Business Intelligence
Luna B.

This dataset comprises user feedback data collected from 15 globally acclaimed mobile applications, spanning diverse categories. The included applications are among the most downloaded worldwide, providing a rich and varied source for analysis.

User feedback is vital for both developers and users because it provides crucial insights into the performance, engagement, and overall satisfaction levels of products and services they offer.

Dataset Info:

Title: User Feedback Dataset from the Top 15 Downloaded Mobile Applications
Data Source: From Kaggle csv file
Rows Count: 15000
Columns:
review_id: Unique identifiers for each user feedback/application review. content: User-generated feedback/review in text format.
score: Rating or star given by the user.
TU_count: Number of likes/thumbs up (TU) received for the review. app_id: Unique identifier for each application via link.
app_name: Name of the application.
RC_ver: Version of the app when the review was created (RC).

List of Included Applications: (each has 1000 review entry)
TikTok, Instagram, Facebook, WhatsApp, Telegram, Zoom, Snapchat, Facebook Messenger, Capcut, Spotify, YouTube, HBO Now, Cash App, Subway Surfers, Roblox

Apps Purpose:

No.	Mobile App	Purpose
1 2	TikTok	Social media, video sharing, entertainment
3 4	Instagram	Social media, photo/video sharing, networking, entertainment
5 6	Facebook	Social media, networking, communication
7 8	WhatsApp	Messaging, communication, calls, video calls
	Telegram	Messaging, communication, privacy
	Zoom	Video conferencing, communication, meetings
	Snapchat	Social media, photo/video sharing, entertainment
	Facebook Messenger	Messaging, communication, calls, video calls

9	Capcut Spotify	Video editing, content creation
10	YouTube HBO	Music streaming, entertainment
11	Now Cash App	Video streaming, entertainment, content sharing
12	Subway Surfers	Video streaming, movies, TV shows, entertainment
13	Roblox	Payment, banking, investments
14		Gaming, entertainment
15		Gaming, social interaction, entertainment

Flow Structure:

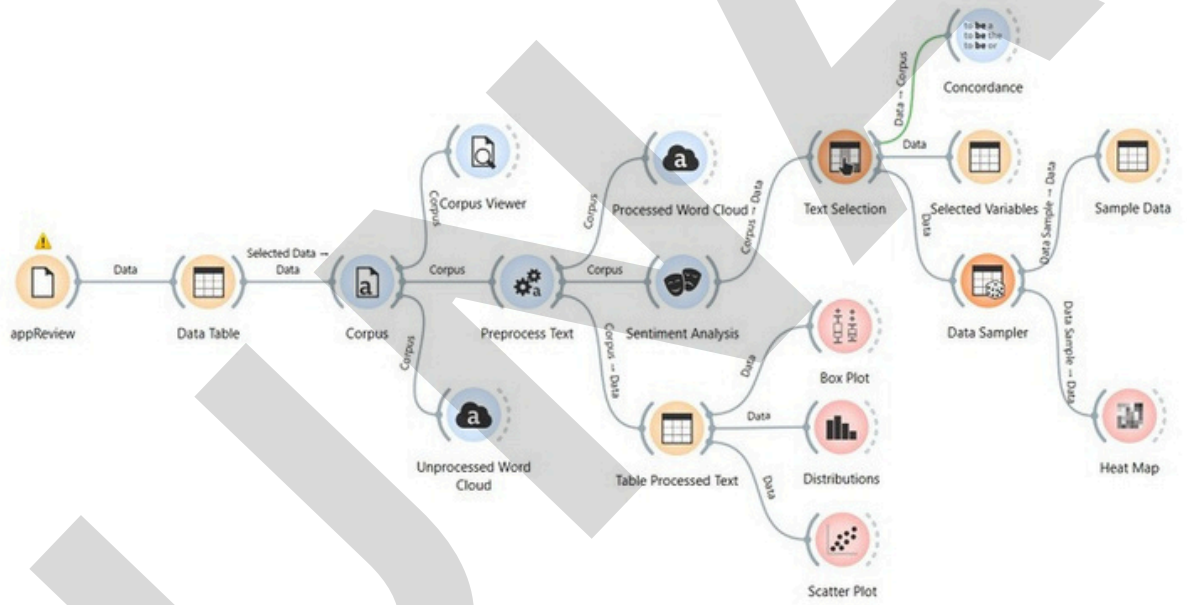


Figure 1: UserReview Data Flow Structure

Objectives 1:

To know the overall rating of the top 15 mobile applications in 2023 and rank them based on user feedback scores. And to evaluate the preferences of the users by comparing similar apps and determining which apps users prefer to use over others that serve the same purpose.

Visualization Type:

- Box Plot to know the score ranges across all platforms (minimum, maximum).

