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PLAYER SENTIMENT TOWARD GAME UPDATES: EVIDENCE FROM REDDIT PATCH-NOTE DISCUSSIONS

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ABSTRACT

Live-service games are updated frequently, yet most sentiment studies aggregate opinions over long periods and miss patch-level reactions. We analyze player sentiment toward individual updates of League of Legends using 14,549 Reddit comments from r/leagueoflegends across patch versions 14.10–14.16 (2024). Comments were collected via the Reddit API and scored with the Google Cloud Natural Language API to obtain polarity and magnitude. We examine distributions overall and by patch, visualize median sentiment per version, summarize frequent terms in positive/negative subsets, and inspect the most extreme comments for context. Overall sentiment is skewed negative (median −0.30): 68.9% of comments are negative, 31.4% strongly negative (≤ −0.5), and 5.6% strongly positive (≥ 0.5). No patch attains a non-negative median; patch 14.9 is notably lower (median −0.40). Word frequency summaries and exemplar comments point to balance concerns and heightened negativity around the introduction of the "Vanguard" anti-cheat system. We discuss ethical handling of public data and limitations related to Reddit's user base. The study demonstrates patch labeled Reddit discussions as a practical source for monitoring update reception and provides a reproducible blueprint for tracking community response at the granularity developers need.

KEYWORDS

Games, Data Analytics, Sentiment Analysis

1. INTRODUCTION

Sentiment analysis is a method of evaluating words, phrases, or sentence structures within text to determine its emotional tone. It is widely used across various domains, including business, where it helps companies track customer satisfaction and brand reputation. Governments and organizations also leverage sentiment analysis to monitor public opinion on policies or events. As computational power and natural language processing techniques have advanced,

sentiment analysis has become more accurate and sophisticated, turning qualitative data into actionable, quantitative insights (Liu, 2012).

Sentiment analysis is especially valuable in the gaming industry, where understanding player feedback can have a significant impact on game design and player engagement. Traditionally, game analytics has focused on internal game data, such as player behavior and gameplay metrics, to assess the player experience (El-Nasr et al., 2013). However, with the rise of external data sources, sentiment analysis is now increasingly being applied to social media and other platforms to gain insights into player sentiment, complementing traditional internal game data (Zagal et al., 2012).

Sentiment analysis of Reddit gaming content has been gaining traction in recent years. For instance, Balcıoğlu et al. (2025) recently did a large-scale study on mobile game reviews from Reddit, highlighting how player sentiment shifts with updates and gameplay elements. These findings illustrate how Reddit can effectively capture how players respond to games.

Most sentiment analysis in gaming so far has focused on aggregated reviews from platforms like Steam and Metacritic, which capture the general player sentiment over time (Yu et al., 2023; Strååt et al., 2017). However, these analyses fail to address player reactions to specific game updates. Player feedback about individual updates, such as changes in gameplay or content, is often lost in generalized reviews, making it difficult to analyze detailed reactions to game updates (Zagal et al., 2012; Lu et al., 2020; Yu et al., 2021). Studies have shown that player performance and engagement can vary significantly before and after updates (Hyeong et al., 2020; Zhong et al., 2022; He et al., 2021). Yet, existing research has not fully addressed sentiment analysis targeted at game updates themselves. While some studies have recognized the need for this type of analysis, they continue to rely on more general data, leaving a gap in research that focuses on game updates.

This paper aims to address this gap by exploring sentiment analysis within game update discussions on the social media website Reddit, where players engage in real-time, in-depth discussions about the latest patches and changes to games. In this paper, we look at player feedback toward game updates for League of Legends. So-called “Games-as-a-service” or “Live-service games” like League of Legends, frequently releases updates or "patches" that adjust game mechanics, introduce new content, or balance gameplay elements. These updates can drastically alter the player experience, leading to a broad range of reactions from excitement to frustration. Such reactions are commonly expressed on Reddit, particularly in the subreddit r/leagueoflegends, which serves as a platform for players to discuss their experiences and opinions. These discussions are often highly specific, labeled according to the version of the game update, making them a rich source of real-time feedback. Yet, the potential of this data for sentiment analysis – especially in tracking player sentiment over time as new updates are rolled out – remains largely untapped.

