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Exploring User Sentiments and App Performance of Threads: A
Media Theory Analysis of Emerging Patterns and User
Satisfaction

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Abstract

In the digital age, social media applications have reached unprecedented levels of popularity. The following thesis investigates user satisfaction of Threads, a new social media application, introduced by Meta's Instagram team, for sharing text updates, and joining public conversations. The study aims to contribute to the literature on social media user satisfaction, while continuing the discussion on hedonic and utilitarian philosophies. The thesis is guided by the three proposed research questions. Firstly, a comparative analysis with its main competitor, X, revealed the main similarities and distinctions between the two applications, from the user perspective. The applications serve the same need of sharing text updates, and the main differences lie for example in the: account registration, as Threads is integrated with Instagram; pricing, with Threads (Meta) having slightly more expensive premium accounts; content limits, with Threads allowing in general for sharing more content in the free version, and X more in the premium version; as well as in the number of functionalities, with Threads having less possibilities at this moment. Secondly, a sentiment analysis of user reviews, using TextBlob and VADER libraries in Python, confirmed a predominantly positive attitude towards Threads (51-55%). Thirdly, two topic modelling techniques, LSA (Latent Semantic Analysis) and LDA (Latent Dirichlet Allocation), were used to identify the main themes discussed by the users. In the negative reviews, the users: (1) say Threads is a copy of Twitter; (2) are not content about the Instagram integration; (3) express data privacy concerns; (4) are dissatisfied with their feed content; (5) and describe the encountered technical issues. In the positive reviews, the users: (1) like the application and appreciate its current features, but express interest in seeing more functionalities in the future; (2) say the platform is easy to use; (3) prefer it over X; (4) and express a general excitement, using positive words such as *'best'*, *'great'*, *'love'*, and *'amazing'*. Overall, users enjoy the application. Threads caters to both hedonic and utilitarian values, potentially influencing users' intentions to continue the usage. The analysis suggests that Threads can be viewed as an alternative to X, as also directly commented by the users.

Keywords: Threads, X, Twitter, social media, user satisfaction, sentiment analysis, TextBlob, VADER, topic modeling, LSA, Latent Semantic Analysis, LDA, Latent Dirichlet Allocation

Zusammenfassung

Im digitalen Zeitalter haben soziale Medien eine enorme Popularität erreicht. Die folgende Arbeit untersucht die Benutzerzufriedenheit von Threads, eine neue Social Media Applikation, die von Meta's Instagram-Team entwickelt wurde. Die Studie zielt darauf ab, zur Forschung über Benutzerzufriedenheit in sozialen Medien beizutragen und an die Diskussion über hedonistische und utilitaristische Medienutzung anzuschließen. Die Arbeit wird von drei Forschungsmethoden geleitet. Erstens, eine vergleichende Analyse mit dem Hauptkonkurrenten X unterstreicht die Hauptähnlichkeiten und Unterschiede zwischen den beiden Anwendungen aus Benutzersicht. Die Anwendungen erfüllen denselben Zweck - die Publikation von Kurztexten - wobei die Hauptunterschiede beispielsweise bei der Kontoregistrierung liegen, da Threads mit Instagram integriert ist; beim Preis, wobei Threads etwas teurer ist; bei den Inhaltsbeschränkungen, wobei Threads im Allgemeinen mehr Inhalt in der kostenlosen Version und X mehr in der Premium-Version bereitstellt; sowie bei der Anzahl der Funktionen, wobei Threads derzeit weniger Möglichkeiten bietet. Zweitens zeigt und bestätigt eine Sentiment Analyse von Benutzerbewertungen unter Verwendung der TextBlob- und VADER-Bibliotheken in Python eine überwiegend positive Einstellung zu Threads (51-55%). Drittens werden zwei Topic-ModelingTechniken, LSA (Latent Semantic Analysis) und LDA (Latent Dirichlet Allocation) verwendet, um die Hauptthemen zu identifizieren, die von den Benutzern diskutiert werden. In den negativen Bewertungen sagen die Benutzer: (1) dass Threads eine Kopie von Twitter ist; (2) sind nicht zufrieden mit der Integration von Instagram; (3) äußern Datenschutzbedenken; (4) sind unzufrieden mit ihrem Feedinhalt; und (5) beschreiben aufgetretene technische Probleme. In den positiven Bewertungen mögen die Benutzer: (1) die Anwendung und schätzen ihre aktuellen Funktionen, äußern jedoch Interesse daran, in Zukunft mehr Funktionen zu sehen; (2) sagen, dass die Plattform einfach zu bedienen ist; (3) bevorzugen es gegenüber X; (4) und drücken eine allgemeine Begeisterung aus, indem sie positive Wörter wie *'best'*, *'great'*, *'love'* und *'amazing'* verwenden. Threads bedient sowohl hedonistische als auch utilitaristische Werte und beeinflusst potenziell die Absichten der Benutzer, die Nutzung fortzusetzen. Die Analyse legt nahe, dass Threads als Alternative zu X gesehen werden kann, dies wird auch direkt von den Benutzern kommentiert.

Schlüsselwörter: Threads, X, Twitter, Soziale Medien, Benutzerzufriedenheit, Stimmungsanalyse, TextBlob, VADER, Themenmodellierung, LSA, Latente Semantische Analyse, LDA, Latente Dirichlet-Allokation

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1. Introduction

The internet connects billions of people globally, and serves as a foundation of modern society. As of January 2024, the number of internet users worldwide reached 5.35 billion, comprising 66.2% of the global population (Statista, 2024). The social media penetration rate, defined as internet users, who use a social network site via any device, at least once per month, is constantly growing. It is forecasted that by 2028, the penetration rate will reach its peak at 75.3%. (Statista, 2024). This represents an opportunity for social media platforms to increase their networks, but they still need to offer compelling features to attract and retain the users, who are constrained by time resources. For any service, it is vital to continuously track user satisfaction, and address any reported issues or needs.

The following thesis focuses on user satisfaction of Threads, a new social media application, introduced by Meta's Instagram team, for sharing text updates, and joining public conversations. The application launched as an alternative to X (formerly Twitter), the largest application of this kind, and one of the most popular social media platforms in general. The purpose of the thesis is to understand the competitive positioning of Threads, by conducting own research and analysis of a dataset, complementing the existent research in the topic of social media user satisfaction. The work starts with a comparison of X and Threads, to understand the similarities and differences between both platforms. It continues with the analysis of a publicly available Kaggle dataset, consisting of 32.9k user reviews, scraped from the Threads mobile application on Google Play and App Store, capturing valuable insights and sentiments. This analysis step is done in Python, using sentiment analysis and topic modelling tools.

The following thesis consists of five chapters: (1) *'Introduction'*, (2) *'Literature Review'*, (3) *'Methodology'*, (4) *'Results'*, and (5) *'Conclusions'*. First, briefly presented is the research area, together with the objectives, and the methodology used. Then, identified are research gaps, and formulated are the research questions to be answered. Next, included is a detailed description of the dataset used, the results of the exploratory data analysis, and presented are research methods employed. After that, discussed are the results of the analysis, with the interpretation in the context of the research questions, limitations of the study, and suggestions for future research.

2. Literature Review

2.1 X

On October 27, 2022, Elon Musk finalized the acquisition of Twitter, via his private technology company X Corp. After the acquisition, Twitter underwent a rebranding process, adopting the new name 'X', and a new logo. For this reason, Twitter is referenced as 'X' in the following thesis. The updated logo, reflecting this change, is visible on the platform's website, as well as in the mobile application.

During an interview conducted as part of VivaTech (Sky News, 2023), France's biggest technology tradeshow, Elon Musk made a remark about the goals at X: *'We should have free speech, as much as possible, as much as it is allowed by the laws in any country', 'We want to allow people to express themselves'*. Elon Musk's primary goals at X are to promote the freedom of speech, by loosening the censorship on the platform, and to remove the spam bot accounts. The owner of X made a remark that people should be able to communicate even offensive viewpoints, because otherwise it would become a censorship. It does not mean that such harmful content should be promoted, but on the contrary, it would be downgraded by the algorithm, as X aims to be a positive force for civilization. *'Freedom of speech, but not freedom of reach'* is the viewpoint that X currently cultivates. On the one hand, promoting free speech might seem like a positive aspect of X's evolution, but on the other, according to Hickey et al. (2024), the average daily proportion of hate speech on the platform, and the number of bot accounts that posted hateful tweets, rose almost twice after Elon Musk purchased Twitter, with no signs of hate speech returning to its previous, typical levels. Insufficiently controlling hateful speech might have negative consequences not only for the platform's users, but also for the platform itself. As described by ADL (2020), a group of organizations launched the *'Stop Hate for Profit'* campaign, to convince the advertisers to stop utilizing Facebook and Instagram advertisements for the month of July. People recognized Facebook's hate speech, incitement, and misinformation policies as unfair and harmful, due to the advertisements being often displayed in near proximity to hateful contents, contributing to Facebook's profits. As a result of the campaign, Facebook lost some of the world's top advertisers, including Coca-Cola, following by Unilever, which alone spent USD \$42.3 million on Facebook in 2019 (NBC News, 2020). A broad range of prior research already points out the possible consequences of online

