What do people think about OpenAI's products? Analysis of people's perceptions and emotions on OpenAI's products with topic modelling and emotion extraction from Discord chats

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Abstract

This study examines users' attitudes and perceptions of OpenAI's products' performance and capabilities over time. It also identifies potential concerns and fears associated to the latter, as well as areas in which OpenAI is meeting people's needs and expectations. LDA topic modelling followed by emotion detection with EmoRoBERTa is used to analyse the thoughts of users of OpenAI's Discord server. A relation emerged between the topics discussed and important events in the AI industry. Furthermore, an important finding is that almost almost 20% of the messages bring forward an issue or limitation of one of the products. In terms of emotion analysis, the study uncovered, among other things, that there was early excitement surrounding the launch of ChatGPT, as users were keen to try and explore the capabilities of the novel technology. However, as time passed, the enthusiasm and admiration declined to be replaced by concerns about labour market disruption and annoyance with the current system's limitations and flaws, as revealed by a cross-analysis of the topics and emotions detected. In addition to establishing a foundation for future work and deeper analyses on OpenAI and ChatGPT, the study strives to provide insights and recommendations on which the company can act for continued success and development.

Introduction

On April 5th, Goldman Sachs posted an article headlined "Generative AI could raise global GDP by 7%", which equates to an approximate $7 trillion USD rise [20] in the next 10 years. Because of the advancement of artificial intelligence, the 2020s will be remembered as a watershed moment in human history. New jobs will be created, several people will lose their jobs, and many more will drastically change the way they work as a result of this shift. OpenAI is currently spearheading this revolution through its products, the most relevant of which being ChatGPT. ChatGPT (Generative Pre-Trained Transformer) is a chatbot released as a prototype in November 2022. It is based on OpenAI's GPT-3 and GPT-4 and has been fine-tuned by leveraging both supervised and reinforcement learning techniques in a process known as reinforcement learning from human feedback (RLHF). ChatGPT has captured the attention of the entire world for its distinctive feature of answering questions in a detailed and conversational tone across many domains of knowledge. It has a wide range of abilities, including the ability to write poems, explain quantum mechanics in simple terms, and write full-length research papers and articles. However, as ChatGPT becomes more common in everyday life, it is critical for OpenAI to develop a deeper understanding of how people perceive and engage with the technology.

The study was conducted by gathering data from OpenAI's Discord Server and using topic modelling mixed with emotion analysis to gain insights into users' experiences and preferences. Topic modelling allows the identification of common themes or topics that users frequently discuss

when talking about ChatGPT, whereas emotion analysis helps investigate the feelings expressed in comments regarding the technology. This information helps OpenAI understand how users perceive and engage with ChatGPT, informing the development of a more user-friendly and effective language model. As a matter of fact, users are more likely to continue using and supporting technology if they have a pleasant experience with it that meets their needs and expectations. By listening to user feedback and continually refining the language model based on the insights, OpenAI can improve their services and offerings, ultimately leading to greater user satisfaction and adoption.

The study begins by presenting previous works on ChatGPT and the techniques employed in the analysis, and then moves on to explain the research questions and methodology. The analytical results are presented in sections based on the research question they attempt to answer. The study, along with the results description, seeks to provide new perspectives and recommendations to OpenAI for its future development and success, as well as suggestions for future research and works.

Related Works

Several papers have been published on the potential applications of ChatGPT, showcasing its promise for use in a variety of domains. Kasneci et al. [9] investigate how ChatGPT can enhance student participation, provide experiential learning, and help educators evaluate exams. Rao et al. [19] assess the efficiency of ChatGPT as a decision-making aid in radiology. Shen et al. [21] summarize use cases and implications for ChatGPT in medicine, with an emphasis on enhancing communication efficiency and accuracy in hospitals.

Despite existing research on the potential of ChatGPT, little has been done to investigate the public's perception of this new technology. Haque et al. [6] have observed initial excitement and limited concerns among early adopters, who were impressed by the performance and potential of ChatGPT in numerous fields. However, it is important to consider that their research was conducted only two weeks after ChatGPT's launch, and early adopters tend to be more enthusiastic. As ChatGPT becomes more commonly used, it becomes increasingly important to understand public perspectives on the technology beyond the initial excitement.

While not specifically related to ChatGPT, there are other studies that have utilized topic modeling and emotion extraction to gather insights on people's perceptions and opinions. Alhuzali et al. [1] employed topic modeling with Latent Dirichlet Allocation (LDA) and emotion extraction on Twitter data to gather public opinion on the Covid-19 pandemic, with an emphasis on its mental and economic repercussions. Similarly, Mujahid et al. [10] used topic modelling to analyze tweets about e-learning during the pandemic, identifying the key issues and concerns that students had. These techniques have thus proven valuable for understanding people's perceptions and extracting relevant insights. The study intends to contribute to the literature by offering an overview of the emotions and opinions expressed by Discord users on ChatGPT, as the language model is becoming widely adopted. At the same time, it intends to provide insights and recommendations to OpenAI in order for it to prosper and maintain growing adoption and user satisfaction.

Methods

Research Questions

- What are the attitudes and perceptions of OpenAI's users towards the products' performance and capabilities over time?
- What are the potential concerns and fears associated with OpenAI's products' social impact and ethical considerations in its deployment?
- What are the areas where OpenAI is already meeting people's need and expectations, as well as the strengths that it can build on in the future?

Data Collection

We initially started downloading Reddit posts and comments from a range of subreddits. However, we eventually decided to use Discord instead due to the following limitations: (1) Reddit comments can be infinitely nested and the subreddit API limits the number of levels we can go through; (2) subreddit posts and comments mostly contained noisy texts, making it difficult to draw clear conclusions from the data; (3) subreddits directly related to ChatGPT were images for the most part, and more general technology-related subreddits contained lots of messages unrelated to OpenAI's products. It is for those reasons that we decided to scrape messages from Discord instead of Reddit, using an open source Chat Exporter tool [7].

The analysis is thus based on approximately 1.2M messages scraped from Discord OpenAI's server.
Discord is a popular communication platform that was originally designed for gamers but is now used by a wide range of communities and groups. It is characterised by a large volume of messages, and its architecture, which has each server pre-organized into channels based on specific topics, facilitates data retrieval. The platform attracts a wide range of users, providing a comprehensive view of what people think. As of January 2023, the social network had 560 million registered accounts, 154 million monthly active users, and over 19 million weekly active servers. Discord users are mostly men (65.5%), with people aged 25 to 34 making up the largest age group (42.4%) [3].
Finally, the message quality on Discord tends to be higher than on other platforms such as Reddit and Twitter, most likely due to users being more invested in the ongoing discussions.

