Assessing Impact of Government Policies on Vulnerable Populations

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1 PROBLEM STATEMENT

"**Policymakers** need to **assess the impact of their policy on vulnerable populations** because understanding the impact of policies is crucial for determining whether they effectively support vulnerable groups or exacerbate their challenges."

For this, we are developing a chat-bot to assess the impact of government policies on vulnerable populations, as it presents a critical need to address disparities and ensure equitable policy outcomes. The project aims to create a conversational system capable of collecting data on government initiatives, understanding their implementation, and assessing effects on vulnerable populations, supporting policymakers and marginalized communities.

2 IMPORTANCE OF THE PROBLEM

In many societies, low-income individuals, ethnic minorities, and other vulnerable groups continue to experience disproportionately negative outcomes as a result of government policies that inadequately consider their unique needs and circumstances. Without effective mechanisms to evaluate policy impacts through an equity lens, these disparities are likely to persist, exacerbating social and economic inequality. Moreover, the COVID-19 pandemic has further highlighted the urgency of addressing systemic inequities, as vulnerable populations have been disproportionately affected by the health, economic, and social impacts of the crisis. The dire need to develop a chatbot to assess the impact of government policies on vulnerable populations is underscored by the persistent and often widening disparities marginalized communities face. Therefore, there is an urgent need to develop innovative tools like chatbots that can provide policymakers with actionable insights to identify and address disparities, ultimately working towards more equitable and inclusive policy outcomes that uplift all members of society.

3 PAST WORK

1. Context-based News Articles Retrieval using CLSM
Paper: Link
Information:

According to (Anamalamudi and Reddy 2021), the context-based analysis method implemented can help us analyze the tweets/news and understand the context of a tweet as to why a policy went so bad or so good. The CLSM model extracts contextual features from both queries and documents. It represents queries and documents as sequences of words and utilizes convolutional and max-pooling layers to capture local and global contextual features at the word and sentence levels, respectively.

2. A Government Decision Analytics Framework Based on Citizen Opinion
Paper: Link
Information:

We can use the Bayesian Predictive Process model to predict citizens' opinion for a new proposal. Analyzing sentiments from existing data will make policy makers draft a better policy.

3. Policy Impact and Evaluation
Paper: Link
Information:

Policy impacts can be assessed and differentiated from this work. Both immediate and futuristic impacts are now well defined. Now, we can provide weights for different types of impact and rank them for our information retrieval.

4 NOVELTY

A vast body of literature exists on retrieving information about government policies. On the contrary, there needs to be more literature on methods to assess the impact of government policies. The novelty of this project lies in its innovative use of technology, particularly chatbots, to determine the impact of government policies on vulnerable populations. By leveraging natural language processing and data analytics, the chatbot provides policymakers with real-time, data-driven insights into how policies affect marginalized communities. Additionally, the project incorporates stakeholder engagement and feedback mechanisms to ensure that the voices of those most affected are heard.

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5 METHODS

It involves a combination of natural language processing (NLP), machine learning, data collection, and analysis tools:

- The Python library Tweepy is employed to facilitate data extraction from Twitter. Tweepy provides convenient access to the Twitter API, enabling the efficient scraping of tweets about government policies.
- For data extraction from government websites, Beautiful-Soup, a Python library for parsing HTML and XML documents, is utilized. BeautifulSoup is a popular choice for web scraping due to its ability to parse various documents.
- Once the data is extracted, the Python library Pandas is used for data manipulation and analysis. Pandas provides robust tools for cleaning and analyzing the scraped data, preparing it for further processing.
- The sentiment analysis of the tweets and text from government websites uses Natural Language Processing (NLP) libraries such as NLTK, SpaCy, or transformers from Hugging Face. These libraries provide comprehensive tools for text analysis, including sentiment analysis.
- The chatbot is built using a framework like Rasa or Dialog Flow. These frameworks provide tools for designing conversational flows and handling user inputs, enabling the creation of a responsive and interactive chatbot.
- Python web frameworks such as Flask or Django are used to create a web application for the chatbot. These frameworks provide tools for building robust web applications facilitating the deployment of the chatbot.

6 EVALUATION CRITERIA

(1) We will classify the Twitter tweets for which there is information about policy. We will use precision, recall, and DCG to evaluate that classification has been done accurately.

(2) We will assess the accuracy of our trained data model, and how accurately and precisely it is able to gather the impacts of policies from the tweets using BERT.

(3) Evaluate the accuracy of the chatbot in assessing the impact of government policies on vulnerable populations. Compare the chatbot's analyses with established metrics and expert evaluations to ensure the reliability of its assessments.

(4) Measure user engagement with the chatbot, including the number of interactions, frequency of use, and duration of sessions.

7 CONTRIBUTIONS

(1) Literature Review: Arpan, Daksh, Tony, Kajol, Riya, Atharv
(2) Data extraction using API and web scraping: Arpan, Atharv
(3) Preprocessing and data analysis: Riya, Kajol
(4) Design and development of chatbot: Arpan, Daksh, Tony

8 REFERENCES

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