hate speech for the individuals. Stefanita and Buf (2021), proposed a review of the literature on the psychological effects of online hate speech. Its consequences may range from anger to severe depression, and even suicide. MIT Technology Review (2022), shared the results of the analysis conducted via Bot Sentinel, indicating that after the change in X's ownership, between October 27 and November 1, around 877,000 accounts were deactivated by their owners, and 497,000 were suspended by X, making it twice the usual behavior. The CEO of Bot Sentinel, Christopher Bouzy, believes that the increase in deactivated accounts results from people being upset with the change in X's ownership structure. Such a decrease in X's users presents a strategic opportunity for another application to capture a portion of the market share. Shortly, after the change in X's ownership, on July 5, 2023, Threads launched. According to Lund (2023), the success of Threads lies in X's issues, and in attracting Facebook's and Instagram's existing user base. While X and Threads might seem similar at first glance, it would be advantageous to understand the core promises and functionalities of those applications, to explore the primary distinctions from the users' perspective. Such a comparison is also useful for further understanding of the user reviews, in the analysis step.

Research question 1. What differentiates X's and Threads' functionalities?

2.2 Hedonism and Utilitarianism

Among different types of applications, social media is the most popular domain, followed by leisure, e-commerce, and communication. 79% of respondents indicate a social media application, as their most frequently used application (Al-Shamaileh and Sutcliffe, 2023). According to Statista (2024), the most popular social networks worldwide, as of January 2024, ranked by number of monthly active users in millions, are: Facebook (3,049), YouTube (2,491), WhatsApp (2,000), Instagram (2,000), TikTok (1,562), WeChat (1,336), Facebook Messenger (979), Telegram (800), Douyin (752), Snapchat (750), Kuaishou (685), X (619), Sina Weibo (605), QQ (558), and Pinterest (482). Akdim et al. (2022), demonstrates that the intention to use social media applications can be explained by a hedonic-utilitarian model. An application may have hedonic or utilitarian nature, where an example of a hedonic application can be Instagram, and of an utilitarian application - TripAdvisor. In other words, the hedonic approach can

be described as pleasure-oriented, and the utilitarian approach as productivity-oriented. The hedonic/utilitarian distinction could be used to better understand the profile of Threads, predict its users' intention to continue using the platform, and contribute to the discussions in the domain of user satisfaction. It is important to articulate why the used distinction is still relevant and important, and why it will be used in the current thesis. The explanation can be found in the next paragraph.

The hedonic and utilitarian concepts have a long philosophical history, and have persisted through to modern times. Some of the key contributors to the debate include: Aristippus of Cyrene (435-356 BC), Plato (427–348 BC), Aristotle (384–322 BC), Epicurus (341–270 BC), Thomas Aquinas (1225-1274), Joseph Butler (1692-1752), David Hume (1711-1776), Jeremy Bentham (1748-1832), John Stuart Mill (1806-1873), Friedrich Nietzsche (1844-1900), Franz Brentano (1838-1917), Henry Sidgwick (1838-1900), George Edward Moore (1873-1958), William David Ross (1877-1971), and Charlie Dunbar Broad (1887-1971) (Stanford Encyclopedia of Philosophy, 2013).

The appearance of the hedonic, pleasure-oriented motive can be traced back to Sumer, which is the earliest known civilization. In *'Epic of Gilgamesh'*, an epic poem from Mesopotamia, the character named Siduri, gives the following advice: *'Fill your belly. Day and night make merry. Let days be full of joy. Dance and make music day and night (...) These things alone are the concern of men.'* (Sandars, n.d.). The Online Etymology Dictionary¹ states that the term *'hedonism'* comes from the Greek word *'hēdone'*, meaning *'pleasure'*. In fact, the concept of hedonism has strong roots formed as early as in ancient Greece. In the book *'The Birth of Hedonism: The Cyrenaic Philosophers and Pleasure as a Way of Life'* (Lampe, 2015), the author focuses on the Cyrenaic movement, founded in the 4th century BC by Socrates' student, Aristippus of Cyrene. In a conversation with Socrates, Aristippus said: *'I assign myself to those who want to live as easily and pleasantly as possible'*. The Cyrenaic school perceives the world in terms of opportunities for pleasure, and risks of suffering pain. The book mentions an anecdote about Aristippus, visiting the tyrant Dionysius in Sicily. Aristippus justifies why he tolerates being spit on by the tyrant: *'Fishermen endure getting wet with sea water in order to catch a gudgeon.'*

¹ <https://www.etymonline.com/>

Shouldn't I endure getting wet with wine in order to catch a tuna?'. Aristippus's primary reason for visiting the tyrant Dionysius was to enjoy the luxuries he could provide.

Another contributor to the hedonic debate is Plato. The philosopher criticizes the pleasure-oriented life, and compares it to a life of an oyster, as such a lifestyle lacks meaning (Stanford Encyclopedia of Philosophy, 2013). The philosopher was not a hedonist, he argued that pleasure is not the sole purpose of life, but he appreciated it, and believed that it could indeed make life better (Sommerville, 2014). Aristotle claims that pleasure cannot be the goal of life, as it is not one concept. There is no such thing as one undifferentiated pleasure, but there are different sources of pleasure, for example eating and thinking, and hence it is not possible to perceive them as different quantities of the same pleasure. In other words, since those are different sources of pleasures, one should not place them under one category of pleasure, as they are not comparable (Gonzalez, 1991).

In the book *'The Cambridge Companion to Epicureanism'* (Warren, 2009), the author introduces the history of ancient philosophical school of Epicureanism, together with its areas of interest. The school, founded around 307/306 BC, by Epicurus, was located in a suburban Athenian garden, and according to Seneca, the following inscription could be seen at the entrance, greatly summarizing the topic of the current paragraph: *'Stranger, your time will be pleasant here. Here the highest good is pleasure.'* The book's chapter dedicated to pleasure and desire states that for an Epicurean, pleasure is the goal of life, and it is described as *'lack of pain'*. In other words, for Epicurus being free of pain, means being in a state of pleasure, which is the highest pursuit. The chapter about Epicureanism in early modern philosophy, discusses how this ancient philosophy recovered in the Renaissance, and was disseminated in the later periods, demonstrating its crucial effect on the evolution of philosophy, and proving its timelessness.

The medieval Christian priest and philosopher, Thomas Aquinas, was a theological eudaemonist. He believed that the highest good is eternal happiness, enabled and fulfilled by God's power. Aquinas does not see pleasure or earthly pursuits as the highest goal, but rather achieving eternal life through God. Theological eudaimonism can be contrasted with rational eudaimonism, stating that individuals can produce their own happiness on Earth. Representatives of the rational eudaimonism movement are for example Plato and Aristotle, mentioned earlier in the current chapter (University of Idaho, n.d.).

Another critics of the hedonistic perspective were Joseph Butler, an Anglican bishop, and David Hume, an Enlightenment philosopher. The motivational hedonist approach says that all human basic and non-basic motives are directed at pleasure. This perspective was commented by Butler, who said that not all human actions are focused on pleasure, such examples are the want of respect, love, or knowledge. Hume contributed to the discussion, by adding other examples, such as hunger, thirst, fame, power, revenge, or genuine desire for the happiness and well-being of others. These examples illustrate that human motivations are diverse, and not exclusively focused on pleasure. They may also involve fulfilling certain needs or objectives (Stanford Encyclopedia of Philosophy, 2013).

The concept of utilitarianism was fully introduced only in the 19th century, by the two classic utilitarians, Jeremy Bentham and John Stuart Mill. Utilitarianism is based on consequentialism, where the results of actions are considered. Utilitarian approach aims to maximize the overall good, including the own well-being, and the well-being of others. According to the philosophy, everyone's good counts the same, and it should be maximized, by taking the right actions. It can be seen as a modification of hedonistic philosophy, expanding the focus beyond individual pleasure (Stanford Encyclopedia of Philosophy, 2014). Jeremy Bentham represents a quantitative approach in utilitarianism, where the quantity of people affected by happiness counts. *'It is the greatest happiness of the greatest number that is the measure of right and wrong'* he wrote in the preface to his *'A Fragment on Government'* (1776). He believed that there were no qualitative differences between different pleasures. Jeremy Bentham starts his book entitled *'Principles of Morals and Legislation'* (1781), with the following words: *'Nature has placed mankind under the governance of two sovereign masters, pain and pleasure. It is for them alone to point out what we ought to do, as well as to determine what we shall do.'* In other words, Bentham suggests that pain and pleasure, that might result from own actions, should guide individuals in decision-making. John Stuart Mill was the follower of Bentham, and another key utilitarian philosopher. Mill, on the contrary to Bentham, had a qualitative perspective to pleasure. He believed in pleasures of higher and lower sort. Pleasures of higher rank are the intellectual ones, and of the lower rank, the ones humans share with animals. According to Mill *'better to be Socrates dissatisfied than a fool satisfied'* (Stanford Encyclopedia of Philosophy, 2014).

