

**Analyzing Filipino Netizens' Perspectives on GMA's Artificial Intelligence Sportscasters
Through Topic Modeling and Sentiment Analysis of Facebook Post Comments**

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Artificial Intelligence (AI) is the term used to describe computational tools that can perform certain tasks that are able to substitute for human intelligence. With its ever-evolving abilities and advancements, AI has been transforming industries and changing how humans approach complex tasks and problems. However, even with the many opportunities it could offer to make people's work faster and easier, AI may still present a serious threat to mankind which includes people's overreliance on them.

In Tyson and Kikuchi's article highlighting Pew Research Center's findings, it is revealed that 52% of Americans express a greater sense of concern than excitement regarding the growing prevalence of artificial intelligence. Their analyses have indicated that Americans' concerns about AI include a preference for maintaining human control over these technologies, skepticisms about the transformative impact of AI, and a caution towards the rapid integration of AI within fields like health and medicine (Tyson & Kikuchi, 2023).

In academic institutions across the Philippines, AI has also been a prominent issue where students are observed to rely on ChatGPT for doing their course tasks and requirements, sparking concern among educators about the risk of cheating and potentiality to undermine the integrity of the learning process (Chi, 2023). This issue was not deemed particularly significant for many Filipino netizens until the use of AI as sportscasters was spotlighted by GMA News.

A pioneering force in the Philippine's broadcast industry, GMA Network, spearheaded the future of sports broadcasting by introducing the first-ever AI-powered sportscasters in the country. The digital project was launched on September 24, 2023 at the opening of the National

Collegiate Athletic Association (NCAA) Season 99, naming these AI sportscasters, Maia and Marco. These AI sportscasters were featured in various Facebook pages with a multitude of users reacting and sharing their thoughts about it. Some were impressed with the new innovation, but there were others who opposed the idea.

To provide an understanding of how this transformative technology is received within the online community, particularly Facebook, in the Philippines, an exploration of discourse topics and analysis of sentiments were conducted. Specifically, this paper seeks to answer three questions:

- What are the perceptions of Filipino netizens on the use of generative AI in sportscasting, generally in journalism?
- What specific discourse topics emerged in this particular issue?
- How do Filipino netizens collectively respond to this matter based on their sentiments?

Methods

Data Collection

For building the textual corpus, five Facebook posts introducing GMA's new AI sportscasters, which garnered the most comments, were selected—two posts from GMA News, two from GMA Sports PH, and one from iMPACT Leadership.

To collect the comments and replies to comments from these posts, a third-party application called Facepager was utilized. Facepager fetches publicly available data from different platforms, such as YouTube, Twitter, Reddit, and Facebook, and offers default presets that can be applied based on the data that need to be retrieved. In this case, the "Get comments" preset for Facebook was applied. After that, all the necessary data was exported as a CSV file.

In total, 21,203 comments were retrieved from different public Facebook users.

Data Translation

Since the comments were written in a combination of Filipino, English, and other Filipino languages (such as Tagalog, Bisaya, Ilocano, and more) and most Natural Language Processing (NLP) resources were limited to English and other high-resource languages, all the comments were translated to English in order to utilize the necessary resources for analyzing the dataset. Rather than using commonly used machine translation packages for NLP, like Google Translate, ChatGPT 3.5 was utilized because it performs better in terms of accuracy and contextual understanding of the text than other translators (Dreibelbis, 2023; Timothy, 2023).

Data Preprocessing and Cleaning

The comments collected still contain unnecessary data that had no relevant meaning for the analysis even after translation. With that, the dataset was pre-processed and cleaned through the following procedures:

1. Remove Facebook mentions (assuming that mentions are usually at the beginning of a comment and the usual name length of users is at most three).
2. Transform all letters to lowercase.
3. Remove non-alphanumeric characters, links, emoticons, and emojis.
4. Remove stopwords in English, Filipino (for entries not completely translated to English), and other possible stopwords the module employed did not recognize, such as word contractions and other frequent words that might not be beneficial for the analysis.
5. Lemmatize verbs, adjectives, and nouns.
6. Remove trailing spaces and leading whitespaces in each entry.
7. Remove all rows with empty entries after cleaning.

Topic Modeling

Topic modeling is a type of statistical modeling that identifies themes or topics that occur within a collection of documents (University of Pennsylvania, 2023). Latent Dirichlet Allocation (LDA) was the topic modeling technique used for this analysis which discovers and builds topic per data model and words per topic model, modeled as Dirichlet distributions (GeeksforGeeks, 2021).

To find the ideal number of topics to be analyzed, an experiment was conducted, visualizing different numbers of topics from three to six through the pyLDAvis.