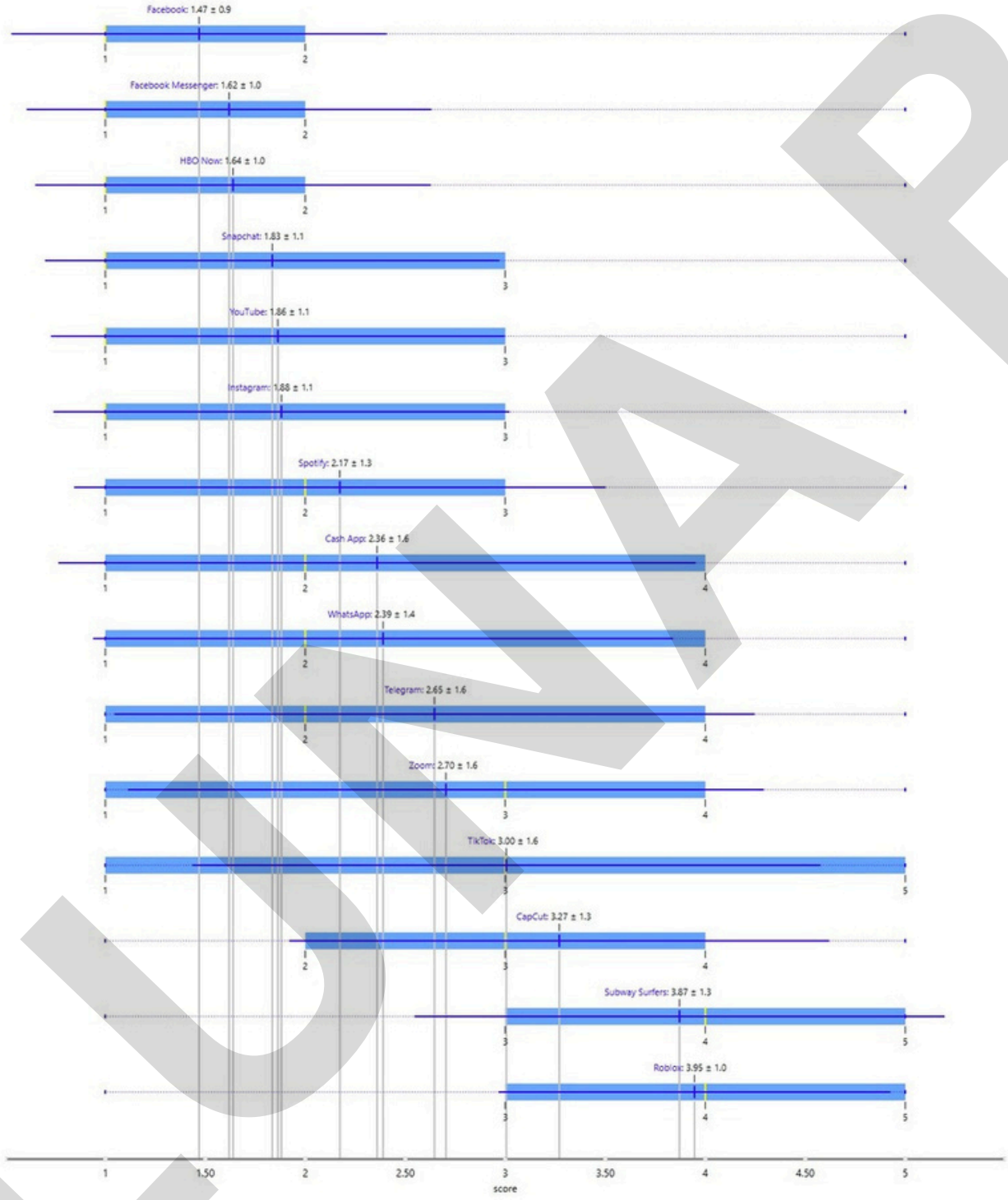


Figure 2: Score distribution across all platforms

Alternative Visual with bar thickness represents the frequency of review score received, and its distribution to different score ratings.

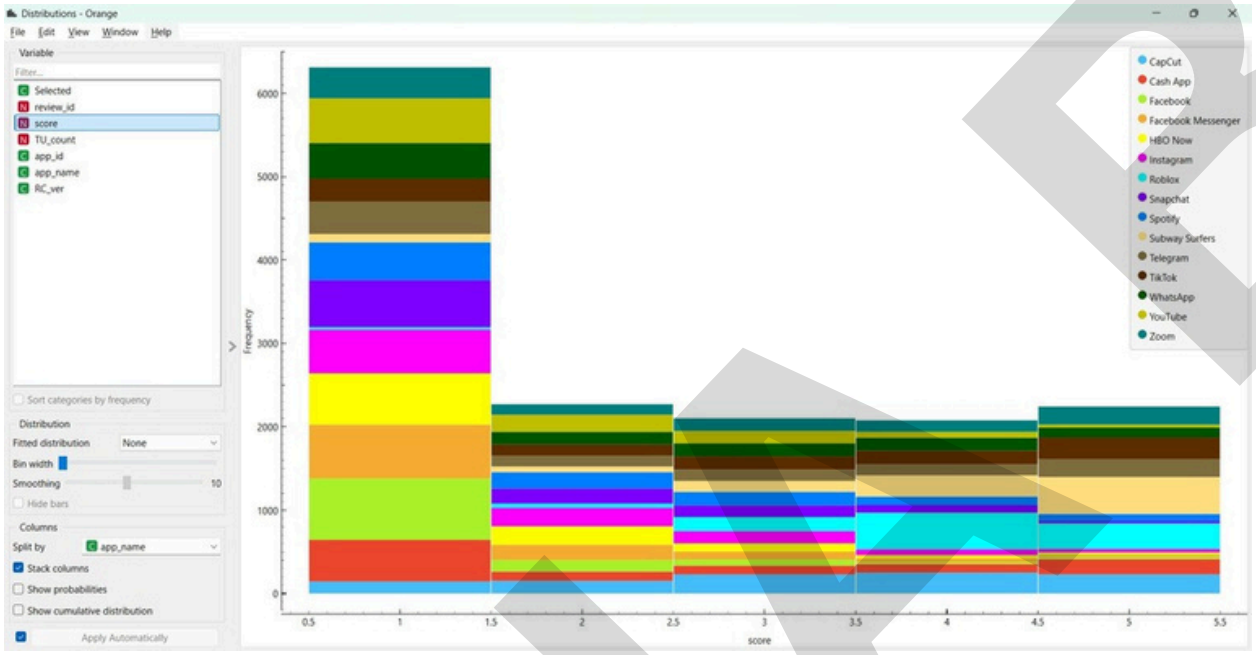


Figure 3: (Alternative) Score distribution across all platforms

Rankings:

Rank	Mobile App	Purpose	MeanScore	Variance
1	Roblox	Gaming,socialinteraction, entertainment	3.95	±1.0
2	Subway Surfers	Gaming,entertainment	3.87	±1.3
3	CapCut	Videoediting,contentcreation	3.27	±1.3
4	TikTok	Socialmedia,videosharing, entertainment	3.00	±1.6
5	Zoom	Videoconferencing,communication, meetings	2.70	±1.6
6	Telegram	Messaging,communication,privacy Messaging, communication, calls,	2.65	±1.6
7	WhatsApp	video calls Payment,banking,investments	2.39	±1.4
8	Cash App		2.36	±1.6

9	Spotify	Music streaming, entertainment Social	2.17	±1.3
10	Instagram	media, photo/video sharing, networking, entertainment	1.88	±1.1
11	Youtube	Video streaming, entertainment, content sharing	1.86	±1.1
12	Snapchat	Social media, photo/video sharing, entertainment	1.83	±1.1
13	HBO Now	Video streaming, movies, TV shows, entertainment	1.64	±1.0
14	Facebook Messenger	Messaging, communication, calls, video calls	1.62	±1.0
15	Facebook	Social media, networking, communication	1.47	±0.9

Note: The greater the number in the variance, the more spread out the data is (some users gave it very low ratings, others gave it very high ratings).

Insights:

1. **In terms of ranking,** gaming apps like Subway Surfers and Roblox got high scores ranging mostly from 3-5 scores for both.Then according to statista the top game apps are the Subway Surfers and Roblox. By that, we can say that gaming platforms mostly appeal particularly to children and teenagers and it gives them a satisfactory level based on certain features that the app offers, especially for its good UI/UX design.

Then Facebook, and Facebook Messenger, as well as the HBO Max, got low low ratings from 1-2 only. And there are moderate rates like Youtube ranging from 1-4. And most of this lies on the entertainment platforms. On the other hand, there are platforms that have ratings ranging from 1-5 which specifically the TikTok, Zoom, Telegram, and Cash App. This means that some users really like them but other users may have encountered dissatisfaction with certain features, which could be related to performance or user interface issues. Overall, gaming platforms have most likely had a positive impact on the users, then social media and entertainment apps may need to address certain issues to improve the user satisfaction.

2. **In terms of user preferences**, there are certain platforms that users prefer than the other though they will fall to the same purpose. For example, many people choose WhatsApp over Facebook Messenger.

Data privacy is one of the factors contributing to this. Encryption in WhatsApp started long 2014, while messenger not so long ago in 2022. Moreover, in sending media WhatsApp lets users send larger files up to 100MB while Facebook Messenger only allows files up to 25MB. Not too long ago, Messenger didn't even have the file-sharing feature on mobile. I used WhatsApp to send files before, especially if the person didn't have Google Drive. Alternatively, with Messenger, if you wish to send it there, you have to open it in desktop mode in the mobile browser, and I find it such a hassle. That's why many prefer using features that benefit them most specially file sending for school or business related.

Supporting Information: Roblox User and Growth Stats You Need to Know in 2024: Roblox is dominated by young users. 58% of users are under the age of 16. Only 18% of Roblox's users are over 25 years old Most Popular Mobile Games (2024) - Business of Apps: Subway Surfers 304, Roblox 208 Is WhatsApp safe to use? How does its end-to-end encryption work? WhatsApp introduced end-to-end encryption in 2014, using Open Whisper Systems' open-source Signal protocol How to Use End- to-End Encryption in Facebook Messenger Right Now | Lifehacker: In August of 2022, the company announced it was testing end-to-end encryption (E2EE) for Facebook Messenger as the default

Objective 2:

To analyze app version release patterns, specifically the frequency of updates and the impact of previous versions on user engagement.

Visualization Type:

- Box Plot- Stacked Bars to know the frequency of user engagementfor every app version.