Continuing with the contributors to the hedonic/utilitarian debate of the 19th century, it would be worth to mention Friedrich Nietzsche, the German philosopher, who is typically not categorized as neither a hedonist, nor utilitarian. In fact, Nietzsche rejects hedonism, and questions the significance of pleasure and pain (Reginster, 2005). The philosopher also criticizes utilitarianism, by questioning its internal consistency, and is raising doubts about utilitarians' true motives (Anomaly, 2005). Franz Brentano, another contributor of the century, was a key figure in the development of intentionalism. Brentano believed that pleasure is not only a feeling, but a mental state with intentionality. It is directed towards a goal. This perspective on pleasure aligns with hedonism in emphasizing the significance of pleasure in human experience and ethical decision-making (Stanford Encyclopedia of Philosophy, 2013). Another philosopher of the century, Henry Sidgwick, was a major contributor when it comes to the utilitarian philosophy. The aim of the piece entitled '*The Methods of Ethics*' (1874), is for Sidgwick to provide an argument for classical utilitarianism, '*The good of any one person is no more important from the point of view of the universe than the good of any other*', he writes, or '*And it is evident to me that as a rational being I am obliged to aim at good generally.*' (Sidgwick, 1874).

Coming to the contributors of the 20th century, George Edward Moore was opposed to the hedonistic value theory. He believed in good, but that the good included far more than what could be simply reduced to pleasure. Moore also did not perceive pleasure itself as intrinsic good. William David Ross argues that pleasure alone does not determine how valuable something is, '*same pleasure, different value*', by providing the story about two worlds. In one world, good people (virtuous) feel good, and bad people (vicious) feel bad. In the other world, the opposite: bad people feel good, and good people feel bad. Even though pleasure is the same in both worlds, Ross thinks that the well-matched world is better. (Stanford Encyclopedia of Philosophy, 2014). Charlie Dunbar Broad rejected both hedonism and utilitarianism. The philosopher disagreed with the hedonistic perspective, and believed that there are also other things besides pleasure and pain, that can have intrinsic value or disvalue. Broad also rejected the utilitarian perspective that there is only one determinant of the right action (Stanford Encyclopedia of Philosophy, 2021).

As can be seen, both hedonism and utilitarianism have been considered for centuries by the most famous philosophers of all time. The topics remain relevant, and continue to be debated today, also in

discussions about social media applications, where an application can have a hedonic, pleasure-oriented nature, or a utilitarian, productivity-oriented one. Regarding the hedonistic philosophy, hedonic applications aim to provide pleasure and amusement. In contrast, utilitarian philosophy guides utilitarian applications, aiming to enhance productivity, by focusing on delivering results in the best way possible, and increasing the overall benefit for the users. As written at the beginning of the current chapter, the intention to use social media applications can be explained by a hedonic-utilitarian model (Akdim et al., 2022). It would thus be of interest to investigate, whether Threads has hedonistic and/or utilitarian values. This hedonic/utilitarian distinction could be used to better understand the profile of Threads, predict users' intention to continue using the platform, and contribute to discussions in the domain of user satisfaction, but also the philosophical field.

2.3 User Satisfaction

As mentioned previously, Akdim et al. (2022) shows that the intention to use social media applications can be explained by a hedonic-utilitarian model. The study is in line with previous research in this area, and confirms that the continuance intention to use an application is explained by perceived usefulness, perceived ease of use, perceived enjoyment and satisfaction. The analysis also confirms that the effects of perceived ease of use are greater for utilitarian applications, while the effect of perceived enjoyment on satisfaction is greater for hedonic applications. The source of the hedonic-utilitarian model in this context can be traced back to the integration of these two perspectives in understanding user behavior. The authors mentioned at the beginning of the current paragraph (Akdim et al., 2022), acknowledge the influence of the Technology Acceptance Model (TAM) (Davis, 1989), and the Information Systems (IS) continuance model (Bhattacharjee, 2001), incorporating perceived usefulness and perceived ease of use as utilitarian variables, and perceived enjoyment as a hedonic variable. According to Davis (1989), perceived usefulness and perceived ease of use are strongly correlated with both self-reported current usage, and future usage of the systems. According to Bhattacharjee (2001), users' intention to continue using information systems is determined by their satisfaction with usage, and the perceived usefulness of continued system use. User satisfaction, on the other hand, is influenced by their confirmation of expectations from prior information system use, and its perceived usefulness.

A study by Meena and Sarabhai (2023), proved that both intrinsic motivators (i.e., perceived enjoyment, perceived involvement) and extrinsic motivators (i.e., perceived usefulness, convenience, perceived ease of use) had significant effect on users' satisfaction, and willingness to use hedonic applications. Satisfaction of mobile applications users' is affected by the perceived security, information technology awareness, and subjective norm (Al-Hammouri and Nusairat, 2020). Trust, continuous use, and the intention to share a mobile application with others are created through the high degree of innovation of the new product or the new service utilization (Cho and Lee, 2018). The choice of a social media application is fast, where only a few functionalities are evaluated in the decision, such as utility, external influences, and convenience. In contrast to other types of applications, social media platforms are abandoned infrequently. User's choice of downloading and deleting applications is driven by usefulness, usability, and contextual factors, such as networking and recommendations. Content, usability, and pleasure, predict overall user experience and, less strongly, satisfaction. (Al-Shamaileh and Sutcliffe, 2023). While high-experience users' satisfaction in social networking sites is more likely influenced by interactivity and information affordance; low-experience users' satisfaction is connected to navigation affordance (Shao et al., 2020).

Previous research also unveiled the determinants of user satisfaction, and intentions of use, within specific social media applications. Using Maslow's needs hierarchy, it was found that Facebook can fulfill basic and advanced human needs, building users' intention to use the application, and increasing peoples' life satisfaction (Houghton et al., 2020). A study by Bahri-Ammari et al. (2019), revealed that the intention to use Instagram is positively affected by the perceived pleasure, social identity, and perceived ease of use. Satisfaction of TikTok users is significantly affected by self-expression, informativeness, sense of belonging, and trendiness. Less significant factors are sociability, affection in TikTok, and past time in TikTok (Sharabati et al., 2022). The intensity of use, and addiction to Snapchat is related to users' needs, such as entertainment, and the application's functionality (Punyanunt-Carter et al., 2017). Finally, content gratifications and new technology gratifications are the two main factors affecting the continuance intention to use Twitter (Liu et al., 2010).

The main objective of the following master's thesis is to expand the existing research in the field of user satisfaction and willingness to use, within social media applications, and to further grasp the

predicates of users' satisfaction behind the new mobile application, Threads. Consequently, the principal questions that emerge within this domain are:

Research question 2. What is the user's overall sentiment towards Threads?

Research question 3. What are the main strengths and weaknesses of the Threads application, as identified through user feedback? What makes the application receive 1 star and 5 stars?

3. Methodology

3.1 Dataset

The dataset used for the analysis is a publicly available Kaggle dataset, entitled '*Threads, an Instagram app Reviews*'². It is a comprehensive collection of 32.9k user reviews about Threads mobile application, scraped from Google Play Store and App Store, capturing valuable insights and sentiments. The dataset enables the understanding of user satisfaction, evaluation of app performance, and identification of emerging patterns. The dataset consists of four columns: (1) '*source*', with the source of review; (2) '*review_description*', with the review given by the user; (3) '*rating*', with the rating given by the user; and (3) '*review_date*', with the date of review. First, the dataset was downloaded and uploaded to Google drive, to ensure its consistency over time. After that, it was accessed, using Python. For each column, an initial exploratory data analysis was performed, to understand the data formats, and structures. Results of the analysis are presented below.

As part of the data preparation before the analysis, missing values and duplicated rows were checked. The dataset had no missing values, and there was only one duplicated row, which was removed. The visualizations start from the first column, *source*. As can be seen below, 92% of reviews come from Google Play, and only the remaining 8% from App Store. The data in this column is an object type, being either '*Google Play*' or '*App Store*'.

