

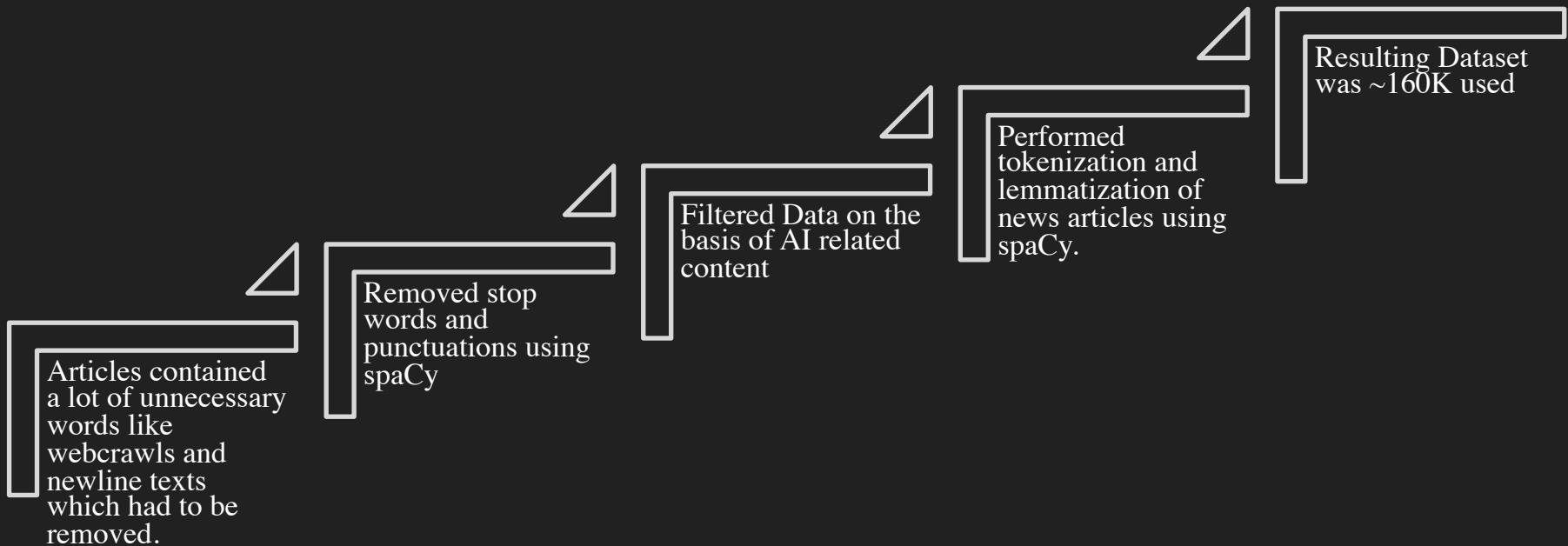
AI: Catalyzing Change

Ashmita Mukherjee

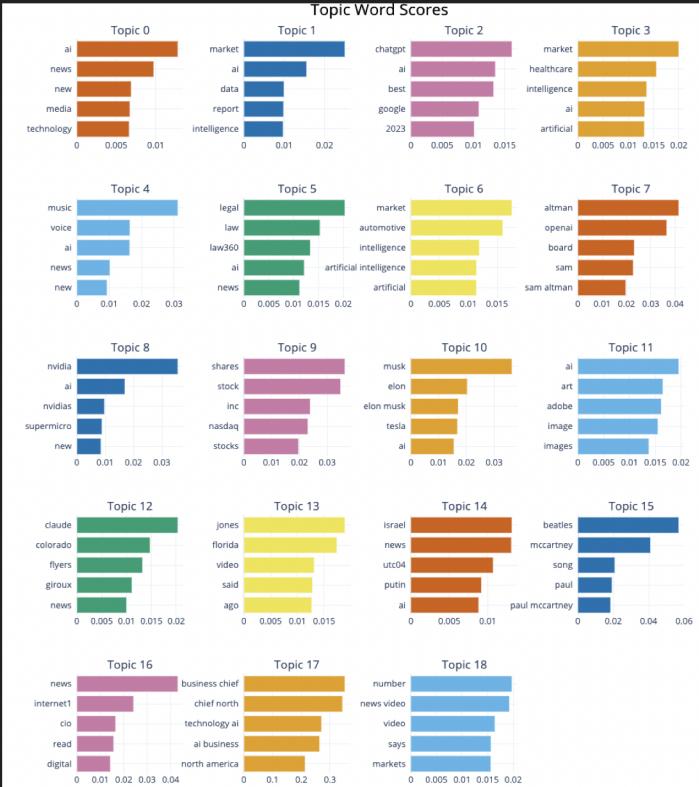
Executive Summary

- Used ~160K News Articles to analyse sentiments of various areas to the rise in AI using Google Cloud Platform
- Articles mainly contained information related to Finance, Politics, Healthcare & Education
- Medical, Finance and Technical industries have been most positively affected by AI whereas its effect on news has declined over the years
- Satya Nadella, Sundar Pichai and Jeff Bezos were prominent figures with positive sentiment towards AI as they integrated AI models to their products. Surprisingly, Sam Altman of OpenAI had a negative sentiment due to some conflicts around his company.
- IBM (Watson AI), Intel (AI builders and Neural Net Processors), Nvidia (CUDA and GPUs) have great success stories after AI integration
- GPT4, Llama 2 and Google Gemini are the new age platforms in the world of AI which are extensively being used by various industries.
- Entry-level jobs to be impacted by AI.
