Calileo

A Highly Scalable Decentralised Social Network Built On The MultiversX Blockchain

Dens Akoka
https://www.calileo.co/

Abstract—The advent of secure decentralised applications (dApps) through Ethereum and later MultiversX, has brought forth a notable degree of interest and capital influx, providing the premise for a global wave of permissionless innovation. Despite lofty promises, creating a secure and scalable decentralised application has proved to be a strenuous task.

With the ongoing bans on Twitter, with YouTube handing strikes, with Facebook stock on the decline. Could it be that it's time for decentralised social networks to finally step up and challenge the status quo? And if they become our new way of socialising online, how would they be different? What would they look like? What would we do differently?

This paper proposes Calileo, a novel social media which goes beyond the state-of-the-art by introducing a genuine data ownership and monetisation scheme for fair distribution, eliminating censorship and lack of customisation while ensuring distributed fairness through an ads revenue sharing consensus. Having a strong focus on security, Calileo will be built on MultiversX to ensure resistance to known security problems like Sybil attack, Nothing at Stake attack and others. In MultiversX's ecosystem that strives for interconnectivity, our solution built on this blockchain will ensure total transparency and fast usability, enabling global adoption of web3 tools.

Preliminary designed social networks have shown that there is a serious need for the population to trust a platform again, whether they are standard users, content creators, or brands.

I Introduction

1 General Aspects

Cryptocurrency and NFTs have sparked considerable interest and have become promising solutions for rewarding creators and their fan base. Today, decentralised social media such as Steemit, Minds and in the future SubSocial and Bluesky are decentralised applications and offer potential digital stores of value while socialising just like on Instagram or Twitter. However, when compared to their centralised counterparts in key metrics, the current state of affairs suggests that current decentralised social networks reveal severe limitations, particularly with respect to scalability, hindering their mainstream adoption and delaying public use. In fact, it has proved extremely challenging to acquire social media users on these dApps [1]. Because those social networks new generation usually have a neglected User Experience, they don't necessarily speak with values. This means people wouldn't automatically want to share and make their friends want to join the new social platform they've used [2]. Several solutions have been proposed, but few of them have shown significant and viable results. Thus, in order to solve the adoption problem, a complete rethinking of decentralised social networks was required.

2 Defining the Challenges

Several issues must be adequately handled in the process of developing a decentralised social network system that can scale:

- Full decentralisation – By eliminating the need for a trusted third party, every single point of failure is eliminated;

- Robust security – By allowing secure transactions and prohibiting attacks based on known attack vectors, any single point of failure is eliminated;

- High scalability — allowing the social network to operate at least as well as its centralised version in terms of TPS.

- Effectiveness – delivering all social network services with the least amount of energy and computation;

- Data storage and synchronisation bootstrapping and storage enhancements – ensuring a low cost of data storage and synchronisation;

- Cross-chain interoperability — Enforced by design, allowing unrestricted contact with external services as well as communication with social platforms;

- Data ownership – Securing privacy and making data accessible and owned by the users;

- Censorship – Empowering free speech and avoiding censorship while fostering independence;

- Algorithm – Initiating an unbiased algorithm that will rank a publication regardless of political views and racial identity;

- Bot take over – Using an efficient and easy-to-use Proof-of-Humanity system permitting to skim through a bot-free social platform, utilising the xPortal or xWallet as a connection method;

- Economy – Offering an economic neutral platform where every stakeholder is fairly rewarded in an utility cryptocurrency.

Starting from the above challenges, we created Calileo as a complete rethinking of decentralised social media, specifically designed to be secure, efficient, scalable, interoperable, and fun. Calileo's main contribution rests on three cornerstone building blocks:

1) A secure online privacy and data ownership approach: effectively provide another answer to data privacy and security, handled in blockchain technology within MultiversX;
2) Freedom of speech and uncensorship: Calileo lets users within their own space complete authority, in compliance with local legal jurisdictions;
3) Provide monetisation fairness: content creators, users, and brands are fairly incentivised depending on their contribution to the platform.

