



SURVEY DATA AI/ML SENTIMENT ANALYSIS

CAL STATE LA: ECST CAPSTONE SENIOR DESIGN PROJECT

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PROJECT OBJECTIVE

The project aims to develop an AI/ML-powered Quality Management System (QMS) that analyzes survey responses related to examinee and staff appointments. The system will determine positive or negative ratings, generate key performance indicator (KPI) data, and display data on a dashboard. Additionally, it will create incident tickets for all negative responses with ratings less than 3.

As a bonus feature, the system will incorporate Generative AI chat capabilities to provide aggregate data trends and insights while ensuring compliance with HIPAA and protecting Personally Identifiable Information (PII).



PROJECT SCOPE

Develop an AI/ML-powered Quality Management System (QMS) to analyze survey responses, generate KPI data, and provide insights through a dashboard and Generative AI chat.

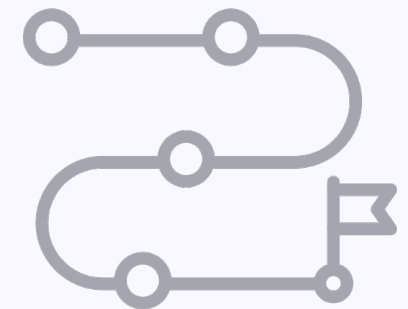
Interpret requirements and design a solution for these users: Quality Management staff, Customer Experience Staff and operations users.

Develop Key Features:

- 1) Sentiment analysis of survey responses (scores and written).
- 2) Dashboard displaying KPI data and insights.
- 3) Automatic creation of incident alert (e.g. to be used to generate a ticket) for negative responses (ratings less than 3).
- 4) Bonus: Generative AI chat for securely querying aggregate data trends and insights.

PROJECT MILESTONES

- 1) Project Initiation**
- 2) Requirements Gathering/Analysis**
- 3) System Design**
Design Review/Approval
- 4) Development Phase 1**
Implement AI/ML models for sentiment analysis. Develop dashboard and reporting features
- 5) Development Phase 2**
Integrate secure and privacy compliant Generative AI chat functionality
- 6) Testing Phase**
Unit & integration testing
- 7) Deployment**
UAT and user training
- 8) Project Presentation**
Deliverables, sign-off and lessons learned



HIGH-LEVEL REQUIREMENTS



FUNCTIONAL REQUIREMENTS

Sentiment Analysis - Analyze survey responses (scores and written) to determine positive or negative ratings. Generate incident tickets for responses with ratings less than 3.

Dashboard and Reporting - Display KPI data on a user-friendly dashboard. Provide insights on common low and high scores, top negative and positive survey trends, issue categories, and resolution categories.

Incident Management - Automatically create alert and track incident tickets for negative responses. *Bonus: Provide resolution suggestions for similar negative scores.*

Generative AI Chat - Enable users to inquire about aggregate data trends and insights. Ensure compliance with HIPAA and protection of Personally Identifiable Information (PII).

NON-FUNCTIONAL REQUIREMENTS

Performance - The system should process and analyze survey responses in real-time. Dashboard and reports should load within 2 seconds.

Security - Ensure data encryption in transit and at rest. Implement role-based access control (RBAC) to protect sensitive information.

Scalability - The system should handle increasing volumes of survey data without performance degradation. Support for future enhancements and additional features.

Usability - The user interface should be intuitive and easy to navigate. Provide comprehensive user documentation and training materials.

Compliance - Ensure compliance with HIPAA regulations. Protect Personally Identifiable Information (PII) at all times.

SENTIMENT ANALYSIS OVERVIEW

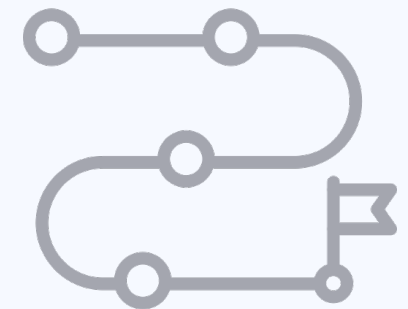


The sentiment analysis feature provides sentiment labels (e.g. **negative, neutral and positive**) based on the highest **confidence score** found by the service at a survey response text-level. This feature must return confidence scores between 0 and 1 for each response for positive, neutral and negative sentiment.

