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Introduction

TECHNATION's hackathon presented the challenge of answering the question "How can technology help businesses stay healthy during the pandemic?" The prompt was broad and required us to narrow our scope significantly in order to produce any practical results, particularly given our limited time frame. To make use of our diverse backgrounds, we decided to look at the project through political, economic and software development lenses. We found that this challenge presented a unique opportunity to analyze how technology could be used to aid effective evidence-based policy making during Covid-19. Our goal is to reduce the gap between what businesses need and what government aid programs provide in order to ensure the best prioritization and utilization of resources.

The Problem

The Covid-19 pandemic has placed an unprecedented level of economic strain on businesses this year. Smaller businesses and minority-owned businesses, which were already vulnerable, have seen a disproportionate impact. The U.S Chamber of Commerce reported that 78% of minority-owned businesses were concerned about permanently closing over the summer compared to 52% on non-minority-owned businesses [B]. The takeaway here is not that only minority-owned businesses need help. It is that Covid-19 relief programs should aim to help all businesses, but they should prioritize helping those that are most vulnerable to sinking. The issue is that a gap exists between what policy is providing and what minority groups —which are often the most disadvantaged— need. In her paper, "Minority Political Engagement and Representation in the United States", Jessica Carew shows how governments fail to facilitate political engagement amongst minorities and consequently fail to reflect minority interests in policy [3]. Carew's paper focuses on the U.S, but her conclusions can be directly applied to the Canadian system, which faces the same defects.

The problem, therefore, is quite clear. The needs of minority-owned businesses, which are facing disproportionate impact from the pandemic, are less likely to be addressed by aid policy because there is no effective system in place to engage their voices.

Our Solution

Solutions to this problem exist across all levels. However, as two university students, we are limited in what we can do. While it would be great to re-design the electoral system so it may proportionately and adequately represent minority needs, we cannot do that. What we can do, however, is create a system through which business owners, minority and non-minority, can be engaged and listened to in order to shape policy programs that will truly fit their needs.

Listen AI aims to do this through an information gathering campaign that would be conducted through the social media platform Twitter. We want to directly hear from as many business owners about what they're struggling with and what they need from government aid programs in order to remain healthy during this pandemic. Our AI system will comb through these tweets by searching for the relevant hashtags and key words like "business, relief, covid-19, minority-owned"[1] in order to analyze what people's main concerns and priorities are. The results can then be presented to policy makers so that they may better integrate the public's needs into their relief plans.

Digital Campaign and Information Gathering

We wanted out solution to enable direct information gathering. This is a new element in the world of politics and policy. The public has never had a direct line to legislators, and has historically relied on voting, town halls, and even protesting to voice their opinions and needs. In the age of social media, this has the potential to change. On Twitter, users of all demographics have access to an even platform from which to speak.

The first step of our plan is a digital marketing campaign that would inform business owners that they should tweet their concerns, needs, and anything else they want policy makers to hear regarding the Covid-19 pandemic. Such a campaign would be easy to organize and promote through social media channels and news outlets. The use of a specific hashtag would allow users to easily identify and share the campaign and their input. Sample digital poster for the campaign are shown below. Variations of the posters would highlight our interest in hearing from minority-owned and female business owners in order to especially encourage members from these traditionally underserved groups to participate.

[1] A full list of search queries used can be found in Appendix A

AI System: Easy to Implement and Use

The code we have developed will search all tweets using the program hashtag “shapingbusinessrelief” in addition to all tweets containing the key words mentioned above and in Appendix A. This process is conducted using the Twitter API v2: Early Access program. We accessed this using Python scripts which were deployed to Microsoft Azure virtual machines. We then anonymize the data, and store the tweets in a PostgreSQL database. Our algorithm will read through these tweets and identify the common phrases and sentiments expressed in the tweets. used python scripts to run microsoft azure cognitive services to perform text analytics such as sentiment analysis, opinion mining and named entity recognition. Microsoft Azure cognitive service to assign sentiment scores to analyze whether the writer was feeling

positive, negative, or neutral. Opinion mining looks at the trend amongst wide groups of people to determine the average feeling amongst a group and determine what the majority is feeling. Name entity pulls out names of businesses or people that come up a lot.
To display the gathered information, we would deploy a python API to return data to an informational dashboard written using the Bootstrap and React frameworks. Because of time limitations, we were unable to do this final step.