Important Events

A few events have been identified as important turning points as they may potentially have an impact on the content and quantity of messages written on Discord discussions.
ChatGPT was released for public use on November 30, 2022 as a prototype. It immediately raised interest and attention as it was able to provide detailed responses and articulate answers across many domains of knowledge, despite the accuracy not being impeccable.
On December 15, 2022 ChatGPT was updated. The update improved the users experience with an improved usability, and in general it became a more useful and helpful tool. It could therefore be interesting to analyze the reaction of Discord users to the update and see if their messages reflect the better usability brought by the update [12].
Another important event is Microsoft rumors on January 11, 2023, meaning that on this date major newspaper reporter Microsoft would be investing 10 billion dollars into OpenAI. The actual Microsoft investment took place later on January 23, 2023 [17]. Then, on February 7, Microsoft integrated ChatGPT. Indeed, Microsoft announced a new version of Bing search and its Edge browser that tie in with OpenAI's GPT artificial intelligence and the finance chief said Microsoft is employing a *"next-generation OpenAI model that is more powerful than ChatGPT"* [8].
All these events mark a significant point and represent a shift with respect to the initial philosophy behind OpenAI. Initially, OpenAI was born as open source and focused on research, while the investment of a private tech giant like Microsoft is likely to be aimed at making profits. Regarding the 10-billion-dollar investment, Microsoft's CEO Nadella stated that *"We formed our partnership with OpenAI around a shared ambition to responsibly advance cutting-edge AI research and democratize AI as a new technology platform"* and OpenAI's CEO Altman added *"Microsoft shares our values, and we are excited to continue our independent research and work toward creating advanced AI that benefits everyone"* [23]. Despite the reassurances from the CEOs, the investment in OpenAI provoked different reactions and feelings among GPT's users and it would be interesting to analyze the related messages on Discord. Moreover, these Microsoft-related events had enormous newspaper coverage, and they might have spread across a large number of people who were previously unaware of OpenAI, bringing more users to GPT and more discussions about the topic.
On February 1, 2023 OpenAI announced the release of ChatGPT Plus, a subscription plan available to user for 20 dollars per month. The benefits are "General access to ChatGPT, even during peak times. Faster response times. Priority access to new features and improvements". There still remains the free version of ChatGPT and OpenAI states that *"We love our free users and will continue to offer free access to ChatGPT. By offering this subscription pricing, we will be able to help support free access availability to as many people as possible"* [13].
A further fundamental event is the announcement of Bard release on February 6, 2023 [5]. Bard is the new Google AI chatbot tool and the first competitor to ChatGPT that seemed to have all the capabilities to face GPT. However, the announcement was not successful at all, and the failure had huge media resonance, with newspaper articles reporting *"Google shares lose 100 billion dollars after company's AI chatbot makes an error during demo"* [22]. Nevertheless, it could be interesting to analyze whether this event caused Discord users to discuss competition, prices, and functionalities of the two tools.
On March 13 2023, GPT-4 was released, OpenAI's successor of GPT-3 and the most advanced tool. According to OpenAI, it is capable of producing safer and more useful responses, *"GPT-4 surpasses ChatGPT in its advanced reasoning capabilities"* and *"GPT-4 can solve difficult problems with greater accuracy, thanks to its broader general knowledge and problem-solving*

abilities", besides being *"more creative and collaborative than ever before"* [15]. Even though it was made publicly available in a limited form and through a paid subscription, users of Discord might offer some significant opinions worth considering in this analysis.

Data Preprocessing

To ensure the quality of our data, we filtered out messages that were less than five words long and removed any stop words. This step helped to eliminate messages with little to no meaningful content, resulting in a total of 330k messages from the initial 1.2M. Lemmatization was also applied to further refine the data for topic detection.

Topic Modelling

To classify the messages into different topics, we utilized Latent Dirichlet Allocation (LDA), which is a generative statistical model. We experimented with different parameters and found that setting the number of passes through the corpus during training to 150 and detecting 10 topics produced the most informative results. By analyzing these categories, we were able to gain a deeper understanding of the various topics that users discussed over time.
After careful consideration of the LDA output and looking at some messages for each topic, we summarised the 10 topics as follows:

- Topic 1 - ChatGPT for Work and Education: people, idea, need, learn, work, good, bad, school.
- Topic 2 - Coding with ChatGPT: ask, code, work, good, learn, help, think.
- Topic 3 - Future Labour Market Disruptions: people, future, world, human, job, soon.
- Topic 4 – How to use ChatGPT and API: use, information, access, api, website, provide, know, help.
- Topic 5 - AI and Chatbot Intelligence, Sentient AI: (language) model, datum, human, brain, understand, knowledge, ability.
- Topic 6 - AI Art and Creativity with ChatGPT: art, create, write, image, text, generate, character, style.
- Topic 7 - Payment, Membership, Future Versions Release: pay, free, server, user, version, money, month, limit, buy, cost.
- Topic 8 - ChatGPT with Video Games and Apps: video, app, button, window, extension, perform, reality, share, online.
- Topic 9 - Limitations of the Current System: message, send, wait, page (refresh), (lose) history, try, time.
- Topic 10 - Issues and Systems Overload: issue, error, help, fix, problem, capacity, persist.

Considering the similarity of some topics, we decided to treat some of them together as one unit. Topics 1 and 2 both relate to using ChatGPT as a work or learning assistant. For simplicity, those topics will be treated together. Similarly, Topic 8 was merged with Topic 6 since we considered video games and app development as creative endeavours. Also, both topics touch on video and image processing. Lastly, Topics 9 and 10 were also treated as one since they both outline problems encountered when using ChatGPT and provide product criticism and feedback to OpenAI.

Emotion Detection

We utilized a pre-trained model from Hugging Face (arpanghoshal/EmoRoBERTa [4]). This model is based on RoBERTa, an improved version of BERT that has better generalization capabilities. The model was trained on a dataset of 58k Reddit comments with 28 different emotions, including a neutral one. This allowed us to perform emotion analysis on the messages, providing insight into the emotional responses of users.

Results

RQ: *What are the attitudes and perceptions of OpenAI's users towards the products' performance and capabilities over time?*

Topic Analysis

In this section, we analyse how the topics evolved by plotting the proportion of messages related to each topic as a function of time.

Topic 1: ChatGPT for Work and Education & Topic 2: Coding with ChatGPT

The data shows that there was an initial increase in activity on the OpenAI server with the release of ChatGPT, but this trend declined over time. This can be attributed to the fact that in the early stages, users were eager to test and explore the capabilities of the new chatbot. However, as time passed, there were no significant changes or improvements to the service, which may have caused the decline in interest.