2. METHODS

The analysis is divided into two primary phases: Data Collection and Data Analysis.

2.1 Data Collection and Pre-Processing

The data collection process is composed of the following: selecting Reddit game update subreddit URLs, game update comment collection via Reddit API, and sentiment analysis using Google Natural Language API.

2.1.1 Selecting the Reddit Game Update Subreddit URLs

The process begins with the manual selection of relevant League of Legends subreddits that publish game update posts. Each post adheres to a specific URL structure, which is crucial for identifying and collecting the appropriate data. The typical URL format for these posts is composed of a submission ID and patch version. The URL "https://www.reddit.com/r/leagueoflegends/comments/" is the fixed prefix for all game update posts within the League of Legends subreddit. The "submission_id" represents a unique identifier for each specific post, which varies with every update and is randomly generated by Reddit. The "patchVersion" indicates the version of the patch being discussed, in this case patch 14.10.

To accurately collect and analyze data, the patch URLs were manually collected for each update. Since the "submission_id" values were not automatically generated, the process involved manually checking the subreddit for new posts each month and ensuring that each URL followed the described structure. While this approach worked for the scope of this study, future work could automate this process for scalability. For this analysis, only League of Legends Reddit subreddits for patches 14.10 up to 14.16 (patches from January until August 2024) were included.

2.1.2 Collecting Reddit Comments via Reddit's API

The Reddit API provides structured access to platform data, allowing developers to retrieve and process information programmatically (Reddit, 2025). For collecting comments from multiple threads within a specific subreddit, the API offers efficient methods to extract relevant data. The primary API endpoints utilized in this process include those for retrieving submissions and their associated comments.

Based on the parsed URLs and their submission IDs, the necessary data fields are extracted. The minimal required data fields for this analysis include: the comment text and the patch version. By collecting the patch version from the subreddit title or URL, each comment is labeled, enabling patch-specific sentiment analysis. This is achieved using the "reddit.submission(submission_id)" method, which retrieves a submission object corresponding to the desired post. The "submission.comments.replace_more(limit=None)" method is then used to access all comments in the submission. This ensures that all nested comments are loaded by replacing MoreComments objects with actual comment data. Finally, the "submission.comments.list()" method retrieves all comments from the submission, including those across multiple threads. This was saved into a two-column CSV file, with columns for patch version and comment text as shown in table 1.

Table 1. Data structure of collected Reddit comments on patch update 14.10

Patch Version	Comment Text
1410	worst patch
1410	There's a lot I really love in this patch. I just hope it ends up working as expected.
1410	Not sure I like this mastery revamp. At least with a level 6 Yasuo with a million points, you used to know what kind of game you were getting into.
1410	Why the heck is lane Viego back? It's fun to play blind and watch others complain but honestly it feels kind of ridiculous lol
1410	The new Mastery system is terrible. It should be rolled back immediately.

2.1.3 Analyzing Sentiment with Google Natural Language API

The second step involves analyzing the sentiment of the comments using a sentiment analysis tool. In this case, we utilize the Google Natural Language API and store the results within the same table. Two new columns were added: Sentiment Score, which ranges from -1.0 (very negative) to 1.0 (very positive), and a magnitude score from 0 to infinity, which reflects the overall emotional strength of the comment, regardless of its positivity or negativity (Google Cloud, 2025a). Deleted comments and very short replies, typically consisting of only one or two words, were excluded to avoid unnecessary API costs.

We loaded the comments into a Pandas DataFrame, providing a structured format for handling large datasets, which facilitates efficient manipulation and analysis, before individually processing each comment with the Google Cloud Natural Language API, adding the respective sentiment and magnitude score values to each row of the CSV file (table 2).