Figure 1-a: *LDA with three topics*



Figure 1-b: *LDA with four topics*

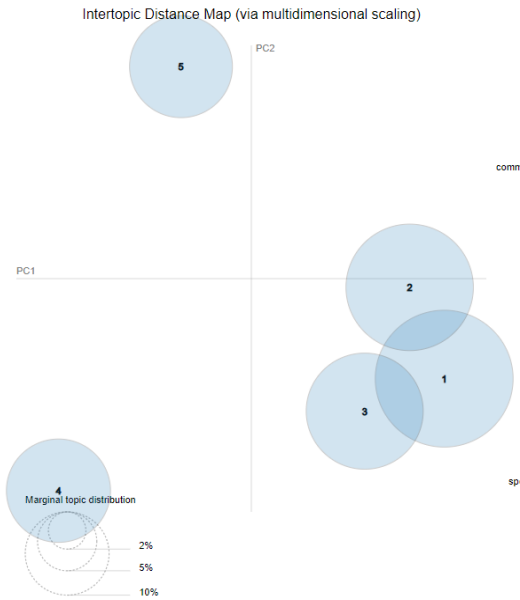


Figure 1-c: LDA with five topics

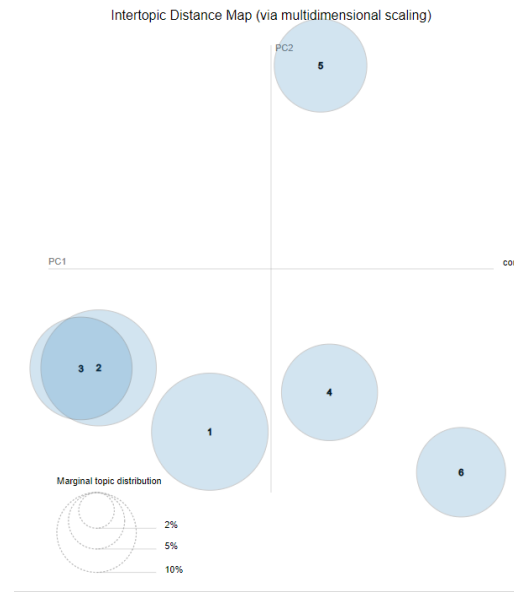


Figure 1-d: LDA with six topics

Based on the results, it had been decided that Figure 1-b with 4 topics was to be chosen because, compared to the others, it had the maximum number of topics that had the least amount of intersection as determined through optical inspection. Figure 1-a with 3 topics had topics that have large marginal topic distributions; They were not niche enough. Figure 1-c and 1-d with 5 and 6 topics, respectively, had small marginal topic distributions but they intersect considerably with other topics; Labeling them would make variants of a single topic.

In addition, the relevance metric tool, which controls how the words for a topic are sorted, was adjusted to (lambda) $\lambda = 0.6$ since it was found to be the optimal value for interpretable results.

Sentiment Analysis

Sentiment analysis is an automated process capable of understanding the feelings or opinions that underlie a text, obtaining viewpoints from it in human language to determine if a given text is neutral, negative, or positive, (Poriyath & Joseph, 2021). In this study, sentiment analysis enables us to mine data and extract the feelings behind social media conversation, to

comprehend how Filipino netizens are discussing the subject. Two resources were used for this analysis:

1. *VADER (Valence Aware Dictionary for Sentiment Reasoning)*

VADER is a rule-based sentiment analysis tool that calculates sentiment scores, specifically expressed in social media. This sentiment score relies on a lexicon that acts as a dictionary that maps word to sentiment intensities. This is employed to determine the degree of both positive and negative feeling in the comment. The negative, neutral, and positive scores all add up to 1 and cannot be negative. The compound score essentially measures the overall sentiment of the comment. If the compound score is negative, the sentiment is negative. On the other hand, a positive-value compound score would mean a positive sentiment. For neutral sentiment, a compound score would show a zero.

2. *NRC (National Research Council) Lexicon*

NRC Lexicon is another sentiment analysis approach to offer a wider range of emotions, not only to positive and negative sentiments. This tool associates with basic emotions such as fear, joy, sadness, surprise, disgust, anger, and anticipation. Like VADER, this relies on a lexicon. This sentiment analysis tool provides scores for each emotion for a more comprehensive analysis on the emotional context of the comment.

Topic-Based Sentiment Analysis

The sentiment analysis was narrowed down to the topics identified by LDA. For this part, VADER was used as a tool for sentiment analysis. This helps the researchers determine how each topic or aspect may affect the overall sentiment.

