VENN TOKEN (VT)

Web3 trust networks

VENN

March 18, 2022

Abstract

In this whitepaper we outline the issues that exist with todays online search the ad driven model behind that. We propose a solution based on a decentralized trust network which users can access to make informed everyday decisions. We put forth a new token based economy which aims to create a long-lasting solution which won't succumb to an inevitable fate given a certain critical market cap. The ideas outlined here are subject to change and feedback and input is always welcome.

Version 0.1

DRAFT

Contents

1. Value Proposition

Users: Get transparent, personalized, trustworthy search results and rewards for activity

Companies: Save of resources and time, efficient ad spend, and conversation rates

Curators: Earn social rewards and earn tokens for recommendations

2. Introduction

2.1 Online Search

Online search has been a crucial part of the internet since 1993 when the likes of Alisearch and WebCrawler debuted. They quickly replaced online directories, which were curated by humans and worked perfectly when the internet was small but did not scale well. Curators could not keep up with new publications and directory users were overwhelmed by the number of offerings. Search engines offered access to the quickly expanding world wide web ever since, using automated crawling and ranking algorithms. The initial search engine space was very fragmented but consolidated quickly with the rise of Google at the end of the 90s. (Pinkerton) Nowadays, Google has de facto a monopoly on search with a global market share of 92%. (*Search Engine Market Share Worldwide*, n.d.).

Without a doubt, search engines have fuelled the internet's success and act as the starting point for a lot of internet user activity. Google is the most visited website on the internet, and the average user uses it more than 3 times per day. Importantly, search engines do not only act as the starting point for information retrieval but also for other online activities such as online shopping - 46% of product searches start on Google. (Mohsin) This shows how search engines have a significant impact on all online activities, whether it's everyday search (search for daily goods, consumables, services), information retrieval, or other use cases.

The search engines' ranking algorithms that drive traffic across the web remain closed source and therefore inaccessible to the general public. Due to its importance though, an entire sector has developed that attempts to optimize search results around Google's centralized algorithm. The search engine optimization (SEO) market is estimated to be 40.92bn USD in 2021 and is still growing quickly. Companies attempt to reverse engineer the algorithms and the underlying factors influencing the results (Bailyn). As the algorithms change constantly, the SEO business stays in high demand.

2.2 Search challenges

Despite all the positive effects that search engines have on the accessibility of the internet and efficient information retrieval, it suffers from multiple systematic weaknesses.

First of all the centralized nature of the search engine market and the commercial and political impact of higher rankings in search engine result pages (SERPs) leads to a cat mouse game between search engine providers, which aim to ensure high quality of results, and different actors, which try to take influence on the rank of search results to drive different agendas. Manipulation of SERPs is attractive for the attacker because a single actor or collective of actors can influence global results for all Google users for certain search terms, often without users noticing as the ranking algorithm is opaque. The intensity of the battle is evident when looking at the sheer amount of updates of the Google Search Algorithm, which are estimated to be between 500-600 per year. ("Google SEO news: Google algorithm updates") that can be clearly linked to efforts to counteract bad actors, which can be inferred by looking at the official release notes by Google for major updates. ("Latest Google Search Documentation Updates | Google Search Central | What's new"). The actors use both positive manipulation/optimization such as SEO methods and bots to boost certain entries and negative manipulation with the aim of throwing other search entries under the bus. The methods are so prevalent, that multiple terms were coined for each method: Google Bombing, Google Bowling, Googlewashing or Spamdexing. Spamdexing is so active that whole sub-categories of different methods exist ("Spamdexing"). That the centralized search engine business is sensitive to attacks despite all the efforts of a trillion-dollar company is evident (see examples in the appendix - section 7.3).

Secondly, the ranking of results is opaque to the end-users and the general public. It is speculated that Google uses about 200 different factors to rank results (Stein). No explainability is given to end-users, which has already led to big discussions around the 2016 election in the US. Results seem to be manually tweaked in certain situations, but end-users have no insights into tweaks made. ("How Google Interferes With Its Search Algorithms and Changes Your Results"). The lack of explainability leads to full dependence on a fully-centralized, private organization that lacks complete oversight and audit regarding the algorithms used. This is worrisome, especially as studies have shown that a "search engine manipulation effect" is one of the largest behavioral effects ever discovered. Studies have shown that not only consumer preferences, but also political elections could be manipulated with search result manipulation. ("Search engine manipulation effect")

Thirdly, query results are to some extent global and do not take the users' preferences into account. This is especially true for everyday search (example: where to eat, what to read, …) which is highly subjective no objective best or right answer exists. Search Engines here often return references to platforms that are mostly based on ratings (e.g. TripAdvisor, GoodReads, IMDb, Amazon). Not only suffer these anonymous global rating systems from fake reviews and paid reviews, which led recently to trust in reviews dropping quickly (Pitman, 2022), but moreover, these systems fail to take personal circumstances of the searcher such as taste preferences, budget limitations, and subcultural contexts into account. Yelp, Google Maps, and other companies use global ratings so that every vote is weighted equally without regarding the relationship between reviewer and searcher and differences and similarities between the two. This leads to significant search costs on the searcher side as he/she needs to manually search through the "prefiltered" list to evaluate how well it matches their personal criteria.