² <https://www.kaggle.com/datasets/saloni1712/threads-an-instagram-app-reviews>

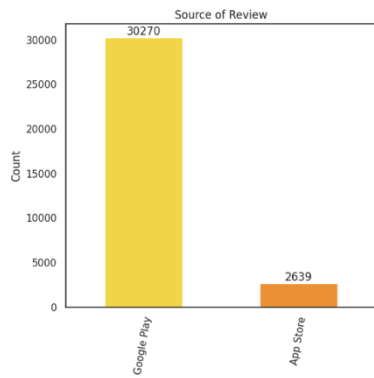


Figure 1. Source of Review

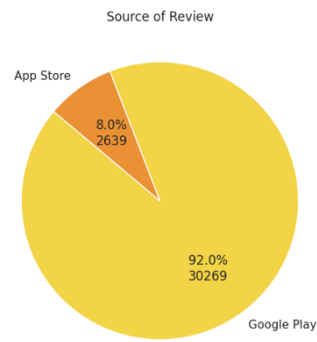


Figure 2. Source of Review

The next column, *review_description*, contains more diverse textual data, with the actual reviews written by the users. Before visualizations, the reviews were tokenized, all the words were changed to lower case, and the punctuation together with stopwords were removed, using the NLTK library. The frequencies of words were counted, and displayed in the form of a bar chart and a word cloud, as visible below.

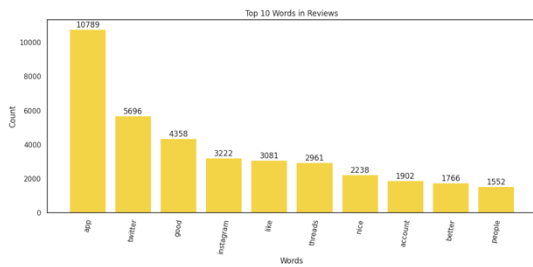


Figure 3. Top 10 Words in Reviews



Figure 4. Top 100 Words in Reviews

For the column *review_description*, computed was also the distribution of words in reviews. As can be noticed, the reviews tend to be rather short, with the minimum of 1 word, maximum of 999 words, and a mean of 12 words per review.

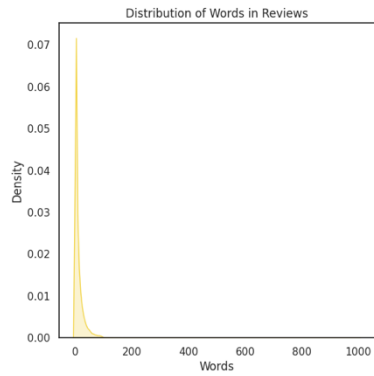


Figure 5. Distribution of Words in Reviews

Column *rating* contains integer numbers from 1 to 5. Almost 50% of the users left 5 stars, and around 30%, 1 star. Meaning, that users tend to leave either 1 star or 5 stars in their reviews. In other words, they seem to be either very satisfied or dissatisfied with the application.

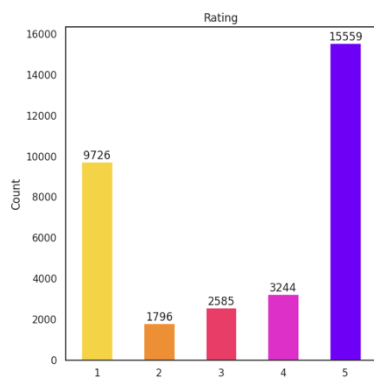


Figure 6. Rating

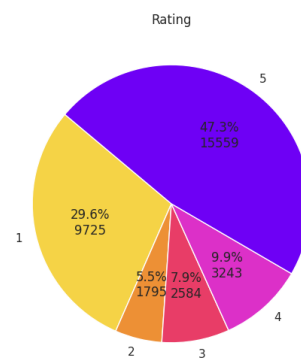


Figure 7. Rating

For each date in the column *review_date*, the number of reviews was counted, and the results were visualized in the form of a bar chart. As can be seen, the dataset covers the reviews from 21 days of July 2023, starting on July 5, and ending on July 25.

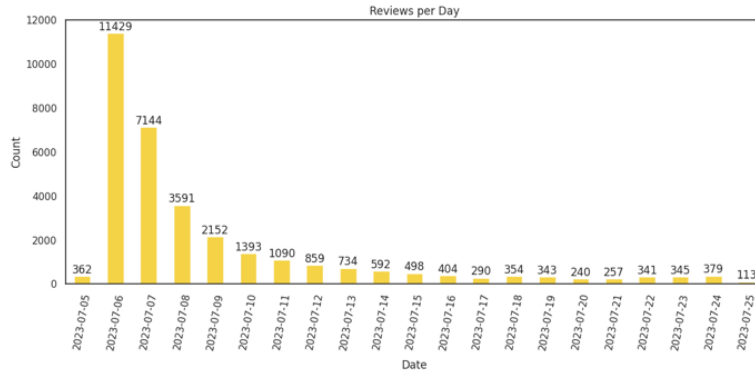


Figure 8. Reviews per Day

3.2 Methods

This section outlines the methods employed to address each research question.

3.2.1 Research question 1.

To answer the first research question, ‘*What differentiates X’s and Threads’ functionalities?*’, the official online resources of both platforms, X³ and Threads, were reviewed. On top of that, own inspection was conducted, by accessing X⁴, and exploring it from the user’s perspective. For Threads, online research was conducted, using resources like Meta’s official website⁵, Instagram’s Help Center⁶, and Threads’ Instagram page⁷. For both applications, compared was the whole cycle of user experience, starting from registration, through usage of basic functions, to paid subscriptions, monetization, finishing with account deactivation. At the end, both platforms were compared in a form of a table.

3.2.2 Research question 2.

To answer the second research question, a sentiment analysis on the previously described Kaggle dataset was performed in Python. First, the duplicated row was removed. Apart from that, no preprocessing

³ <https://help.twitter.com/>

⁴ <https://twitter.com/>

⁵ <https://about.fb.com/news/2023/07/introducing-threads-new-app-text-sharing/>

⁶ <https://help.instagram.com/>

⁷ <https://www.instagram.com/threads>

steps were done. This is because the punctuation, stop words, and letter case can give more context to the reviews' sentiment analysis. What is also worth noting is that in total, the dataset had 13,912 emojis in 6,622 rows. This means that slightly more than 20% of the rows contained at least one emoji. Emojis can be used to improve communication, and express feelings (Boutet et al., 2021). Therefore, it was decided to leave the emojis in the dataset for additional context.

To compute the users' overall sentiment towards Threads, two different sentiment analysis tools were applied to the column *review_description*. The first tool used was TextBlob⁸. It is a simple library that assigns polarity scores, from -1 to 1, to words, based on a predefined sentiment. The second chosen library was VADER⁹ (Valence Aware Dictionary and sEntiment Reasoner). It is a lexicon and rule-based sentiment analysis tool, that is especially tailored to emotions conveyed through social media. Some examples of cases that VADER can handle include: (1) punctuation, e.g. signaling increased sentiment intensity, such as '*Good!!*'; (2) capital letters to signal emphasis, e.g. '*SUPER*'; (3) degree modifiers, e.g. '*very*', '*kind of*'; (4) emoticons such as '<3', but also the utf-8 encoded emojis like '❤️'; as well as (5) slang words, initialisms and acronyms, e.g. '*lol*'. VADER is considered a more advanced tool compared to TextBlob. Therefore, both libraries were selected to generate a range of sentiment scores for each review, enhancing the sentiment assessment through the utilization of two distinct techniques. Based on the scores produced by the libraries, each review was assigned one label from TextBlob, and one label from VADER, using the following threshold values: '*Negative*' for score ≤ -0.05 ; '*Neutral*' for score between -0.05 and 0.05; and '*Positive*' for score ≥ 0.05 . These are the typical threshold values, as mentioned in the official GitHub repository dedicated to VADER¹⁰.

⁸ <https://textblob.readthedocs.io/en/dev/>

⁹ <https://pypi.org/project/vaderSentiment/>

¹⁰ <https://github.com/cjhutto/vaderSentiment>

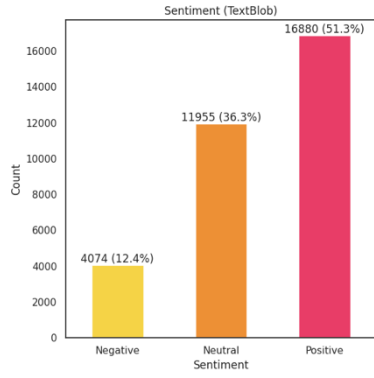


Figure 9. Sentiment (TextBlob)

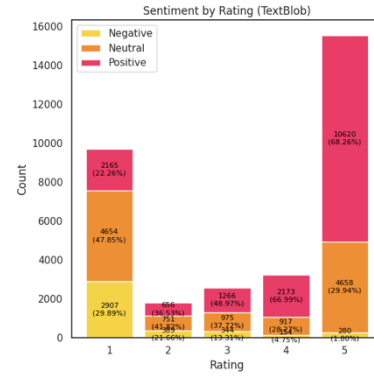


Figure 10. Sentiment by Rating (TextBlob)

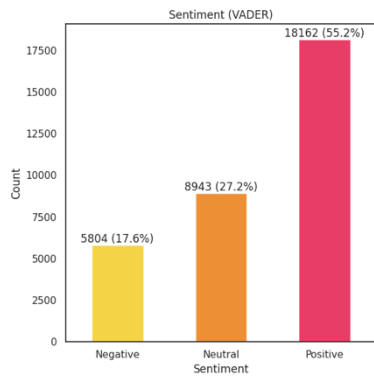


Figure 11. Sentiment (VADER)

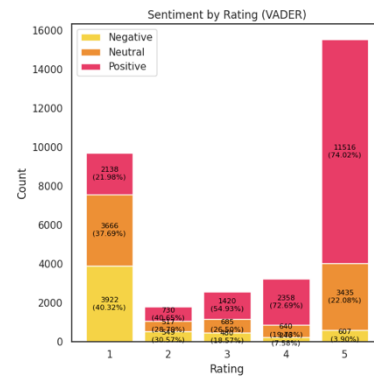


Figure 12. Sentiment by Rating (VADER)

At the end, the sentiment analysis results were visualized, using the matplotlib.pyplot module, as part of the matplotlib¹¹ Python library, to comprehend the distribution of reviews with negative, neutral, and positive language. The visualization also involved comparing the sentiment analysis results with the ratings given by users, to assess whether the emotions expressed in the reviews aligned with the provided ratings. The visualization results are visible on *Figures 9-12*.