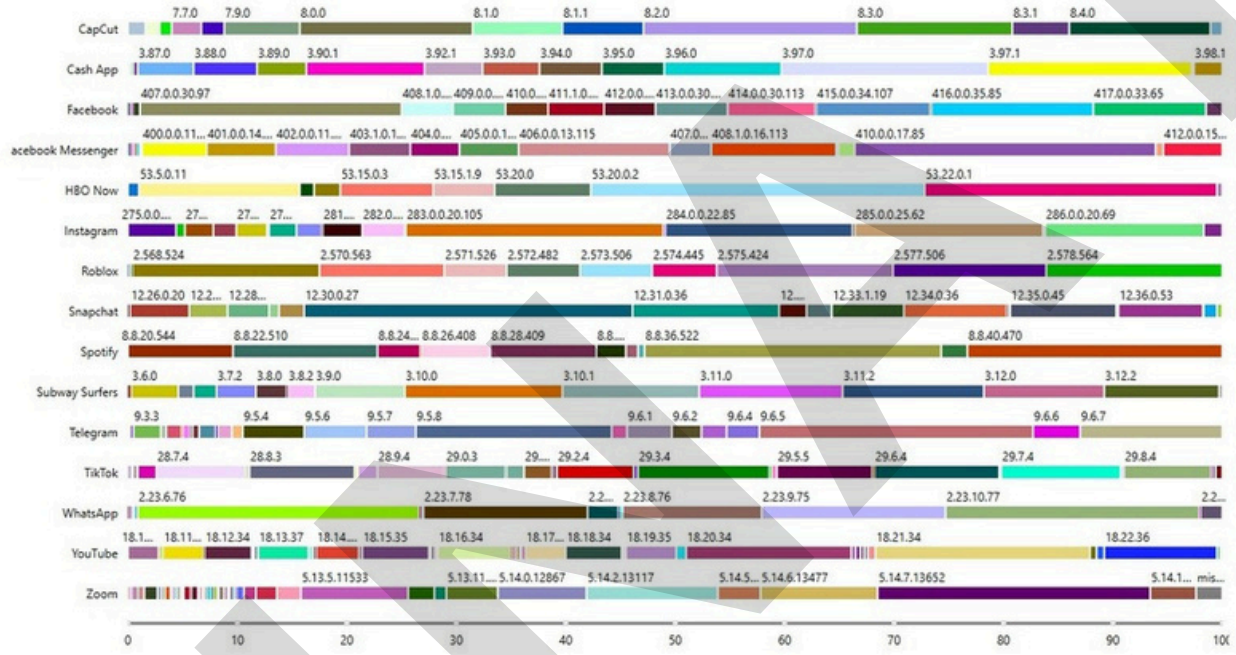


Figure 4: App Version distribution across all platforms and user engagement

Each horizontal bar represents a specific app

Within each app's bar, different colored segments represent different app versions

The length of each colored segment corresponds to number of user reviews (count ofthe review_id)

Alternative Visualwith exact count value of user reviewed

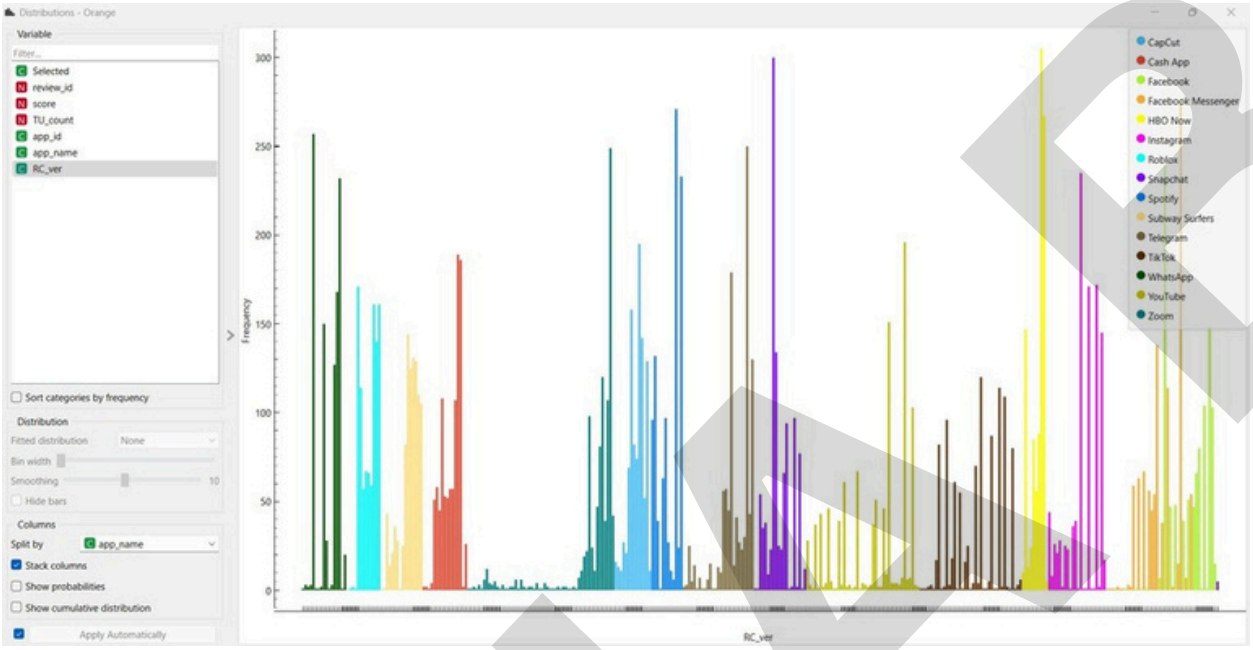


Figure 5: (Alternative) App Version distribution across all platforms and user engagement

Note: The highest bar with purple color refers to Snapchat of version 20.30.0.27 which in stacked bars also has a longer horizontal bar.

Insights:

1. There's a diverse pattern that we can extract from this visualization and by comparing the lengths of the segments within each app, we can get a sense of which app versions were more popular or widely used. Longer segments suggest higher user engagement or adoption for that particular version (because if we hover to a specific version, it has a percentage which represents the review counts).
2. We can see how often new versions are released for each app by looking at the number of segments in each app's bar. More segments mean more frequent updates. For example, with Zoom, it seems like when the app first launched, they released a lot of versions but had low user engagement. To attract more users, they kept pushing out updates until one version gained significantly more engagement. After that, they maintained a steady level of high user engagement. This pattern is common for most apps, where they start with low engagement and build up over time.
3. This also helps explain why Roblox has the highest average score unlike other apps. Roblox doesn't have as many versions, but each one seems to have high user engagement, so they don't need frequent updates to keep users engaged.
4. Also, we observe that (some apps) there is a decrease in engagement for a current version (during that period) compared to the previous one, and this could indicate that

the update did not address previous user concerns or somehow introduced new features that most probably they don't like. Thus, user feedback analysis is crucial to understand the impact of each update which will be shown on the sentiment analysis.

Objective 3:

To identify the most frequent and recurring themes in user feedback related to user experiences and concerns.

