



## Community-Led-Growth using Management Tools for Discord

<sup>1</sup>Hanish. S, <sup>2</sup>Akschaya. B, <sup>3</sup>Ms. A. G. Aruna

<sup>1</sup>M. Sc (Decision and Computing Sciences) Coimbatore institute of Technology, Coimbatore, India [1933015mdcs@cit.edu.in](mailto:1933015mdcs@cit.edu.in)

<sup>2</sup>M. Sc (Decision and Computing Sciences) Coimbatore institute of Technology, Coimbatore, India [1933003mdcs@cit.edu.in](mailto:1933003mdcs@cit.edu.in)

<sup>3</sup>Assistant Professor Dept. of Computing (DCS) Coimbatore institute of Technology, Coimbatore, India [agaruna@cit.edu.in](mailto:agaruna@cit.edu.in)

### ABSTRACT-

This paper introduces an innovative Community Management tool specifically designed to optimize community engagement, growth, and activity tracking within Discord and Slack platforms. The tool offers a consolidated dashboard presenting essential Key Performance Indicators (KPIs), enabling administrators to gain valuable insights into the community's overall health. By analyzing historical trends and visualizing member participation, message frequency, reaction patterns, new member registrations, and other relevant metrics, administrators can make informed, data-driven decisions to enhance community engagement and ensure its sustainable development. Moreover, the tool incorporates sentiment analysis to provide a nuanced understanding of the community's overall sentiment, further informing strategic decision-making.

**Keywords:** *Community Management, Key Performance Indicators (KPIs), engagement, growth, activity tracking, Discord, Slack, dashboard, data-driven decisions, sentiment analysis.*

### I. Introduction

In the rapidly evolving landscape of online communities, platforms such as Discord and Slack have emerged as hubs for diverse groups to interact, collaborate, and share ideas. Effectively managing these communities is paramount for sustaining their vitality and fostering meaningful engagements. To address this need, this paper presents a novel and sophisticated Community Management tool tailored specifically for Discord and Slack. At its core is a robust, centralized dashboard meticulously designed to aggregate and visualize a wide array of Key Performance Indicators (KPIs) essential for gauging community health. These KPIs encompass vital metrics related to community engagement, growth, and activity, offering administrators a comprehensive view of the community's dynamics and evolution over time. Through insightful analyses of historical trends and intuitive visualizations depicting member participation, message frequency, reaction patterns, new member registrations, and other relevant metrics, administrators can make informed, data-driven decisions to optimize community engagement.

Furthermore, the tool seamlessly integrates sentiment analysis, providing administrators with a deeper understanding of the community's overall sentiment. By harnessing this multifaceted tool, community administrators can proactively nurture a vibrant community, enhance user experiences, and ensure the community's long-term sustainability. This paper aims to shed light on the transformative potential of leveraging such data-driven insights to shape the future of community management in the digital realm.

### II. BACKGROUND

#### 1) Why Online communities a major part in Monetization

Here are some key trends and developments in the field of online communities and community tech:

**1. Increased Focus on Online Communities:** With the widespread adoption of social media platforms and advancements in communication technology, people have become more accustomed to interacting and forming connections online. This has led to an increased demand for online communities that cater to specific interests, hobbies, professions, or causes.

**2. Niche and Specialized Communities:** While mainstream social media platforms continue to thrive, there is a rising demand for niche and specialized communities that bring together like-minded individuals with shared passions or goals. These communities foster stronger connections and provide more relevant and meaningful interactions for their members.

**3. Virtual Events and Conferences:** The COVID-19 pandemic has accelerated the adoption of virtual events and conferences. Online communities have become vital platforms for hosting virtual gatherings, workshops, and networking events. Community tech is evolving to support seamless integration of virtual event features and tools for enhanced engagement.

**4. Integration of AI and Chatbots:** Artificial Intelligence (AI) and chatbots are being increasingly integrated into community tech to enhance user experiences. AI-powered algorithms help in content curation, recommendation systems, and personalized user interactions, making communities more engaging and relevant for members.

**5. Decentralized and Blockchain-Based Communities:** Blockchain technology is being explored to create decentralized online communities. These communities offer increased privacy, ownership of data, and transparent governance models, empowering members to have more control over their online interactions.