3.2.3 Research question 3.

To answer the third research question, a topic modelling analysis of the previously described Kaggle dataset was conducted in Python. As in the case of the second research questions, two techniques, LSA

¹¹ <https://matplotlib.org/>

(Latent Semantic Analysis) and LDA (Latent Dirichlet Allocation), were employed and compared. The technique delivering visually more appealing results – LDA, was chosen for further interpretation. The analysis followed the steps described in the publicly available Kaggle notebook, entitled ‘*Topic Modelling with LSA and LDA*’¹², but with an extended preprocessing part. The code started with dataset preprocessing, including: removing the single duplicated row, converting text to lowercase, removing non-ASCII characters, to avoid errors when retrieving the topics; tokenization, removing punctuation and stop words, as well as lemmatization of reviews. At the end of the preprocessing, a filtering step was applied, first to retrieve the negative reviews with *rating* = 1, and then the positive reviews with *rating* = 5. Then, retrieved was a list of top words for reviews with *rating* = 1, and *rating* = 5 separately, giving an overview into the core vocabulary of satisfied, and unsatisfied users. The results are visible below.

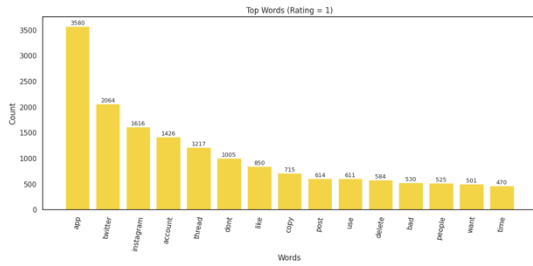


Figure 13. Top Words for Rating = 1

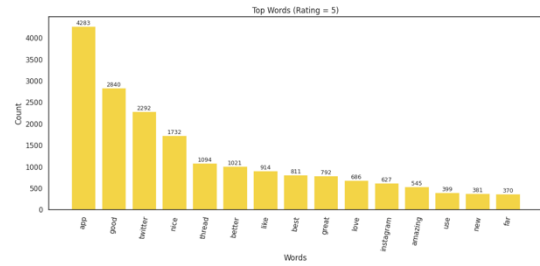


Figure 14. Top Words for Rating = 5

After that, further preprocessing steps were applied. To apply topic modelling, the reviews needed to be represented in some tractable feature space, in other words each review was converted into a numerical vector. This was done using the CountVectorizer¹³ object from scikit-learn Python library. The result of the vectorization is a $n \times K$ document-term matrix, where ‘ K ’ is the number of distinct words across the ‘ n ’ reviews in the dataset. Then, the number of topics for topic modelling is set. The number was chosen based on own experimentation. For each number of topics, checked were: (1) the visualization results, in other words whether it looked reasonable, with a clear distinction between the topics; (2) the human interpretability of the produced topics; and in addition (3) the perplexity scores for the LDA results,

¹² <https://www.kaggle.com/code/rcushen/topic-modelling-with-lsa-and-lda>

¹³ https://scikit-learn.org/stable/modules/generated/sklearn.feature_extraction.text.CountVectorizer.html

being a measure of fitness or model performance, informing how well the model captures the underlying structure of the data, where lower scores are desired.

The first topic modelling technique used was LSA, with a Truncated SVD¹⁴ (Truncated Singular Value Decomposition) implementation, from the `sklearn.decomposition` module, as part of the `scikit-learn` Python library. The input for the LSA analysis was the previously prepared sparse document-term matrix. The matrix was then internally decomposed by the Truncated SVD algorithm, using the predefined number of topics, resulting in a reduced matrix. Taking the *arg max* for each review in the topic matrix, provided the predicted topic for each review. The second topic modelling technique used was LDA, which is a generative probabilistic process designed to reveal latent topic structures in text corpora. It assumes that each document is a mixture of topics, and each topic is a mixture of words. The algorithm probabilistically assigns words to topics, and topics to documents. LDA was also applied to the previously mentioned sparse document-term matrix, with the `LatentDirichletAllocation`¹⁵ class, from the `sklearn.decomposition` module. The used class requires to specify several parameters, including the number of topics, the learning method, as well as '*alpha*' and '*beta*' values. The learning method was set to '*online*', as it is faster than the '*batch*' method, according to the class documentation. It also delivered better results. The *alpha* parameter represents the concentration of topics within a dataset. A low *alpha* value indicates that documents are expected to contain only a small number of topics, while a high *alpha* value means that documents may contain many topics. The *beta* parameter represents the concentration of words within topics. A low *beta* value indicates that topics consist of a small subset of all words from the vocabulary, while a high *beta* value means that the topics may contain a larger proportion of words from the vocabulary. The *alpha* and *beta* parameters were set based on own experimentation. For negative reviews it was set to *alpha* = 0.25, *beta* = 0.05, and for positive reviews it was set to *alpha* = 0.25, *beta* = 0.04. Similarly, as for the number of topics, the parameters were chosen based

¹⁴ <https://scikit-learn.org/stable/modules/generated/sklearn.decomposition.TruncatedSVD.html>

¹⁵ <https://scikit-learn.org/stable/modules/generated/sklearn.decomposition.LatentDirichletAllocation.html>

on: (1) the visualization results, (2) the human interpretability of the produced topics, and (3) the perplexity scores for the LDA results. As in the case of LSA, taking the *arg max* for each review, allows to assign the most suitable topic to each review in the LDA model.

To enhance comprehension and interpretation of the topics generated by LSA and LDA, the top 10 words occurring within each topic were displayed, facilitating a human-readable characterization. Those 10 words for each topic can be seen below, under the respective bar charts, where topic occurrences were counted and visualized, using the matplotlib.pyplot module. As can be observed, the distribution of topics for the LDA analysis is more even than in the case of the LSA analysis, for both negative and positive reviews.

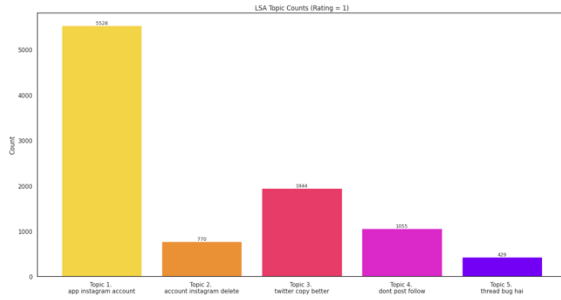


Figure 15. LSA Topic Counts (Rating = 1)

Topic 1. app, instagram, account, twitter, like, dont, thread, use, bad, glitch
 Topic 2. account, instagram, delete, thread, dont, want, deleting, login, use, log
 Topic 3. twitter, copy, better, like, elon, thread, paste, dont, cheap, musk
 Topic 4. dont, post, follow, people, feed, like, time, want, thread, im
 Topic 5. thread, bug, hai, instagram, post, try, crash, crashing, profile, reply

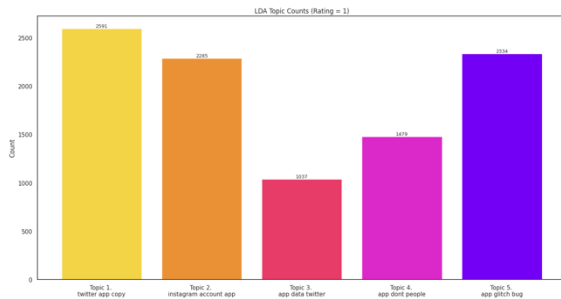


Figure 16. LDA Topic Counts (Rating = 1)

Topic 1. twitter, app, copy, bad, like, better, useless, boring, paste, instagram
 Topic 2. instagram, account, app, thread, delete, dont, twitter, use, want, like
 Topic 3. app, data, twitter, privacy, instagram, meta, thread, hai, personal, zuck