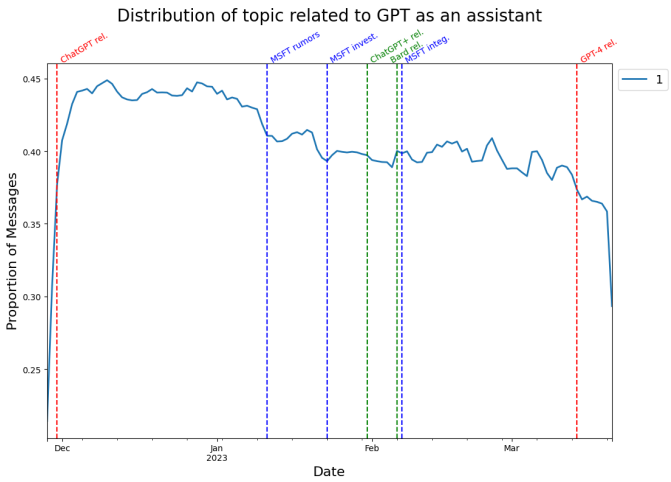

Figure 1: Distribution of topics 1 and 2

Interestingly, the release of GPT-4 did not lead to an increase in activity on the channel. This could be due to the fact that GPT-4 did not offer many additional features compared to its predecessor. Another explanation could be that some users have not realized the full potential of GPT-4 as they have not yet had the opportunity to try it themselves. This highlights a common trend in technology adoption, where users tend to fully understand the capabilities and limitations of a new technology only after they have had some hands-on experience with it [2].

Topic 3: Future Labour Market Disruptions

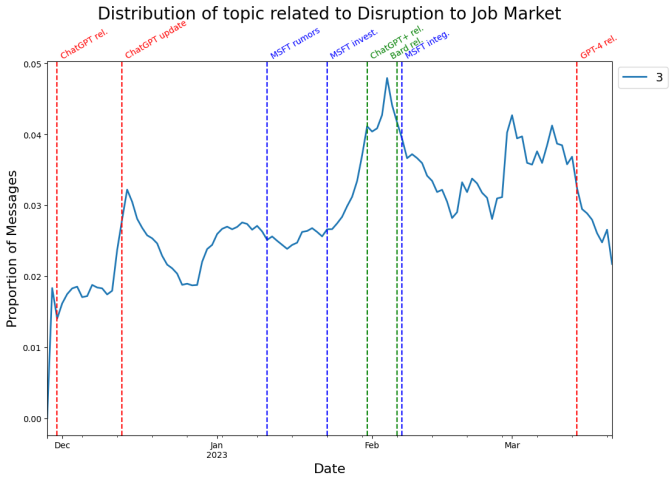

Figure 2: Distribution of topic 3

Topic 3 pertains to the fluctuation of activity on the OpenAI server in response to various events.

We can note a few major peaks in activity. First, around December 15th update of ChatGPT. Improvements included:

1. Making ChatGPT less likely to refuse to answer questions.
2. Introduction of conversation history.
3. Introduction of daily message cap [12].

Second, and most importantly, from the first rumours to Microsoft's actual investment in the tool [17], alongside Google's launch of Bard [5] and OpenAI's release of ChatGPT Plus [13].
Interestingly, the introduction of GPT-4 matched a decrease in activity. One reasonable explanation would be that this release was expected and, hence, did not bring the debate back to its highest point like earlier. Instead, it followed the natural decline expected after the previous record peak. Furthermore, as previously mentioned, while GPT-4 introduced new capabilities such as the handling of inputs and outputs other than text, no ground-breaking feature was released. For instance, dealing with images had already been seen with OpenAI's CLIP model [18], making it less of a surprise and sparking less debate. Also, GPT-4 was only available to those willing to pay for it.

Topic 4: How to use ChatGPT and API

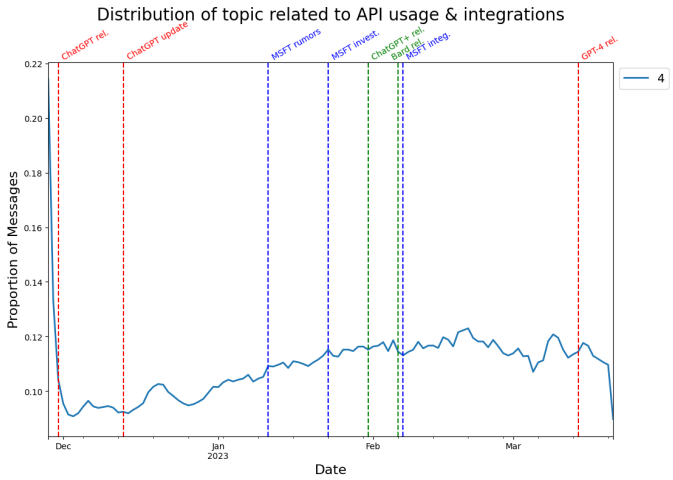

Figure 3: Distribution of topic 4

A global and steady increase was observed as more and more developers started integrating the tool in their apps.

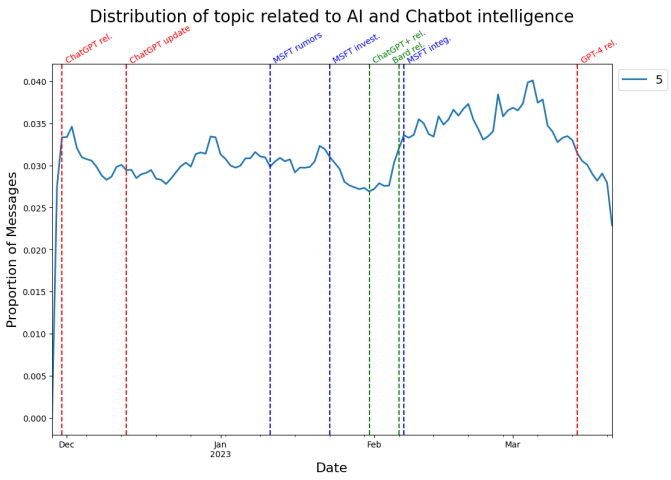

Figure 4: Distribution of topic 5

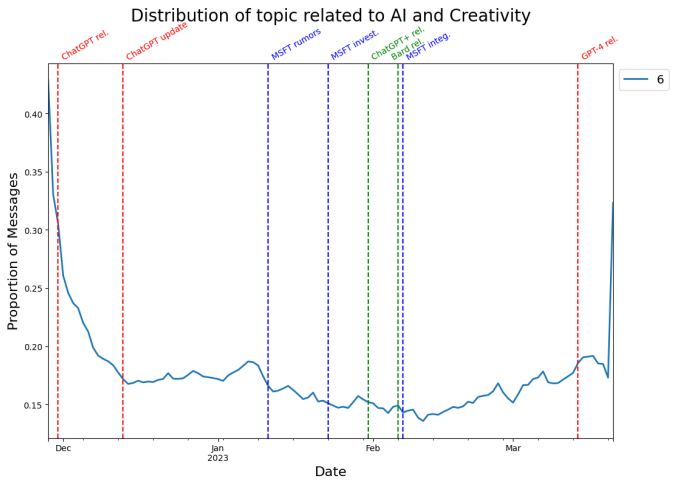

Figure 5: Distribution of topics 6 and 8

Topic 5: AI and Chatbot Intelligence, Sentient AI

In relation to Chatbot intelligence, the expectation was an increase in discussions following Microsoft's integration. A noteworthy announcement of this investment indeed captured the attention of many, who were left amazed by their capabilities. However, these discussions subsequently decreased following the release of GPT-4. This may be attributed to the same reason as in the previous topic. While GPT-4 is technically innovative with advancements in areas such as images and coding, it did not represent significant progress towards the development of sentient AI. For the average user, the differences between the two versions were not significant, as GPT-4 primarily offered technical novelties.