Results and Analysis

Topic Modeling

Topic Labels	Most Relevant Terms
Topic 0: Emotions towards AI and of AI	emotion, thing, scary, great, think, player, lack, feel, wrong, life, happen, expression, human, artificial, intelligence
Topic 1: AI replacing human jobs or Humans losing jobs their to AI	job, people, lose, like, replace, real, good, look, creepy, human, soon, okay, robot, guy, newscaster
Topic 2: Mass communication students' emotions (and/or attitudes) towards the issue	news, communication, mass, student, study, ugly, journalism, graduate, broadcast, bad, sad, caster, idea, ellen, comm
Topic 3: Cost-cutting or Saving money over hiring humans to work.	right, work, human, use, money, maybe, need, pay, save, people, want, sportscaster, future, reporter, hire

Table 1: Topic Labels and Their Most Relevant Terms

Topic 0: Emotions towards AI and of AI

Based on the words most associated with the first topic, it seems that this topic revolves around emotions. However, looking into the comments that were assigned under this topic, this

topic involves two parts, which are the emotions of people towards AI and the emotions portrayed by AI.

Emotions towards AI refers to how they feel about AI as sportscasters. Many comments associated with this part alone express their fear towards the innovation, often conveyed through the word “scary.”

Meanwhile, emotions of AI refers to its lack of it, which does not pass the requirement deemed by the netizens in sportscasting. They believe that sportscasting should involve emotions, passion and love for the game, which makes sports special to them and which AI cannot capture. As one comment said:

AI as sportcaster? 🤔 While technology continues to amaze us, I can't help but feel that some things are best left to the human touch. Sports broadcasting is about passion, emotion, and the thrill of the game. Let's not lose that unique human connection that makes sports so special!

In comments where these two parts are combined, the lack of emotions from AI often causes people's emotions towards AI. For instance:

- a. “Paano ka nyan aaliwin kung walang emotion ang casting pag mag kaka score ang players.”
- b. “Ai lack with emotions and common sense and self analysis..not so excited with this so called hype...”

Topic 1: AI replacing human jobs or Humans losing their jobs to AI

The second topic being mostly associated with the words "job," "people," "lose," "replace," "human," and "robot" shows that it is clearly about AI replacing human jobs or humans losing their jobs to AI. The comments under this topic often predict and express their

worry, disappointment or dissatisfaction on the possible reality that AI might replace human work in the future. For example:

- a. “Grabe. Imbes na trabaho ng tao, naging trabaho ng AI.”
- b. “...the amount of jobs that will be lost to AI in all fields will still outnumber the jobs the rise in AI will produce in the near future. Expect millions of people fighting for limited jobs once this becomes widespread not just in mass media.”
- c. “Sorry for the actual people qualified for this job. But that's life. Soon, more industries will fade and shift because of this. Doing so on live TV broadcast sublimely normalizes the aggravating situation.”

Topic 2: Mass communication students' emotions (and/or attitudes) towards the issue

For the third topic, words such as "news," "mass," "communication," and "student" along with "ugly," "bad," and "sad" indicate that this topic has to do with mass communication students' emotions towards AI as sportscasters. Being faced by the same possible reality—of being replaced by AI in the future—comments under this topic shows mass communication students being dispirited on taking their current course and being alarmed by the situation of their future careers.

- a. “As a Communication Graduate, this is sad and alarming. It's one of the dark sides of innovation and technology, especially for students in the field of journalism. 😞 Hold the line, folks.”
- b. “This is so amazing, GMA News! What about us future journalists?”
- c. “It's sad to think that some mass communication students study hard to become broadcasters or sportscasters, and then there's this hahahahahhahahahaha it hurts.”

Topic 3: Cost-cutting or Saving money over hiring humans to work.

With "human," "money," "pay," "save," and "hire" as the words associated with the fourth topic, it means that the topic is about cost-cutting, particularly saving money instead of hiring people to work. Comments under this topic speculate that businesses and companies opt for using AI in the workforce rather than hiring actual humans because it is cheaper to maintain AI technologies rather than pay human workers their proper salary.

- a. “Nagtitipid? Maraming mahuhusay na sportscasters. Sana para sa opening lang ito.”
- b. “Ayaw na nila mag hire ng tao para tipid kaya ai nalang.”
- c. “mga bagay na hindi naman kailangan gawan ng AI, ginawa lang para makatipid sa sweldo.”
- d. “Tuwang Tuwa ang mga big companies makaka tipid talaga sila”