3. Web3 trust networks

3.1 Search

At the core of our solution lies a trust network. A trust network is a directed graph where users are vertices and the trust relationship is an edge. If Alice trusts Bob, there is an edge from Alice to Bob. Furthermore, let's assume another trust relationship exists from Bob to Carol.

Users build up a list of items they find enjoyable from a global database. Items are indexed by name, category, tags etc. as you would in a traditional database to enable search and filtering.

When a user makes a query, it propagates recursively to some fixed depth. In the example above, Alice sends bob a query (e.g. "Movies released in 2021"). Bob in turn passes on the query to all users he trusts, in this case Carol. Bob receives the results and aggregates them, adds his own results and returns his response to Alice. Alice sees results returned by all the users she trusts. She aggregates these to get a personalized ranking for her query.

This result is fully explainable while at the same time preserving privacy. Alice only sees Bob and a trusted party of Bob recommended an item.

3.2 Ads

In order to finance the VENN project, we will allow for external companies to promote their products in a non-intrusive privacy preserving way. External companies place ads in an ad pool. In order to show these to users, companies need to pay a fee. Companies do this by placing an amount of VENN tokens in a smart contract. Every time the ad is shown to a user, their balance of VENN tokens is reduced.

Advertisers have the benefit that when their ads are shown, they have a chance to get a massive trust boost by the user seeing his trust connections also recommending the advertized item. The advertiser can choose keywords, categories etc. when this ad should be shown.

3.3 Kickbacks

For convenience, users are shown direct call to actions (e.g. to buy, rent, book etc.) on their search results. This is not only a nice UX feature but also is a major second revenue generator. The VENN organization will create affiliate partnerships with the providers of the products being indexed in the global database. Once the user completes a purchase using this link by clicking on the button in app the VENN organization receives a kickback of some percentage of the sale.

The VENN organization in turn pays the user the equivalent amount of VENN tokens of the market value at the time of the purchase to the user making the purchase and the users who recommended the item.

4. VENN Token Economics

4.1 Token Utility

The VENN token will be freely tradeable. Secondly, users holding tokens will be allowed to vote in the VENN DAO. The weight of their vote is a product of how long they have held the token (token age) and the quantity of tokens held.

The VENN token can also be earned by users for value adding activity.

4.2 Participants

4.2.1 Users

Users can take one of two roles interchangeably. Firstly, as a curator, they add recommendations and provide useful insights about products to their trust network. Secondly, as consumers. They query their trust network for advice and buy/rent/consume items they find.

4.2.2 External companies

External companies build and create the items for users to enjoy in the real world. They pay to promote their products on the VENN network.

4.2.3 VENN organization

The VENN organization develops the VENN protocol as well as supplying the infrastructure on which the product runs in the first iteration.

Furthermore, they act as an interface between External companies and users. This topology is chosen to protect users' anonymity as well as provide a simple interface for legacy companies to interact with VENN users (asking companies to interact with a blockchain to buy tokens and place these in a smart contract to display ads would be an unnecessarily high barrier of entry).

Lastly, it is responsible to improve the product long term. It achieves this by skimming a service fee off all transactions that happen on the VENN network. The organization is run as a DAO.

4.3 Activities that lead to user Rewards

4.3.1 Sign-ups

The VENN network will work on an invite-only basis. For each new sign-up to the VENN network, the user who signed up as well as the user who invited the other user is rewarded with γ VT each. γ is given by an exponential decay function to incentivize joining the network as early as possible. These are taken from the VENN organization's user acquisition pool.

4.3.2 Seeing ads

Users have the option to enable ads with the upside of receiving VT if they do. On every search query they make, the top result is a clearly marked ad. The reward for seeing an ad decays exponentially to prevent users from spamming the network and seeing ads to earn an arbitrary amount of VT.

The amount of VT received for watching an ad is determined as follows. The reward weight for each ad seen is ε which decays exponentially. This ε is then split 50% to the user making the query Q_u and 50% to the curators C who recommended the items returned.