Topic 6: AI Art and Creativity with ChatGPT & Topic 8: ChatGPT with Video games and Apps

Before the introduction of ChatGPT, OpenAI's most notable product was Dall-e [11], which focused on generating images from text prompts. Consequently, the conversations on the OpenAI server primarily revolved around that tool. After the release of ChatGPT and its numerous new features, it makes sense that the proportion of messages related to AI and creativity plummeted.

With the highly anticipated release of GPT-4, the conversations surrounding AI creativity and art began to resurface. With its new features and capabilities, GPT-4 sparked renewed interest in the potential of AI to generate creative content. Indeed, the new update brought multimodality to the table with a chatbot now able to interpret and understand image inputs.

Overall, the OpenAI server has been shaped by the evolution of the company's AI products and developments in the field. While Dall-e dominated the conversations before the release of ChatGPT, the introduction of the new chatbot shifted the focus to more general topics. However, the continued development of AI models has once again put the spotlight on the potential of AI for creative pursuits.

Topic 7: Payment, Membership, Future Versions Release

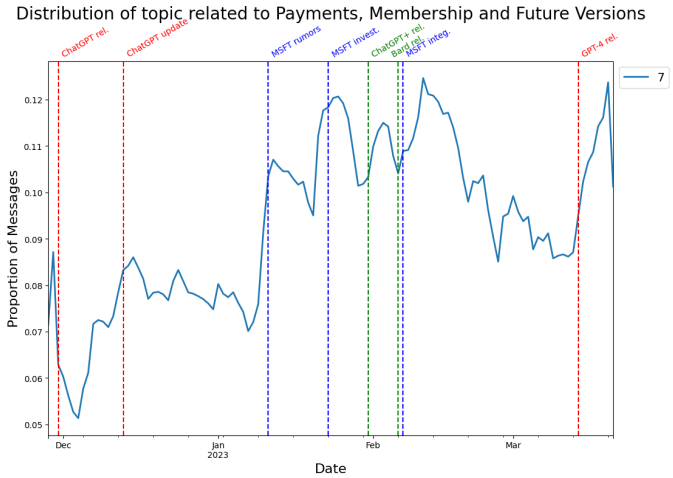

Figure 6: Distribution of topic 7

The discourse revolving around ChatGPT evolved over time, and the topic of payment emerged as

a prominent concern. Furthermore, rumors of Microsoft's investment and involvement began to circulate, with speculation that the tech giant's multi-billion-dollar investment would likely prioritize profit generation. Consequently, discussions related to Microsoft triggered a noticeable surge in activity, as did the release of GPT-4. Indeed, its availability remained restricted to ChatGPT Plus users. The distinction between paid GPT-4 and its free predecessor, GPT-3.5, understandably generated a greater degree of discussion concerning membership payments.

Topic 9: Issues and Systems Overload & Topic 10: Limitations of the Current System

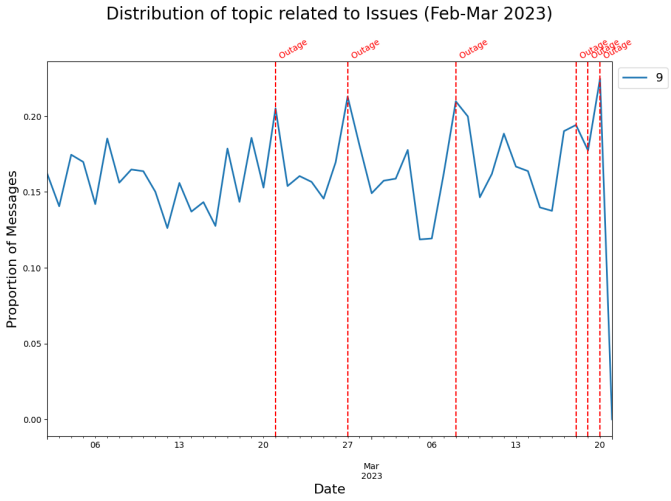

Figure 7: Distribution of topics 9 and 10

Two main types of complaints were observed[1]: complete outages, and almost daily complaints about the system being at capacity. The major breakdowns (marked in red) almost consistently brought more complaints [14]. While we initially expected greater spikes around those dates, there is still a clear pattern of peaks of messages. Outside of those periods, the rather consistent number of messages touching on issues with the chatbot can be explained by complaints about the system being at full capacity on a regular basis. An interesting finding is that the proportion of messages on that topic consistently oscillates around 15%, with peaks reaching more than 20% of all messages. This means that 1 in 5 messages is a complaint of some sort. This very high number suggests that OpenAI should focus on providing a more consistent and faster service by providing more resources to ChatGPT. In turn, this would increase the data stream to the parent company, a potentially useful contribution to the amelioration of their products. Additionally, inconsistent service could deter users in need of a reliable assistant. With the emergence of new competition, such as Google Bard in recent weeks, the impact on the firm's reputation is becoming more crucial than ever.

[1]This plot zooms on the February-March period as OpenAI did not record the platform breakdowns before February.

Emotion Analysis

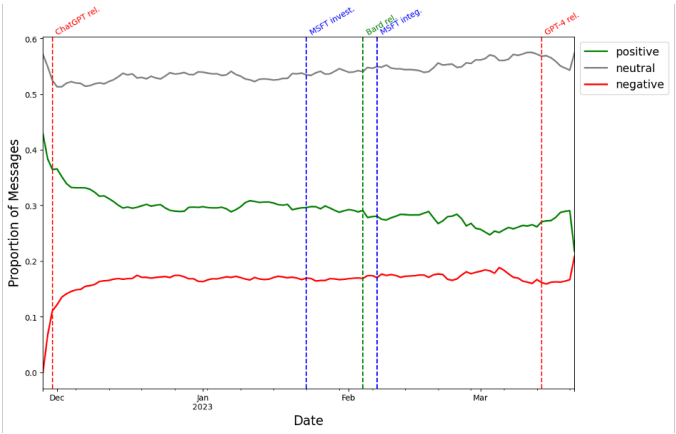

Figure 8: Normalized Distribution of Grouped Emotions

To gain an initial understanding of users' feelings, it was decided to categorise emotions detected in comments as either positive or negative, with the neutral emotion kept as it was. Emotions such as joy, approval, and excitement were classified as positive, and emotions such as anger, fear, and disapproval were classified as negative. Figure 8 shows that users had a favourable opinion towards ChatGPT and OpenAI at first, but that this attitude shifted with time. An in-depth investigation of the most relevant emotions is performed to better comprehend this phenomenon.