Sentiment Analysis

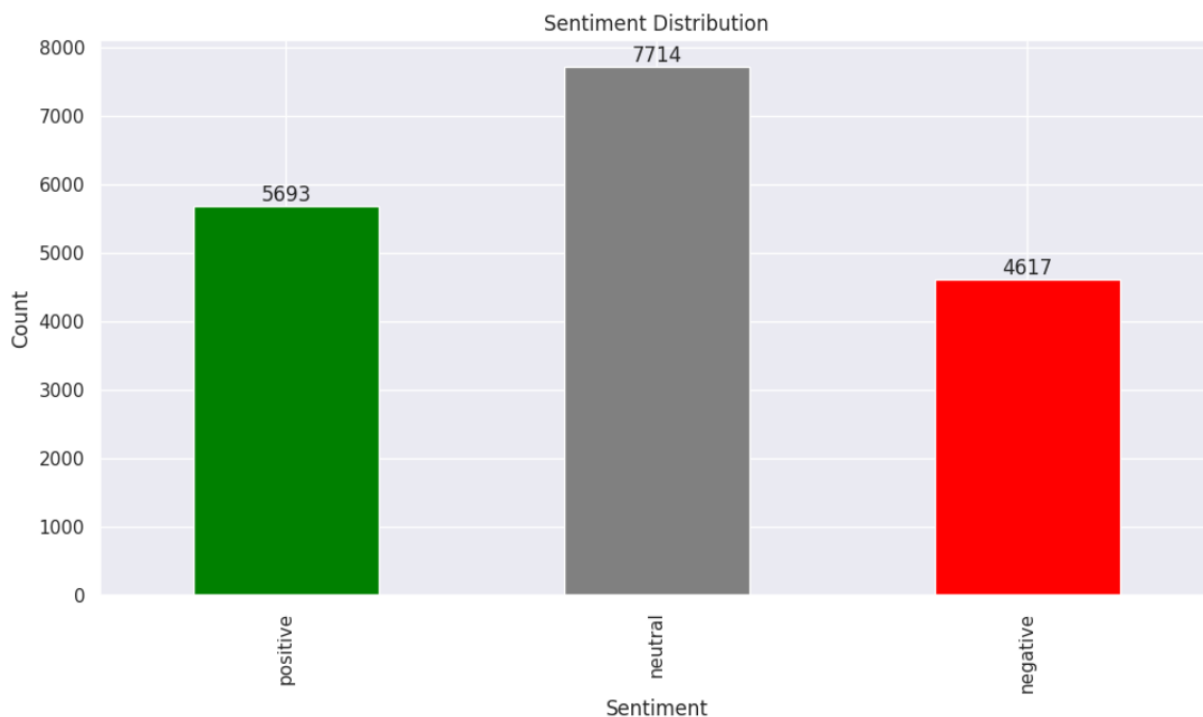


Figure 1: *Sentiment Distribution from Using VADER*

Figure 1 utilizes a bar graph to visualize and help us track the count of each sentiment. As shown, positive sentiments generated 5,693 counts which is higher than the negative sentiment count of only 4,617. Neutral sentiment, having 7,714 counts, generated the highest among the three.