Table 2. Data structure of collected Reddit comments on patch update 14.10 including Google Natural Language API sentiment and magnitude score

Patch Version	**Comment Text**	**Sentiment Score**	**Magnitude Score**
1410	worst patch	-0.8	0.8
1410	There's a lot I really love in this patch. I just hope it ends up working as expected	0.7	1.5
1410	Not sure I like this mastery revamp. At least with a level 6 Yasuo with a million points, you used to know what kind of game you were getting into.	-0.4	0.9
1410	Why the heck is lane Viego back? It's fun to play blind and watch others complain but honestly it feels kind of ridiculous lol	0	1.2
1410	The new Mastery system is terrible. It should be rolled back immediately.	-0.3	0.9

2.2 Data Analysis and Visualization

In the data analysis phase, sentiment scores and the corresponding text were thoroughly examined. This includes a semantic exploration to uncover the underlying meaning and context of user comments, ensuring a nuanced understanding of sentiment expression. Visualizations were then employed to illustrate sentiment scores across different patch versions, providing a clear overview of sentiment trends. Additionally, word clouds were

generated to highlight frequently mentioned terms, and comments with the highest and lowest sentiment scores are identified to pinpoint areas of particular interest or concern.

2.2.1 Visualizing Sentiment Distribution Per Patch

A key question is how players perceive a particular game update in comparison to previous ones. We address this by visualizing the median sentiment distribution of patches in chronological order. To compute and visualize sentiment scores for each patch version, we first grouped the data based on the patch version. For each group, the median sentiment scores were calculated, ensuring that each patch was represented by a single robust statistic. Using the median instead of the average reduces the impact of outlier comments – those with exceptionally high or low sentiment scores – and provides a more accurate representation of the typical community sentiment for each patch version. The decision to use the median was supported by examining the distribution of sentiment scores, which were found to be skewed rather than symmetrically distributed. We then visualized the median sentiment scores using a bar plot. The x-axis represents each individual patch version, while the y-axis displays the corresponding median sentiment scores. This method allowed us to clearly identify both overall sentiment patterns and notable outliers, making the sentiment analysis more insightful and directly interpretable.

2.2.2 Creating Word Cloud of Most Frequently Used Words

To get a summary of the feedback, we displayed the most frequently used words in the most positive and negative comments using word clouds. First, the comments were grouped according to their respective patch labels. Comments were filtered based on sentiment scores, with negative and positive feedback separated by predefined thresholds of -0.5 and +0.5. While the choice of threshold clearly influences the result, the ±0.5 cutoff was selected after experimenting with different values to find a balance that made the word clouds both meaningful and readable. The goal was to filter out noise without losing too much content. As the choice of thresholds significantly affects result interpretation, careful adjustment according to specific research objectives and dataset characteristics is recommended. The filtered comments were tokenized and preprocessed to remove punctuation and common stop words. The resulting tokens were counted to determine the frequency of each word. Finally, the word clouds were generated, visually encoding word frequencies by size, thus immediately highlighting the most prominent terms used by players to express their sentiments. This allowed for rapid qualitative interpretation of common feedback themes for each patch version.

2.2.3 Extracting Comments with Highest and Lowest Sentiment

To further complement the visual summaries and statistical analyses, we directly examined individual comments that exhibited clearly extreme sentiment – either strongly positive or strongly negative. For each patch version, the ten comments with the lowest and highest sentiment scores were identified and extracted. The reason for looking closely at these individual extreme comments is that aggregated sentiment scores or visualizations alone can miss important details. Reading through single comments directly helps uncover the exact issues players reacted to strongly, such as specific gameplay changes, balancing decisions, or controversial features introduced in a patch. This gives additional context that aggregate data alone can't provide, clearly illustrating player feedback and highlighting potential areas of action for developers.

