Governance Participation Analysis Report

(Analyze Tally (Onchain) ETH Spent)

This report delves deep into Ethereum (ETH) spending by voters on Tally Proposals within the Arbitrum ecosystem. The analysis attempts to understand the ETH spending by members of DAO & allow interpretation on whether there is a need to have better optimized governance contracts or shift in the platform or to reward the participants with ARB for their retro-participation.

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Summary

The analysis of ETH spending by voters on Arbitrum tally proposals illuminates critical insights into the intricacies of decentralized governance. By delving into the patterns of ETH expenditure, we uncover valuable understandings of voter behavior and participation dynamics. Through meticulous examination, we have discerned trends, outliers, correlations, and other significant factors pivotal to comprehending the nuances of governance participation on Arbitrum. These insights serve as vital signposts for refining governance mechanisms, fostering voter engagement, and ultimately fortifying the efficacy of decentralized decision-making processes.

Introduction

Decentralized governance stands as a cornerstone in the evolution of blockchain ecosystems, epitomizing community-driven decision-making, inclusivity, and transparency. Within the dynamic landscape of Arbitrum, a prominent layer 2 scaling solution for Ethereum, governance participation assumes a pivotal role in fostering ecosystem development and resilience. As the platform burgeons with burgeoning decentralized applications and a vibrant user base, understanding the intricate nuances of voter behavior becomes imperative. This analysis endeavors to delve into the ETH spending behavior of voters on Arbitrum tally proposals, unraveling the intricate tapestry of voter engagement, participation trends, and the overarching vitality of the governance process.

Methodology

The methodology employed for data gathering and analysis leveraged the robust capabilities of Dune Analytics dashboard, a powerful tool for exploring and visualizing on-chain data.

To acquire comprehensive insights, data was gathered from three primary tables within the Arbitrum ecosystem:
arbitrum.transactions,
arbitrum_arbitrum.L2ArbitrumGovernor_evt_VoteCast,
arbitrum_arbitrum.L2ArbitrumGovernor_evt_ProposalCreated

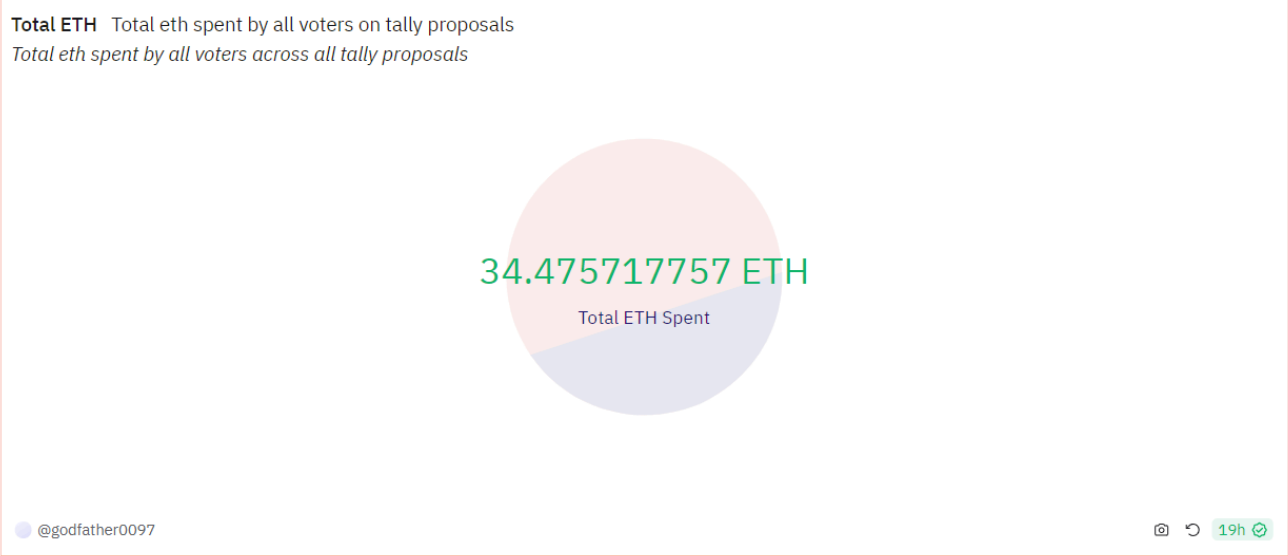
These tables collectively provide a rich repository of transactional and governance-related information, enabling a thorough examination of voting activities and proposal creation events.