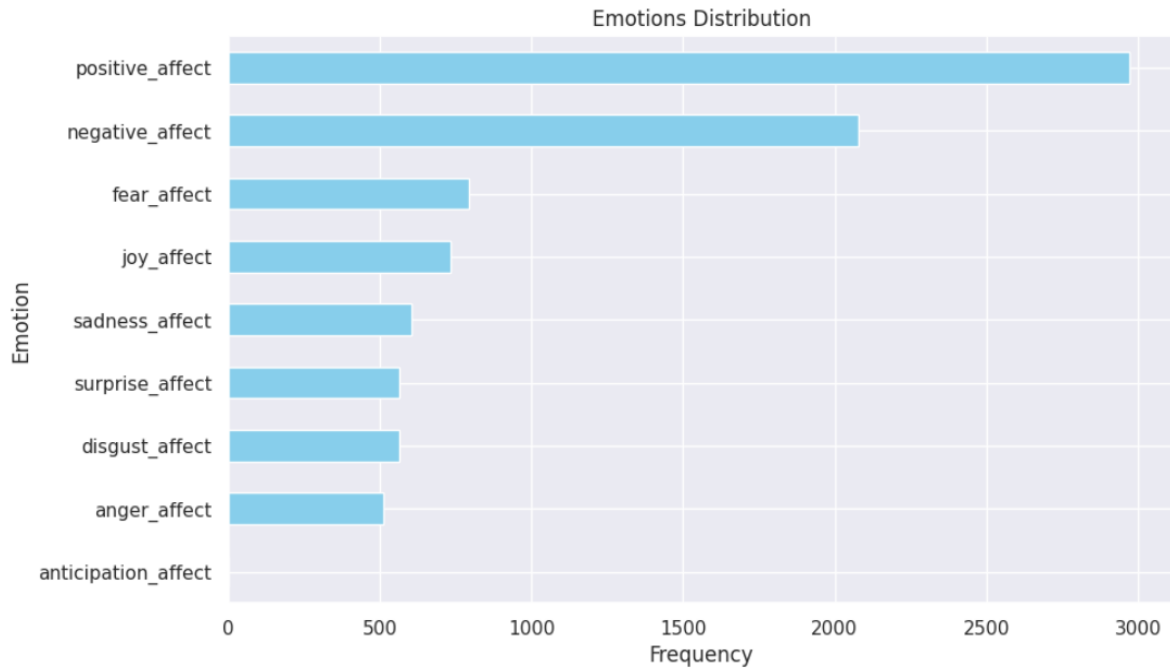


Figure 2: *Sentiment and Emotions Distribution from Using NRC Lexicon*

Figure 2 utilizes a bar graph that visualizes the distribution of each sentiment and emotion. As shown, positive sentiment yielded the highest among the others, followed by negative, fear, joy, sadness, and so on.



Figure 3: Word Clouds of Each Sentiment and Emotion from Using NRC Lexicon

Figure 3 shows the word clouds that clearly distinguishes that the words ‘people’, ‘lose’, ‘job’, and ‘replace’ stand out prominently from almost all of the emotions.

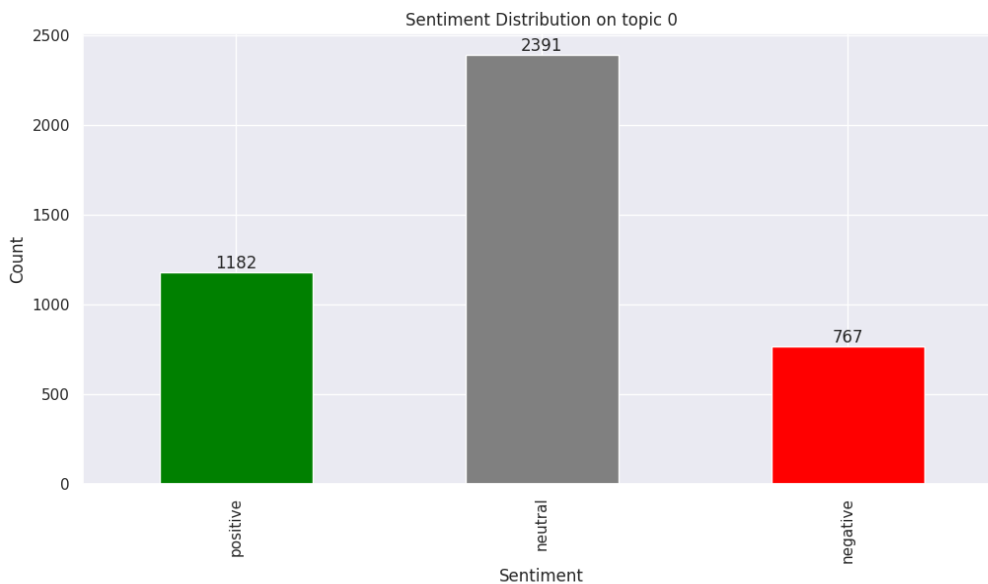


Figure 4-a: VADER sentiment analysis on the topic: “Emotions towards AI and of AI”