Visualization Type: Word cloud to visualize the frequent phrase discussed represented by bigger words

Figure 6: Frequency of keywords in user reviews

Insights:

1.The world cloud clearly shows us that most of the reviews are talking about the problems they have encountered using the app. By setting the N-grams to three, we can really comprehend what it means because it makes the thought complete by using three words rather than just one. These words are "please fix bug, please fix issue, something went wrong" and these are the negative experiences brought by the app to them. Yet the frequent word also is referring to a game because it says "best game ever". So not just negative comments are there but also positive feedback exists, likely associated with highly-rated apps like Subway Surfers and Roblox. Overall, the word cloud likely reflects issues across all the apps and it presents common problems like frequent crashes, poor performance.

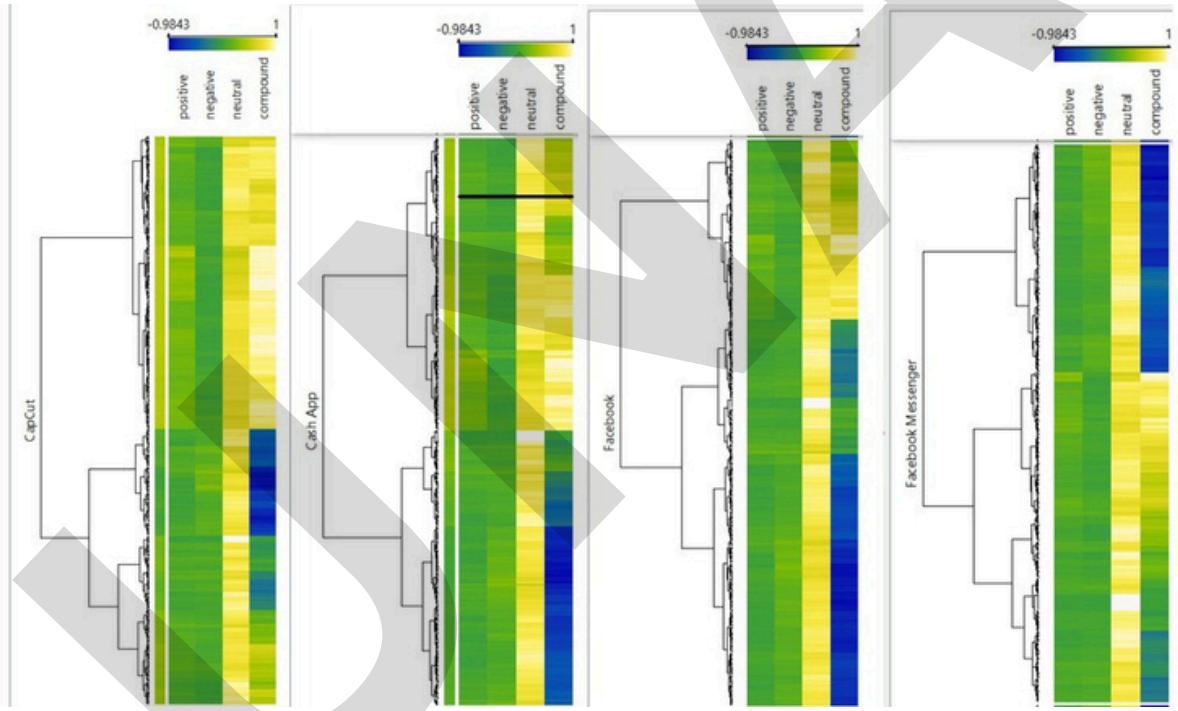
2. By identifying these, the producer of the app needs to prioritize bug fixing and improve its overall performance to reduce the dissatisfaction, and potentially app uninstallation. It could be great help to them to protect their brand reputation by addressing those issues, and ofcourse increase their user engagement that could help increase their revenue too (particularly for streaming and subscription-based apps), and premium content offerings.

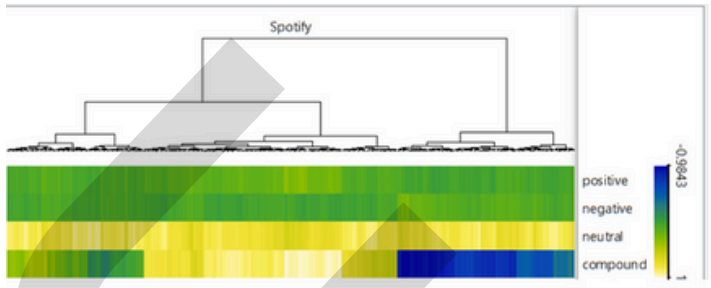
Objective 4:

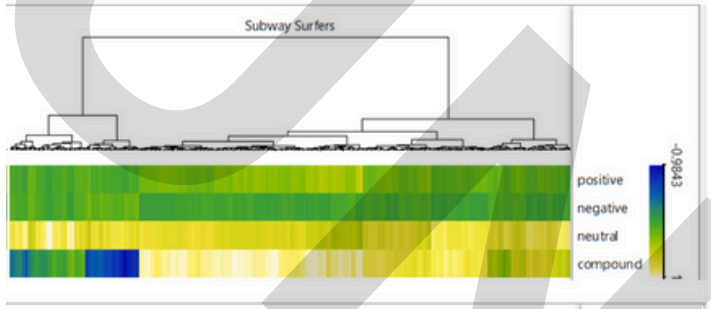
To determine the overall sentiment towards the app.

Visualization Type:

- Heatmap
- **Blue:**Typicallyrepresentsnegativesentiment(-value).
- **Yellow:**Oftenindicatespositivesentiment(+value).
- **Green:**Usuallysignifiesneutralsentiment.
- Andwe'llbeusingthecompoundsegmentforitreferstotheoverallsentiment score.