**6. Enhanced Data Analytics and Metrics:** Community tech platforms are incorporating more sophisticated data analytics tools and metrics to provide administrators with deeper insights into community health, member engagement, and growth trends. This helps community managers make data-driven decisions to improve community experiences.

**7. Mobile App Focus:** As mobile usage continues to grow, community tech platforms are placing greater emphasis on developing robust mobile applications. Mobile-friendly experiences enable members to stay connected and engaged on-the-go, further contributing to community growth and activity.

**8. Gamification Elements:** Community tech is incorporating gamification elements, such as badges, points, and leaderboards, to incentivize member participation and promote healthy competition within communities.

**9. Integration with Existing Platforms:** Many community tech platforms are focusing on seamless integration with existing social media and collaboration tools like Discord, Slack, or Microsoft Teams. This integration allows communities to extend their reach and provide a unified experience to members.

**10. Focus on Inclusivity and Safety:** In response to concerns around online safety and toxicity, community tech platforms are implementing stronger moderation tools, content guidelines, and reporting mechanisms to ensure inclusive and safe environments for all members.

### III. Understand the synergy between Community and Product

The community and product are two intertwined pillars that drive member engagement and satisfaction. Understanding the interplay between the two is essential for maximizing member retention. The community acts as a platform for members to connect, share knowledge, and seek support, while the product serves as the solution that fulfills their needs. By recognizing how these elements complement each other, organizations can create a seamless experience that keeps members actively involved and invested in the community and the product.

## Growth in online community participation

% of global internet users who engage with online forums, blogs, and/or vlogs across all devices



Question: In the past month, which of the following things have you done on the internet via any device?

Source: GlobalWebIndex 2017-2019 (averages conducted between Q1 2017-Q3 2019) Base: 303,502 (2017) 391,130 (2018), 351,239 (2019) global internet users aged 16-64

Figure 2.1-Online community growth

IV. Community Flywheel



Figure 4.1-Flywheel

RFM analysis matrix for customer segmentation

This slide highlights a matrix of RFM analysis for segmenting market customers to gain better understanding of target audience and develop effective marketing strategies. It classifies segments such as can't lose them, hibernating, lost, loyal customers, champions, need attention, potential loyalist, recent users, etc.



Figure 4.2 RFM Matrix

---

## V. DATA COLLECTION



Figure 5.1 Discord Server

We began by setting up a Discord server and configuring specific channels tailored to our study's requirements. To facilitate seamless data gathering, a custom Discord bot was meticulously developed and seamlessly integrated into the server. This specialized bot was designed to effectively capture and record messages posted within the designated channels, encompassing various dimensions of community interaction.

With each message sent within the channels, the Discord bot swiftly retrieved and meticulously organized essential metadata, including the message content, timestamp, author information, and any associated reactions. This structured data was then efficiently stored in a MongoDB database, ensuring an organized and systematic approach to data management. By employing this methodical data collection process, we successfully accumulated a comprehensive dataset that served as the fundamental basis for our subsequent analyses, offering valuable insights into community engagement and discernible activity patterns.

This thorough and systematic data collection methodology served as the linchpin of our research, empowering us to extract meaningful insights and draw well-informed conclusions regarding the dynamics of our Discord community.

---

## VI. MODEL BUILDING

In the "Model Building" phase, sentiment analysis was pivotal for comprehending the community's sentiment and extracting insights from the collected data. Sentiment analysis involves evaluating and categorizing text based on the expressed emotions or opinions it contains. For this purpose, we utilized TextBlob, a powerful Python library widely acknowledged for its text processing capabilities.

TextBlob employs natural language processing (NLP) techniques to analyze sentences and assign sentiment scores, such as subjectivity and polarity, to each message. NLP involves the application of algorithms and machine learning to enable computers to understand, interpret, and generate human language. In the context of sentiment analysis, subjectivity measures the statement's objectivity or subjectivity, ranging from 0 (objective) to 1 (subjective). Polarity, on the other hand, gauges the sentiment expressed, varying from -1 (negative) to 1 (positive), with 0 indicating neutrality.

Through TextBlob's analysis, we classified messages into sentiment categories based on their polarity scores. Messages with a polarity score less than 0 were categorized as conveying negative sentiment, scores of 0 denoted neutral sentiment, and scores greater than 0 represented positive sentiment. This approach facilitated a clear categorization of the community's sentiment as expressed through their messages.