3 Progressive Decentralised Social Network

Calileo is a decentralised social network that is dynamically progressive and always improving its platform and services. Users vote on which characteristics should be assigned to them, resulting in an adaptable type of governance. When opposed to the static approach, adaptive governance presents new challenges. One of the important aspects is how polycentric and multi-level governance characterise complex societies. For our purposes, it is critical to note that adaptive and democratic governance cannot rely solely on official institutions, but must also include a variety of democratic associations, groups, and communities.

Additionally, Calileo proposes to bring the next step Decentralised Social Networks need to gain attractiveness and be utilised by a larger public. Platforms such as Instagram and TikTok welcome new users every day because they remain entertaining, and therefore people use social platforms every day [3]. Calileo is on the edge of bringing web3 technologies to a larger public and achieving its mission to popularise the new internet and other blockchain technologies that support data ownership, freedom of speech, and efficient community management/entertainment.

Calileo proposes a solution for this problem below, but first some notions have to be defined: freedom of speech and data ownership. Freedom of speech is the right to seek, receive and impart information and ideas of all kinds, by any means [4]. Freedom of speech and the right to freedom of expression applies to ideas of all kinds including those that may be deeply offensive [5]. Data ownership encompasses both the possession and the accountability for data. Ownership entails both power and control [6]. Notions like freedom of speech, data ownership, and cryptocurrency monetisation will be further described in chapter II.1 - Entities. Calileo solves this challenge by:

1) Letting the users vote on any decisions that need to be made in Calileo, whether this will be for the introduction of a new feature or when a user does not want to see his post disappear if it has been judged too offensive.
2) Introducing a technique of filtering the preferences the user sets to improve their recommendations over time. It

is the "build your algorithm and create your feeds feature".
3) Designing a built-in mechanism for automatic data giveaway to the account that has created the data on the platform, with the possibility to add a user-friendly smart contract between two accounts that will share the ownership of content.
4) In order to achieve considerable improvements with respect to bootstrapping and storage, Calileo uses MultiversX to make use of a shard pruning mechanism. This ensures the sustainability of our architecture even with a throughput of tens of thousands of transactions per second (TPS).

4 Calileo Platform

We introduce a Do-To-Earn mechanism, that expands on Minds and Steem's idea of a Create-To-Earn mechanism [7] with more customisation and support to users, differentiating itself through the following aspects:

1) Calileo introduces an improvement that improves the support towards creators/authors with the implementation of NFTs and user-friendly Smart Contracts between users. Two or more users will be able to be linked together through one or multiple contents, enabling the share of monetisation for instance. It will be explained in detail through a simple use case in chapter VII.2 – Use Cases.
2) The platform users will have total control over their content, bringing back freedom of speech to social media users. Vulnerable people may be affected by a social platform putting down censorship barriers [8]. Therefore, it is important to say that illegal content will be banned from the start. Users will also be able to filter their contents by building their own algorithm/creating their own feeds thanks to a series of customisation such as selecting which account, topics and languages they'd like to view on your feeds.
3) In addition to putting creators at a focal point in the platform, Calileo will support mental health/wellbeing and climate awareness initiatives. It has been well known that social media can create a form of addiction and regulate the way people see their own image [9]. The current climate change crisis is also of high importance. We will put down to 0 the cost of promoting/boosting content that improves this direction on the platform. Calileo will also use the model of mobile applications that have a calming and relaxing interface as they're proven to work positively on app users [10].
4) The total control of users over their content will mean that they will be the owners. They will decide what to do with it who can see it, who can utilise it, and monetise it.
5) Calileo considers making formal verification for the content signalled by its users on the platform (e.g. content with hate speech signalled) in order to validate the correctness of our algorithms and protect our vulnerable users.

