

SENTIMENT ANALYSIS FOR HOTELS USING COMPUTER VISION

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Abstract: The aim of sentiment analysis using machine learning is to identify the sentiment of a feedback provided by the customers to determine the emotion justified in parts of speech. The sentiment of a customer to hotels is a key part to understand the sentiment of the services provided by them. The purpose of this project is to build a dashboard to analyse customer reviews based on their experience with a hotel. The dashboard allows the hotel to get analytical insights such as top delights and quality of service that is being provided to the customer and what the customer thinks about the services provided. This way, hotels can have an effective way of evaluating the quality of their service.

Keywords: Sentiment Analysis, Hotel assist, Hospitality

I. INTRODUCTION

Sentiment analysis is one of the natural language processing fields, dedicated other exploration of subjective opinions or feelings collected from various sources about a particular subject. Sentiment analysis is a predominantly classification algorithm aimed at finding an opinionated point of view and its disposition and highlighting the information of particular interest in the process. Sentiment analysis is the general definition of opinion: “a view or judgment for med about something, not necessarily based on fact or knowledge.” As, from the data science stand point, an opinion is much more than this. On the one hand, it is a subjective assessment of something based on personal empirical experience. It is partially rooted in objective facts and partly ruled by emotions. On the other hand, an opinion can be interpreted as a sort of dimension in the data regarding a particular subject. It is a set of signifiers that in combination present a point of view, i.e., aspect for the particular issue. Thinking about it as if it was one of the rings of Saturn.

II. LITERATURE SURVEY

Our day-to-day life has always been influenced by what people think. Ideas and opinions of others have always affected our own opinions. The explosion of Web 2.0 has led to increased activity in Podcasting, Blogging, Tagging, Contributing to RSS, Social Bookmarking, and Social Networking. As a result, there has been an eruption of interest in people to mine these vast resources of data for opinions. Sentiment Analysis or Opinion Mining is the computational treatment of opinions, sentiments and subjectivity of text. We take a look at the various challenges and applications of Sentiment Analysis. We will discuss in details various approaches to perform a computational treatment of sentiments and opinions. Various supervised or data-driven techniques to SA like Naïve Bays, Maximum Entropy, SVM, and Voted Perceptron’s will be discussed and their strengths and drawbacks will be touched upon. We will also see a new dimension of analysing sentiments by Cognitive Psychology mainly through the work of Janyce Wiebe, where we will see ways to detect subjectivity, perspective in narrative and understanding the discourse structure. We will also study some specific topics in Sentiment Analysis and the contemporary works in those areas.

III. MODEL DESIGN

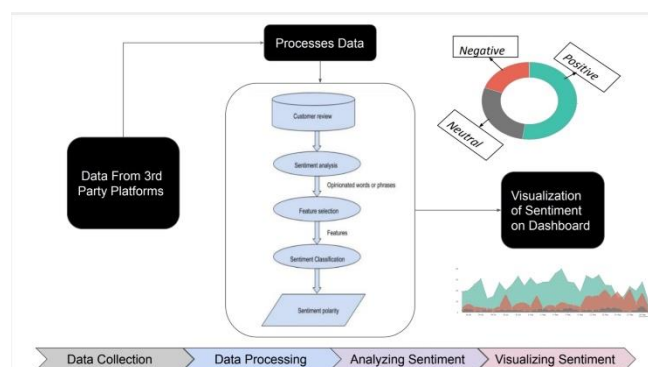


Fig1: Model design phase diagram

The model follows a simple design structure.

Data Collection: User Data can be collected through various sources from 3rd party feedback platforms like Google reviews. We accumulate the feedback provided by customers on different platform. **Data Processing:** We process the collected data through a data filtering mechanism to make sure there are no unnecessary or irrelevant data and noise in the collected data. This phase also involves developing a model that does better than a baseline model with model training. Choosing a measure of success deciding on an evaluation protocol. And finally scaling up the developed model. **Analysing Sentiment:** This process involves mainly feeding the processed data through our model to perform sentiment analysis and polarizing the sentiment through our trained model, classifying the sentiment into positive, negative and neutral sentiment. This also involves using algorithms like Rule Based Approach and Automatic Sentiment Analysis. **Visualization of Sentiments on the Application Dashboard:** We finally curate all of processed data and its sentiment on a dashboard to provide analytical insights to the Hotels.

The 4 steps of implementation:

- Step 1: Install nodejs and npm package.
- Step 2: Install Elixir.
- Step 3: Install Mongo DB.
- Step 4: Create Project and install dependencies.