Integrating sentiment analysis within our data processing pipeline using NLP techniques allowed us to efficiently analyze and categorize messages. We utilized the "apply" method in Python to seamlessly apply sentiment analysis to the "Polarity" column within our data frame. The resulting distribution of sentiment categories provided valuable insights into prevailing sentiment trends within the community, contributing to a deeper understanding of community dynamics.

This sentiment analysis approach played a vital role in our research, aiding in the interpretation of the community's sentiment and enabling us to draw informed conclusions regarding their attitudes and perceptions.

---

## VII. ALGORITHMS USED

### A. NATURAL LANGUAGE PROCESSING (NLP):

Natural Language Processing (NLP) is a field of artificial intelligence and computational linguistics that focuses on the interaction between computers and human language. It involves the development of algorithms and models to enable computers to understand, interpret, and generate human language in a valuable and meaningful manner. NLP techniques are utilized for tasks such as text analysis, sentiment analysis, language translation, chatbot development, and more, facilitating applications that involve human-computer interaction and automated language processing

### B. TEXTBLOB:

TextBlob is a Python library built on top of NLTK (Natural Language Toolkit) and Pattern, providing an intuitive and simplified API for processing textual data and performing various NLP tasks. It offers functionalities for tasks like part-of-speech tagging, noun phrase extraction, sentiment analysis, classification, translation, and more. TextBlob makes NLP accessible to individuals without extensive programming or linguistic expertise, enabling easy integration and utilization of NLP capabilities in applications and analyses.