- Despite its potential, AI may struggle to fully integrate into industries like construction and manufacturing due to the intricate human expertise and decision-making required in these sectors.

Cleaning and Filtering of the Initial Document



Topic Detection using BERTopic resulted in detection of 15 major topics out of which Healthcare, Finance and Tech industries were prominent.



- Applied BERTopic with hyperparameter tuning on the news text which resulted in approximately 340 new topics.
- The topics were further clustered and reduced using Agglomerative Clustering.
- This resulted in 20 topics related to healthcare, finance, news, sports, music, technology and so on.
- Further found the sentiments of the major industries which have been impacted by AI in the recent years.

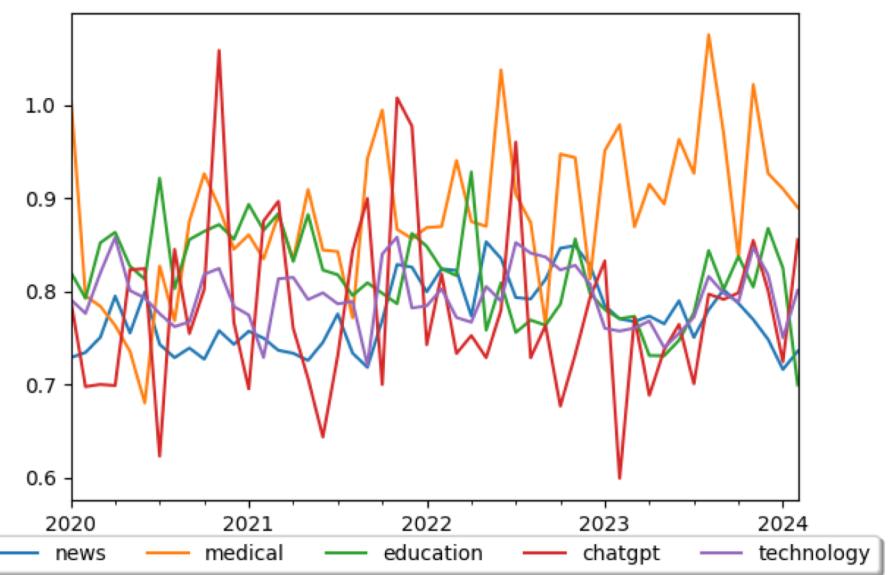
DistilRoberta Financial Sentiment Analysis model was used to conduct Analysis on the topics

Conducted Sentiment Analysis using the DistilRoberta Financial Sentiment Analysis model.