3. ETHICAL AND LEGAL CONSIDERATIONS

This study uses publicly available Reddit comments accessed via the official Reddit API (Reddit, 2025). All data collection was conducted in accordance with Reddit's Terms of Service and API usage guidelines. Rate limits and technical constraints were respected. Only comment text and patch version labels were stored for analysis; no usernames, user IDs, profile links, or other identifying metadata were collected or retained. Deleted or removed comments were excluded from the dataset. Therefore, only minimum data necessary for the analysis was used. All analysis was performed on aggregated data. Quotes shown in this paper (table 1 and 2) were either paraphrased or shortened to avoid re-identification of users. Even though adequate measures were taken, the possibility of indirect re-identification cannot be entirely excluded. Since the quoted comments are non-sensitive, they are unlikely to cause harm, even in the unlikely event of re-identification.

Sentiment analysis was conducted using the Google Natural Language API through a paid Google Cloud project. Google's terms of use, terms of service and data processing and security terms were respected. Only text data, no personal identifiers or metadata were exchanged with Google's API. Accordingly, privacy risks were reduced and alignment with data protection principles ensured. Under the Cloud Data Processing Addendum (Google Cloud, 2025b), all data was processed exclusively to deliver sentiment scores. Google acts as data processor and is contractually prohibited from using the submitted data for model training, storage or other purposes.

That said, there are still residual risks. Reddit users may not expect their comments to be analyzed for research purposes, even if they post publicly. Users did not explicitly consent to their comments being used for academic research. Considering this, users might view the large-scale data collection and analysis as intrusive, even if it is legal and anonymized.

4. RESULTS AND DISCUSSION

Reddit, as a platform, is uniquely suited for such analyses, especially for popular games like League of Legends. Subreddits dedicated to specific games foster communities of highly engaged and knowledgeable players who have a deep understanding of the game's mechanics, lore, and community dynamics. These users often provide detailed, nuanced feedback that goes beyond superficial opinions, making their discussions an invaluable resource for developers and researchers. Players on these subreddits are not casual players; they tend to be invested in the game's progression and are vocal about how specific updates affect their experience. This makes Reddit a goldmine for feedback that is not only immediate but also often more insightful than reviews posted on traditional platforms. However, the findings may not be fully representative, as they primarily reflect the views of highly engaged players and cannot be generalized to casual or less active players.

A core functionality of Reddit is the ability to up- and downvote comments. Users tend to upvote on-topic, high-quality contributions. A comment's score (upvotes minus downvotes) is a plausible indicator of what the community approves of and sees as relevant. In this study we do not weight sentiment by votes; all comments are treated equally. Our results therefore reflect the distribution of expressed sentiment rather than its popularity. Incorporating comment score as an attention signal could be a reasonable improvement for future work.

Additionally, the reply tree was not captured, so sub-thread dynamics are out of scope; analyses use single comments aggregated by patch.

To first provide an overall baseline of player sentiment, we aggregated all collected comments across patch versions (Figure 1). Using the subreddit r/leagueoflegends, we collected a dataset consisting of 14,549 comments for game update 14.10 (January 2024) up to 14.16 (August 2024). Sentiment analysis results indicate that players predominantly perceive the League of Legends patch versions negatively. Across all patches (n = 14,549), sentiment is skewed negative (median = -0.30). 68.9% of comments are negative; 31.4% strongly negative (≤ -0.5) vs. only 5.6% strongly positive (≥ 0.5). This suggests that, in r/leagueoflegends, updates are received more negatively than positively. These figures reflect the distribution of expressed opinions over all patch versions.