For analysis purposes, a diverse array of visualizations available within the Dune Analytics dashboard was utilized. These encompassed **bar charts, area charts, scatter charts, line charts, pie charts, counters, and tables**, each tailored to elucidate specific aspects of ETH spending behavior, voter engagement, and participation trends. By harnessing the analytical prowess of Dune Analytics, we were able to dissect the data comprehensively and derive actionable insights to inform governance strategies and enhance ecosystem dynamics.

Analysis Findings

1. Analysis of Total ETH Spending Across Tally Proposals

Objective:- To determine the total amount of ETH spent by all voters across all tally proposals on Arbitrum.

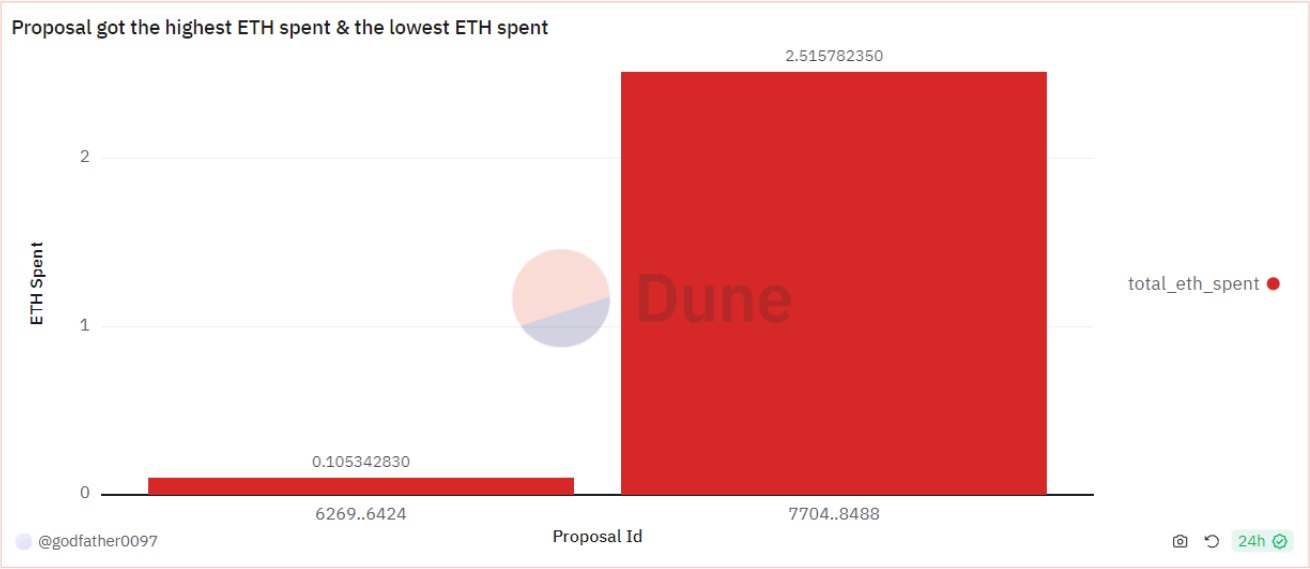


Source:- Query Link

Explanation:- The total ETH spending across tally proposals represents the sum total of ETH spent by voters on various governance proposals within the Arbitrum ecosystem. In this analysis, the total amount of ETH spent is calculated to be 34.475717757 ETH. This metric provides a clear picture of the overall financial activity within the governance process, reflecting the collective monetary contribution of voters towards shaping the direction of the Arbitrum network.

2. Identification of Proposals with Extreme ETH Spending

Objective:- To identify the tally proposals with the highest and lowest ETH spending by voters.



