NAVIGATING THE CHALLENGES: EVALUATING MARKETING CAMPAIGNS IN A DECENTRALIZED LANDSCAPE

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ABSTRACT

In the age of Web 3.0, the decentralized nature of platforms poses significant challenges to traditional advertisement assessment tools, making it imperative to redefine campaign effectiveness metrics. This paper delves into the intricacies of marketing within the decentralized ecosystem, highlighting pressing issues like fake engagements and the inadequacies of token-based verification systems. Through a combined methodology of literature review and author brainstorming sessions, we introduce the Decentralized Engagement Score (DES) — a novel, user-centric metric designed to measure genuine interactions without the need for complex blockchain validations. The DES formula amalgamates variables like Engagement Depth, Peer Sharing Score, and Feedback Value, providing a holistic, adaptable, and transparent means for marketers to gauge and optimize their campaign strategies in a Web 3.0 environment.'

INTRODUCTION

As the digital realm continues to evolve, the acceptance and utilization of cryptocurrencies have witnessed a significant surge, signaling a shift in the economic landscape (Smith & Doe, 2022). However, accompanying this growth is the intricate and decentralized nature of Web 3.0, which presents unique challenges, particularly when evaluating the efficacy of cryptocurrency advertisement campaigns. Unlike the relatively centralized dynamics of traditional internet models, Web 3.0 is built on peer-to-peer principles, making data aggregation and interpretation more challenging (Chicotsky, 2023)

A rising concern in this decentralized ecosystem is the increasing instances of fake engagements, which often cloud genuine interactions, making it exceedingly difficult for marketers to differentiate authentic responses from manufactured ones (Ramachandran et al., 2023). This differentiation is crucial as precise measurement is the bedrock of optimized advertising expenditures. Without clear metrics, companies risk misallocating resources, ultimately impacting their return on investment (Järvinen & Karjaluoto, 2015).

Traditional metrics, adept at evaluating campaigns in centralized platforms, often fall short when applied to the Web 3.0 paradigm. Infact, in a study by Sakunia & Parida (2023), it was found that social media engagement did not have a correlation with the change in prices of cryptocurrencies. The reasons range from a lack of centralized data repositories to enhanced user privacy protocols inherent in decentralized platforms (Rudman & Bruwer, 2016). This paper delves into the nuances of Web 3.0 marketing dynamics, contrasting them with conventional internet practices, and exploring how marketing agencies and companies are adapting their assessment tools to this new frontier.

RESEARCH QUESTION

How could marketers adapt their traditional assessment tools to evaluate advertising campaigns in a decentralized ecosystem?

LITERATURE REVIEW

Web 3 (decentralized internet) is, as the name suggests, distributed amongst various repositories. Most of these repositories can be accessed by the public. However, to stitch them together in meaningful data is next to impossible. We discuss in this section the existing metrics to measure advertisement effectiveness of a advertisement campaign, its use cases as well as the reasons why using these metrics might not be possible in a decentralized scenario.

Measurement Metrics

The measurement metrics along with the formula and benchmarks are given below Table 1.

Table 1 THE MEASUREMENT METRICS ALONG WITH THE FORMULA AND BENCHMARKS				
Measurement Metric	**Formula**	**Explanation**	**General Benchmark**	**Citation**
Impressions	N/A (Direct Count)	The number of times an ad is viewed/displayed.	N/A	(IAB, 2016)
Circulation	N/A (Direct Count)	The number of copies of a publication distributed.	N/A	(AMA, 2021)
Click-Through Rate (CTR)	(Total Clicks ÷ Total Impressions) × 100	Percentage of users who clicked on an ad after seeing it.	1-3% for display ads	(IAB, 2016)
Cost Per Click (CPC)	Total Cost ÷ Total Clicks	The cost paid by the advertiser for each click on their ad.	Varies, depending on industry/platform	(IAB, 2016)
Engagement Rate	(Total Engagements ÷ Total Impressions) × 100	Percentage of users who interacted with content or ad.	0.5%-1% for social ads	(IAB, 2016)
Open Rate	(Total Opens ÷ Total Delivered Emails) × 100	Percentage of email recipients who open a given email.	15-25%, depending on industry	(Mailchimp, 2021)
Cost Per Install (CPI)	Total Cost ÷ Total Installs	Cost paid by an advertiser for each app installation from their ad.	Varies, depending on platform/region	(IAB, 2016)
Attendance Rate	(Number of Attendees ÷ Number of Registrants) × 100	Percentage of registered participants attending an event/webinar.	40-60% for webinars	(ON24, 2021)
Ad Recall	N/A (Qualitative Measure)	Measure of audience's ability to remember an ad after exposure.	Varies, often >20% is considered good	(Nielsen, 2021a)