Spotify
positive
negative
neutral
compound
-0.9843
1


Subway Surfers
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negative
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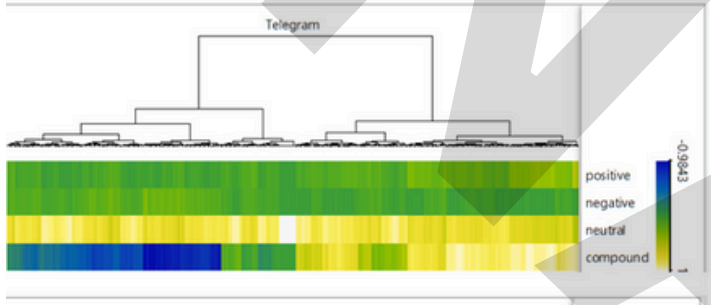
Telegram
positive
negative
neutral
compound
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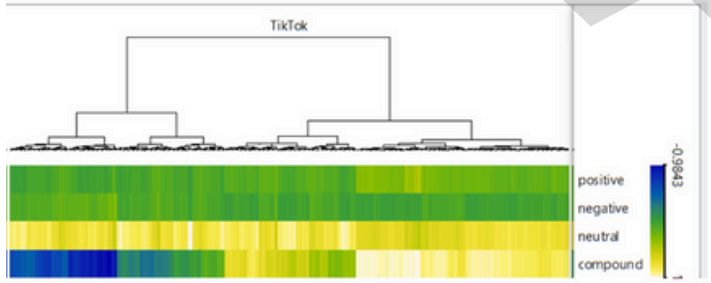
TikTok
positive
negative
neutral
compound
-0.9843
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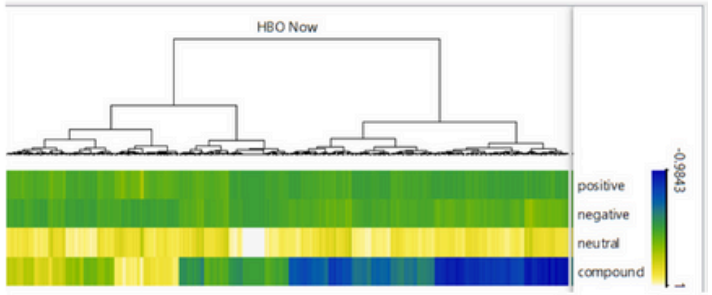
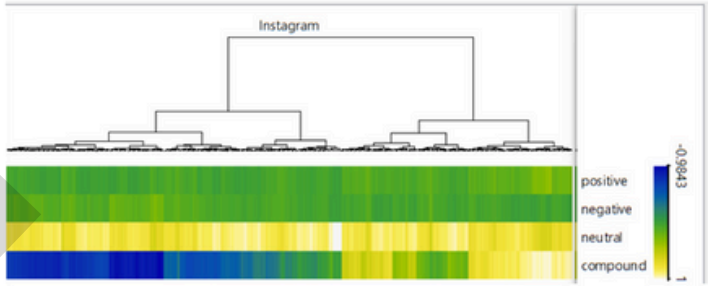

HBO Now
positive
negative
neutral
compound
-0.9843
1


Instagram
positive
negative
neutral
compound
-0.9843
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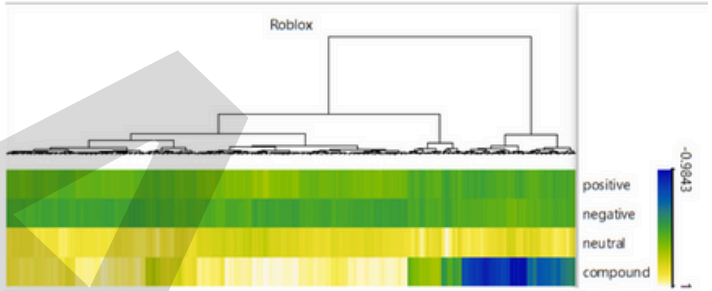
Roblox
positive
negative
neutral
compound
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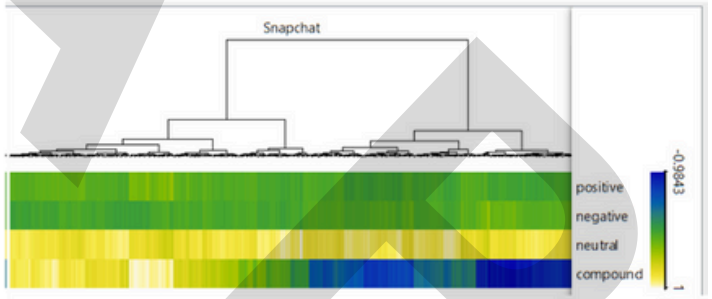
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positive
negative
neutral
compound
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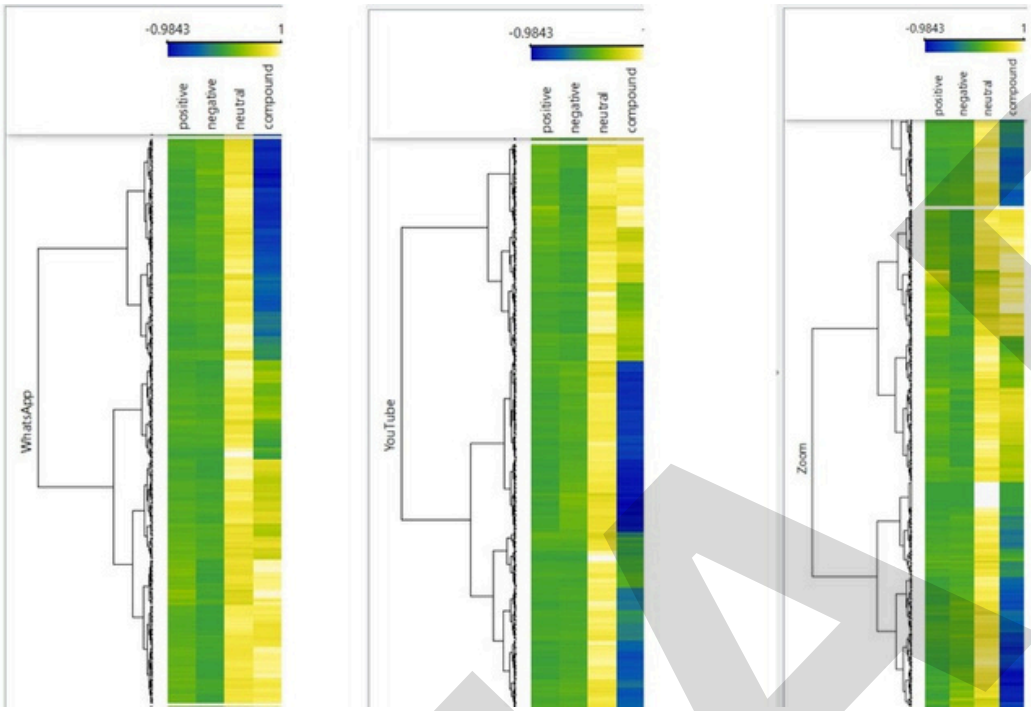