II Architecture Overview

1 Entities

There are two main entities in Calileo: creators and curators. The creators, each creating a finite or infinite number of content that can be text, photo, video, video story, live video, external link, etc., use the Calileo platform to deploy user-friendly signed transactions for value transfers or smart contracts' execution. They can be identified by one of their account addresses (derived from the public key), their "herotag", and their Calileo handle (nametag). The curators are represented just like the creators but will ensure that the content is of quality and get the engagement it deserves. Ultimately, creators can be curators, and vice-versa. Throughout time, all users will access more features and can be passive or actively engaged in ensuring that the platform runs well. Eligible accounts will be important in the Calileo platform, and will act as a jury (moderator team). Specifically, they are responsible for moderating content, voting censorship on content, maintaining the state and being rewarded for their contribution. Each eligible account can be uniquely identified by a public key constructed through a derivation of the address that staked the necessary amount of CALs. Then they get randomly selected and make a twelve-person jury, made of users.

2 Intrinsic Token

Calileo grants access to the usage of its network through intrinsic utility tokens called *Calileos*, in short *CALs*. All rewards for various contributions to the network will be paid in *CALs*. Creating content, curating content, improving the open-source code, supporting creators and users, having an impact on others in the platform, and other sorts of contributions will be rewarded in *CALs*.

3 Threat Model

Calileo assumes highly driven users will try to elevate their extremist opinions through the platform and incite violence with their publications or attempt to harass other users directly.

Online threats prevention

1) Violent speech: removed through the principle of the randomly selected jury that will fairly vote if the publication is violent or not, after our Machine Learning has identified a potential hate speech;

2) Illegal content: equally removed through our screening technology. Fed with our Machine Learning, recognising which content may be illegal or not. Automatically not allowing it to be posted.

3) Messages that users would rather not see on their feed will be moderated by them and themselves only. They will be able to build their own algorithm/create their own feed and decide what to see and how to see content. They will also decide several different types of algorithm or feeds if they want to, easily switching from one to another;

4) Online harassment: mitigated through the principle of the randomly selected jury that will fairly decide the sanction the harasser will get;

5) Mental health deterioration: mitigated by our incentivisation model that will reward in CALs users supporting other users with end-to-end encrypted counselling chat;

6) Negative body image: the platform will give more incentives to accounts that publish real-not-photoshopped images and post high-quality mindful content thanks to our Machine Learning.

Other threats we have taken into consideration are: quality content, cyberbullying, social media addiction, polarisation, fake news, etc.

4 Subtle UX

There are numerous statistics available that demonstrate the critical necessity for mobile-friendliness and brand-building across a wide range of devices in today's digital age. The user experience must be one that is accessible and visible across all the devices available (or at least the most popular to start). There isn't any other option. The User Experience (UX**)** must be pleasant and smooth.

If the user agrees to it, Calileo will automatically utilise the information we have about user devices coupled with lots of other metrics on user behaviour, geography and demographics to personalise the user experience via content and design. What we will present along with how we present it will take centre stage, as users will be presented with what is most useful to them at the exact time. UX design together with monitoring, collection and analysis of user behaviour will drive the goal of creating a productive and engaging personalised user experience [11].

In order to create a great mobile user experience, our UX designers thought outside the box and leveraged input techniques like motion and speech. When using apps that don't require security, people can save the login information on their mobile devices wherever possible [12]. However, on Calileo, where our users want total security and privacy over their account, they can use the most secure and connectable login solution, the non-custodial wallet, xPortal. They can swipe, tap, and pinch, which are the only movements that will provide a smooth user experience.

The number of gestures will continue to grow as we progress, notably when a native app will be released. Furthermore, each platform has its unique set of gestures. Tapping, swiping, pinching, and shaking are just some of the ways users can interact with their phones. How users make their mobile devices do what they want without having to type or even talk is a key component of the user experience [13]. It is a user experience that users want to return to and spread the word about with just a few actions to obtain what they want. Calileo allows extensive customisation through the platform to please the user and make them come back.

For different things, different groups of users prefer different gestures [14]. When creating an app for a specific demographic,

such as Gen Y or Gen Z, our designers kept that demographic in mind. They know what kind of gadget they're using, what operating system they're running, and what they prefer to do to get the latest publication shared or their best friend's story. So, whether it's a tap, double-tap, flick, drag, or two-finger scroll, strong UX implies our team considered all of these factors before deciding what's ideal for our users.