Response Rate	(Number of Responses ÷ Number of Delivered Items) × 100	Percentage of recipients who respond to an offer or call-to-action.	1-3% for direct mail	(DMA, 2021)
Cost Per Acquisition (CPA)	Total Cost ÷ Total Acquisitions	Cost paid by an advertiser for a specific action, such as a sale or sign-up.	Varies by industry/platfo rm	(IAB, 2016)
Conversion Rate	(Number of Conversions ÷ Total Visitors) × 100	The percentage of users who take a desired action, like making a purchase.	1-3% for e-commerce sites	(IAB, 2016)
Scan Rate	(Number of Scans ÷ Total Opportunities) × 100	Percentage of users who scanned a QR code.	Varies widely based on context/placem ent	(Scanova, 2022)
Time Spent	N/A (Direct Measure in Seconds/Minutes)	Duration users spend on a specific activity, like viewing content or ads.	Varies by content type/platform	((IAB, 2016)

Use Cases

While there are several web pages and research journals that provide metrics for measuring advertisement effectiveness, editorials and guidelines by the Interactive Advertising Bureau (2021), American Marketing Association (2021), and Nielsen (2021b) provide a comprehensive list of which metrics are used. Below is a table 2 explaining which metrics is used.

Table 2 USE CASES FOR VARIOUS ADVERTISEMENT MEASUREMENT METRICS		
Channel	**Measurement Metric**	**Explanation**
Mobile Apps	Cost Per Install (CPI)	Cost an advertiser pays each time the advertised app is installed.
SMS Marketing	Open Rate	Percentage of SMS recipients who open and read the message.
Webinars	Attendance Rate	Percentage of registered participants who attend the webinar.
Sponsored Content	Engagement Rate	Similar to social media ads but for content sponsored on platforms like news websites.
Direct Mail	Response Rate	Percentage of recipients who respond to the mailed offer.
Trade Shows/Events	Leads Acquired	Number of potential business inquiries or leads generated from the event.
Cinema Advertising	Ad Recall	Measure of how many cinema-goers remember the ad after viewing.
Transit Advertising (buses, trains)	Impressions	Estimated number of times the ad is viewed, often based on transit ridership or routes.
Product Placement (in movies, TV shows)	Ad Recall	Measure of audience's recall of a product or brand placement within content.
Loyalty Programs	Customer Retention Rate	Measure of how many customers remain loyal to the brand due to the program.
QR Codes	Scan Rate	Number of scans or interactions with the QR code.
Augmented Reality (AR) Ads	Engagement Rate	Total interactions with the AR experience divided by total impressions or activations.
Virtual Reality (VR) Ads	Time Spent	Duration users spend interacting with the VR advertisement.
Flyers & Brochures	Response Rate	Percentage of recipients who take the desired action after receiving the flyer or brochure.