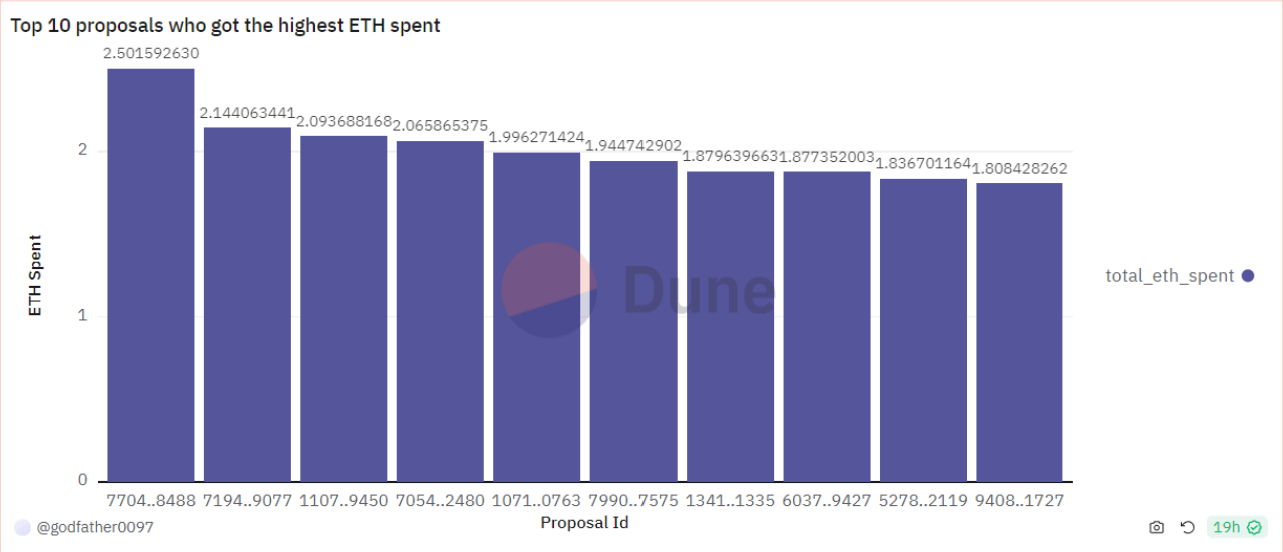
Source:- Query Link

Explanation:- This analysis identifies proposals within the Arbitrum ecosystem that exhibit extreme levels of ETH spending. Proposal ID "**77049969659962393408182308518930939247285848107346513112985531885924337078488** " stands out with the highest ETH spending, amounting to approximately **2.15 ETH**.

In contrast, Proposal ID "**62693727119417571390426894958563824660584965357558003731402315920902749064 24**" demonstrates the lowest ETH spending, totaling around **0.10 ETH**.

3. Ranking of Top Proposals by ETH Spending

Objective:- To rank the top 10 proposals with the highest ETH spending by voters.



Source:- [Query Link]

Explanation:- The proposal with Proposal ID "**77049969659962393408182308518930939247285848107346513112985531885924337078488**" ranks at the top with a total ETH spending of around **2.15 ETH**.

