MSDS 25.4 Project Proposal: Voice of Market (VoM)

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Executive Summary

This project aims to analyze customer sentiment on Costco's products and services using public social media data. By employing advanced natural language processing (NLP) and sentiment analysis techniques, we will deliver actionable insights for product and service improvements. The solution includes a user-friendly interactive dashboard and an AI-powered summarization chatbot, enabling stakeholders to explore key insights dynamically. These tools will help Costco merchandise products aligned with customer preferences, offering a competitive edge in the retail industry.

Introduction

Costco, a leader in wholesale retail, seeks to enhance its understanding of customer sentiment regarding its products and services. While platforms like Reddit, X, and Instagram offer rich data, current methods lack automated tools to harness these insights effectively. Leveraging NLP and sentiment analysis, this project will provide scalable solutions for data-driven decision-making.

Problem Statement

Our team will analyze public social media data of Costco's services to extract customer sentiment, preferences, and trends. Using NLP, the project will address the absence of actionable tools that translate these insights into recommendations. The end goal is a scalable solution comprising a sentiment analysis report, a knowledge graph, and an AI-driven summarization chatbot.

Proposed Solution
 Our approach includes:

1. **Data Collection**: Using APIs and web scraping tools like BeautifulSoup and Selenium to extract data from platforms such as Reddit, Instagram, and X.
2. **Preprocessing**: Cleaning and segmenting the data for relevance and quality assurance.
3. **Sentiment Analysis**: Leveraging natural language processing models, using python libraries like NLTK and deep learning models for contextual and nuanced sentiment understanding. This combination allows us to capture both general sentiment trends and intricate variations in customer feedback, ensuring a deeper and more accurate analysis.
4. **Visualization**: Developing a dashboard with Python libraries like Plotly or a tool like Tableau.

Deliverables and Timeline

- **Week 5**: Completion of data collection and preprocessing.
- **Week 12**: Sentiment analysis and knowledge graph development.
- **Week 15**: Delivery of an interactive dashboard.
- **Week 18**: Final deliverables and presentation, including a cleaned dataset, analysis report, and reusable NLP models.

Conclusion
The project opens a completely different level of leveraging the potential of unstructured social media data. Using NLP-sentiment analysis techniques, we reveal detailed insight into consumer behavior, catch the emerging trend or the new set of changing customer preferences. Other than recommending actionable items in each business cycle, this activity sets up an enabling, forward-compatible platform for scalability to which Costco can iteratively add further refinement and more capability.

It places Costco at the forefront of AI-driven customer insight and assures relevance in an ever evolving retail environment. The decision-makers will be empowered to make data backed choices, anticipate market demands, and strengthen customer relationships. This can be a powerful enterprise wide system driving innovation across not just customer satisfaction but also operations and marketing at Costco as we go forward.

With the expertise of our team and a strategic roadmap for the project, we believe in the delivery of a transformative solution to support Costco's long-term vision toward customer-centric growth and operational excellence.