Content Marketing (Blogs, Articles)	Time Spent, Engagement Rate	Metrics can vary but often include time spent on content and engagements like shares/comments.
Native Advertising	Click-Through Rate (CTR)	Similar to online ad banners but designed to fit seamlessly within the platform's content.
Push Notifications	Click Rate	Percentage of users who click on the content of the push notification.
Affiliate Blogs	Cost Per Acquisition (CPA)	The cost an advertiser pays when a specified action (like a sale) is taken via the affiliate link.
Remarketing/Retargeting Ads	Conversion Rate	Percentage of users who take a desired action after seeing a retargeted ad.
Video Marketing (YouTube, Vimeo)	View Count, Engagement Rate	Metrics include views, shares, likes, and time spent watching.
Pop-Up Shops	Sales Volume	Total sales or transactions during the duration of the pop-up shop.
Guerilla Marketing	Ad Recall, Engagement Rate	Often qualitative measures of brand recall, awareness, and engagement with unconventional ads.
Sponsored Podcasts	Listener Count, Engagement Rate	Metrics include number of listens and engagements such as shares or comments.
Wearable Ads (T-shirts, Caps)	Impressions, Ad Recall	Often qualitative measures based on the visibility and recall of the wearable advertisement.
Aerial Advertising (Plane banners, Skywriting)	Impressions	Estimated number of times the aerial message is viewed based on location/population density.
Beacon Marketing	Engagement Rate	Metrics can include interactions, such as offers redeemed from proximity-based marketing.
Vehicle Wraps	Impressions	Estimated based on the routes and locations the vehicle travels to.
Shopping Carts	Impressions, Ad Recall	Based on the number of shoppers and recall of the ads on shopping carts.
Digital Signage (Malls, Stores)	Impressions, Engagement Rate	Metrics can include views and interactions, especially if interactive elements are included.
Chatbots (websites)	Engagement Rate, Conversion Rate	Metrics can include user interactions, inquiries, and conversions facilitated by the chatbot.
Voice Search Optimization (for devices like Alexa, Google Home)	User Interactions, Search Rank	Metrics related to how often voice-optimized content is accessed or ranked.
Packaging	Sales Volume, Ad Recall	Metrics can be related to sales driven by packaging and qualitative measures of recall and perception.
Elevator Ads	Impressions, Ad Recall	Based on the footfall in the building and qualitative measures of ad recall.

| Vending Machine Ads | Sales Volume, Impressions | Metrics related to product sales and visibility based on location and traffic. |

However, not all the above metrics can be used in a Web 3 (decentralized internet) and often need special measurement links to measure. The table below explains how these metrics could be used in various channels of a decentralized internet versus what would be the biggest hurdles for measuring using these metrics in a decentralized internet Table 3.

Table 3 PROBLEMS FACED IN MEASURING ADVERTISEMENT EFFECTIVENESS IN VARIOUS CHANNELS (NARULA, 2017) AND (BUTERIN, 2014)		
Channel	Why Metrics Might Not Work in Web 3	How It Could Be Used in a Decentralized Scenario
Online Ad Banners	1. Decentralization makes user tracking difficult. 2. Privacy focused nature reduces data availability.	Metrics could be based on self-reported user interactions or use blockchain-based attestations for verified engagement.
Social Media Ads	1. Lack of centralized platforms reduces aggregate metrics. 2. Users have more control over their data.	Utilize token-based incentives for users to voluntarily share engagement data or use decentralized social platforms that have in-built metrics.
Email Marketing	Decentralized mail services might prioritize user privacy, reducing open rate tracking capabilities.	Implement opt-in analytics where users can choose to report if they've engaged with content, potentially incentivized by tokens.
Search Ads	Decentralized search may not have centralized ad platforms or ranking algorithms.	Advertisers might engage directly with users for token-based incentives to display ads, bypassing traditional search ad platforms.
Affiliate Marketing	1. Tracking conversions becomes difficult due to lack of central monitoring. 2. Affiliates may prioritize privacy.	Smart contracts on blockchains can automate affiliate rewards when conditions are met, reducing the need for central tracking.
Remarketing /Retargeting Ads	1. User behavior is harder to track. 2. Users have more control over their data, making retargeting difficult.	Direct token-based incentives for users to voluntarily view ads again or provide feedback on viewed ads.
Video Marketing (YouTube, Vimeo)	1. Decentralized video platforms may not aggregate views in the same manner. 2. Privacy features may restrict tracking.	Utilize decentralized video platforms with built-in metrics or incentivize users to provide feedback on videos using tokens.
Content Marketing (Blogs, Articles)	1. Central analytics platforms might be incompatible. 2. User data is not centrally stored.	Encourage users to interact with content using blockchain-based rewards, thereby getting insights into engagement.
Native Advertising	1. Lack of centralized tracking. 2. Decentralized platforms may not have standardized ad formats.	Engage directly with content creators on decentralized platforms to integrate native advertising and use platform-specific metrics.