The sentiments were classified into 3 labels
- Positive, Negative and Neutral along with a sentiment score for each label.

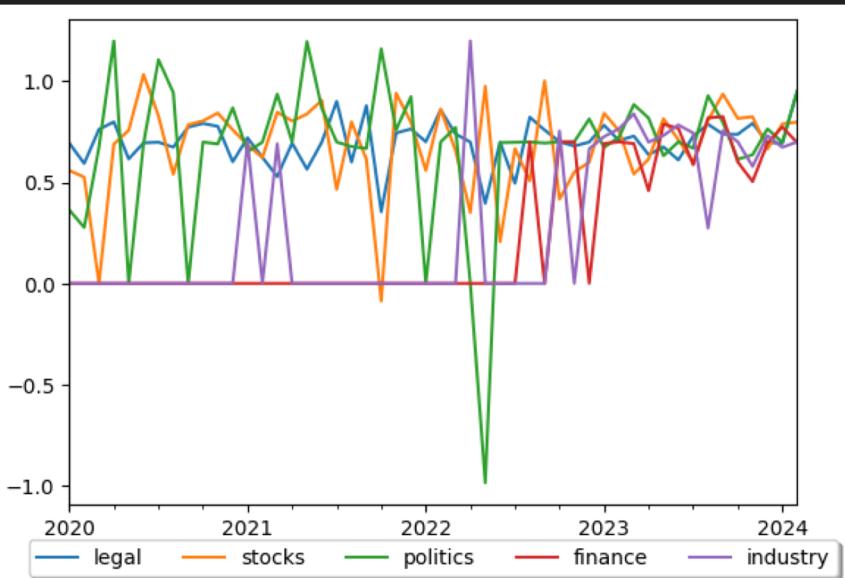
Featured engineered a new column combining the labels with the sentiment score to get the sentiment score for further analysis.

DistilRoberta Financial Sentiment Analysis model was used to conduct Analysis on the topics



- Medical has the highest linearly increasing positive trend. It is used in almost all healthcare activities like LLMs and image detection using computer vision.
- Tech has a positive trend maintained since AI is actively used in the form of NLP, predictive analytics, recommendation systems.
- Education has a constant positive trend because proctoring, scheduling for teachers and personalized learning for students. Chatgpt has also been an integral part of every student's life recently.
- ChatGPT sentiment is seen rising and deteriorating over the years. This is due to its hallucinating property which has caused problems for lawyers and writers who have used citations from Chatgpt for their work.
- News also has a constant upward trend due to dynamic paywalls, automated transcriptions and data analysis in news production.

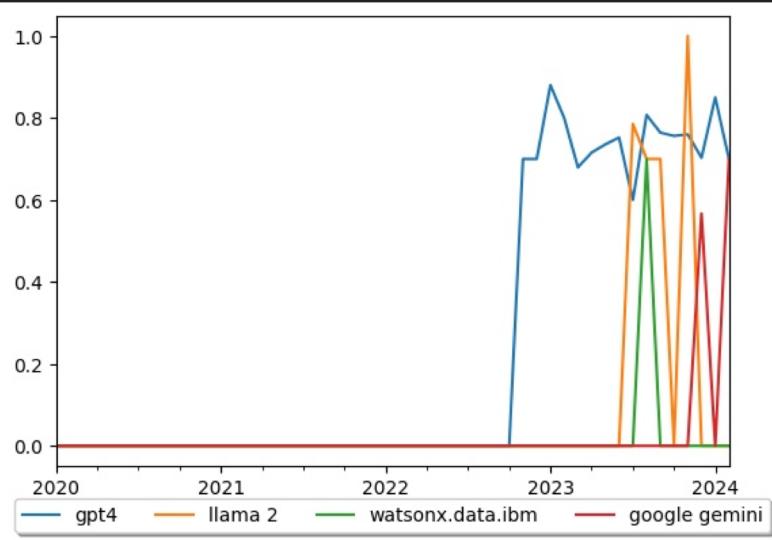
DistilRoberta Financial Sentiment Analysis model was used to conduct Analysis on the topics



- AI has been an important part of finance in the recent years with its increasing use in risk assessment and fraud detection to identify trends but still observes several dips in data due to the black box problem.
- Users can design unique AI-based stock trading algorithms but cannot execute trades automatically because trading with money without human intervention is highly risky.
- Military AI capabilities includes not only weapons but also decision support systems that help defense leaders at all levels make better and more timely decisions.
- Many industries have adopted AI to automate their work workflow for optimisation, accuracy and flexibility purposes.
- AI in Legal is playing a role in most of the research, writing and jury exhibit creation that goes into trial preparation, summaries and translations.