## VIII. ENGAGEMENT METRICS

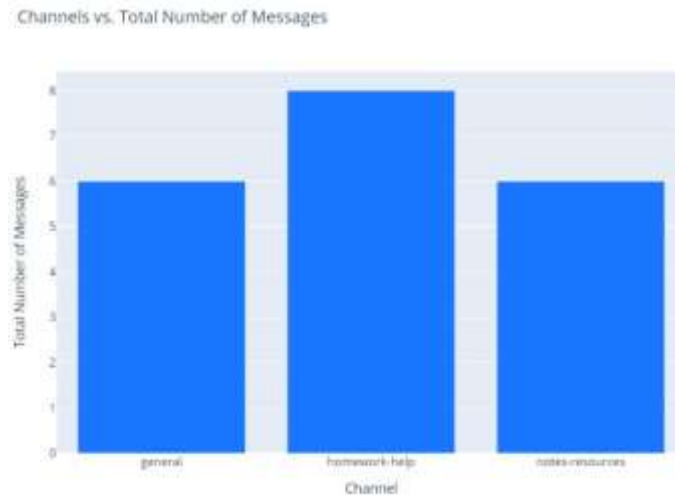


Figure 8.1- Active Channels

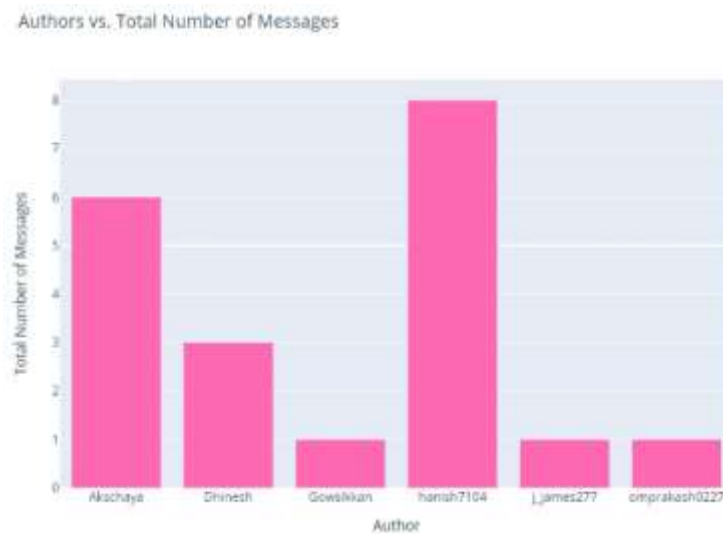


Figure 8.2- Active Members

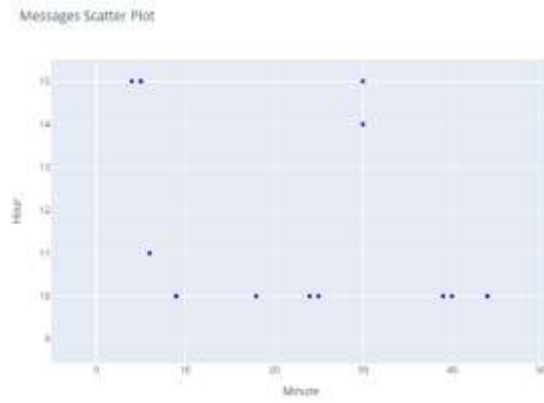


Figure 8.3- Hotspots of Active timings.

8	64e87adaef6ee5e0d40553e3	notes-resources	Akschaya	Sharing few notes tomorrow	2023-08-25 15:05:29
9	64e87adbef6ee5e0d40553e4	general	Akschaya	I am fine	2023-08-24 18:44:35
10	64e87bc26e237fac1faa8a74	notes-resources	Akschaya	Sharing few notes tomorrow	2023-08-25 15:05:29
11	64e87bc36e237fac1faa8a75	homework-help	hanish7184	this group is for homework help	2023-08-25 15:30:06
12	64f056f8b09c9d3bd69af090	homework-help	hanish7184	this group is for homework help	2023-08-25 15:30:06
13	64f056f8b09c9d3bd69af091	general	Dhinesh	Hi I am Dhinesh	2023-08-31 14:30:25
14	64f18b5c585bbfd63d0d17b8	homework-help	j_james277	Hi	2023-09-01 18:24:56
15	64f18b5c585bbfd63d0d17b1	homework-help	omprakash0227	Hi	2023-09-01 18:25:51
16	64f18b5c585bbfd63d0d17b2	homework-help	Gowsikkan	Hi	2023-09-01 18:39:15
17	64f18b5c585bbfd63d0d17b3	homework-help	Dhinesh	Bye!	2023-09-01 18:44:26
18	64f18b5c585bbfd63d0d17b4	homework-help	Akschaya	I will be posting homework post 6pm	2023-09-01 11:06:43
19	64f18b5c585bbfd63d0d17b5	general	Dhinesh	Hi I am Dhinesh	2023-08-31 14:30:25