Dealing with Fake Engagements

To deal with the fake engagements, marketing professionals have come-up with measurements and red flags which often serve as a rule of thumb. Few such gauging methods are given below Table 4:

Table 4 **METHODS USED BY MARKETERS TO IDENTIFY FAKE ENGAGEMENT**		
Measure	**Explanation**	**Sources**
Traffic Source Analysis	By examining the sources of traffic, marketers can identify suspicious patterns, such as a sudden influx of traffic from a single, unknown source or region. Genuine engagements typically have a more diverse traffic source.	(Google Analytics, 2020)
Bounce Rate Examination	A high bounce rate, where users leave almost immediately after arriving, can indicate non-human or low-quality traffic. Examining bounce rates helps in identifying pages or ads with likely fake engagements.	(Moz, 2019)
Interaction Depth	Genuine users often interact more deeply with content, exploring various pages or sections. If most users only engage with a single piece and then leave, it might be a sign of fake engagements.	(HubSpot, 2020)
Session Duration Analysis	Extremely short or uniform session durations can be indicative of bot traffic. Genuine users tend to have varied session lengths.	(Google Analytics, 2020)
Click-Through Rate (CTR) Assessment	Extremely high CTRs, especially in contexts where such rates are unusual, can indicate fake clicks or engagements.	(Search Engine Journal, 2020)
Captcha Implementation	Using CAPTCHA or similar systems can filter out bots during interactions, ensuring that engagements are from real users.	(Google reCAPTCHA, 2019)
Behavior Analysis Tools	Advanced tools analyze user behavior, differentiating between human-like interactions and automated bot patterns.	(Imperva, 2021)
IP Address & Device Tracking	Multiple engagements from the same IP address or device in a short period can indicate fake interactions. Marketers can filter out such repetitive engagements to get genuine metrics.	(Moz, 2019)

Methodology

The methodology for this research comprises two integral components: a rigorous literature review and author brainstorming sessions. Both elements aim to provide a comprehensive understanding of the subject matter, with the literature review offering empirical insights and the author brainstorming sessions contributing experiential and innovative perspectives.

Analysis and Result

We designed a simplified Decentralized Engagement Score (DES) to gauge the effectiveness and genuine engagement of an advertisement campaign in the decentralized Web 3.0 ecosystem without relying on advanced technology such as advanced blockchain-based tokens/contracts, etc.

Decentralized Engagement Score (DES)

The DES metric aims to capture the essence of user engagement in a decentralized setting without delving deep into the technological intricacies of Web 3.0. It can be a starting point, with room for refinement as more insights into user behavior in decentralized platforms emerge.

DES can be calculated by using the below formula:

DES = (ED x a) + (PSS x b) + (FV x c) + (CRS x d)

Where:

- **Engagement Depth (ED)**: This measures the depth of a user's interaction with the content. For instance, instead of just counting views, it gauges how long users stayed, if they interacted with the content (like comments or likes), and if they accessed linked resources.
- **Peer Sharing Score (PSS)**: Given the community-driven nature of decentralized platforms, peer-to-peer content sharing can be an indicator of campaign success. This metric would measure the frequency and reach of content being shared directly between users.
- **Feedback Value (FV)**: These metric aggregates user feedback, such as comments, decentralized poll results, or upvotes/downvotes on platforms that allow such interactions.
- **Content Relevance Score (CRS)**: Based on keyword tags, track how often your content is being pulled or referenced in decentralized searches or platform recommendations. This indicates the organic pull and relevance of your ad content.
- **a, b, c, and d** are weights assigned depending on the campaign's objectives and target demographics. For instance, if peer sharing is a vital success indicator for a campaign, b might have a higher value.

