, Apex Charts
- Database: SQLite
- Machine Learning: Hugging Face Transformers (RoBERTa)
- Containerization: Docker

System Overview

The high-level architecture of the platform, is receiving product or subject input from user, then we collect social media data regarding the product/subject, finally generate sentiment analysis and metric.

Platform Workflow Overview
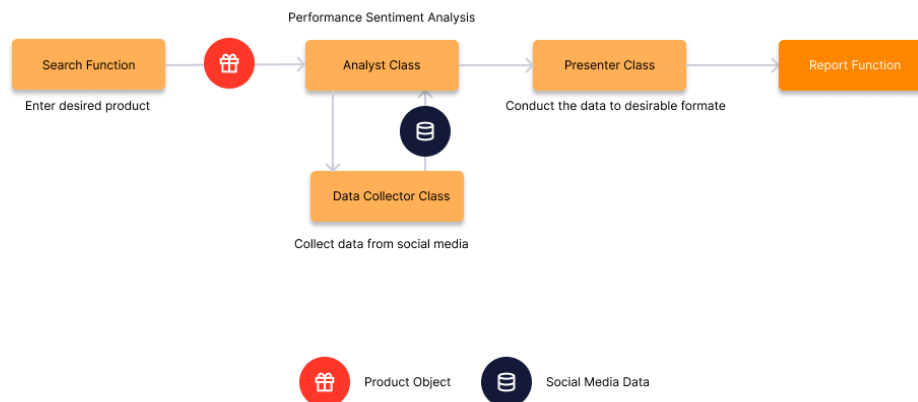
For the search function design, the platform will send a check request to the database first before collecting data from internet, in order to shorten the response time.

Here's the search and report page of the platform

emo

Hello
What product are you looking for ?

Product Name ✕

Search

Sign in or sign up to save to unlock more functionality

Sign in   Sign up

emo

iPhone 16
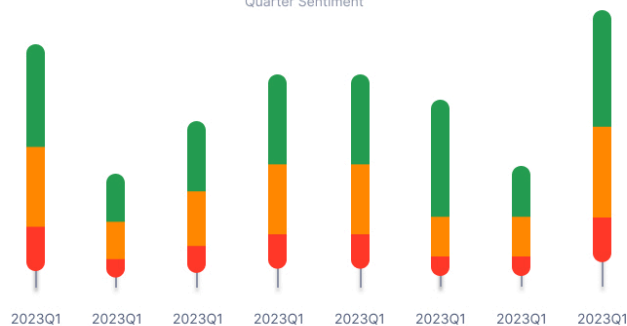## Sentiment Analysis Report

Overall Sentiment

Summary

The iPhone 16 improved battery life, like enhanced processing power and new display technology, such as higher refresh rate or new design elements.

Quarter Sentiment

2023Q1   2023Q1   2023Q1   2023Q1   2023Q1   2023Q1   2023Q1   2023Q1

emo

Subject ▾   Period ▾   Source ▾   District ▾   Content Type ▾

⊗ iphone 16 pro   ⊗ Last Month   ⊗ Reddit   ⊗ Thailand   ⊗ Comments

Result

The camera quality on the new flagship models is simply outstanding! It's amazing how smartphones have evolved to capture professional-quality images. (1 Jun 2025)

The battery life of this phone is quite disappointing. I find myself needing to charge it multiple times a day, which is really inconvenient. (30 May 2025)

I've encountered several bugs since I got this phone. Apps tend to crash unexpectedly, and it's frustrating to deal with these glitches. (31 May 2025)

I love the variety of accessories available for this phone. From cases to wireless chargers, it's easy to personalize it to my style. (19 May 2025)

2023Q1   2023Q1   2023Q1   2023Q1   2023Q1

Product Sentiment Table

Products	Price	QTY	Sentiment (%)	Trend
Samsung Galaxy S25	$1,299	10	Positive (60%)	↑
Apple iPhone 16 Pro Max	$1,199	20	Positive (65%)	↑
Google Pixel 9 Pro XL	$1,099	12	Neutral (55%)	→
OnePlus 13	$799	10	Negative (55%)	↓
Xiaomi 15 Ultra	$1,199	12	Positive (57%)	↑
Oppo Find X8 Pro	$999	10	Negative (48%)	↑
Samsung Galaxy S25	$999	19	Negative (70%)	→
Apple iPhone 16 Plus	$1,299	10	Positive (55%)	↑
Google Pixel 9 Pro	$899	10	Neutral (66%)	↑
Nothing Phone 3a Pro	$499	10	Negative (65%)	↓

Development Process

Backend Development

1. Set up Flask and Blueprint for modularity

2. Implement models for Search, Product, and Sentiment_table using SQLAlchemy

3. Implement the data_collector class that collect social media posts and comments and pass to the analyst class.

4. Implement the analyst class that integrate the RoBERTs model for sentiment analysis with the data collected from data_collector class and save the result as sentiment_table model in the database