Figure 7: Overall sentiment for each app

Insights:

1.The majority of the heatmap is dominated by shades of yellow and green but the compound segment is to be used for the overall analysis because it summarizes the sentiment expressed in the text. It is good in this case, for example, a piece of text might contain both positive and negative aspects. The compound score captures this nuance by considering the overall emotional tone.

If we look closely at the compound column, we can see that some apps have more blue in them. This means that a lot of users expressed negative feedback about those apps. Examples are Facebook, Instagram, Youtube, and HBO.

On the other hand, apps like Zoom, WhatsApp, TikTok, Telegram, and Spotify are mostly yellow and it means that it caters most to the user preferences and they like using it. And the apps like Subway Surfers and Roblox have the very least blue which corresponds to higher level of user satisfaction (correlated to the average score rating it got). Also there are apps that have a balanced sentiment like Instagram and Snapchat and it suggests that users have both positive and negative experiences with the app. The app might be in a stage of development where it is still evolving to meet user expectations. Initial versions might have had some shortcomings, which have been addressed in subsequent updates.

It's important to remember that even the best apps have room for improvement. Users might have suggestions or find some things frustrating and the developers could improve app performance, and introduce new features that cater to user needs.

Objective 5:

To understand how users use the specific term to describe their experiences with the apps for knowing the relationships of queried words in the review text.