Figure 8.4- Data Extraction

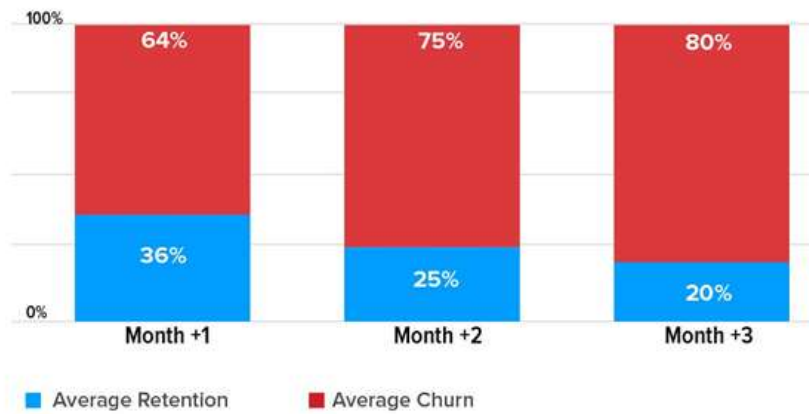


Figure 8.5-Average Retention and Churn

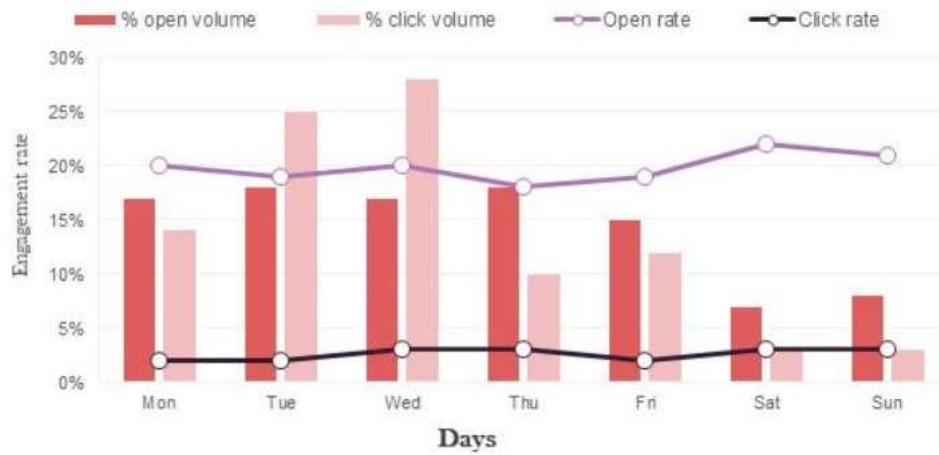


Figure 8.6- Engagement Days

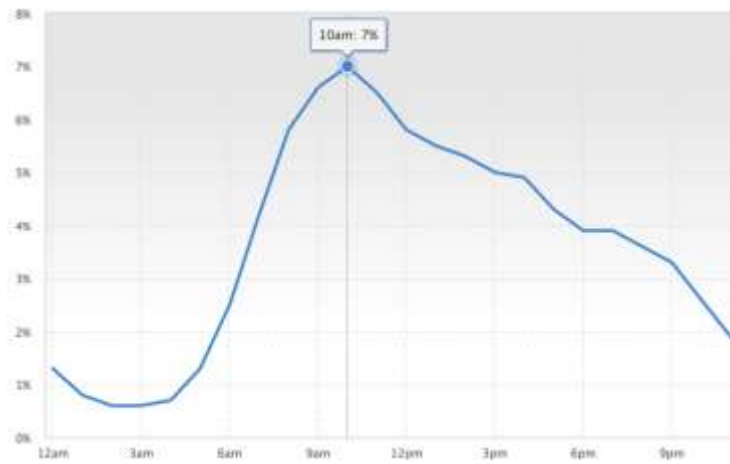


Figure 5.7- High Engagement Time

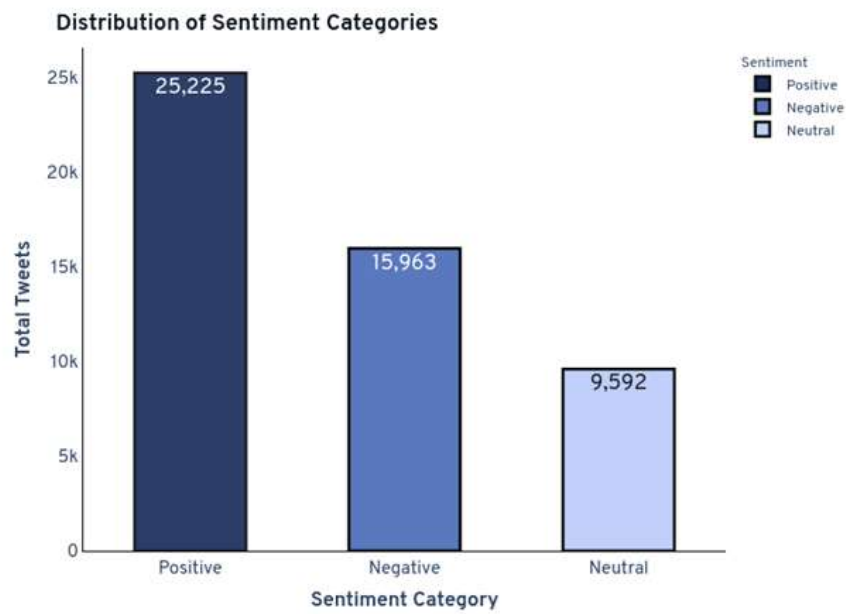


Figure 5.8 Sentiment Analysis

---

## IX. RESULT ANALYSIS

The comprehensive analysis of community engagement metrics and sentiment analysis using the Community Management tool provides a nuanced understanding of the Discord and Slack communities. Notably, the sentiment analysis revealed that a significant portion of the community exhibited higher sentiments, indicating a predominantly positive and favorable atmosphere within the community. This positivity is fundamental to fostering a welcoming and engaging environment, which is vital for community growth and sustainability.