Topic 4. app, dont, people, follow, post, twitter, thread, feed, like, time

Topic 5. app, glitch, bug, screen, thread, like, worst, use, post, fix

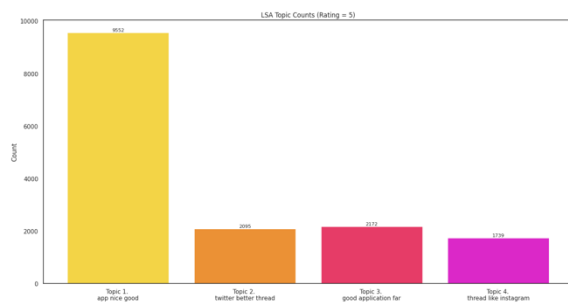


Figure 17. LSA Topic Counts (Rating = 5)

Topic 1. app, nice, good, great, best, love, twitter, amazing, like, thread

Topic 2. twitter, better, thread, elon, like, musk, instagram, best, way, great

Topic 3. good, application, far, twitter, aap, experience, apps, thread, instagram, really

Topic 4. thread, like, instagram, review, follow, add, new, im, account, feature

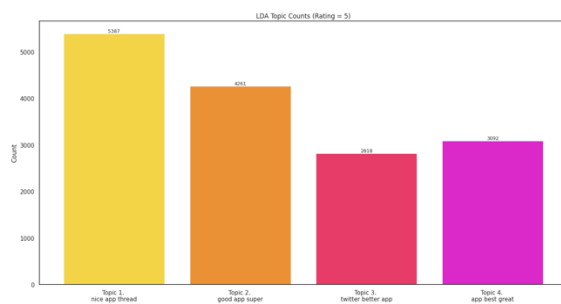


Figure 18. LDA Topic Counts (Rating = 5)

Topic 1. nice, app, thread, like, instagram, twitter, good, feature, far, review

Topic 2. good, app, super, awesome, use, excellent, application, cool, twitter, thread

Topic 3. twitter, better, app, elon, musk, thread, like, good, let, meta

Topic 4. app, best, great, love, amazing, twitter, hai, new, mark, thread

To properly compare both algorithms and choose the best one to further interpret its topic modelling results, the generated topic matrices were converted into a two-dimensional space using t-SNE¹⁶, and then visualized, using the Bokeh¹⁷ Python library, revealing the results of the topic-review assignments.

¹⁶ <https://scikit-learn.org/stable/modules/generated/sklearn.manifold.TSNE.html>

¹⁷ <https://docs.bokeh.org/en/latest/docs/reference/bokeh.html>



Figure 19. t-SNE Clustering of 5 LSA Topics (Rating = 1)

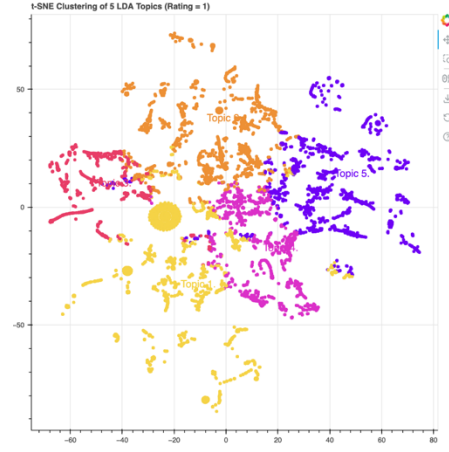


Figure 20. t-SNE Clustering of 5 LDA Topics (Rating = 1)

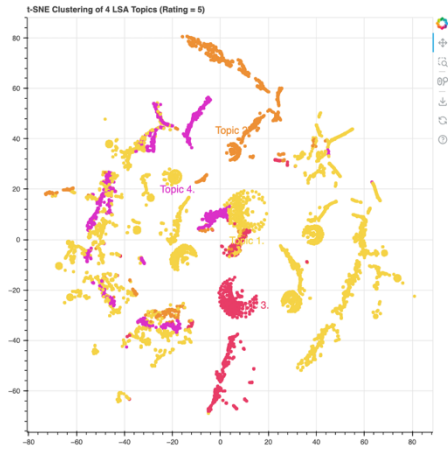


Figure 21. t-SNE Clustering of 4 LSA Topics (Rating = 5)

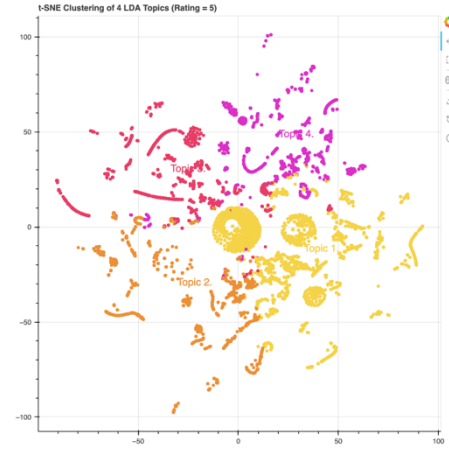


Figure 22. t-SNE Clustering of 4 LDA Topics (Rating = 5)

Based on the visualizations from *Figures 19-22.*, the LDA technique produced better results in separating out the topics, and thus its outcomes were selected for further interpretation.

4. Results

4.1 Research question 1.

The following section aims to present the answer to the first research question, '*What differentiates X's and Threads' functionalities?*'. The comparative analysis revealed that X and Threads are similar applications, offering comparable value to their users. X has a broader range of offerings, which is pre-

dictable given its longer history. The below table was created to emphasize the main distinctions between X and Threads, as of February 26, 2024. The left side of the table lists the features, and characteristics of both platforms, within the scope of the current analysis.

| | X | Threads |
|---------------------------------|---|---|
| Owner | Elon Musk, by X Corp. | Mark Zuckerberg, by Meta |
| Availability | Worldwide | Worldwide |
| Account registration | From scratch, using Gmail or an Apple account | Using an Instagram account |
| Subscription price | Starting at \$8/month, or \$84/year | \$11.99/month on the web, and \$14.99/month on iOS and Android |
| Profile checkmarks | Blue, gold, grey | Blue |
| Name and surname maximum length | 50 characters | 64 characters |
| Username maximum length | 15 characters | 30 characters |
| Bio maximum length | 160 characters | 150 characters |
| Text maximum length* | 280 characters, or 25,000 characters for subscribers | 500 characters |
| Maximum number of photos* | 4 | 10 |
| Video maximum length* | 140 seconds, or 3 hours for subscribers | 5 minutes |
| Audio maximum length* | 2 minutes and 20 seconds | 29 seconds |
| Hashtags | Yes | No, only on Instagram; Threads has posts tagging and keyword search |
| Scheduling posts | Yes | No, only on Instagram |
| Editing posts | Yes, with subscription up to 1 hour after posting | Yes, up to 5 minutes after posting |
| Undo posts | Yes, with subscription up to 1 minute after posting | No, only edit or delete |
| Translation | Yes | Yes |
| Fact-checking | Yes | Yes |
| Alt text | Yes | Yes |
| Live audios | Yes | No, but Instagram offers live videos (not the same) |
| Live videos | Yes | No, only on Instagram |
| Polls | Yes | Yes |
| Monetization/advertising | Yes | No, only on Instagram |
| Analytics | Yes | No, only on Instagram |
| Private messages | Yes | No, only on Instagram |
| Finding other people | Yes, profile recommendations from imported contact list | Yes, importing followings from Instagram |
| Interconnected network | Yes, e.g. with Grok | Yes, with Instagram and coming more in the future |

Table 1. Comparison of X vs. Threads, *Quantities per post

Both applications were developed by different companies, X is owned by Elon Musk via X Corp., while Threads is under the control of Mark Zuckerberg's Meta. Both platforms are available worldwide. One of the main differences is that a new X user can onboard to the platform: from scratch, by providing their name, e-mail, and date of birth; by Gmail, or by an Apple account. In contrast, Threads is integrated with Instagram, making it possible to register to the application only by an Instagram account. This difference is especially important, as it is often emphasized by the users, which will be shown later. There is also a difference in the pricing of premium accounts. On X, the prices start at a slightly more affordable point of \$8/month, while on Threads, it begins at \$11.99/month. Profiles on X are organized in a more descriptive manner, including professional labels for business accounts, and different kinds of checkmarks (blue, gold, and grey). The content limits tend to be more attractive on Threads than on X, when it comes to free accounts. Higher is the name and surname maximum length, username maximum length, text maximum length per post, maximum number of photos per post, and video maximum length per post, for free accounts on Threads. X has higher limits for bio maximum length, and audio maximum length per post, for free accounts. Becoming a premium user of X significantly increases the limits for text maximum length per post, and video maximum length per post. X is based on hashtags, while Threads uses posts tagging and keyword search, which might increase the usability of the platform. Other major differences that can be noticed are that X offers a wider range of features to its users, including scheduling posts, undo posts, live audios, live videos, monetization/advertising possibilities, analytics, and private messages. There are also several features that the platforms have in common, for example editing posts, translation, fact-checking, alt text, polls, connection with other people, and interconnected networks. Of course, Threads is still developing, and might come up with X's features and more in the future. What is also worth noting is that many of X's additional features are already available on Instagram, which is seamlessly integrated with Threads, allowing users to decide whether they would like to use Instagram only, or to extend the Instagram's features by downloading Threads, resulting in a more X-like experience; while on X, those options come rather as one package. Such features, that are already available on Instagram, but not on Threads, are hashtags, scheduling posts, live videos, monetization/advertising possibilities, analytics, and private messages. One of the major plans for Threads is the integration of the platform with other websites, using the ActivityPub, the open social networking

protocol, which might be a significant advantage for the platform in the future. X is already using inter-connected networks, e.g. with Grok, which is a conversational AI made by X Corp. In other words, X users can log in to Grok using their existent accounts, which makes the user journey more seamless.