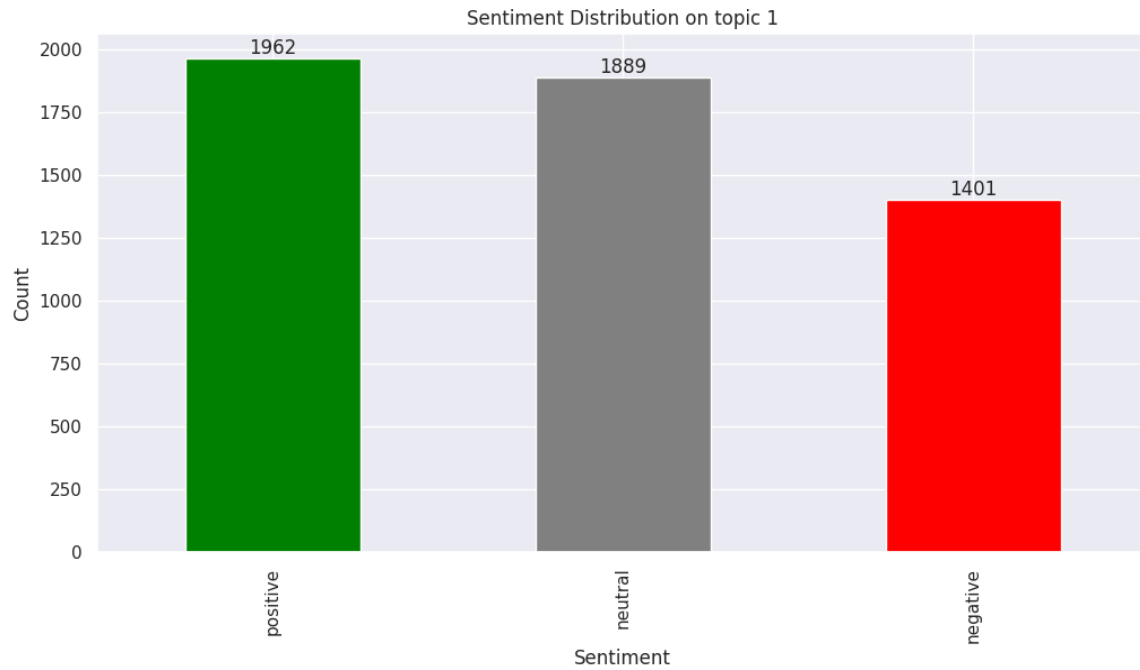


Figure 4-b: *VADER sentiment analysis on the topic: “AI replacing human jobs/Humans losing jobs to AI”*

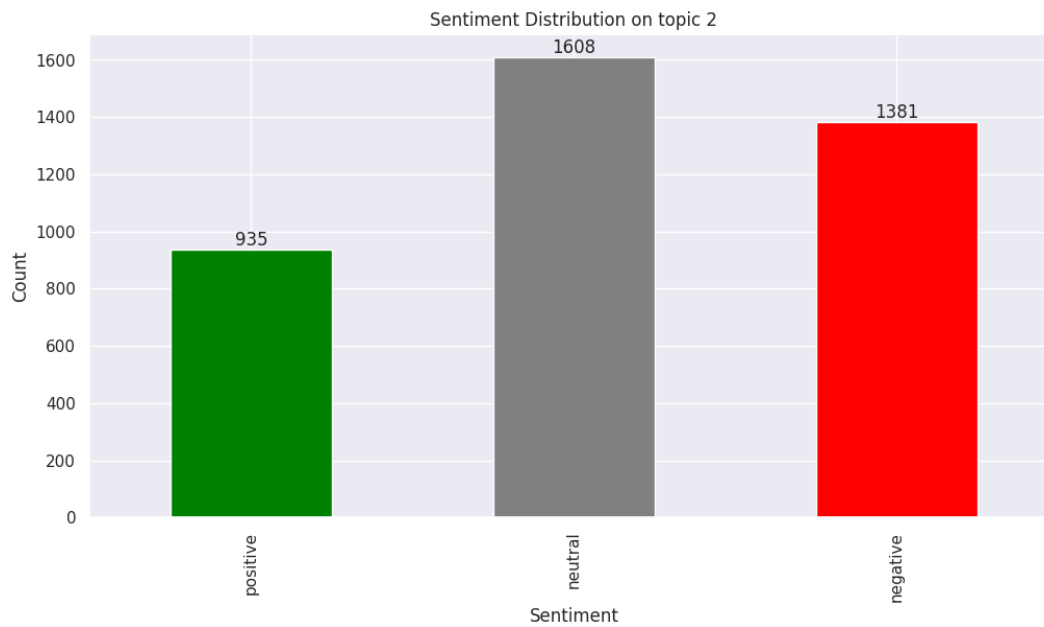


Figure 4-c:

VADER sentiment analysis on the topic: “Mass communication students’ emotions (and/or attitudes) towards the issue Emotions towards AI.”