III Related Work

Calileo is designed upon and inspired by the ideas from Steemit and Minds. But also, our centralised counterparts such as Instagram, TikTok, and Twitter. Our architecture will go beyond state of the art and will be seen as an augmentation of the existing models, improving the performance while focusing to achieve a better nash equilibrium state between security, entertainment and decentralisation.

1 Steemit

Steemit is a blockchain-based blogging and social media service that has 1,238,717 users. For publishing and curating content, users can earn STEEM, a cryptocurrency. Steemit Inc., a privately held business based in New York City with headquarters in Virginia, owns the firm. Steemit is a decentralised application (DApp) built on the Steem blockchain that rewards users for their content with the STEEM money. Users can decide the payout of posts and comments by voting on them. Users can also earn "Curation Rewards" for discovering and upvoting content that is then upvoted by other users [15].

The social media site Steemit was launched as the first application built on the Steem blockchain on July 4, 2016, by Steemit, Inc., a corporation created by Ned Scott and blockchain developer Daniel Larimer [16].

Steemit announced on their website on July 14, 2016, that they had been hacked. According to them, roughly 260 accounts have been compromised as a result of the hack. The assailants are said to have grabbed about $85,000 worth of Steem Dollars and STEEM [17].

Daniel Larimer, Steemit's chief technological officer, resigned down and departed the firm in March 2017.

Steemit ran into financial difficulties after the STEEM price dropped during the 2018 cryptocurrency meltdown, and had to lay off 70% of its workers [18].

2 Minds

Minds is a social media site with over 6 million users. Minds is a blockchain-based alt-tech social network. For utilising Minds, users can earn money or cryptocurrency, and tokens can be used to boost posts or crowdfund other users. Minds has been compared to conventional social media networks in terms of privacy. The prevalence of far-right users and content on the network has been observed by writers for The New York Times, Engadget, and Vice. Minds describes itself as a platform that promotes free speech and moderates content to a minimum. Its creators have stated that they do not remove extremist content from the site in the hopes of deradicalising people who submit it through civil conversation [19].

Minds is a desktop and mobile app as well as a website. Users earn Ethereum ERC20 cryptocurrency tokens depending on their activity on the network, which they may use to advertise their content or crowdfund other users through monthly subscriptions. The tokens can also be purchased and exchanged for regular money. A monthly premium subscription to Minds grants users access to special content, allows them to become verified, and allows them to remove boosted posts from their feed [20].

Unlike many popular platforms, which use more intricate and frequently secret ranking algorithms to select which posts appear, posts on Minds appear in reverse chronological order [21].

Minds is said to be more privacy-conscious than its competitors. All messages sent between users are end-to-end encrypted, which means that even company employees are unable to access them. Minds is also open source, allowing for a free analysis of its coding for security flaws or other privacy problems. Users can register anonymously if they like [22].

An application security consultant wrote to the Full Disclosure email group in 2015, claiming that the Minds client accepted encryption keys without any form of identity authentication and that Minds used its own poor cryptography protocol. A security firm had produced a full disclosure report earlier that week, saying that they had discovered that they could delete any message, alter any user's profile, and upload any things to Minds. Minds' CTO, Mark Harding, refuted the assertions made on the mailing group. Although the encryption used by Minds was not necessarily vulnerable, a security expert at Johns Hopkins Information Security Institute acknowledged that it was poor, saying, "I am not optimistic that they got it correctly." Bill Ottman, Minds' CEO, acknowledged the issues reported in the security company's full disclosure and said that the company had addressed them [23].