4.2 Research question 2.

The following section aims to answer the second research question, '*What is the user's overall sentiment towards Threads?*'. Based on the sentiments computed by both libraries, TextBlob and VADER, the following conclusions are drawn: 51-55% of reviews are positive, 27-36% of reviews are neutral, and 12-18% of reviews are negative. The results can be seen on *Figure 23*. What is also worth commenting, is the way both libraries dealt with the identification of neutral language. VADER is considered a more advanced tool, and it was more sensitive towards detecting negative and positive language. As shown on the bar chart below, VADER generated fewer neutral results, and appeared to be more specific in assigning '*Negative*' and '*Positive*' labels to the reviews.

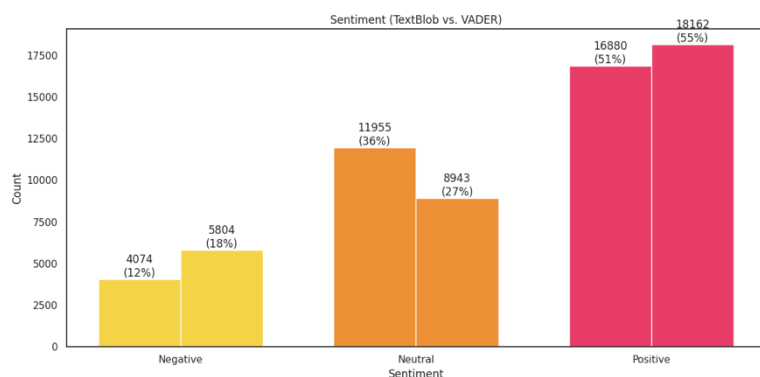


Figure 23. Sentiment (Textblob vs. VADER)

The above percentages refer to the language used by the users in their reviews, and were generated as the outcome of the sentiment analysis, described in detail before, and conducted on the textual data. The provided intervals suggest that most of the users used positive or neutral language in their reviews, with fewer than one out of every five users using negative language. As shown in one of the earlier chapters, on *Figure 7*. of the exploratory data analysis step, the distribution of ratings given by the users suggests the following: 47.3% of reviews are positive (*rating* = 5), 7.9% of reviews are neutral (*rating* = 3), and

29.6% of reviews are negative (*rating* = 1). It can also be stated that users tend to give either 1 star or 5 stars to the application. Comparing the results of the sentiment analysis on the reviews, and the exploratory data analysis of ratings given by the users, the percentage of reviews with positive language is comparable to the percentage of reviews with positive ratings (*rating* = 5). The difference lies in the percentage of reviews with negative language compared to the percentage of reviews with negative ratings (*rating* = 1), as the first metric is almost twice lower. This means that part of the users leave a low rating (*rating* = 1), without necessarily expressing their discontent in the reviews, using negative language. Also, the users tend to use neutral language, without necessarily selecting a neutral rating (*rating* = 3). The validity of the sentiment analysis results was confirmed by the following two bar charts, on *Figures 24-25.*, illustrating how the language used by the users tends to be more negative for reviews with low ratings, and more positive for reviews with higher ratings.



Figure 24. Sentiment by Rating (Textblob vs. *VADER*)

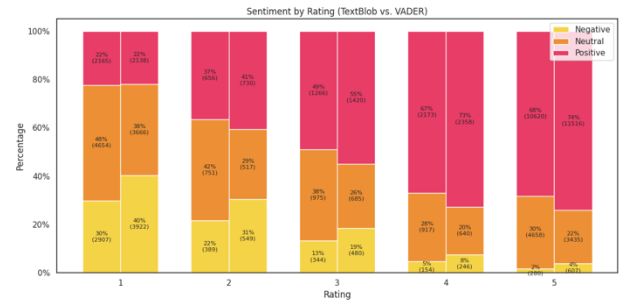


Figure 25. Sentiment by Rating (Textblob vs. *VADER*)

4.3 Research question 3.

The following section aims to answer the third research question, ‘*What are the main strengths and weaknesses of the Threads application, as identified through user feedback? What makes the application receive 1 star and 5 stars?*’. First presented are the results of the analysis for negative reviews, with *rating* = 1, and then for positive reviews, with *rating* = 5.

4.3.1 Negative reviews

Based on the domain knowledge, the interpretation of topics produced by the LDA model for negative reviews is as follows:

*Topic 1. **twitter**, app, **copy**, **bad**, like, better, useless, boring, paste, instagram*

The users discuss that Threads is a poor copy of Twitter. They also find it useless and boring.

*Topic 2. **instagram**, **account**, app, thread, **delete**, dont, twitter, use, want, like*

The users are unhappy with the Instagram integration, as it necessitates having an Instagram account to use Threads, and prevents them from deleting Threads without also deleting their Instagram account.

*Topic 3. app, **data**, twitter, **privacy**, instagram, meta, thread, hai, **personal**, zuck*

The users have concerns about data privacy, and are worried about the security of their personal information, as the application appears to collect excessive amounts of various types of data.

*Topic 4. app, dont, **people**, **follow**, post, twitter, thread, **feed**, like, time*

The users see irrelevant posts on their feed, from accounts that they do not follow.

*Topic 5. app, **glitch**, **bug**, screen, thread, like, worst, use, post, **fix***

The users encounter technical problems while using the application, often using terms such as ‘glitch’ or ‘bug’, and are requesting fixes for these issues.

The interpretation of the topics above was ultimately assessed by reading the reviews assigned to the respective topics, confirming the accuracy of the interpretation. As could be seen before on *Figure 16.*, the most popular topic mentioned by the users is *Topic 1.*, stating that Threads is a bad copy of Twitter. The second most popular topic is *Topic 5.*, describing the technical issues, that the users experienced while using the application. The third topic is *Topic 2.*, expressing discontent about the integration with Instagram. After that comes *Topic 4.*, about the irrelevant posts the users see on their timelines, and at the end, *Topic 3.*, about data privacy concerns. The daily counts of the five topics were visualized on the below bar chart, and a matrix.

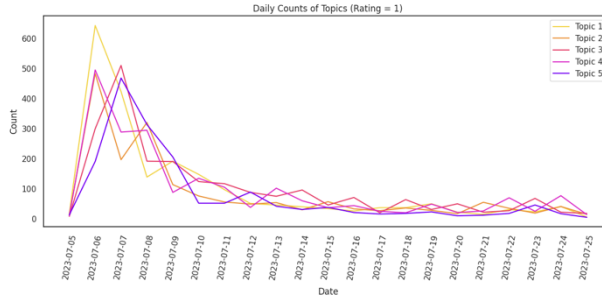


Figure 26. Daily Counts of Topics

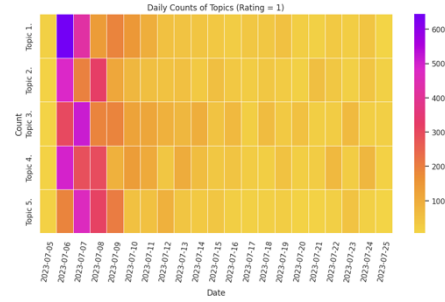


Figure 27. Daily Counts of Topic

4.3.2 Positive reviews

Based on the domain knowledge, the interpretation of topics produced by the LDA model for positive reviews is as follows:

*Topic 1. nice, app, thread, like, **instagram**, twitter, good, **feature**, far, review*

The users mainly describe Threads as 'nice'. They enjoy the Instagram integration, allowing to log in using the existent account, and importing the data, to instantly connect with others, as well as Threads' simple and clean interface. They appreciate the current features, but express interest in seeing additional functionalities in the future. The users make suggestions for the new features, such as adding a translation option, or a trending posts page.

*Topic 2. **good**, app, super, awesome, **use**, excellent, application, cool, twitter, thread*

The users describe Threads as 'good' and 'easy to use'. The ease of use is often attributed to the friendly interface, although in most of the reviews it is not supported by any specific arguments.