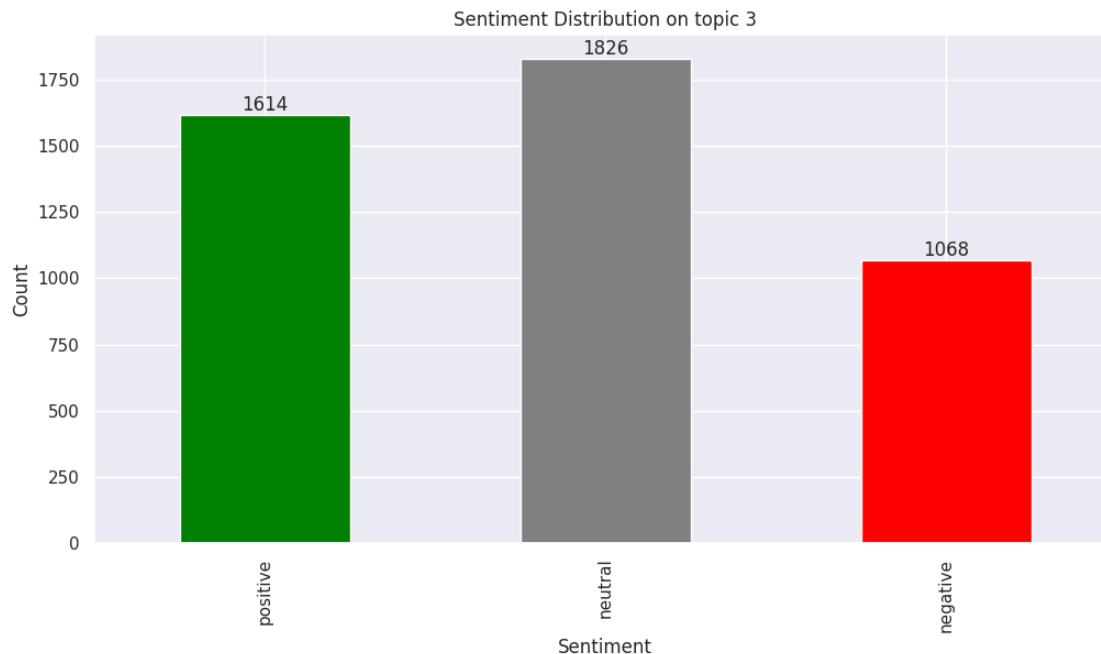


Figure 4-d:

VADER sentiment analysis on the topic: “Cost-cutting or Saving money over hiring humans to work.”

Figures 4-a, 4-b, 4-c, and 4-d represent the VADER sentiment analysis for each topic found by LDA. Here, the topics can be narrowed down which had a positive and negative reception. The second and fourth topics, as shown in Figure 4-b and 4-d, were mostly positive. This could mean that the people in the comments section received the news on AI sportscasters well even though they acknowledge them taking their jobs. In fact, Figure 4-a shows that the people are mostly emotionally neutral towards AI. The third topic, as shown in Figure 4-c, was more negative than positive. This means that the mass communication students were not particularly happy about this issue.

Social Analysis

From the topics and the sentiments Filipino netizens have on GMA's AI sportscasters, it

can be observed that this specific emerging technology being integrated to sportscasting or generally, to the field of journalism is perceived as something that poses risks to one's source of income or livelihood, one's career opportunity, and the status quo within this field of profession. This leads us to the Risk Society Theory.

Ulrich Beck's Risk Society Theory suggests that modern societies are increasingly shaped by risks and uncertainties, particularly those associated with technological advancements. Moreover, as risks in modern societies Moreover, as these risks faced by the modern society are manufactured risks, which are the product of human activity (such as technological advancements), Beck argue that it is possible for societies to assess the level of risk that is being produced, or that is about to be produced .(Beck, 1992; Draper, 1993) Hence, using this theory could shed light on the potential concerns and uncertainties related to the integration of AI in sports broadcasting or in the field of journalism.

To reiterate, the topics identified in the analysis serves as the perceived risks by the Filipino netizens towards the use of generative AI in the field of sports broadcasting. Specifically, they see it as a threat in their course, career opportunities, and jobs as AI might replace them in the future. In relation, this replacement might be fueled by companies and businesses' desire to save money as maintaining AI technologies costs cheaper than hiring human workers and paying their appropriate salary. This integration is also seen as a risk in the status quo of the field of sports broadcasting as the importance of having emotions, passion and love in this profession might be altered because of the AIs lack of emotion and expression.

On the other hand, people's sentiments may also reveal how they perceive this integration—whether as an improvement, threat or both.

The higher occurrence of positive sentiments in the comments about GMA's AI

sportscasters among Filipino netizens suggests an initial acceptance or enthusiasm for this technological development. In the context of Ulrich Beck's risk society, this positivity aligns with the idea that modern societies often embrace technological innovations, seeing them as progress and improvement.

However, the prevalence of neutral sentiments, as the highest among the three, signals a nuanced response. In the realm of risk society, this neutrality might reflect a sense of caution or uncertainty among netizens. They may be taking a wait-and-see approach, acknowledging the potential benefits of AI sportscasters but also withholding strong judgments.

The prominence of words like "people," "lose," "job," and "replace" suggests that amidst the positive and neutral sentiments, there are still concerns such as mentioned before.. In the context of Ulrich Beck's risk society, this aligns with the idea that technological advancements can bring about new risks and challenges.

Conclusion and Discussion

To sum it all up, Filipinos, collectively, have a positive outlook with AI used in sportscasting. They see it as the future. They talked about how they feel towards AI in general, how it is going to replace their jobs, how the mass communication students feel about their course, and how people will use it for cost-cutting. Narrowing down the sentiments to each topic shows that mass communication students actually have a mostly negative sentiment towards AI, unlike the other topics.

Furthermore, while positive sentiments yielded a higher count than negative sentiments as shown from the bar graphs, the word clouds provides us with a common story of where the feelings of Filipino netizens about AI sportscasters were generally rooted. Hence, giving us an

understanding that the loss of jobs for many Filipinos and their potential replacement by AI is a cause for concern for many Filipinos.