Mind's purpose, according to creator and CEO Bill Ottman in a 2018 interview with TechCrunch, is "Internet freedom with privacy, transparency, free expression within the law, and user control." [24] Doxing, encouraging violence, uploading terroristic content, and harassing other users directly are all prohibited by Minds' terms of service. Minds has been compared to more prominent social networks in terms of deleting undesirable content. Hate speech was not prohibited, according to a 2018 Wired story, and "the great majority of content on Minds is benign, but posts do surface there that would constitute hate speech on other platforms." [21]

Following Ottman's appearance on Fox News' Tucker Carlson Tonight in February 2018, Media Matters for America labelled Minds "full of hatred" and its material racist, antisemitic, and misogynist [25]. In 2018, an Engadget writer expressed his reservations about the site's dedication to free speech, writing, "It's not until you scan the most popular channels on the platform that you start to ask what kind of free speech and discussion Minds is interested in safeguarding." The site's stars are mostly far-right intellectual heavyweights, and the argument appears to be quite one-sided. It's here if you're

wondering where folks with Pepe the Frog avatars have gone. Minds had a modest workforce in charge of regulating content on the site in 2018, and they weren't employing artificial intelligence to try to discover information that broke the site's terms of service. Minds' moderation team was "around five" individuals in May 2019, according to Wired, and the firm was in the process of developing a "jury system" that would remove content based on user votes [26]. In August 2019, Ottman told NPR that they had just launched the juror system, which allows users who believe their content has been unfairly moderated to appeal to a twelve-person jury made up of other users [26].

Ottman has stated that eliminating hate speech and other offensive content from Minds will just draw more attention to it, and that deplatforming extremists will only lead individuals to "other darker parts of the internet." Minds leaders emphasised their conviction in "free expression and transparency as the antidote to radicalisation, violence, and extremism" in a statement to Vice in 2019 [26].

Daryl Davis and Minds have collaborated on a deradicalisation effort named "Change Minds." Davis is a Black R&B singer who tries to persuade members of the Ku Klux Klan to leave and condemn the organisation. Davis has stated that he aims to utilise Minds to teach people how to interact civilly with one another, even when their viewpoints are diametrically opposed [27].

Minds is one of a handful of alt-tech websites "whose mild touch in content regulation is touted as a dedication to free speech," according to The Guardian, prompting conservatives to register accounts on the platform to utilise in the case of banning from more restricted platforms. The New York Times reported in January 2021 that YouTube and Facebook had kicked tens of thousands of Trump supporters and white supremacists off their sites, and that Minds was one of the apps they used instead [28].

IV Scalability via MultiversX

1 Why Blockchain Technology

By keeping user content on a blockchain's immutable ledger, Calileo can avoid censorship. It can also provide users control over incentives and reputation points by encrypting the data and transferring it via unstoppable crypto transactions.

Fake news is currently the most serious issue on social media [29]. Anything can become viral and become true in a matter of hours. In such case, if misleading news goes viral, awful things can happen.

Thankfully, blockchain's ledger technology is capable of fixing this issue. Personal verification, information verification, and data verification are all functions that blockchain can provide [30].

Calileo allows everyone to manage their digital information. This framework leverages authentication to verify IDs, content, and posts. Similarly, blockchain also makes data collection on social media platforms easier [31].

From the market perspective, social media is a collection of data. If a user doesn't get control over this, data can reach third parties. Every post, like, or share creates a behavioural profile

of the user [32]. This profile is the reason you receive news and ads according to your preference.

However, these informational pieces can also allow third parties to manipulate a user. Hacking personal information and selling it to other parties are the issues that the social media sector is facing nowadays [33].

Blockchain has the capacity to put an end to this activity. There are blockchain applications that allow users to control their data. They can decide who sees their information and how much. Calileo allows users to manage their information. Every platform requires permission to access the data, which keeps users' information secure.

The technology will help users to charge a fee for their information when sharing with advertisers. Hence, one can select the right people to get access to the correct data.

Crowdfunding is helping startups to grow faster. The money is also raised for charities. These activities are taking place on social media platforms as well. Blockchain technology makes investors feel secure and works against money laundering too [34].

Social networks that are enabled by blockchain make crowdfunding easier for investors. Peers can track contracts, accept payments and verify users without taking any extreme measures.

