

Automated Market Survey: AI Voice Calls with MarketMind (FYP24041)

Project Plan

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Background

Market surveys play a crucial role in understanding consumer preferences and behaviors, providing businesses with valuable insights to inform strategic decisions. Currently, traditional market surveying methods involve human employees manually conducting phone interviews with respondents. While this approach has been the standard for many years, it presents several significant drawbacks:

1. **High Costs:** Employing staff to conduct surveys can be expensive, especially for large-scale projects where numerous respondents must be contacted.
2. **Labor and Time-Intensive:** The manual nature of traditional surveys means that data collection can be slow and cumbersome, leading to delays in obtaining vital market insights.
3. **Emotional Responses:** Human interviewers may inadvertently provoke emotional reactions in respondents, which can skew the results and diminish the reliability of the data collected.
4. **Human Error:** The potential for miscommunication, misinterpretation, and recording errors can compromise the integrity of the survey results.

Given these challenges, the need for an automated market surveying tool has become increasingly apparent. By leveraging advanced artificial intelligence technologies, including large language models (LLMs), text-to-speech, and speech-to-text capabilities, this project aims to revolutionize the market surveying process.

The desirability of this project stems from the rapidly evolving market landscape, where timely and accurate consumer insights are paramount for competitive advantage. Businesses are increasingly seeking innovative solutions that not only enhance operational efficiency but also deliver more reliable data. By implementing an automated market surveying tool, organizations can streamline their research processes, reduce overhead costs, and ultimately make data-driven decisions that align with consumer needs.

Objective

The primary objective of this project is to develop an automated market surveying tool that addresses the limitations of traditional methods. This tool will:

1. **Reduce Costs:** By automating the survey process, the need for a large workforce is diminished, leading to significant cost savings.
2. **Enhance Efficiency:** The automation will allow for faster data collection and analysis, enabling businesses to gain insights more quickly and respond to market demands in a timely manner.
3. **Minimize Bias:** An AI-driven approach reduces the risk of emotional influences and biases that can arise from human interactions, leading to more objective and reliable results.
4. **Improve Accuracy:** Advanced speech recognition and processing capabilities will minimize errors associated with manual data collection, ensuring high-quality data.

Methodology

Our strategy includes integrating various large-scale models to meet our goals. Upon receiving the streamlined audio from the customer, we will convert it into text using a speech-to-text model. We plan to employ large language models to generate appropriate responses based on the received text. Subsequently, we will use a text-to-speech model to convert the generated text into audio. In addition, we will evaluate the local market's responses using a sequence classifying model. Moreover, we will collect user feedback on our models to progressively enhance the performance of the large language models.

Each stage entails numerous technical details, with the primary concern being how to reduce the inference time of different models to minimize response latency. Trade-offs between sound quality and generation speed may be necessary. We aim to experiment with popular models such as Speechify, Coqui, and OpenAI for text-to-speech conversion, balancing effectiveness and speed to meet our requirements. We also seek to enhance the professionalism of queries by training models on various market survey dialogues. This process may involve fine-tuning the models or engaging in prompt engineering to optimize their effectiveness. We will establish a database to efficiently manage data and derive market insights based on user query responses.

Schedule

- ❖ 1 Sep 2024 to 30 Nov 2024:
 - Establish a framework and focus on basic functionalities without major involvement with Large Language Models (LLM).
 - Utilize APIs to address most text-to-speech and speech-to-text challenges.
 - Collect relevant data for training the LLM.

- ❖ 30 Nov 2024 to 31 Jan 2025:
 - Fine-tune the LLM to enhance question and response quality and professionalism.

- ❖ 31 Jan 2025 to 31 Mar 2025:
 - Enhance the part related to market data analysis, visualizing the current market situation based on user responses.

- ❖ 31 Mar 2025 onwards:
 - Deployment phase: Implement the system in production.
 - Maintenance tasks and model updates based on user feedback for iterative improvements.