New Technologies and AI solutions

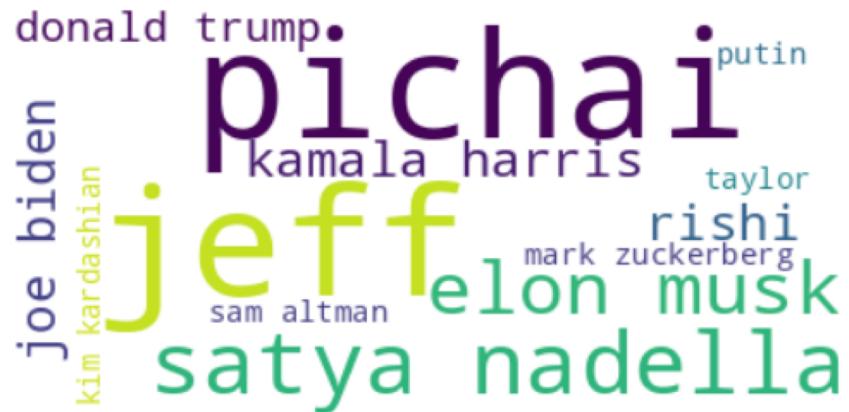
- In the realm of AI, there are both intriguing new advancements and enduring topics of discussion.
- IBM's Watson Studio continues to be a significant player, empowering developers to craft novel AI solutions, while Alteryx enters the scene with its AI deployment platform.
- Google stands out with innovations like Gemini, Gemini Nano (Palm), and Duet, while Facebook boasts the popular Llama 2.
- OpenAI has introduced GPT 4 after the classic GPT-1.
- Aetina brings forth their AI of Things model, leveraging the established foundation of IoT in collaboration with NVIDIA Jetson.



A collage of various AI-related company names and models, including Google, Duet, Alteryx, Gemini, Gemini Nano, Google Gemini, BMW GPT4, Aetina, WatsonX, Data, IBM, Google Cloud, Google Llama, and Llama 2, all rendered in a colorful, overlapping font.

- There has been a notable uptick in the development and deployment of advanced AI technologies, particularly evident with the emergence of GPT-4, which gained significant traction starting from late 2023.
- Subsequently, other LLM systems, including Llama2, WatsonX, and the recent introduction of Gemini, have experienced considerable growth in their capabilities for NLP tasks.
- Presently, both GPT-4 and Gemini are closely matched in terms of their performance and adoption rates within the industry.
- Gemini is not only trained on text data but also images, audio and videos thus being the most advanced.

Performed Targeted Sentiment Analysis on People



- Bezos has a positive sentiment as he recently joined a group investing in Figure AI, a company developing humanoid robots.
- Sundar Pichai's tenure as Google CEO is undergoing a period of evaluation and Gemini has prompted discussions about the company's AI strategy and Pichai's leadership.
- On the other hand, Nadella views AI as an assistant, not a replacement, for human ingenuity.
- Elon had a lower sentiment as he has been critical of OpenAI's shift towards for-profit structures and closed-source development, fearing it hinders safety measures.
- Zuckerberg has a relatively lower sentiment as he plans to use massive amounts of user data for AI training which raise privacy concerns in regard to potential for bias and misuse.

