Amazon Cell Phone Review Sentiment Analysis

Milestone 1: Project Initialization and Planning Phase

The **Project Initialization and Planning Phase** marks the start of the "Amazon Cell Phone Review Sentiment Analysis" project, defining its goals, scope, and identifying stakeholders. This phase lays the foundation for the project, sets realistic timelines, allocates resources, and includes a risk assessment and mitigation strategy. Effective project initiation ensures smooth execution and alignment with the objectives during development.

Activity 1: Define Problem Statement

Problem Statement: In today's competitive market, understanding customer feedback is crucial for cell phone manufacturers. This project aims to analyze Amazon reviews of cell phones to extract customer sentiments (positive, neutral, or negative). By leveraging machine learning and sentiment analysis, the system will help identify key areas for improvement and highlight trends in customer satisfaction.

Analysis of Amazon Cell Phone Reviews Problem Statement Report: Click Here

Activity 2: Project Proposal (Proposed Solution)

The project, "Amazon Cell Phone Review Sentiment Analysis," aims to classify reviews using machine learning algorithms like Random Forest and VADER sentiment analysis. The proposed solution will help manufacturers and marketers gain insights into product reception, focusing on aspects like customer satisfaction and feature performance.

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Analysis of Amazon Cell Phone Reviews Project Proposal Report: Click Here

Activity 3: Initial Project Planning

Initial planning involves setting up project goals, defining the scope, and preparing a workflow for data collection, text preprocessing, sentiment classification, and

model development. Timelines are set to ensure efficient execution, and risks related to data quality and model performance are addressed in the planning phase.

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Milestone 2: Data Collection and Preprocessing Phase

This phase focuses on gathering reviews from Amazon and ensuring the data is clean, organized, and ready for analysis. The raw reviews are preprocessed to remove noise, convert text to lowercase, and apply techniques like stemming and vectorization.

Activity 1: Data Collection Plan

Data is sourced from Amazon's cell phone reviews dataset. The dataset is checked for duplicates and missing values, ensuring high data quality for machine learning.

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Analysis of Amazon Cell Phone Reviews Data Collection Report: Click Here

Activity 2: Data Quality Report

The **Data Quality Report** outlines the steps taken to clean the review dataset, including removing irrelevant information (e.g., special characters) and ensuring proper data format for analysis.

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Analysis of Amazon Cell Phone Reviews Data Quality Report: Click Here

Activity 3: Data Exploration and Preprocessing

Exploratory analysis of the reviews includes analyzing word frequencies, review lengths, and sentiment distributions. Preprocessing involves using TF-IDF vectorization and handling bigrams to prepare the text for model training.

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Analysis of Amazon Cell Phone Reviews Data Exploration and Preprocessing Report: Click Here

Milestone 3: Model Development Phase

This phase includes selecting and training models like Random Forest for sentiment classification. VADER sentiment analysis is used for understanding customer feedback trends.

Activity 1: Feature Selection Report

This activity outlines the selection of text-based features like word frequency, n-grams, and sentiment scores, explaining their impact on the overall model performance.

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Analysis of Amazon Cell Phone Reviews Feature Selection Report: Click Here

Activity 2: Model Selection Report

The **Model Selection Report** explains the strengths of models like Random Forest in text classification. It compares model performance and justifies the final model selection based on accuracy, recall, and F1-score.

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Analysis of Amazon Cell Phone Reviews Model Selection Report: Click Here

Activity 3: Initial Model Training and Evaluation

This activity involves training the Random Forest classifier and validating it using metrics like accuracy, precision, and F1-score. The evaluation report shows how well the model predicts sentiments in the review data.

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Milestone 4: Model Optimization and Tuning Phase

This phase fine-tunes the Random Forest model by optimizing hyperparameters, improving model accuracy, and refining sentiment classification.

Activity 1: Hyperparameter Tuning Documentation

Hyperparameter tuning focuses on optimizing parameters like the number of estimators and maximum depth to enhance the model's ability to classify sentiments accurately.

Activity 2: Performance Metrics Comparison Report

This report compares model performance before and after tuning, highlighting improvements in metrics like precision and recall for each sentiment class (positive, neutral, and negative).

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Activity 3: Final Model Selection Justification

The justification explains why Random Forest was selected as the final model, based on its high performance in sentiment classification, ease of implementation, and robustness.

Milestone 5: Project Files Submission and Documentation

For project submission, all files including model code, data preprocessing scripts, and the Flask web application code will be uploaded to GitHub. Proper documentation is included to ensure ease of understanding for stakeholders.

Analysis of Amazon Cell Phone Reviews Project Files Submission and Documentation: Click Here

Milestone 6: Project Demonstration

In the **Project Demonstration**, a video will showcase the working Flask application, explaining how users can submit reviews and receive sentiment analysis and ratings. The video will cover the project workflow, code structure, and model performance.