The Curator split is calculated as follows. The results are all given $C\_ij = 2^{\wedge}(-ij)$ where i is the position in the result list starting at $1 \rightarrow n$ and j is the position of the curator in the list of users that recommend an item $1 \rightarrow m$. All these curator rewards are normalized. This incentivizes curators to recommend things first that will later be recommended by many others (consensus) to make it reach the top of the results list.

The total reward for a user, R_u is then the sum of his Q_u (query rewards) + C_u (curation rewards). We normalize all R_u so they sum to one and name it R_u^*.

Thus, 1 VT is minted every time interval, creating steady and predictable inflation of the VT.

4.3.3 Buying products via affiliate links

To facilitate this, the VENN organization signs up for affiliate programs with various online shops. These purchasing links are then shown to the user in the app for convenience, clearly marked that the user receives VT as reward for using this.

The amount of VT received for a purchase is given by the market price of VT at the time of the purchase. A fraction of this goes to the VENN organization to fund ongoing developments and maintenance.

The rest is split 70% to the user making the purchase and 30% split between all the users who recommended an item by the same rule of 2^-j where j is the curators position in the curator list.

4.4 Initial token distribution

Upon instantiation of the protocol, the VENN organization receives 100% of VENN tokens minted, split into 3 pools.

1. User acquisition pool 70m VT
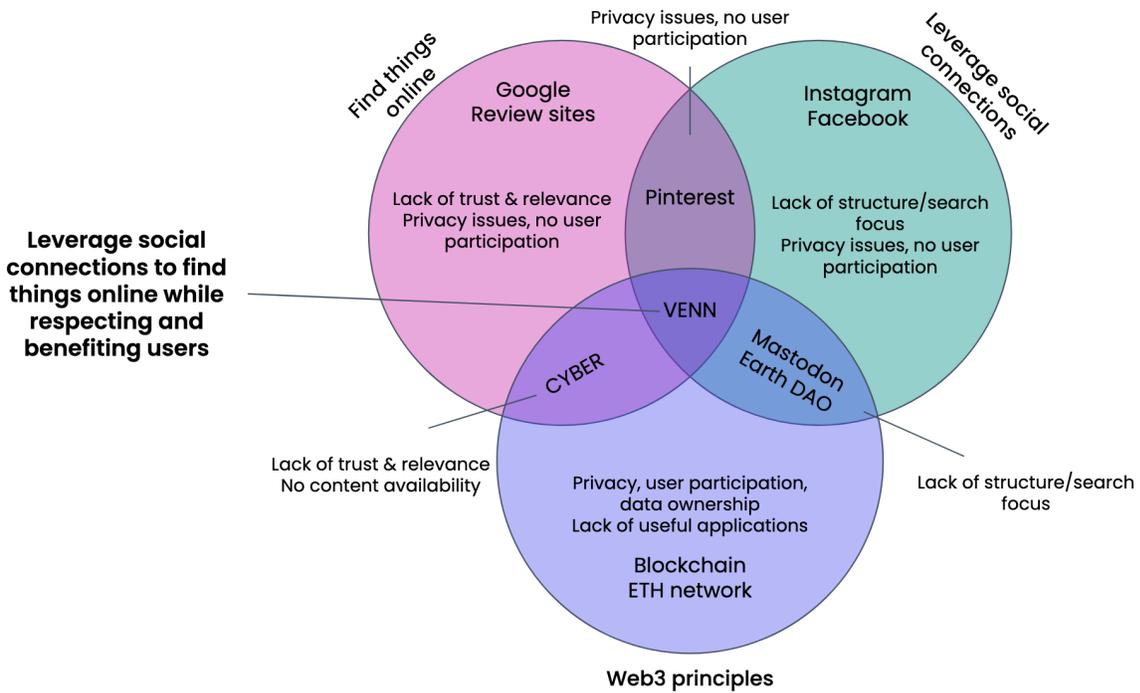2. Development pool 20m VT
3. Advertising pool 10m VT

The VENN organization starts off highly centralized and becomes more and more decentralized over time. The VENN organization wants to increase the value of the VENN tokens it holds. In order to do that, it must get more users and activity on the network. By doing this it distributes the ownership to the users which are making the product valuable.

4.5 Long term operational model

Once all tokens initially held by the VENN organization are diluted to the user base, the organization needs a mechanism to extract value from the network to ensure its longevity. It does this by charging a service fees on affiliate links directly, so the full kickback is never given back to the user in the form of VENN tokens purchased at market price. For the advertising revenue stream, the VENN network charges more VT per time interval than the amount paid out to its users. The difference is held by the VENN organization for future development.