Type: Concordance

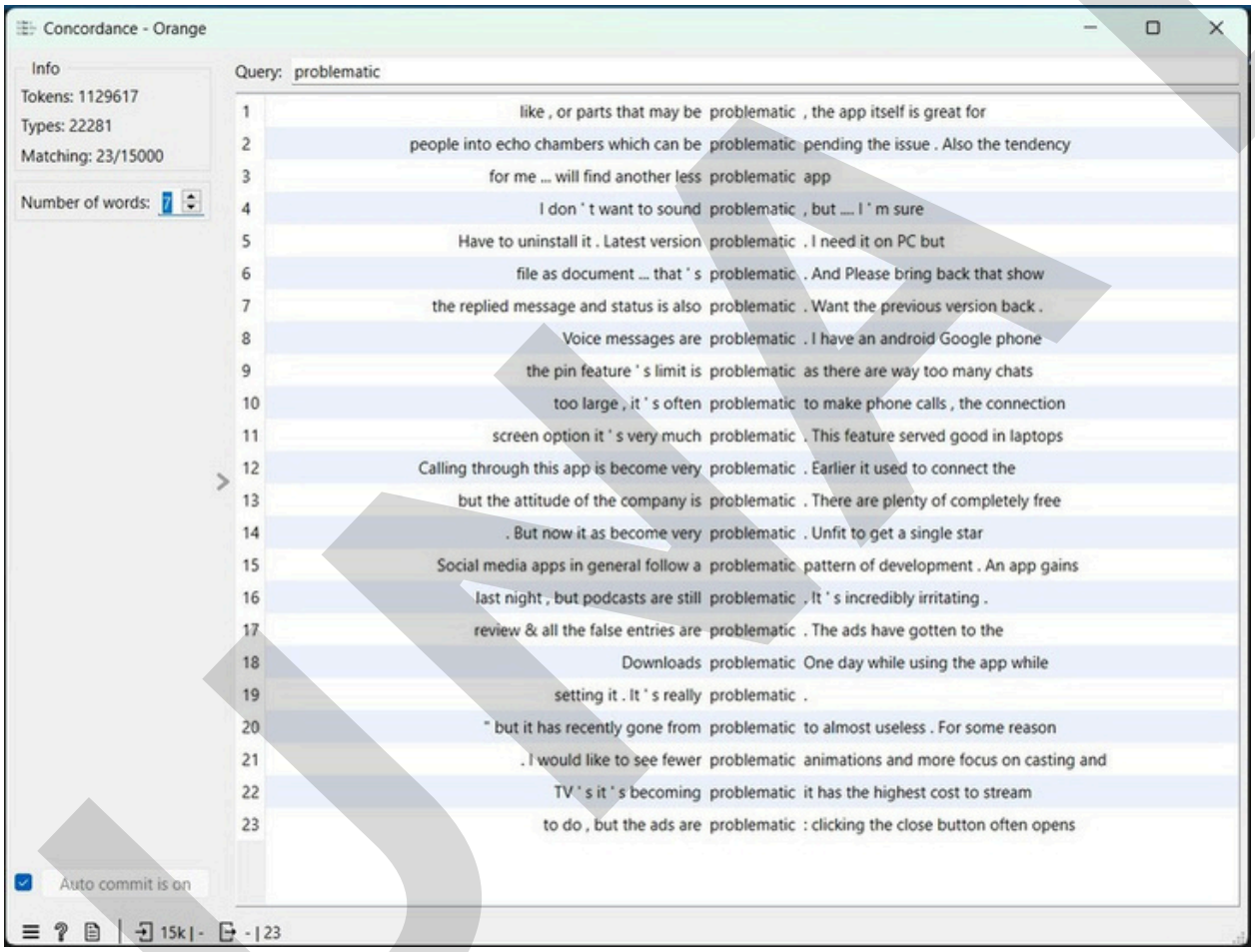

Figure 8: Concordance "problematic" query

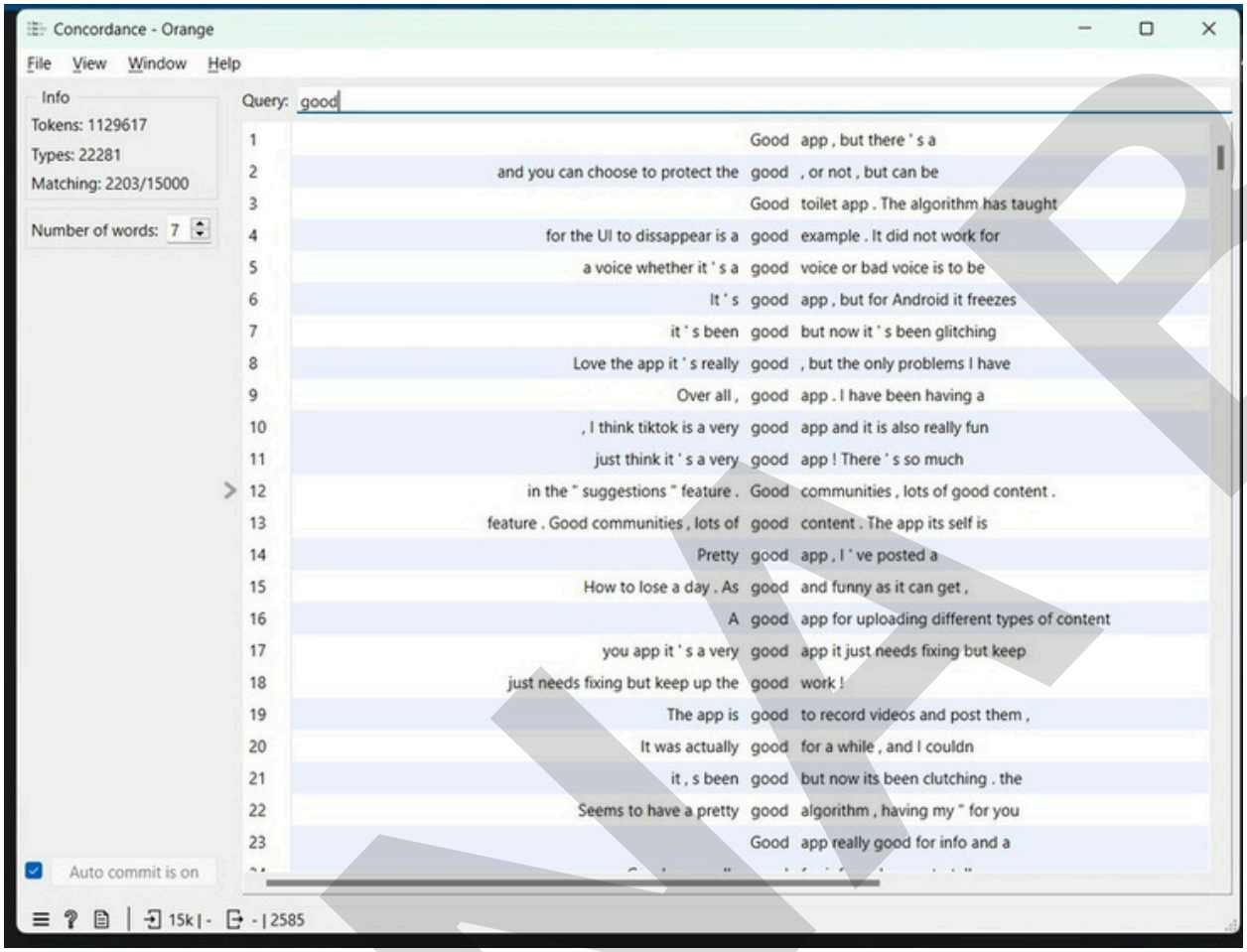

Figure 9: Concordance "good" query

Insights:

1. It highlights the importance of understanding the relationship between these terms and the overall sentiment expressed in the user reviews. For instance, how does the usage of the term "problematic" correlate with negative sentiment scores? We can then refer to the number of appearances which is 23 out of 15000 reviews.
2. This could also expose which aspects of the app (e.g., features, performance, or usability) are frequently associated with negative or positive terms. Example here is that voice is problematic, and others are referring to the attitude of the company as problematic, and to specific features such as replied message and status is problematic. By understanding how users describe the issues they encounter, we can organize this feedback and turn it into actionable decisions. It can greatly help the company to reassess their versions and features. For example, if users often mention the "voice feature" as problematic, those become clear priorities for improvement.

Thus, user feedback is a critical asset for app developers. It isn't just criticism, but it's an opportunity to increase their user reach, enhance the retention, and continue to get positive feedback towards their brand app.