IV. TECHNICAL ARCHITECTURE

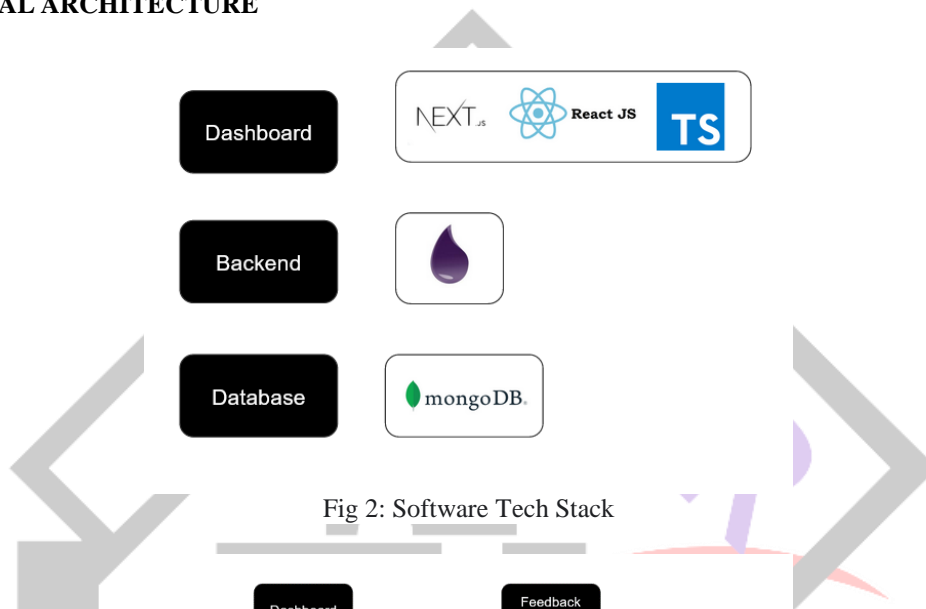


Fig 2: Software Tech Stack

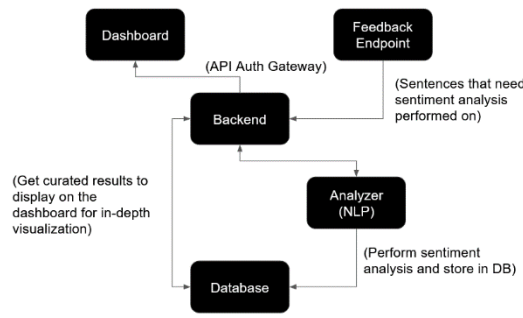


Fig 3: Software Architecture

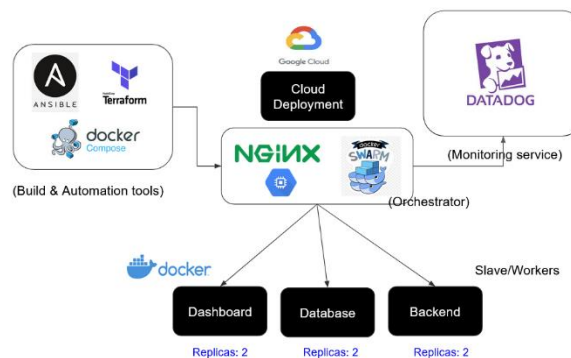


Fig 4: Cloud Architecture

Technical Description:

- NextJS- It is an open-source React front-end development web framework that enables functionality such as server-side rendering and generating static websites for React based web applications.
- ReactJS- It is JavaScript library used for building reusable UI components. According to React official documentation, following is the definition – React is a library for building compassable user interfaces. It encourages the creation of reusable UI components, which present data that change over time.
- Elixir- Elixir is a functional, concurrent, general-purpose programming language that runs on the BEAM virtual machine used to implement the Erlang programming language.
- Google NLP API- The Cloud Natural Language API provides natural language understanding technologies to developers, including sentiment analysis, entity analysis, entity sentiment analysis, content classification, and syntax analysis.
- MongoDB- MongoDB is a source-available cross-platform document-oriented database program. Classified as a NoSQL database program, MongoDB uses JSON-like documents with optional schemas.
- Google Cloud Platform (GCP)- Google Cloud Platform (GCP), offered by Google, is a suite of cloud computing services that runs on the same infrastructure that Google uses internally for its end-user products, such as Google Search, Gmail, file storage, and YouTube.

V. RESULTS:

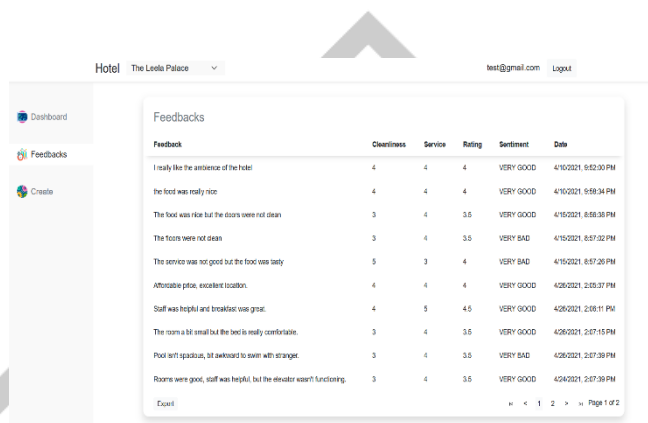


Fig 5: Feedbacks

Description: The above snapshot shows the feedback of the user or customer.

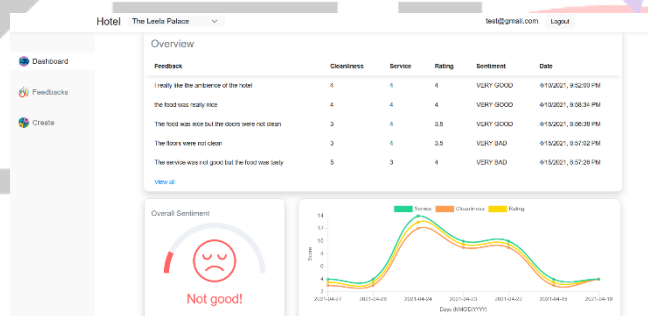


Fig 6: Feedbacks

Description: The above snapshot shows the Dashboard overview.

VI. CONCLUSION

Sentiment analysis will provide you with valuable insight into customers’ perceptions of your brand. That type of feedback will help you improve your brand and keep you out of trouble. Nowadays, the quality of the product is not the only thing that matters. Brand reputation and values play an important role as well. More and more, customers are realizing that they hold power by choosing where they spend their money. And that choice is often influenced by the brand’s position on certain topics. 57% of millennial women say that their purchase decisions are driven by a brand’s values and stance on issues that are important to them. Media monitoring can help you understand your customers wants and needs better, and put you on the right side of issues. Sentiment analysis is an incredibly valuable technology for businesses because it allows getting realistic feedback from your customers in an unbiased (or less biased) way. Done right, it can be a great value-added to your systems, apps, or web projects.

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