Therefore, we can conclude that Filipinos do accept AI with some reservations; Particularly, from those whose jobs will get replaced and whose college courses will be rendered obsolete.

Limitations

Multilingual and Low-Resource language. With the dataset having a combination of languages, finding NLP packages with Filipino, Taglish, and other Filipino languages to support the analysis was challenging because these languages are considered as low-resource languages.

Translation of Comments. While ChatGPT serves a better language translator than others, manually copy-pasting the Facebook comments gathered was a tedious task and might also have resulted in a few human errors. Moreover, translation itself can also be prone to error because of existing expressions, slangs, and other words that require contextual understanding and might be mistranslated and misinterpreted. For example, the word "pangit" literally translates to "ugly". However, in the Philippine context, it can be an expression of dissatisfaction instead of being a description of one's appearance.

Unfiltered Stopwords. There are instances that some stopwords, such as contractions like ‘don't’, ‘you're’, etc., were unfiltered by the NLTK module for stopwords. While these can be manually inputted, it still was a challenge to identify all contractions that cannot be recognized. This is also the case with some of the words that were manually included in the stopwords list, such as ‘sportscaster’ and ‘caster’.

Removing Facebook Mentions. Although some mentioned names were removed, by

identifying proper nouns in the first three words (assuming that mentions are always typed in the beginning of the comments and their name length is at most three), there were still Facebook mentions that remain in the entries.

Undetectable Sarcasm. Identifying sarcasms for most sentiment analysis approaches remains a challenge. VADER, for example, is geared towards understanding the overall sentiment of a text and might misinterpret the polarity of individual words while NRC as well relies on word-level sentiment annotations which faces difficulty in accurately identifying sarcasms.

Overall, given these limitations, they might have affected the accuracy of our sentiment analysis, even with the use of VADER and NRClexicon as resources.

Recommendations

Social Media Friendly. As social media data often includes hashtags, emojis and all the colloquialisms and code switches that users on social media use, an analysis tool that is able to understand all the colloquialisms and code switches that people on social media use could be a way to provide additional context and sentiment clues.

Diversify Collected Data. Different social media platforms could offer more and different perspectives on the topic. Scraping data not only from Facebook but also in other social media platforms may provide a more comprehensive analysis to capture sentiments in different contexts.

Use More Advanced NLPs. Using NLP packages that support the language used if there are any.

References

- Beck, U. (1992). *Risk society: Towards a new modernity* (Vol. 17). Sage.
<https://www.naph.or.th/storage/app/uploads/public/601/91e/767/60191e7678334605480851.pdf>
- Chi, C. (2023, July 19). Should ChatGPT be banned in schools? UP crafts ‘responsible’ AI use guidelines. *Philstar.com*. Retrieved November 8, 2023, from
<https://www.philstar.com/headlines/2023/07/19/2282226/should-chatgpt-be-banned-schools-crafts-responsible-ai-use-guidelines#:~:text=%E2%80%9CA%20already%20many%20are%20worried%20that,of%20AI%20%E2%80%9D%20UP%20said>
- Draper, E. (1993). Risk, Society, and Social Theory [Review of *Risk Society: Towards a New Modernity*; *Risk and Blame: Essays in Cultural Theory*, by U. Beck, M. Ritter, & M. Douglas]. *Contemporary Sociology*, 22(5), 641–644. <https://doi.org/10.2307/2074588>
- Dreibelbis, E. (2023, June 8). Google Translate vs. ChatGPT: Which One Is the Best Language Translator? *PCMag*.
<https://www.pcmag.com/news/google-translate-vs-chatgpt-which-one-is-the-best-language-translator>
- GeeksforGeeks. (2021, June 6). *Latent dirichlet allocation*.
<https://www.geeksforgeeks.org/latent-dirichlet-allocation/>
- Poriyath, A. S., & Joseph, A. (2021, February 20). Sentiment Analysis on Facebook comments. Retrieved November 10, 2023, from
https://www.ijsr.net/conf/ICIPR2021/ICIPR2021_01.pdf

Timothy, M. (2023, October 4). *ChatGPT vs. Google Translate: Which Is Better At Translation?*

MUO.

<https://www.makeuseof.com/chatgpt-vs-google-translate-which-is-better-at-translation/>

Tyson, A., & Kikuchi, E. (2023, August 29). *US public concern grows over role of AI in daily*

life. Pew Research Center. Retrieved November 8, 2023, from

<https://www.pewresearch.org/short-reads/2023/08/28/growing-public-concern-about-the-role-of-artificial-intelligence-in-daily-life/>

University of Pennsylvania. (2023). *Guides: Text analysis: topic modelling*.

https://guides.library.upenn.edu/penntdm/methods/topic_modeling