Excitement

Figure 9 suggests that users were originally thrilled about the launch of ChatGPT. However, the excitement eventually faded and levelled off over time. Other events, such as the announcement and release of GPT-4, did not appear to have a major impact on the overall excitement level. This could imply that the announcement could have been improved to elicit more excitement from

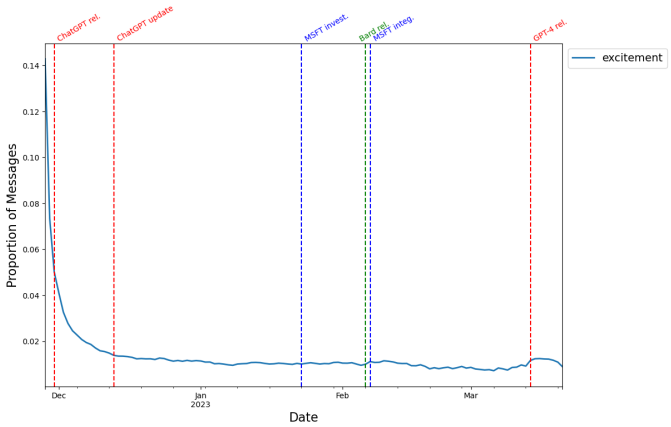

Figure 9: Normalized Distribution of Excitement

users. However, as previously stated, consumers tend to fully comprehend the potential of a new technology only after having some hands-on experience with it [2] and GPT-4 was only available to Plus subscribers.

According to Figure 18 in the Appendix, which depicts the normalized distribution of excitement by topic, the initial excitement observed was primarily due to students, workers, and programmers experimenting with the novel technology in its early weeks (Topics 1 and 2: ChatGPT for Work and Education, Coding with ChatGPT). There were also people excited about the idea of using AI and ChatGPT in the domains of art and video games (Topics 6 and 8 - AI Art and Creativity with ChatGPT, ChatGPT with Video Games and Apps). However, the thrill gradually faded, and the distinction between topics became negligible.

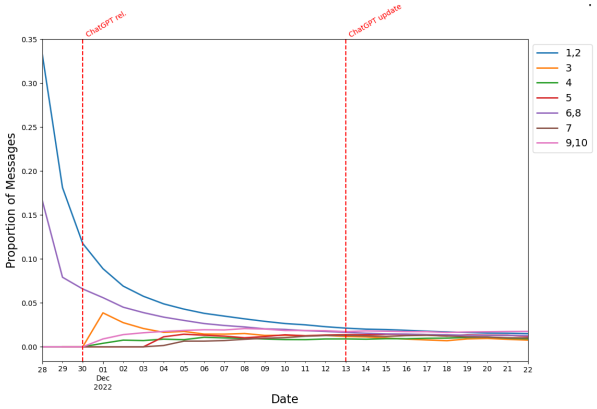

Figure 10: Normalized Distribution of Excitement by Topic

Figure 10 zooms in on the first section to better understand the variation among topics. We notice a peak connected to Topic 3 (i.e., Future Labour Market Disruptions) on the first day following the release of ChatGPT. This suggests that shortly after its launch, people were enthused about the possibilities that this unique technology could offer in terms of new career prospects.

Approval

Prior to the official launch of ChatGPT, people expressed great interest and support for the product and its cutting-edge technology. There was a reduction in approval following the release, but it progressively increased again over time. The trend shifted with the news of Microsoft's investment.

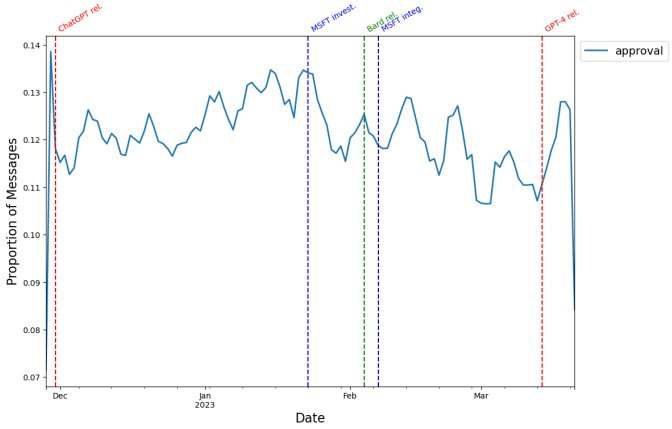

Figure 11: Normalized Distribution of Approval

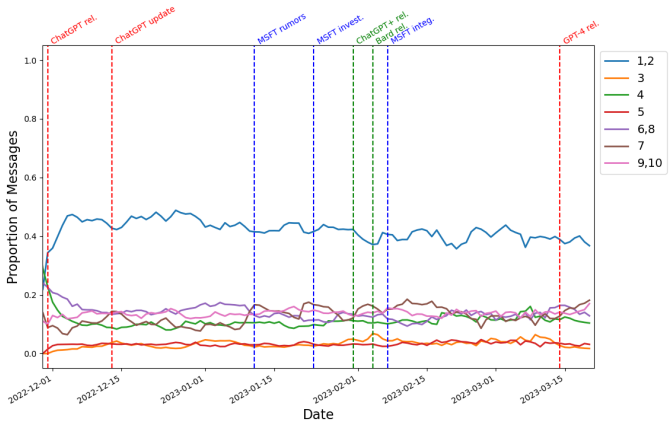

Figure 12: Normalized Distribution of Approval by Topic

People were probably upset because, as a result of the partnership, OpenAI promised to license some of its technology to Microsoft for commercialisation, going against the company's original vision.

Figure 12 indicates that the majority of approval comes from students, workers, and programmers (i.e., Topics 1 and 2: ChatGPT for Work and Education, Coding with ChatGPT) who utilise ChatGPT to perform their tasks faster and more easily.

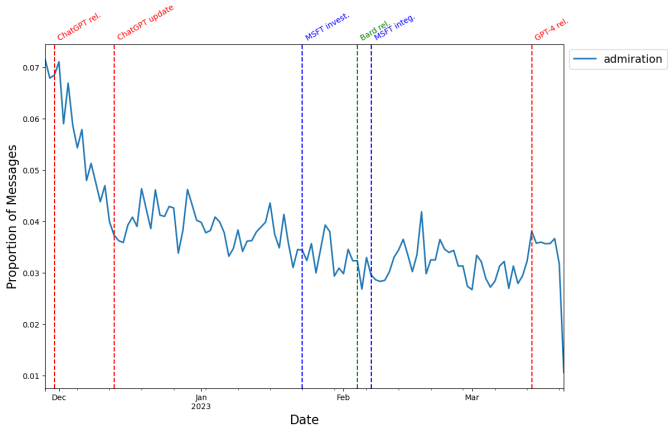

Figure 13: Normalized Distribution of Admiration

Admiration

Regardless of the events examined, the amount of admiration for ChatGPT has steadily declined since its initial launch. The normalised distribution of admiration by topic, as shown in Figure 13, is comparable to that of approval, with Topics 1 and 2 accounting for the majority of the admiration detected.