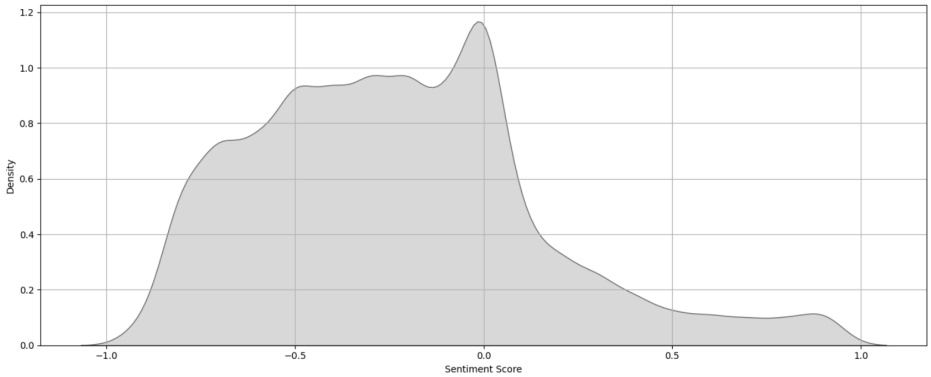

Figure 1. Overall Sentiment Score across all Game Updates

As discussed earlier, most existing research focuses on overall sentiment aggregated over time. To go beyond this general perspective and in line with the aim of this study, we analyze sentiment per patch version. Figure 2 shows that median sentiment scores for all patch versions typically range from –0.2 to –0.3. It is noticeable that patch version 14.9 stands out as particularly negative, with a median score of –0.4, indicating especially low player satisfaction for this update. In general, the sentiment scores follow the same pattern as the overall sentiment distribution across all game updates, with values consistently in the negative range. No patch version reaches a neutral or positive median score, which indicates that none of the updates were well-received by the community.

This overall consistency suggests that players were generally dissatisfied throughout the examined period. However, the drop in 14.9 highlights that certain updates triggered stronger negative reactions than others. This likely relates to specific changes introduced in the patch. This also highlights a key point: sentiment scores should always be interpreted in connection with the content of the corresponding patch. A drop or spike in sentiment only becomes meaningful when considered alongside the changes introduced. In the case of patch 14.9, the strong negative reaction likely stems from the implementation of the new anti-cheat software "Vanguard." Without linking sentiment back to the specific context of each update, conclusions remain limited.

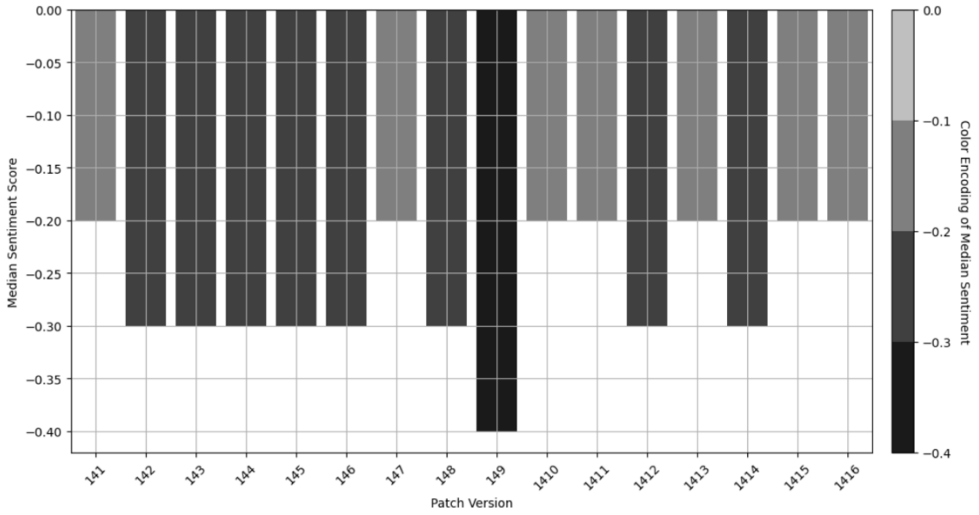

Figure 2. Median Sentiment Scores by Patch Version

The word clouds generated allow for the human interpretation of the most dominant themes (Figure 3). A particularly promising example is the word cloud for patch version 14.9, based on negative sentiment comments. Frequently occurring terms such as "nerf," "buff," "damage," and "item" indicate player dissatisfaction with game balancing, a critical aspect of live-service and esports-oriented games. Additionally, the word cloud highlights a focus on Riot's "Vanguard" – the newly introduced anti-cheat software. However, the word cloud also illustrates a key limitation: While recurring terms indicate areas of dissatisfaction, they alone do not provide sufficient context to interpret players' specific concerns. Without considering the full context of the comments, including their connections and nuances, a precise understanding of the issues is not possible. Additionally, the presence of irrelevant words often clutters the chart. Further tweaking of the analysis is necessary to improve the clarity of the results.