*Topic 3. **twitter**, **better**, app, elon, musk, thread, like, good, let, meta*

The users think that Threads is a better alternative to Twitter.

*Topic 4. app, **best**, **great**, **love**, **amazing**, twitter, hai, new, mark, thread*

The users express their enjoyment of Threads by using positive words such as *'best'*, *'great'*, *'love'*, and *'amazing'*. This topic groups together reviews containing these positive words, without providing further insights into why users like the app.

Threads offers both hedonic and utilitarian values, which could predict its continuance intention to use. The hedonic and utilitarian features could be seen in *Table 1.*, summarizing the platform's functionalities. Examples of the hedonic features include: (1) text updates and public conversations, aligning with the expressive and social nature of the platform, those are often associated with hedonic experiences such as self-expression, or networking with friends; and (2) additional features, like photos, videos, GIFs, and polls, which are entertaining, and interactive pieces of content. Examples of the utilitarian aspects are: (1) text updates and public conversations, that could be used for news and information sharing; (2) fact-checking on Threads adding a utilitarian aspect, and emphasizing the platform's commitment to promoting accurate information, and countering misinformation; (3) keyword search, translation of posts, and the ability to edit alt text descriptions, which contribute to a utilitarian user experience by enhancing functionality and accessibility; (4) simple and clean user interface, making it easy to use the application; and finally (5) the plan to make Threads compatible with the ActivityPub protocol, reflecting a utilitarian approach by aiming for interoperability with other social networks. The users also confirm both hedonic and utilitarian values in their reviews, by expressing their enjoyment towards Threads, by writing positive words like *'nice'*, *'good'*, *'best'*, *'great'*, *'love'*, and *'amazing'*; by complimenting the existent features, e.g. easy log in thanks to the integration with Instagram; as well as by stating that the application is easy to use, and has a friendly interface.

Similarly, as in the case of negative reviews, the interpretation of the topics above was ultimately assessed by reading the reviews assigned to the respective topics, confirming the accuracy of the interpretation. As could be seen before on *Figure 18.*, the most frequent topic is *Topic 1.*, with the users mainly describing Threads as *'nice'*, enjoying the app's features, and asking for more functions to be added. The second most popular topic is *Topic 2.*, in which the users describe Threads as *'good'* and *'easy to use'*. Then, comes *Topic 4.*, expressing a general excitement towards the new application, and

at the end is *Topic 3.*, with the reviews saying Threads is a better version of Twitter. The daily counts of the four topics were visualized on the below bar chart, and a matrix.

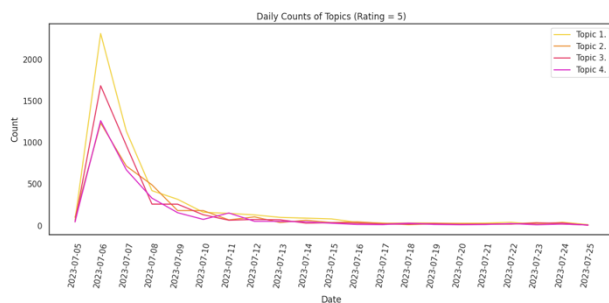


Figure 28. Daily Counts of Topics

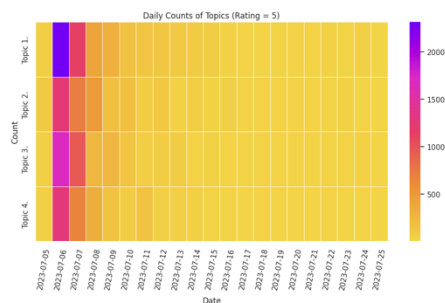


Figure 29. Daily Counts of Topics

5. Conclusions

The following thesis focuses on Threads, a new social media application, built by the Instagram team, designed for sharing text updates, and joining public conversations. The application launched only in July 2023, and therefore the current research on this topic is limited. In result, the following thesis aims to enrich the existing literature on social media user satisfaction, and to answer the three proposed research questions. The thesis also brings practical implications to social media developers, as the included insights can inform decision-making processes related to the platform development.

To answer the first research question, *‘What differentiates X’s and Threads’ functionalities?’*, a comparison of X and Threads was conducted, and the results were summarized in form of a table. The comparative assessment indicated that both X and Threads share similarities as applications, providing similar value to their users. Based on the conducted research, it was found that one of the main differences between X and Threads is that Threads requires an existent Instagram account to use the platform, therefore it targets a different audience than X, and provides an opportunity for Threads to easily transfer Instagram users directly to the new app, which might be a huge competitive advantage. On the other hand, the integration with Instagram was often criticized by users, as it was the third out of five most popular topics discussed by them in the negative reviews (*rating* = 1), as could be seen in the chapter dedicated to answering the second research question. In negative reviews, the word *‘Instagram’* was also the third mostly used. Part of the users was very unhappy about the integration. In terms of the pricing, for both platforms it is rather comparable, with X starting at \$8/month, while Threads at \$11.99/month. In majority of cases, the content limits are more attractive on Threads than on X, when it comes to free accounts. Even though X is slightly cheaper and offers higher content limits for premium users, the majority of people decide to have a free account, rather than a premium one. This means that the slightly lower pricing on X, and higher content limits for premium accounts would not be advantageous for most of the users, as they are in general not interested in paying for the service. From this perspective, Threads would be preferable for them, as it offers higher content limits for free. In 2023, X had around 350 million users worldwide (Statista, 2023), and out of those, 640 thousand were premium subscribers. (Statista, 2023), which makes it only 0.18% of premium users. At this point, X offers a

wider range of features to its users than Threads does, and the users of Threads are often suggesting adding more functions to the application, this could be observed in the topic modelling exercise. Of course, Threads is a new application, and might come up with X's features, and more, later. It is unsurprising that X offers a wider range of features at this moment, considering its longer history on the market. The exploratory data analysis results revealed that *'Twitter'* is the second used word by users in general, meaning that users often compare both applications and think they are of a similar nature. As the topic modelling shown, slightly more users think that Threads is a better alternative to Twitter (2818), than Threads is a poor copy of Twitter (2591). What is more, 47.3% of reviews come with a five-star rating, and 51-55% of reviews were labelled as *'Positive'*, based on the language used, representing users' generally positive attitude towards Threads. Based on the overall analysis results, Threads can indeed be considered as an alternative to X, as also directly stated by the users.

To answer the second research question, *'What is the user's overall sentiment towards Threads?'*, an analysis of a publicly available Kaggle dataset was conducted in Python. First an exploratory data analysis was performed, to deliver the initial insights into the data. The key takeaways from this part of the analysis are that the users tend to leave either 1 star (29.6%), or 5 stars (47.3%) in their reviews, signifying either their highest satisfaction or complete dissatisfaction. For this research question, two sentiment analysis tools were used, TextBlob and VADER. The two techniques were chosen, as TextBlob is considered a rather simple library, and VADER a more sophisticated one. Based on the outputs of both libraries, the following intervals were constructed for the reviews: 51-55% of reviews have positive, 27-36% neutral, and 12-18% negative language. Comparing sentiment analysis results with the given ratings, the percentage of reviews using positive language aligns with the percentage of the reviews with 5-star ratings. However, the percentage of reviews using negative language is almost half that of the reviews with 1-star ratings, suggesting that part of the users give low ratings without expressing discontent with negative language in their reviews. Additionally, users use neutral language without necessarily choosing a neutral *rating = 3*.

To answer the third research question, *'What are the main strengths and weaknesses of the Threads application, as identified through user feedback? What makes the application receive 1 star and 5 stars?'*, the analysis of the Kaggle dataset was continued in Python. To answer this question, two

topic modelling techniques were applied, LSA and LDA. The results of both algorithms were visualized, and the more suitable one - LDA, was chosen to draw the final conclusions. Based on the LDA model, the negative reviews mention the following topics: (1) Twitter copy, (2) Instagram integration, (3) data privacy, (4) bad feed, (5) and glitches; and the positive reviews mention the following topics: (1) good features, (2) easy to use, (3) better Twitter, (4) and general excitement. Based on *Table 1.* and the user reviews, Threads provides both hedonic and utilitarian values. The hedonistic/utilitarian concepts can be used in that case to predict the continuance intention to use the platform, which is confirmed by the previous research done in this area.

Although the thesis has notable positive aspects, it also identifies certain limitations and opportunities for improvement. As one of Elon Musk's primary goals at X are to promote the freedom of speech, by loosening the censorship on the platform, in the future, the current research could be enriched by comparing content moderation on X and Threads, and its impact on user experience. Also, the analyzed dataset comprises of reviews written during a single month of July 2023, shortly after the application's launch. Since then, Threads has undergone numerous updates and feature additions, and its introduction to European markets followed later in December 2023. Exploring reviews from a broader timeframe could provide insights into how these updates influenced user perception and satisfaction over time. Additionally, examining the satisfaction levels of European users, after the delayed launch in Europe, would be valuable.

6. References

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