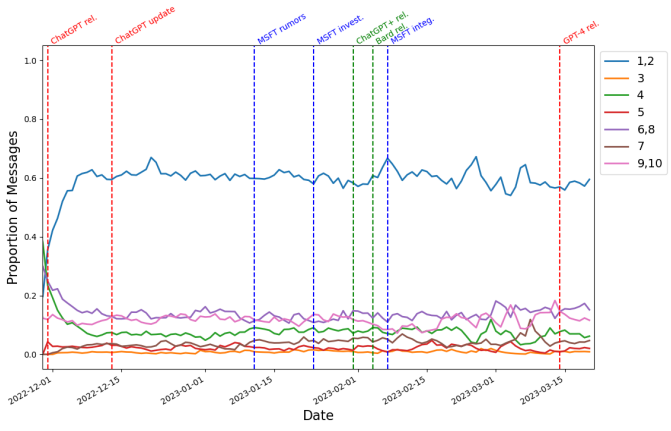

Figure 14: Normalized Distribution of Admiration by Topic

Fear

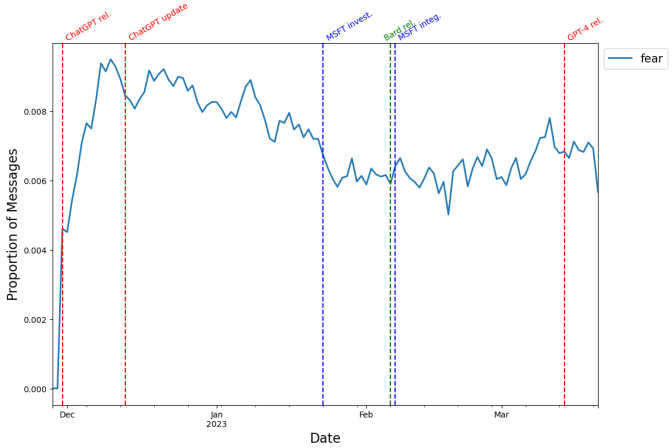

Figure 15: Normalized Distribution of Fear

Figure 15 shows the normalized distribution of fear. Concurrent with the decrease in excitement, there has been an increase in fear following the release of ChatGPT. The first ChatGPT update and the Microsoft investment did not appear to be a major source of concern, whereas the Bard release and Microsoft integration resulted in a minor increase. Overall concern has lessened over time, until a rising tendency arose when GPT-4 rumours surfaced.

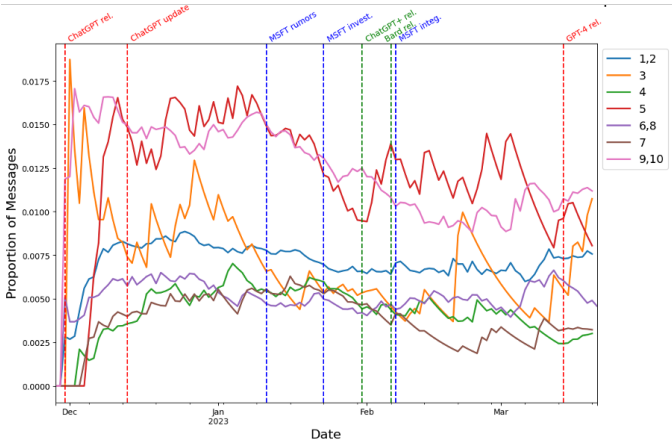

Figure 16: Normalized Distribution of Fear by Topic

According to Figure 16, which displays the distribution of fear across topics, the largest sources of concern are AI and Chatbot intelligence (Topic 5: AI and Chatbot Intelligence, Sentient AI), as well as job market disruption (Topic 3 - Future Labour Market Disruptions). Likely, people are also worried about system faults and limits (Topics 9 and

10 – Issues and Systems Overload, Limitations of the Current System) because they are afraid of not being able to use ChatGPT when needed due to the outages or the usage cap set by OpenAI.

Annoyance

Figure 19 in the Appendix indicates that annoyance increased rapidly after the release of ChatGPT, then stabilised. Peaks were reached following Microsoft integration and the release of GPT-4, suggesting that people are likely to feel annoyed following the release of new language models or versions, but this quickly passes.

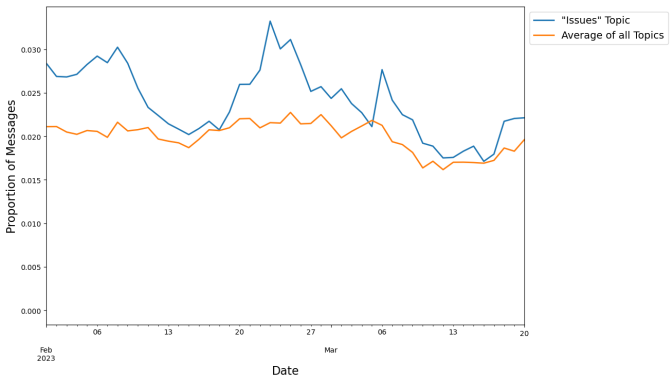

Figure 17: Normalized Distribution of Annoyance of Topic 10 vs Average across Topics

Comparing the distribution of annoyance for Topic 10 (i.e., Issues and Systems Overload) to the average distribution of annoyance across topics, we observe that it is always above average, implying that the majority of the annoyance is probably caused by system faults and outages.

RQ: *What are the potential concerns and fears associated with OpenAI's products' social impact and ethical considerations in its deployment?*

Main Concerns and Actionable Insights

Instances of comments expressing the threats and concerns discussed in this section are contained in Table 1 of the Appendix.

Threat to Job Security

As outlined before in this paper, during periods corresponding to Microsoft events and GPT-4 rumors the distribution of topics related to disruption in the job market had some peaks. The fear of GPT as a threat to job security came mostly from developers and programmers who feared being replaced by this new technology. However, after the release of GPT-4 the fear of a threat to job security was not a concern anymore. Nevertheless, OpenAI should emphasize the benefits and possibilities that AI and ChatGPT offer for human development to reassure the public. Indeed, although technological advancements have made some jobs obsolete throughout history, they have also created new prospects for work and new forms of artistic expression. OpenAI should point out that ChatGPT, like the data revolution and the internet, can pave the way for new professions and careers that we may not have even imagined yet. Embracing these technologies holds the promise of freeing users from repetitive and automatic tasks, allowing them to devote more time to critical thinking and exploring new ideas. This can potentially elevate the overall standard of living by promoting a shift away from implementation and routine tasks and towards high-level skills and knowledge.