Below is a table with details of the components of the DES metric. Each component of the DES can be used to measure as a separate measure for the respective components as well Table 5.

Table 5
COMPONENTS OF THE DES METRIC

Component	Formula/Measurement Criteria	Example (Values)
Engagement Depth (ED)	**ED= [(TD+DI+CT+IR)/4] ×100%** Where: **TD = Time Depth:** Proportion of time spent on content compared to its total duration or length. For a video, this would be the time watched over the total video time; for an article, it could be the time spent reading over an estimated read time. Formula: TD = Time spent by user / Total content duration **DI = Depth of Interaction**: Proportion of interactive elements engaged with over total interactive elements available. This could encompass things like clicks on embedded links, use of interactive widgets, etc. Formula:	Let's assume for a piece of content: Users typically spend 3 minutes on it, but the total content duration is 5 minutes. Users engage with 4 out of 5 interactive elements. Users traverse 90% of the content. 70 out of 100 users interact with the content beyond just viewing. Plugging these values into the formula: [(0.6+0.8+0.9+0.7)/4] ×100%=75% So, the Engagement Depth for this content is 75%.

	DI = No. of interactive elements used by user / Total interactive elements available **CT = Content Traversal:** Measures how much of the content a user went through. For a scrollable content piece, it could be the proportion of the content scrolled through. Formula: CT = Amount of content traversed by user/ Total content length **IR = Interaction Rate**: Proportion of users who interacted with the content over those who merely viewed it. This could include actions like liking, sharing, commenting, etc. Formula: IR = No. of users who interacted / Total no. of users who viewed the content The resulting ED will be a percentage that provides an insight into how deeply users are engaging with a piece of content.	
Peer Sharing Score (PSS)	No. of times content shared / Total Visitors	50 / 100 = 0.5 or 50%
Feedback Value (FV)	(No. of positive feedback - No. of negative feedback) / Total feedback	(40 - 10) / 100 = 0.3 or 30%
Content Relevance Score (CRS)	No. of times content appeared in platform recommendations / Total content recommendations	20 / 50 = 0.4 or 40%

For the above example, let's assume the weights a, b, c, and d are 0.25, 0.3, 0.2, and 0.25 respectively.

Calculating DES using the above example:

DES = (0.75 x 0.25) + (0.5 x 0.3) + (0.3 x 0.2) + (0.4 x 0.25)
DES = 0.19 + 0.15 + 0.06 + 0.1
DES = 0.5 or 50%

This DES score of 50% offers a comprehensive measure of the content's engagement and relevance in the decentralized context, providing a quantified view of campaign effectiveness.

Benefits of Using the Proposed Metric (DES) For Measurement of Advertisement Effectiveness in Decentralized Ecosystems

- **Simplicity and Clarity:** DES offers a straightforward formula that doesn't rely on complex blockchain interactions, making it accessible to marketers unfamiliar with the intricacies of Web 3.0 technologies.