Ensuring Accessibility

Since our solution aims to serve all businesses, ensuring easy accessibility was of paramount importance. A post by Alistair Duggin for the UK Government presents an excellent definition of accessibility in government. Duggin says, “[accessibility] means that people are empowered, can be independent, and will not be frustrated by something that is poorly designed or implemented.” In order for our system to be accessible, it needs to be “perceivable, understandable, operable, and robust” and ensure “there aren’t any barriers that make it impossible or difficult for anyone to use it”. [A]

Twitter is a widely used app that is free, easy and fast to sign-up for, and simple to navigate. The app is popular with users of all demographics and can be used in all languages. We therefore feel secure in saying that by using this platform, we are ensuring the greatest level of accessibility for all business owners to participate.

Results & Next Steps

Given the time limitation of this hackathon, the time pressures of our university student schedules, and our limited technological resources, we weren’t able to complete Listen AI the way we had envisioned. We were obviously unable to conduct the actual digital campaign, so we tested our AI program on general tweets that fit the aforementioned requirements. UnfortunateluSince one of the goals of our digital campaign is to have people voice specific concerns and needs they have, the general tweets we used to test the code lack the specificity we need to reach solid conclusions about possible policy implications. We were nevertheless able to analyze the general sentiment of the tweets. We ended up collecting and processing 1613 tweets by Canadian business owners discussing the effects of the pandemic over the past week. Through our program, we found that on average 48% of Canadians felt positive about the pandemic and the relief measures being taken, 19% felt neutral and 33% felt quite negative.

Concerningly, 3% of tweets demonstrated extreme mental distress, mentioning suicide and depression. While the tweets weren't specific enough to tell us why business owners feel this way and how they think aid programs could better help them, they did show that the stress business owners are facing is real and needs immediate and effective attention.

The Bigger Picture

Our goal was to design a system that could be used to address the needs of businesses during the Covid-19 pandemic. Our system could have broader applications, however. The gap between policy and public needs could be narrowed through more direct engagement initiatives like this one. Historically, civic engagement and participation has largely been limited to individuals with the resources like time, money, skills, and knowledge to participate. Minorities and members of lower socioeconomic classes have been furhter marginalized as a result of not having equal access to these resources. If policy makers cannot learn about the unique problems faced these groups, they are unable to create solutions to fix them. A simple system like ours, with almost no barriers of entry, would allow these tradtionallly disenfranchised voices to be heard. This could help shape policy regarding resource allocation long after this pandemic is over.

References

[A] https://accessibility.blog.gov.uk/2016/05/16/what-we-mean-when-we-talk-about-accessibility-2/

[B]https://www.uschamber.com/press-release/coronavirus-pandemic-hits-minority-owned-small-businesses-disproportionately-hard-new

[C] Minority Political Engagement and Representation in the United States.

Appendix

Appendix A: Full list of search queries used

```
# query = "(canada OR british columbia OR vancouver OR toronto OR GTA OR ontario) (covid OR COVID-19 OR coronavirus) business -is:retweet"
# query = "(alberta OR calgary OR edmonton OR montreal OR quebec OR nova scotia OR newfoundland) (covid OR COVID-19 OR coronavirus) business -is:retweet"
# query = "(NWT OR yukon OR yellowknife OR whitehorse OR PEI OR gatineau OR victoria) (covid OR COVID-19 OR coronavirus) business -is:retweet"
#  query = "(canada OR british columbia OR vancouver OR toronto OR GTA OR ontario) (covid OR COVID-19 OR coronavirus) (business OR economic impact) -is:retweet"
#  query = "(PoC OR WoC OR women" and "business OR economic) and (Canada OR BC OR British Columbia) -is:retweet"
```