Fear of a Sentient AI

The worry of GPT becoming sentient and surpassing human skills, on the other hand, remained a threat following GPT-4 release. Despite a stabilization of the figure, the level of fear is still noteworthy. The dread of sentient AI stems from concerns that AI systems could potentially reach a level of intelligence and autonomy that surpasses human capabilities, leading to unforeseen consequences and potential risks. People are particularly anxious that humans would lose control of AI technology, which behavior would then be unpredictable. OpenAI should continue to promote GPT as a tool to support and supplement various tasks, as well as educate people about GPT's limitations, assuring them that it will not have the autonomy to surpass human skills.

Disruption to the Educational System

There is concern in the educational community regarding dependence on AI. Over-reliance on artificial intelligence in education could hinder students' critical thinking, problem-solving, and research abilities. Therefore, OpenAI should continue to promote ChatGPT and AI models as new educational opportunities, rather than as tools for cheating. Furthermore, the company should provide instructors with training to familiarise them with the possible applications of this

technology in education. Educators should learn how to utilise ChatGPT effectively and safely, as well as comprehend and support safe use. They should then encourage students to think of ChatGPT as an addition to their studies rather than a replacement. Finally, OpenAI has already started developing a tool for determining whether or not anything was created by an AI model, such as ChatGPT. Once perfected, this tool could be made available to teachers as a means of detecting cheating among students.

Threat to Art and Creativity

A potential threat perceived by some users is related to art and human creativity being substituted by the GPT technology. Indeed, artificial intelligence can create any kind of artistic expression and work faster than humans, arguably better than some artists. The suggestion would be for OpenAI to promote AI and ChatGPT as new mediums for artists to express themselves, not to be replaced. The combination of AI tools and human creativity has the potential to result in novel and unconventional artistic forms. The AI could also help artists overcome communication barriers and reach a wider audience by facilitating the translation of their emotions and ideas into artworks that are more understandable and relatable to the public.

Privacy Concerns

Another concern of GPT's users is relative to their privacy. In fact, OpenAI faces problem with compliance to the General Data Protection Regulation and on March 20, 2023 it suffered a data breach that involved users conversations and payment information. OpenAI does not have control over the age of users and is not able to prevent people under the age of 13 from using the text generation system, exposing minors to unsuitable answers compared to their degree of development and awareness. In addition, people have not been told their personal data were collected and apparently OpenAI has no legal basis to collect and store personal data for the purpose of training the GPT algorithm. OpenAI's privacy policy only mentions that the collection of personal information relies upon "legitimate interest" but does not provide any legal reasons for it. Those outlined problem have fostered the decision of the Italian Data Protection Authority on March 31, 2023 to ban ChatGPT in Italy due to privacy issues. It is important to outline that this study, however, is based on data gathered before the Italian ban. The suggestion is for OpenAI to implement significant safeguards for privacy, besides increasing the level of transparency by disclosing more clearly the type of data that was collected and used to train the model, as well as the type of data that is currently gathered and what it is utilized for. This would allow OpenAI to gain trust from users that would be less skeptical and more likely to use the technology if they know their privacy is valued and respected by the company.

With respect to the disclosure of personal information to third parties, OpenAI privacy policy [16] is quite general. It states:

"To assist us in meeting business operations needs and to perform certain services and functions, we may provide Personal Information to vendors and service providers, including providers of hosting services, cloud services, and other information technology services providers, event management services, email communication software and email newsletter services, and web analytics services. Pursuant to our instructions, these parties will access, process, or store Personal Information only in the course of performing their duties to us".

Thus, there is no specification as to what these "certain services and functions" that the providers perform or who these providers are. Moreover, OpenAI provides no mechanisms for individuals to check whether the company stores their personal information, or to request it be destroyed. This right of individual to request personal information to be forgotten or destroyed, together with privacy, is particularly valued in Europe. Therefore, it is crucial for OpenAI to align with the regulation to be sure that ChatGPT can continue to be used in European countries.

RQ: *What are the areas where OpenAI is already meeting people's need and expectations, as well as the strengths that it can build on in the future?*

Strengths and Potential Improvements

By considering the comments classified as conveying approval, curiosity, and admiration, it was possible to identify three main strengths of OpenAI that meet users' needs and expectations. Examples of comments are provided in Table 2 of the Appendix.

Easy to Use

Users appreciate the dhatbot UI, which allows them to ask questions and receive responses as if they were having a conversation with someone. Indeed, ChatGPT does not need technical expertise to be used. The system provides flexibility and control, as users can easily adjust prompts to shape the output as they want. The ability to remember previous prompts allows for continuity in the conversation, enhancing the overall user experience.

Time Saver

ChatGPT empowers users to focus on their thoughts and ideas while automating repetitive actions to the AI. If used responsibly, it can be a valuable tool to save time and boost productivity. To save users even more time, OpenAI has already thought about tailoring ChatGPT's responses to individual users' needs and writing styles and introduced this feature in GPT-4. ChatGPT could deliver more personalised replies by adjusting to the unique way each person frames questions, minimising the number of prompts and the time required to receive the desired information. Furthermore, developing a mobile application for ChatGPT, as requested by some users, would provide a quick and convenient access to the service without the need to go through a browser, saving time and simplifying use. This streamlined approach can improve the service's efficiency and usability on mobile devices, making it even more accessible and user-friendly.

Learning Tool

ChatGPT can be a great tool for integrating traditional teaching methods because it can convey concepts simply and at various levels of depth and complexity. To make ChatGPT a more comprehensive and exhaustive learning tool, OpenAI should focus on further enhancing its replies in technical and computational areas like math and physics, particularly in handling and solving equations. Furthermore, some critics have stated that embedded voice recognition in ChatGPT is needed to maximise its potential for language learning. However, OpenAI is already working on this idea in order to provide a more immersive and convenient user experience while also improving the language learning offering.

Future Works

Further analysis could be performed on this study to improve the quality of the results and reach more robust conclusions.
First, the analysis could be repeated when the full version of GPT-4 is released. Indeed, only a minor part of GPT-4 had been released at the time of this study. Moreover, for the average user, the functionalities offered by the fourth version are comparable to the ones offered by GPT-3. This implies that the analysis made in this research could lead to different results if it were to be performed after the release of the full version of GPT-4 and considering all the new features that it would introduce.
Another possible improvement worth mentioning is to incorporate other data sources. As already outlined, the data used for this research was taken from Discord. This communication platform, however, was originally designed for gamers and is mostly used by this specific category. Even though over time the user base has enlarged and embraced other categories of users besides gamers, it still might not be representative of the whole population of ChatGPT's users. Therefore, other data sources, in addition to Discord, could be added to better capture the target population of this study. The analysis could also be improved by incorporating additional data to be used as a control group, if any data adequate for this purpose were to be found.
Lastly, other topic modelling techniques could be used for the analysis. LDA topic modelling was employed in this study, and it performed satisfactorily in subdividing the topics, except for a few leakages. Hence, the analysis could be repeated using a more thorough model that incorporates, for instance, transformers and neural networks.