- **Holistic Approach:** By incorporating engagement depth, peer sharing, feedback value, and content relevance, DES provides a comprehensive understanding of user interaction and content's effectiveness.
- **Flexibility:** The weightages in the DES formula can be adjusted based on campaign priorities, ensuring that the metric remains relevant across different marketing strategies.
- **Focus on Organic Engagement:** With its emphasis on genuine user interactions, peer-to-peer sharing, and feedback, DES is designed to capture organic user engagement, a critical factor in decentralized platforms.
- **Cost-Effective:** As DES doesn't require advanced tools or token-based verifications, it offers a cost-effective solution for marketers to gauge campaign effectiveness in the decentralized web.
- **Compatibility:** The DES metric can be used across various decentralized platforms, offering a standardized measure of engagement and campaign success.
- **User-Centric Feedback:** The inclusion of feedback value in DES ensures that direct user responses, both positive and negative, play a pivotal role in determining the overall engagement score.
- **Promotion of Quality Content:** By incorporating the content relevance score, DES naturally promotes content that aligns well with user queries and platform recommendations, ensuring that quality content is rewarded.
- **Adaptability:** As the decentralized web continues to evolve, the components of DES can be refined or expanded upon, ensuring that the metric remains up-to-date with the latest user behavior trends and platform developments.
- **Data-Driven Decision Making:** DES provides marketers with quantifiable data on campaign performance, enabling data-driven decisions and optimizations.
- **Review Integration:** DES's emphasis on feedback value integrates user reviews into the engagement score, giving marketers insight into public sentiment and areas for improvement.
- **Addressing Fake Engagements:** By focusing on organic metrics such as peer-sharing and genuine feedback, DES inherently reduces the influence of fake reviews and artificial engagement, offering a more authentic assessment.
- **Decentralization-Friendly:** Recognizing the core principles of Web 3.0, DES is tailored for decentralized platforms, ensuring that its metrics are aligned with the inherent nature and dynamics of the decentralized ecosystem.

By emphasizing genuine interactions and filtering out inauthentic engagements, the DES metric offers a transparent and reliable measure of campaign effectiveness in the decentralized environment of Web 3.0. Effective marketing measurements combined with effective advertisement as discussed in Sakunia and Parida (2004) could give better advertisement yield.

REFERENCES

American Marketing Association. (2021). Marketing metrics.

Buterin, V. (2014). Ethereum white paper: A next-generation smart contract and decentralized application platform. Ethereum Foundation

Chicotsky, B. (2023). Web3 and marketing: The new frontier. Applied Marketing Analytics, 9(2), 182-194.

Google Analytics. (2020). Traffic source and behavior reports.

Google reCAPTCHA. (2019). The importance of CAPTCHA in filtering out bots.

HubSpot. (2021). Understanding HubSpot's Contact Create Attribution.

Imperva. (2021). Bots hide behind user privacy should you be concerned

Interactive Advertising Bureau (IAB). (2016). Glossary-Formatted.

Järvinen, J., & Karjaluoto, H. (2015). The use of Web analytics for digital marketing performance measurement. Industrial Marketing Management, 50, 117-127.

Mailchimp. (2021). Email marketing benchmarks.

Moz. (2019). Understanding and recognizing bot traffic.

Narula, N. (2017). The Decentralized web.

Nielsen. (2021). Nielsen Annual Marketing Report: Era of Adaptation.

Nielsen. (2021). Total ad ratings.

Ramachandran, G., Nemeth, D., Neville, D., Zhelezov, D., Yalçin, A., Fohrmann, O., & Krishnamachari, B. (2020, November). WhistleBlower: towards a decentralized and open platform for spotting fake news. In 2020 IEEE International Conference on Blockchain (Blockchain) (pp. 154-161). IEEE.

Rudman, R., & Bruwer, R. (2016). Defining Web 3.0: opportunities and challenges. The electronic library, 34(1), 132-154.

Sakunia, D., & Parida, B. (2023). Is Social Media Engagement and Sentiments the Right Metric for Investing in Crypto-Currencies? Implications for Entrepreneurs and Investors. *Indian Journal of Research in Capital Markets, 10*(1), 8-14.

Sakunia, D., & Parida, B. (2024). Exploring antecedents for user acceptance of cryptocurrencies through the lens of the indian forex market. *Academy of Marketing Studies Journal, 28*(1), 1-10.

Scanova. (2022). QR code statistics.

Search Engine Journal. (2020). What Is Click-Through Rate & Why CTR Is Important.