5. Develop the presenter class to process and format data for visulization.

Frontend Development

1. Designed the UI using HTML and CSS

2. Used ApexCharts for interactive visualizations (e.g. sentiment bar chart, time series trends).

3. Styled the navigation bar and sidebar for a clean and responsive layout.
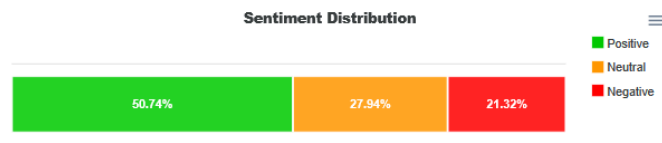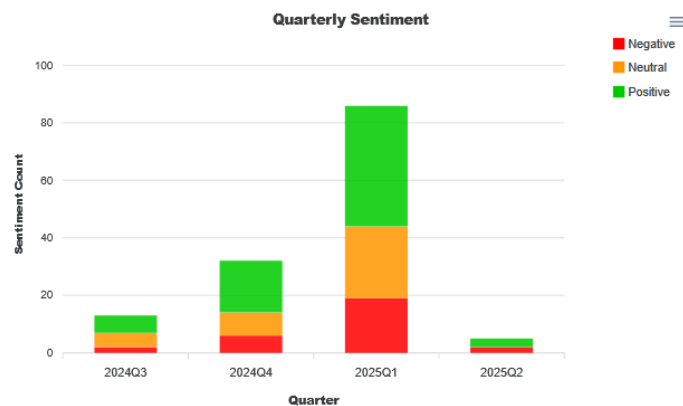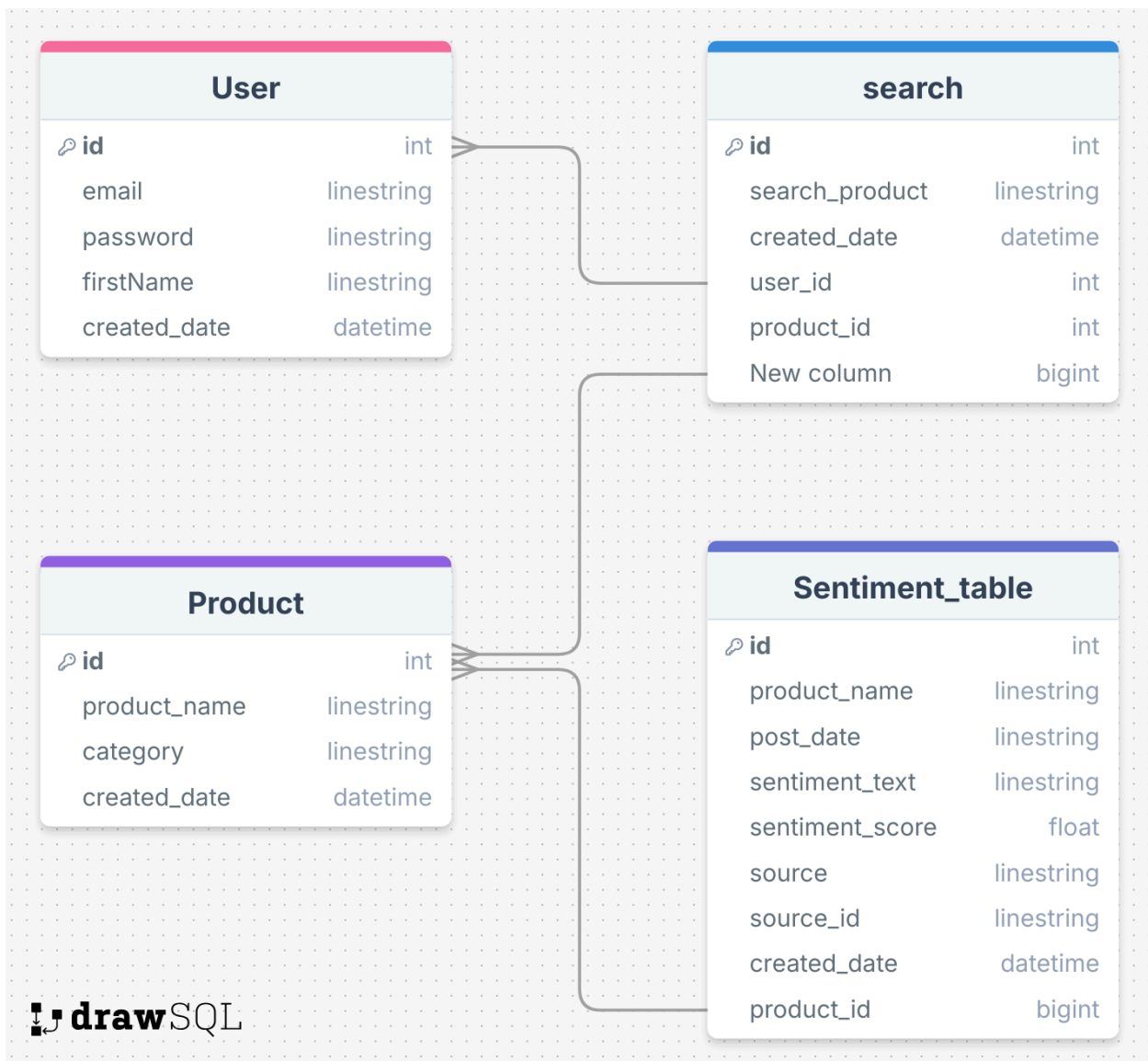
Database

1. Used SQLite for local development

2. Created relationships between User, Search, Product, and Sentiment_table models.

System Design

There are three main classes: the analyst class, data collector class, and presenter class.

The analyst class receives product objects from the search function and passes them to the data collector class to gather social media data.

The data collector class handles the logic of data collection, including data limits and time periods, to optimize the platform's response time.

The presenter class formats data for visualization.

The presenter class queries the database for product data and reshapes it for HTML rendering.

Platform Workflow Overview