Figure 3. Word Cloud of Frequent Negative Terms in User Feedback for Patch 14.9 (Sentiment < -0.5)

The printed comments for patch version 14.9 allow closer inspection of the individual users' experience and feedback. Previously, the main topic "Vanguard" was already identified for this patch version. While the aggregated data left room for interpretation, these individual user comments have a clear message complaining about the forced installation of Riot's anti-virus. Users express concerns over security and fairness, highlighting the emotional impact of these changes. These comments illustrate the importance of directly examining user feedback, as sentiment analysis alone cannot fully capture the complexity of user concerns. Following the explanation of the data analysis methodology, it is valuable to transition to a broader examination of its significance within the context of game analytics and related research. The exploration of sentiment analysis in game update discussions is highly relevant for several reasons. First, the nature of live-service games like League of Legends, where regular updates are a key part of the gaming experience, makes understanding real-time player feedback critical for maintaining player satisfaction. Updates can introduce significant changes to gameplay mechanics, balance and player behavior. Player responses to these updates often provide essential feedback for developers seeking to iterate and improve their games. By analyzing sentiment, developers can better understand the impact of their updates, identifying areas of success or dissatisfaction that may not be captured in broader game reviews or by traditional game analytics.

Platforms like Reddit offer a unique structure that facilitates update-specific sentiment analysis. Each discussion thread is labeled by the version of the game update, providing an organized way to categorize feedback and track sentiment over time. This is particularly valuable for games like League of Legends, where frequent updates can lead to evolving player opinions as new features or balances are introduced. The ability to segment and analyze discussions based on specific updates allows researchers and developers to track how player sentiment changes with each patch, offering more granular insights into the factors driving player satisfaction or frustration.

Moreover, the Reddit community is made up of highly engaged players who are often experts in the games they discuss. These players possess an in-depth understanding of the mechanics and dynamics of the game, and their feedback tends to be more detailed and informed than that of casual players. This makes Reddit discussions especially valuable for developers seeking to understand the finer points of how an update affects gameplay. By focusing on these discussions, researchers can gain deeper insights into the expectations and concerns of the most dedicated player base, which is often the most vocal and influential in shaping community sentiment. Conversely, Reddit discussions may not fully represent the views of all players, as casual and infrequent players are less inclined to participate in detailed conversations regarding each patch version.

5. CONCLUSION

This study demonstrates an integration of the Reddit API for retrieving and aggregating comment data from various threads within specific subreddits. This approach has streamlined the extraction of comments, allowing for a comprehensive dataset that supports detailed analysis. The application of the Google Natural Language API for sentiment analysis has further enhanced this process by providing a clear overview of the emotional tone within the comments. The sentiment analysis, powered by advanced machine learning models, helps to quickly discern overall sentiment trends, making it easier to understand the general mood of the comment data.

By focusing on patch-specific Reddit discussions, this paper addresses a gap in current research, which often looks only at aggregated sentiment over time or platform-wide review scores. The patch-level analysis adds an important layer of granularity and helps to identify which specific updates triggered particularly strong player reactions. This has practical value for developers, as it enables a better understanding of community response to concrete changes in gameplay, balance, or system features. The example of patch 14.9 shows how sentiment scores, when linked with patch content, can reveal not just general trends but also moments of intensified dissatisfaction tied to specific features.

Given the growing prevalence of live-service games, where regular updates are a core part of the game lifecycle, understanding real-time player sentiment is critical for iterative game design and community engagement. The analysis of update-specific discussions represents a relatively new opportunity in game analytics, offering actionable insights that can enhance player satisfaction and drive game improvement in a more dynamic and responsive manner.

Looking ahead, future research could focus on leveraging these AI tools to generate more coherent and insightful summaries that can assist game developers. By focusing on game update discussions, this research contributes to the growing body of work on game analytics by introducing a more granular approach to understanding player feedback. This analysis not only captures detailed player reactions to updates but also allows developers to track evolving sentiments of game updates over time.

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