A notable finding was the identification of the "homework-help" channel as the highest engagement channel. This discovery underscores the community's strong interest and engagement in educational discussions and assistance related to homework. Tailoring content and strategies to further support and enhance engagement in this channel could potentially drive overall community engagement and satisfaction.

Figure 8.2 illustrates the distribution of active members across the community. This visual representation aids in understanding the growth trajectory and dynamics of the community, showcasing peaks and troughs in member participation. Analyzing this figure in conjunction with other engagement metrics allows administrators to tailor engagement strategies and targeted communications to specific audience segments, thus optimizing community engagement efforts.

Further delving into activity patterns, the analysis revealed that the highest levels of activity occurred consistently around 9 am to 10 am. Understanding peak activity times is crucial for planning events, discussions, or announcements to maximize engagement and reach within the community. Additionally, the consistent peak activity on Tuesday and Wednesday suggests a pattern of behavior that can be leveraged to drive targeted engagement strategies during these days.

The Month-over-Month (MoM) retention rate analysis demonstrated a positive trend, consistently maintained within the range of 75-80 percent. This stable and satisfactory retention rate indicates effective community management and retention strategies in place. It is essential to continue monitoring and analyzing retention rates to identify potential areas for improvement and refine strategies to sustain or enhance retention rates over time.

In conclusion, the detailed analysis of engagement metrics and sentiment analysis offers valuable insights into the community's dynamics, highlighting key areas for optimization. Leveraging these insights, community administrators can tailor their approach to enhance engagement, member satisfaction, and community growth, ultimately contributing to a thriving and active community ecosystem.

---

## X. CONCLUSION

This paper underscores the vital role of an innovative Community Management tool in optimizing engagement and growth within Discord and Slack communities. By providing a consolidated view of key performance indicators and sentiment analysis, the tool enables data-driven decisions to enhance community dynamics and sustain growth.

Future Scope:

Future endeavors should focus on refining the tool, integrating real-time analytics, and incorporating advanced AI techniques for deeper sentiment analysis. Additionally, exploring applications in diverse community platforms and assessing the tool's scalability and adaptability would expand its utility and impact.

---

## XI. REFERENCES

### **Title: Community Management and the Ecosystem of Online Platforms**

Authors: Nathan Schneider, Brooke Foucault Welles, and Sarah J. Jackson Published in: Proceedings of the 2020 Conference on Fairness, Accountability, and Transparency (FAT\* '20)

### **Title: Managing Online Communities: Unveiling the Challenges, Strategies, and Best Practices**

Authors: Gianluca Elia, Eleonora Ferraris, and Marco Guerini Published in: Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems (CHI '21)

### **Title: Designing for Participation in Online Communities: A Framework for Moderation**

Authors: Yubo Kou, Yun Huang, Noshir Contractor, and Haiyi Zhu Published in: Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems (CHI '20)

### **Title: Reducing Inequality in Online Communities: A Study of Community Management Practices**

Authors: Muhammad Ali, Prerna Juneja, Adrian Benton, et al. Published in: Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems (CHI '22)

### **Title: The Role of Community Managers in Online Health Communities: A Qualitative Study**

Authors: Cathal D. Walsh, Maarten A. Immink, and Claudia N. Laurence Published in: Journal of Medical Internet Research, 2023 Link:



---

**\*\*<https://www.jmir.org/2019/2/e12432/>\*\***

**Title: Strategies and Trade-Offs in Online Community Moderation** Authors: Benjamin J. Thomas, David M. Frohlich, and Ilaria Liccardi Published in: Proceedings of the ACM on Human-Computer Interaction, 2019 Link: **\*\*<https://dl.acm.org/doi/10.1145/3359258>\*\***

**Title: Decentralized Online Social Networks**

Authors: Qinghua Li, Guanyu Gao, Yuyi Xia, et al. Published in: Communications of the ACM, 2020 Link:

**\*\*<https://dl.acm.org/doi/abs/10.1145/3213760>\*\***

**Title: Measuring Member Engagement in Professional Online Communities**

Authors: Michael J. Muller, Jonathan L. Elford, Susannah Fox, et al. Published in: Proceedings of the ACM Conference on Computer-Supported Cooperative Work and Social Computing, 2019