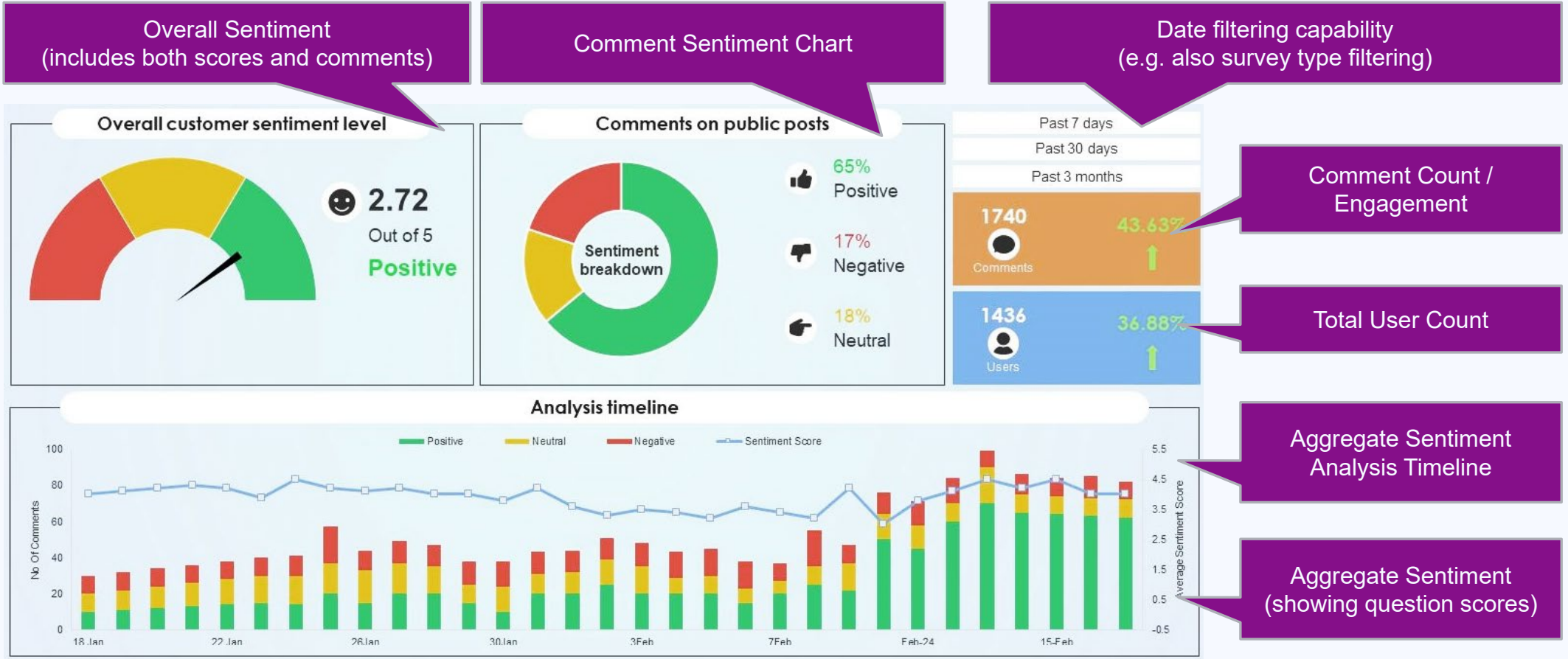
“The **exam** was **quick** and **easy** and the **location** was **impeccably** clean.”

- target
- expression

Sentence sentiment	Opinion	Opinion
Positive Confidence: 100% Positive: 100% Neutral: 0% Negative: 0%	Target: exam Expression: Quick (Positive:100%) Juicy (Positive:100%)	Target: location Expression: Quick (Positive:100%) Juicy (Positive:100%)



DASHBOARD SAMPLE – FOR INSPIRATION ONLY





QUESTIONS?