5. Business Landscape

5.1 Competiton

Privacy issues, no user participation

Find things online

Leverage social connections

Google
Review sites

Instagram
Facebook

Lack of trust & relevance
Privacy issues, no user participation

Pinterest

Lack of structure/search focus
Privacy issues, no user participation

Leverage social connections to find things online while respecting and benefiting users

VENN

Mastodon
Earth DAO

CYBER

Lack of trust & relevance
No content availability

Privacy, user participation, data ownership
Lack of useful applications

Lack of structure/search focus

Blockchain
ETH network

Web3 principles

5.2 Advantages

Current ecosystem	VENN
Centralized, opaque No oversight over algorithms and policies System is inherently vulnerable to attacks No voting rights for end-users No finanical participation for users	Decentralized Checks & balances via open source code Resilient trust network User participation via governance tokens Financial participation for users

5.3 Key team members

- Mark Dembo, CEO, co-founded VENN. Previously: VP Strategic Development @ e-bot7.
- Till Bauer, CTO, co-founded VENN. Previously: Head of AI @ e-bot7.

6. FAQs

7. Appendix

7.1 Bad actor resilience

7.1.1 Recommend everything

As curators are rewarded more for being the first to recommend something, there is an incentive to recommend everything on the VENN network. There are 2 mechanisms that should prevent this.

1. If a user recommends everything, the information gained by his trustees is lowered. Users will not see the value of trusting this person or see their behaviour as suspicious and remove the trust connection. The risk of losing trust connections would result in no curation rewards, and that should keep users honest.
2. We place an upper bound on how many recommendations can be made in a time interval.

7.1.2 Spam network with queries to receive ad rewards

As the ad reward follows an exponential decay in a time interval, sending an infinite number of requests still results in a finite and bounded reward. Furthermore, such behaviour would be picked up by nodes on the network, and they will begin to ignore requests from the user making massive amounts of requests.

7.2 Fraudulent sign-ups

To prevent infinite sign-ups, we will deploy various fraud detection methods. Once fraud is detected Users are incentivized to report fake users as they inflate the VT in circulation and thereby reducing its value.

7.3 List of Google attacks

https://alexskra.com/blog/the-mermaid-is-taking-over-google-search-in-norway/
https://casparwre.de/blog/seo-scam/

https://blog.infostruction.com/2021/05/08/google-spamdexing-attack/

8. References

Works Cited

Bailyn, Evan. "The 2022 Google Algorithm Ranking Factors." *First Page Sage*, 13 December
    2021, https://firstpagesage.com/seo-blog/the-google-algorithm-ranking-factors/.
    Accessed 4 March 2022.

"Global Agencies SEO Services Market Report 2021: Market is Expected to Reach $83.7 Billion
    in 2025 at a CAGR of 19.6%." *PR Newswire*, 7 September 2021,
    https://www.prnewswire.com/news-releases/global-agencies-seo-services-market-repor
    t-2021-market-is-expected-to-reach-83-7-billion-in-2025-at-a-cagr-of-19-6-301370521.h
    tml. Accessed 4 March 2022.

"Google SEO news: Google algorithm updates." *Search Engine Land*,
    https://searchengineland.com/google-seo-news-google-algorithm-updates. Accessed 4
    March 2022.

"How Google Interferes With Its Search Algorithms and Changes Your Results." *Wall Street
    Journal*, 15 November 2019,
    https://www.wsj.com/articles/how-google-interferes-with-its-search-algorithms-and-ch
    anges-your-results-11573823753. Accessed 4 March 2022.

"Latest Google Search Documentation Updates | Google Search Central | What's new." *Google
    Developers*, https://developers.google.com/search/updates. Accessed 4 March 2022.

Mohsin, Maryam. "10 Google Search Statistics You Need to Know in 2022." *Oberlo*, 2 January
    2022, https://www.oberlo.com/blog/google-search-statistics. Accessed 4 March 2022.

Pinkerton, Brian. "A Short History of Online Search |." *InformIT*, 10 March 2014,
    https://www.informit.com/articles/article.aspx?p=2181834. Accessed 4 March 2022.

"Search Engine Market Share Worldwide." *Statcounter Global Stats*,

https://gs.statcounter.com/search-engine-market-share. Accessed 4 March 2022.

"Spamdexing." *Wikipedia*, https://en.wikipedia.org/wiki/Spamdexing. Accessed 4 March 2022.

Stein, Adriana. "Your Cheat Sheet to Google's 200 (Known) Ranking Factors." *HubSpot Blog*, 13

July 2021, https://blog.hubspot.com/marketing/google-ranking-algorithm-infographic.

Accessed 4 March 2022.