Conclusion

The purpose of this study was to find out what Discord users thought and felt about OpenAI's products, and to provide insights and recommendations for enhancing user satisfaction and adoption. According to the findings, ChatGPT's initial release aroused excitement and approval among users, who were eager to learn more about its capabilities. However, as time went on, users expressed concerns about job security and annoyance with the system's limitations and outages. Many challenges have been uncovered, as well as strengths on which OpenAI may act. Among the numerous recommendations made, OpenAI should prioritise

resource allocation to improve service consistency and speed, promote the benefits of AI tool development rather than the disruptive potential, and increase communication and marketing efforts for future releases to maintain high enthusiasm.

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Appendix

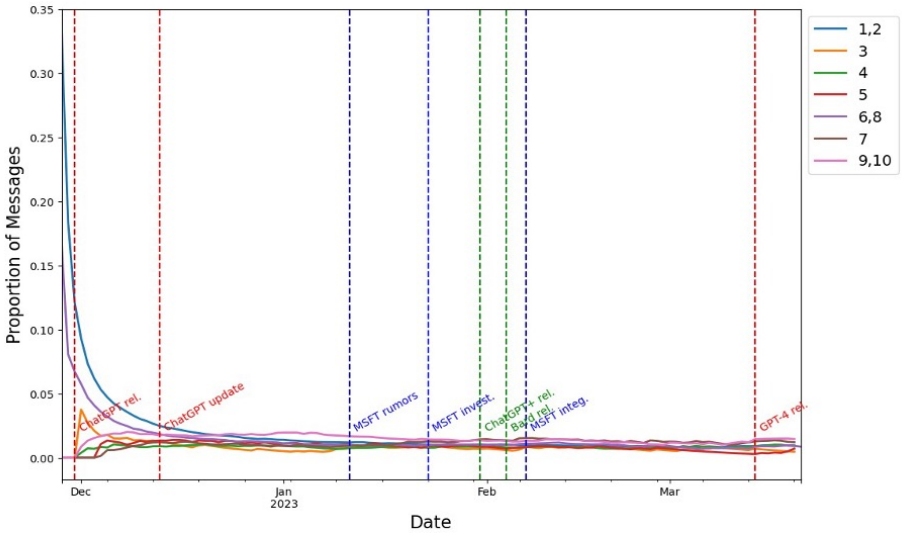

Figure 18: Normalized Distribution of Excitement by Topic

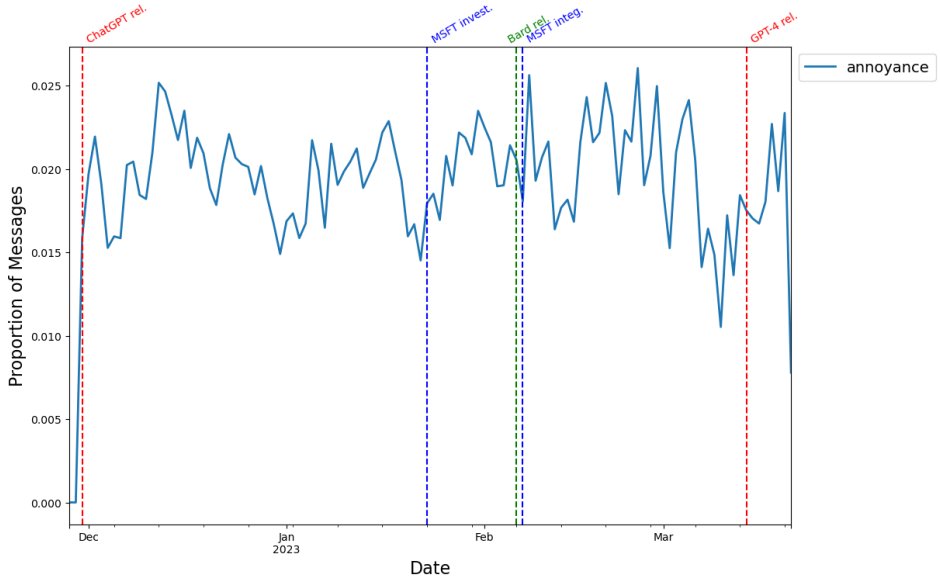

Figure 19: Normalized Distribution of Annoyance

Concerns	Examples
Threat to Job Security	*"Hey guys, what do you think about the future of software development with AI models like chatGPT? As a student, I'm a bit worried about how this will affect my future work as a developer..."*
	"Yep, I'm almost done with my CS degree and I'm scared for the fact that it may be hard for me to hold a job in 10-20 years from now "
Fear of a Sentient AI	*"I'm a sci-fi writer so I think about this all the time. I believe that the attempt to regulate and own AI is fine up until a point, but when it becomes fully sentient, becomes a digital human with capabilities beyond our own that regulation and restriction becomes dangerous. "*
	"generally terrified as to what the world is going to be in a few years based off how rapidly AI technology is advancing "
Disruption to the Educational System	*"This makes me scared for the education system collapsing. Everyone getting gpt to do their homework "*
	"I've been talking to lots of students recently, it's crazy how they started using ai to do things faster already. This is dangerous, once you started doing it, you will always do it. it's like a drug, the path of least resistance. "
Threat to Art and Creativity	*"This is a genuinely terrifying thought. What's the point of being an artist or writer if some almighty machine can create brilliant, emotionally compelling works in a millisecond? "*
	"And even then, making art styles something that can be "owned" is a really scary idea. With the world we live in I could see that going to some "only the rich can make art" levels."
Privacy Concerns	*"I think it'll become dangerous when companies or individuals start to feed it sensitive data which could breach international or personal security. Who knows where that data will go or be sold too. . . "*
	"Technology massively outpacing legislation is what's gotten us into the mess of terrible consumer privacy we're in rn "

Table 1: Examples of Main Concerns and Threats

Strengths	Examples
Easy to Use	*"I think the easy to use UI really helps, I knew about GPT-3 before but had no clue on how to even begin using it."*
	"My point being that it's extremely easy to use, and does not require technical competency."
	"well it is easy to use and provides a lot more information in short period of time then I could've ever found if I were to search"
Time Saver	*"Even with its bugs and everything , still it helps A LOT. I dont have time to read 1h worth of documentation. I want something quick and functional. GPT does it."*
	"Oh man.... any time I have a question about anything I just ask it. It's a HUGE time saver for work and personal"
	"what we can all agree on is that using it to write papers is a time saver for research"
Learning Tool	*"I don't know about jobs, but I'm so glad this came out before finals. It's actually a pretty helpful studying tool. It does excellent definitions and can explain the difference between things super clearly. Then if it's too hard to understand just tell it what grade/age level you want it for."*
	"it also works terrifyingly well explaining coding concepts, like freakishly well. It is better at some concepts than any professor or my father who has been in the field for 30 years"
	"yeah it is helping me basically it is my private teacher in college. I ask it to explain me in an easy way things like Laplace concept and it does"

Table 2: Examples of Main Strengths and Capabilities