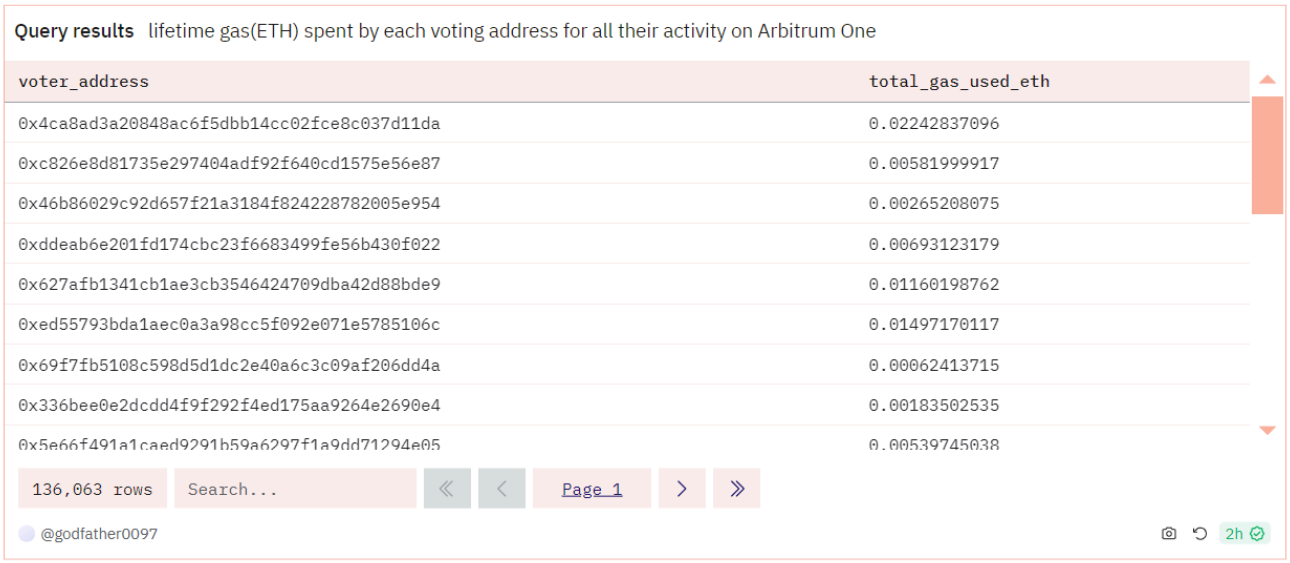
Following closely, the proposal with Proposal ID "**71941171835710778457735937894689629320431683601089057868136768380925169329077**" secures the second position with a total ETH spending of **2.14 ETH**.

Lastly, the proposal with Proposal ID "**110793123084980773896129216551445203207286848914653873956746115694475823589450**" takes the third spot with a total ETH spending of **2.09 ETH**.

This ranking provides a clear visualization of the distribution of ETH spending among the top proposals, highlighting their relative significance in terms of financial contribution within the Arbitrum ecosystem.

4. Assessment of Lifetime Gas Spending by Voting Addresses

Objective:- To calculate the lifetime gas (ETH) spent by each voting address for all their activity on Arbitrum.



Query results lifetime gas(ETH) spent by each voting address for all their activity on Arbitrum One

voter_address	total_gas_used_eth
0x4ca8ad3a20848ac6f5dbb14cc02fce8c037d11da	0.02242837096
0xc826e8d81735e297404adf92f640cd1575e56e87	0.00581999917
0x46b86029c92d657f21a3184f824228782005e954	0.00265208075
0xddeab6e201fd174cbc23f6683499fe56b430f022	0.00693123179
0x627afb1341cb1ae3cb3546424709dba42d88bde9	0.01160198762
0xed55793bda1aec0a3a98cc5f092e071e5785106c	0.01497170117
0x69f7fb5108c598d5d1dc2e40a6c3c09af206dd4a	0.00062413715
0x336bee0e2dcdd4f9f292f4ed175aa9264e2690e4	0.00183502535
0x5e66f491a1caed9291b59a6297f1a9dd71294e05	0.00539745038