The blockchain is in the middle of disrupting different industries and providing substantial benefits. If incorporated effectively, these benefits can improve the way users look at social media platforms. Data can become secure and users can rely on third-parties.

Mass adoption has been a long-standing goal for the blockchain and crypto industry. Almost every business in this space strives for mass adoption in one way or the other. But, with just over 300 million crypto users and 70 million blockchain wallet users [35], there's clearly a long way to go. Reasons like lack of government recognition, lack of understanding of the technology, and high-risk factors have been credited as deterrents to mass adoption. In this long list, the main deterrent still remains to be the lack of a strong enough use case [36].

Today's blockchain industry is brimming with unrivalled innovation. However, most of these developments are focused on short-term growth and do not give a compelling rationale for individuals to switch from centralised to decentralised systems.

The internet was in a similar scenario in the early 2000s. There's a lot of promise here, but it's not worth much. However, the introduction of social media, primarily Facebook, in 2004, altered the entire dynamic. The internet attracted a flood of new users from all around the world who saw it as one of humanity's greatest innovations.

Even after two decades, it is still social media that has the potential to catapult blockchain adoption into the mainstream [37].

While Facebook, Instagram, Twitter, and YouTube are now synonymous with the word social media, this is probably about to change soon. Blockchain technology is giving birth to a new wave of social networks that could be bigger and even better. Calileo takes the existing social models and gives them

superpowers. Data scams, uninformed algorithm changes and unnecessary content censorship could become a thing of the past. This is because Calileo is owned and run by the community.

Along with this, Calileo also brings the possibility of social finance (SocialFi). Social influence on these networks is tokenised and users can get direct monetary benefits from being influential figures on these platforms.

The rise of Calileo and our SocialFi integration will probably be one of the best uses of blockchain technology and could be at the helm of mass adoption.

There has been a recent boom in venture capital funding as big social networks incorporate blockchain technology and SocialFi ventures gain traction. SocialFi was identified as one of the primary areas of focus in Binance Smart Chain's newly announced $500 million investment initiative. In collaboration with Reddit co-founder Alexis Ohanian, Solana Ventures launched a $100 million fundraising round for web3 social entrepreneurs [38].

Furthermore, the venture capital firm Paradigm launched a $2.5 billion fundraising round for web3 and crypto firms, which could be the largest crypto fund ever. The venture capital sector appears to have recognised the promise of blockchain technology and is now investing in promising SocialFi startups [38].

The crypto and blockchain businesses are also working full-time on the development of the next generation of social media, which might appeal to the public and bring them on-chain, thanks to an injection of new VC capital [38].

It's easier said than done, yet mass acceptance is one of those things. Convincing a significant section of the people to adopt a new technology is difficult. This is where social media may play a significant role. With things like SocialFi and decentralisation entering the picture, social media networks may be the key to unlocking mainstream adoption [38].

Many features are missing from centralised social media networks. As a result, blockchain presents solutions to these problems. Let's go over the fundamental elements needed to build a better social media network:

- Open-source code: With blockchain technology, it is possible to keep an open-source code. This will have the advantage of inspecting the data algorithms [39];
- Decentralised control: Decentralisation is possible using blockchain technology. This will allow for network-based decentralisation, and no firm or government will be liable to take action as a result [40];
- Everyone agrees that a democratic system is the best option. So why not adapt social media to the network structure, allowing everyone to make democratic decisions?
- Explainable AI: Integrating blockchain networks with social networks and using explainable artificial intelligence (AI) as a result could be a significant step toward digital transformation. This system is capable of explaining the reasoning behind each decision.

Decentralisation on social media, enabled by blockchain technology, has a number of advantages:

- Unethical use of users' data can be avoided using decentralised networks [41];
- Cryptography is used by blockchain technology to protect user interactions, resulting in data confidentiality and privacy [42];
- Because there is no central authority, people can control how data is used, resulting in freedom of speech. As a result, users have control over what they can and cannot publish (to some extent) [42];
- Cryptocurrency, the most popular blockchain application, aids with crowdfunding and has a lot of potential in the future [43];
- Content moderation is a flaw in today's popular social media platforms that are addressed by decentralised social networks. As a result, the primary benefit of employing a blockchain-based social networking platform is this.