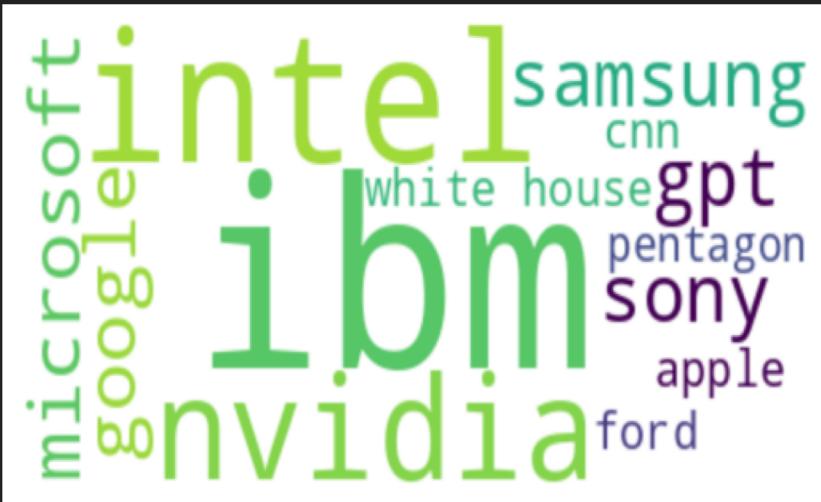
Performed Targeted Sentiment Analysis on Places



The major countries with positive sentiment towards AI are:

- US aims for AI dominance to fuel economic growth and national security.
- Germany turns to AI to address aging population and stay on the cutting edge of tech.
- Japan leverages AI to maintain economic competitiveness despite a shrinking workforce.
- France prioritizes "strategic autonomy" in AI, seeking domestic development to reduce reliance on other countries.
- India sees AI as a tool for economic growth, aiming to close the gap with developed nations through rapid AI adoption.

Companies investing largely in AI



- IBM are incorporating GenAI, that can handle various tasks across different formats like text, image, and video. They see this as a key driver for enterprise transformation.
- NVIDIA specializes in graphics processing units (GPUs), the workhorses for training powerful AI models. They are leveraging AI to expand their market beyond gaming and into scientific computing and self-driving cars.
- Intel: While challenged by NVIDIA in GPUs, Intel develops CPUs crucial for various AI tasks. They aim to be a one-stop shop for AI hardware, offering processors, software tools, and AI chips.
- Samsung integrates AI into their devices for features like facial recognition and voice assistants, aiming to stay ahead of the curve in a competitive market.
- Microsoft develops cloud computing platforms (Azure) widely used for AI training and deployment. They see AI as a way to enhance their existing software products and services like Office and search engines.
- Google views AI as core to their future, aiming to create intelligent products and services across various domains.

Actionable Recommendations

- There are concerns around bias in AI, so it's important to ensure AI is developed and used ethically, considering issues like fairness, accountability, and transparency.
- The inner workings of AI systems, especially those used for critical decision-making, should be understandable to avoid a "black box" effect.
- Automation through AI will likely lead to job displacement in some sectors. Efforts should focus on reskilling and upskilling the workforce to adapt to the changing job market.
- AI has the potential to solve some of the world's most pressing problems in areas like healthcare, climate change, and poverty reduction. Investment in these areas should be encouraged.
- AI in Finance needs more explainability and accuracy to become reliable.

AI failed to perform well in the Finance sector and sectors requiring physical strength

- According to the sentiment model, companies like Datametrex AI and Guardforce AI had a negative sentiment and on analyzing these companies, they are currently performing poorly in the market.
- AI struggles with empathy, creativity, physical tasks, complex decisions, and social interaction. These jobs, along with constantly evolving fields, are likely safe from AI replacement, requiring human strengths for success.
- Particularly the finance sector and companies like Wells Fargo and J.P. Morgan had a negative sentiment. This is clear from the many dips in the finance companies and stocks sentiments.

This is possibly so because of the following reasons:

- Black box problem where lack of transparency can be problematic in finance, where clear reasoning is crucial.
- AI algorithms can perpetuate biases present in the data they're trained on. This could lead to unfair outcomes, like biased loan approvals or discriminatory investment strategies.
- While AI excels at analyzing data and identifying patterns, it currently struggles with genuine creativity and human-like judgment.