136,063 rows | Search... | Page 1

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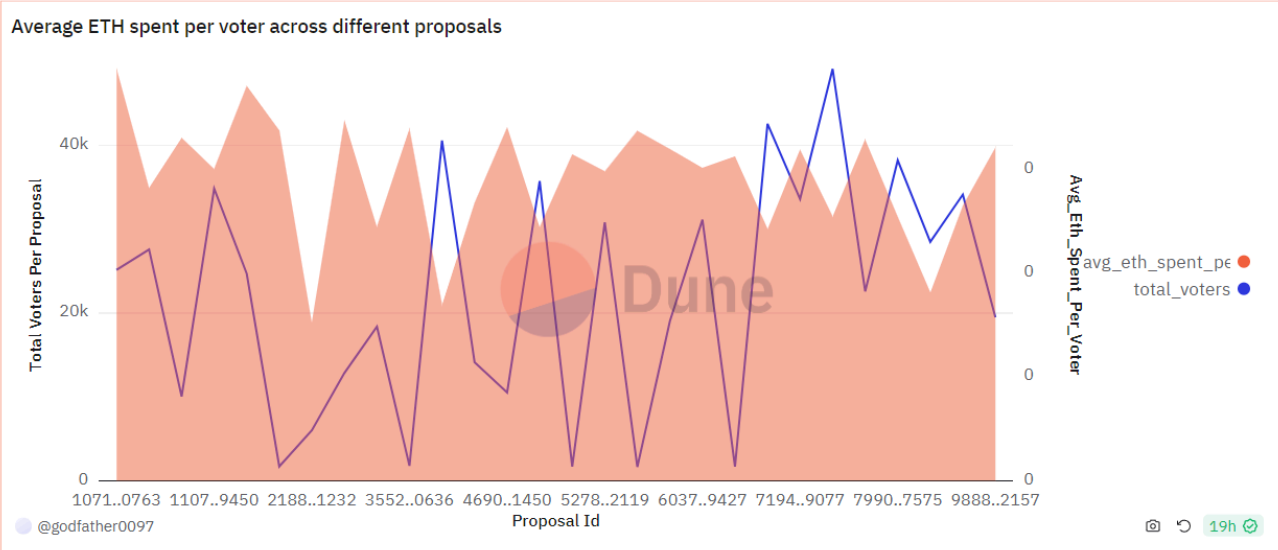
Source:- [Query Link]

Explanation:- This analysis evaluates the lifetime gas spending by voting addresses within the Arbitrum ecosystem. It provides insights into the cumulative gas consumption associated with each voting address, facilitating a better understanding of their participation and contribution to governance activities. The visualization illustrates the distribution of gas spending among voting addresses, allowing stakeholders to identify the extent of engagement and activity levels of individual participants within the network.

5. Determination of Average ETH spent by voters per proposal

Objective:- To ascertain the average amount of ETH expended by each voter across various proposals within the Arbitrum ecosystem.

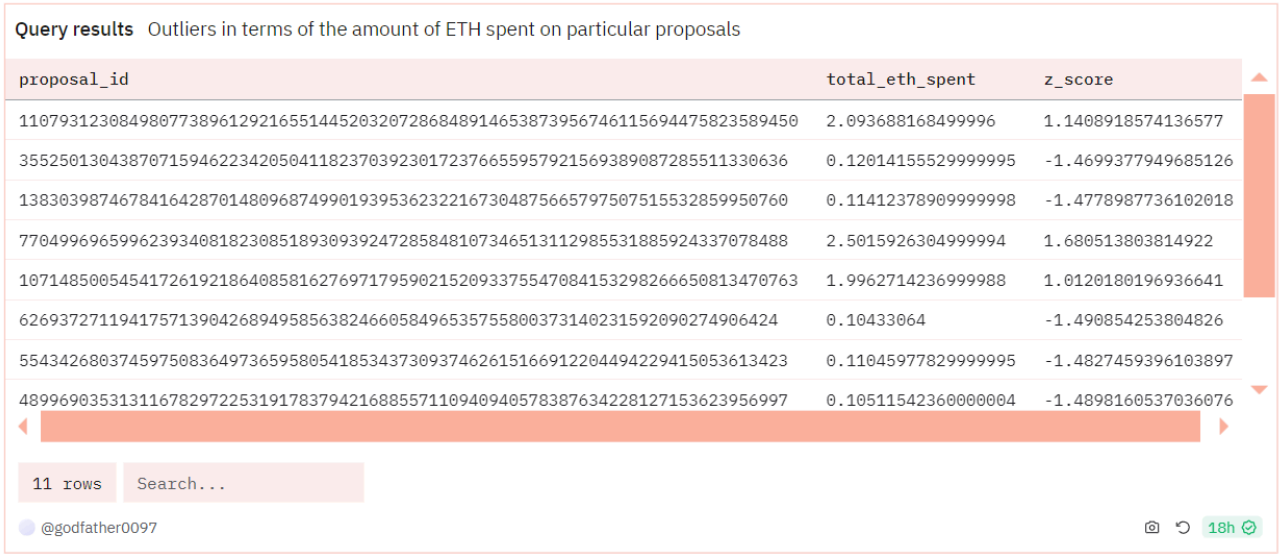


Source:- [Query Link]

Explanation:- This analysis calculates the average amount of ETH spent by each voter across different proposals within the Arbitrum ecosystem. The visualization provides a clear representation of the average ETH spending per voter for each proposal, allowing stakeholders to understand the level of financial engagement exhibited by voters towards individual governance initiatives.

6. Identification of Outliers in Proposal ETH Spending

Objective: To identify proposals with outliers in terms of the amount of ETH spent by voters.



Query results Outliers in terms of the amount of ETH spent on particular proposals

proposal_id	total_eth_spent	z_score
110793123084980773896129216551445203207286848914653873956746115694475823589450	2.093688168499996	1.1408918574136577
3552501304387071594622342050411823703923017237665595792156938908728551133063 6	0.12014155529999995	-1.4699377949685126
13830398746784164287014809687499019395362322167304875665797507515532859950760	0.11412378909999998	-1.4778987736102018
770499696599623934081823085189309392472858481073465131129855318859243370784 88	2.5015926304999994	1.680513803814922
107148500545417261921864085816276971795902152093375547084153298266650813470763	1.9962714236999988	1.0120180196936641
626937271194175713904268949585638246605849653575580037314023159209027490642 4	0.10433064	-1.490854253804826
554342680374597508364973659580541853437309374626151669122044942294150536134 23	0.11045977829999995	-1.4827459396103897
489969035313116782972253191783794216885571109409405783876342281271536239569 97	0.10511542360000004	-1.4898160537036076

11 rows Search...

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Source:- [Query Link]

Explanation:- In the result output, the three columns are:

- **proposal_id:** This column indicates the unique identifier for each proposal within the Arbitrum ecosystem.

- **total_eth_spent:** This column represents the total amount of Ethereum (ETH) spent on each proposal, aggregated across all transactions associated with that proposal.

- **z_score:** This column displays the Z-score for each proposal's ETH spending. The Z-score is a statistical measure that quantifies how many standard deviations a data point is from the mean of the dataset. In this context, the Z-score helps identify outliers in proposal ETH spending. A Z-score greater than 1 or less than -1 indicates that the proposal's ETH spending significantly deviates from the average ETH spending across all proposals. Positive Z-scores indicate higher-than-average spending, while negative Z-scores indicate lower-than-average spending.

7. Analysis of Correlation between Votes and ETH Spending

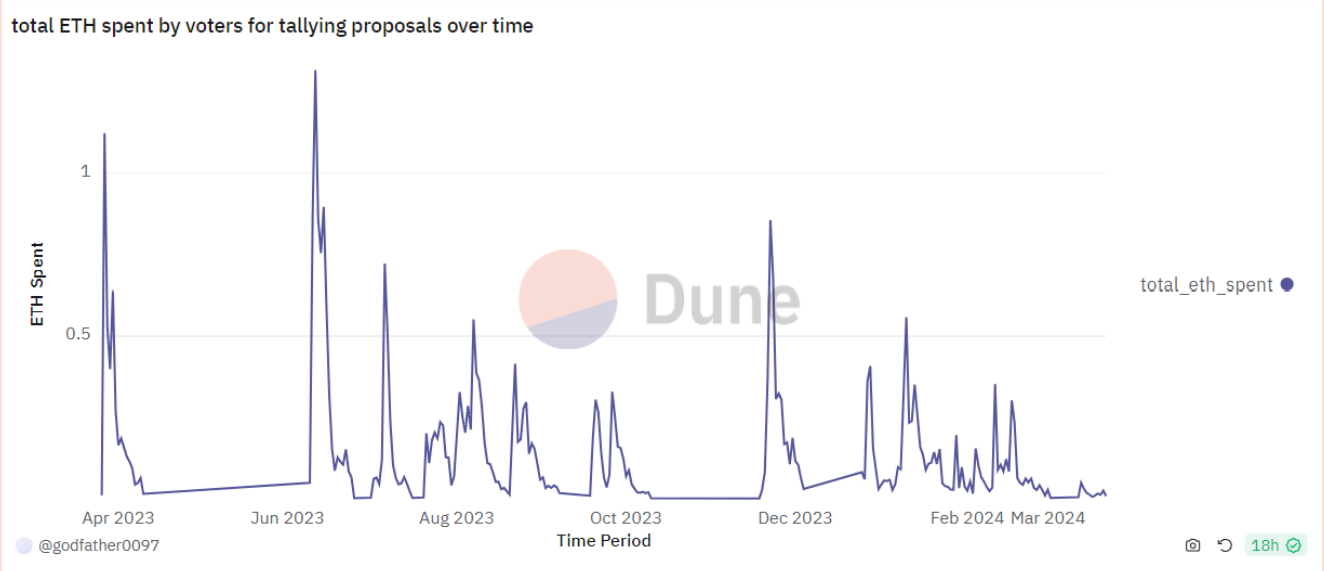
Objective:- To calculate the correlation coefficient between the number of votes cast and the total ETH spent on proposals.

Source:- Query Link

Explanation:- The correlation coefficient measures the strength and direction of the linear relationship between the number of votes cast for proposals and the total ETH spent on those proposals. A correlation coefficient of **0.93** indicates a strong positive correlation between votes and ETH spending. This means that as the number of votes cast increases, the total ETH spent on proposals also tends to increase, and vice versa.

8. Trend Analysis of ETH Spending Over Time

Objective:- To analyze the trend of total ETH spent by voters for tallying proposals over time.

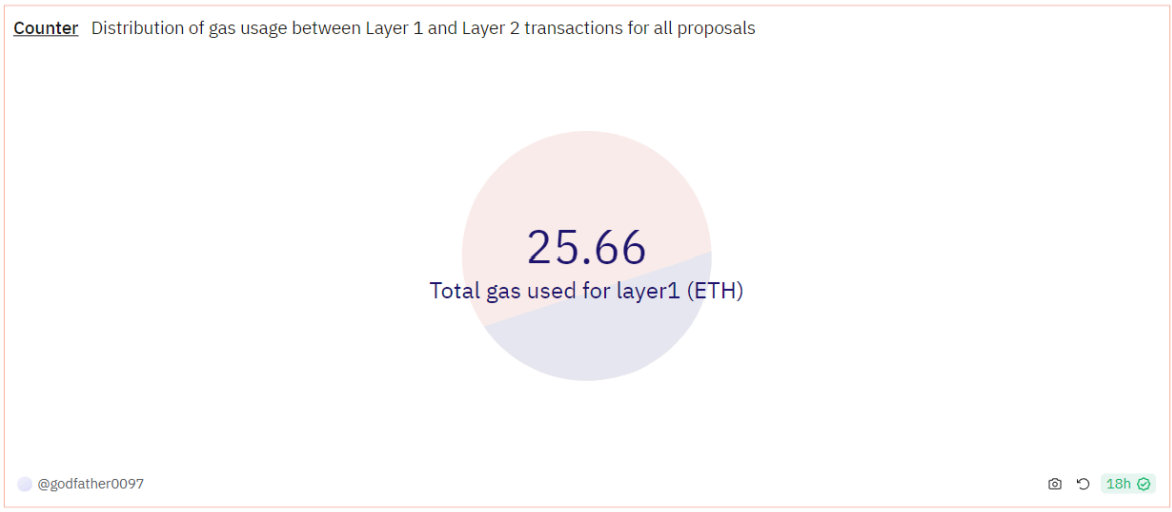


Source:- Query Link

Explanation:- The line chart depicts the variation in ETH spending over time within the Arbitrum ecosystem. In June 2023, there was a notable peak in ETH spending, indicating a period of increased spending activity. Conversely, in April 2023, ETH spending experienced a notable decline, suggesting a period of reduced spending. This visualization allows stakeholders to observe trends and fluctuations in ETH spending behavior over time, offering insights into the dynamics of spending patterns within the governance process.

9. Examination of Gas Usage Distribution Across Transactions

Objective:- To determine the distribution of gas usage between Layer 1 and Layer 2 transactions for all proposals.



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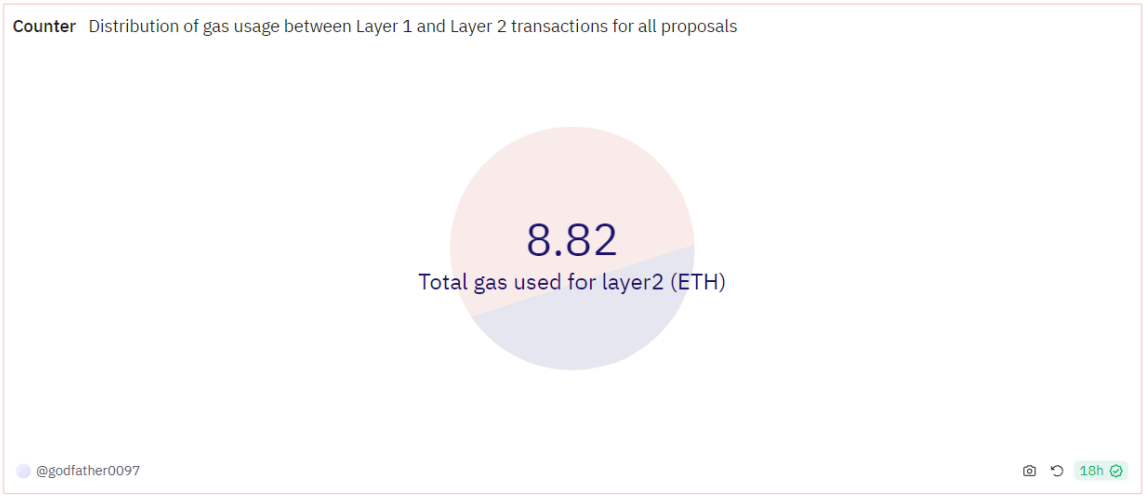

Source:- Query Link

Explanation:- Total gas used for **Layer 1** transactions is **25.66 ETH**, while the total gas used for **Layer 2** transactions is **8.82 ETH**. This breakdown provides insight into the distribution of gas usage between Layer 1 and Layer 2 transactions within the Arbitrum ecosystem. Understanding this distribution is crucial for assessing the efficiency and scalability of transaction processing across different layers of the network.

Conclusion

The analysis of Ethereum (ETH) spending and gas usage within the Arbitrum ecosystem unveils a multifaceted landscape of governance participation and transaction dynamics.

- **Financial Engagement:** Our analysis reveals active participation from voters in governance activities, as evidenced by varying levels of ETH spending across different proposals. This underscores the community's commitment to shaping the direction of the ecosystem.

- **Outlier Identification:** The identification of outliers in ETH spending sheds light on proposals with exceptional spending behavior, prompting further exploration into the underlying factors driving such deviations from the norm.

- **Correlation Analysis**: The strong positive correlation coefficient between votes cast and ETH spending signifies a robust relationship between voter engagement and financial investment in governance initiatives. This highlights the interconnectedness of participation and resource allocation within the ecosystem.

- **Trend Analysis:** Examination of ETH spending trends over time reveals dynamic fluctuations, indicative of evolving community sentiment and response to governance events. Such insights provide valuable context for understanding the evolving nature of governance dynamics.

- **Gas Usage Distribution:** Analysis of gas usage distribution between Layer 1 and Layer 2 transactions underscores the efficiency of transaction processing mechanisms within the Arbitrum network, offering insights into the network's scalability and operational effectiveness.

In conclusion, retroactive reward in ARB to these governance participants can allow further interest in governance from holders. The cost of this reward shall be around 50,000 ARB & can go a long way. A portion of it will come as a part of Sequencer Fees paid during these votes.
On the other hand this analysis also reveals that the cost per voter may not be a significant deterrent for the network participants. Also, with Blobs on Ethereum this burden of cost will reduce significantly.

Resources

Dune Dashboard Link:- https://dune.com/godfather0097/tally-proposals-analyze-eth-spent