Fake news, excessive trolling, censorship, and demonetisation are all major issues on traditional social media platforms like Facebook, Twitter, and Youtube, respectively. Because there is no central organisation or supervisor regulating value, the decentralised nature of Blockchain technology represents the future of various fields, especially in social media, regardless of how we look at it.

To sum up, Calileo employs blockchain technology to alter the way we interact on the internet through its social network.

2 Why MultiversX

Scalability, security, and decentralisation are the three most crucial qualities of a mature blockchain network. Unfortunately, with today's technology, none of these can be accomplished at the same time [44]. An attempt to improve decentralisation, for example, could have a negative influence on security and scalability. Additionally, a blockchain's security and decentralisation may have to be compromised in order to increase scalability. In fact, achieving two of these attributes without sacrificing the third is extremely difficult. A blockchain trilemma is the technical term for this condition of rigidity.

With its unique method of operation, MultiversX solves the trilemma. With a scalability strategy called adaptive state sharding and a unique consensus mechanism called secure proof-of-stake, it hits all three major objectives [45].

MultiversX is a popular and strong blockchain that overcomes the scaling problem by using adaptive state sharding to parallelise transaction processing.

With over 250,000 transactions per second, the MultiversX blockchain can process transactions in near real time (Testnet results) [45]. Such speed is essential for Calileo, as we want to scale our blockchain social network and bring it to the masses. It is essential for such a product. Platforms such as Instagram and Twitter have between 1,000 and 6,000 publications posted in one second of activity [46][47]. MultiversX is the only decentralised network possible to use to scale Calileo.

During a transaction, data is encrypted and stored on the blockchain's hardware infrastructure, which consists of millions of computer nodes.

At the time of creation, nodes are updated with each new data record, and this data is safeguarded from tampering by cryptographic mechanisms.

To ensure the security of the data recorded on the blockchain, MultiversX employs secure proof-of-stake. Validators are chosen at random to build consensus, and the process takes less than 100 milliseconds. Manipulation is avoided by using a randomised validator selection method [45].

To make blockchain projects more accessible to the masses and keep prices competitive, transaction costs must be low. MultiversX has a clear advantage in this area with negligible transaction fees compared to other networks [48]. It combines the power and security of Ethereum, and the low-cost transaction fees of Solana.

Calileo has been building the social platform on MultiversX, the first and only carbon-neutral blockchain [49], respecting the environment and staying aligned with our values. Allowing this data ownership feature to existing, along with the integration of NFTs and other blockchain features. We will allow our users to create and do more with others on the platform while owning the content, unlike traditional social networks. They will also benefit from one more feature that has disappeared from the Internet in general: Freedom of Speech.

Total freedom of speech can be very difficult to integrate on social media platforms [50]. But, illegal content will never appear to begin and other content that may be deemed explicit will be hidden from vulnerable users through our UX-friendly "customise your algorithm" feature.

To target the market, Calileo starts with MultiversX cryptocurrency holders ($EGLD) and builds within this promising ecosystem to attempt to capture more of the social media market.

This blockchain (MultiversX) is still in its very early days. However, they already have a large community and native applications from their network, such as their non-custodial wallet, xPortal. This has gathered 1M+ active users in two years among 2M MultiversX wallets and keeps growing every day [51][52]. Calileo can expect to reach the same number of users in its first two years, and we will grow from there.

3 MultiversX Ecosystem

MultiversX's non-custodial wallet, xPortal, is a digital wallet and global payments app that allows people to exchange and securely store money on their mobile phones. People can use xPortal to send and receive money near-instantly, to and from anyone around the world by just using a phone number or herotag [53].

The app is the simplest way to buy, store or transfer crypto money. Powered by the amazing MultiversX blockchain, it will radically change the way we interact with money. xPortal is intuitively simple and highly secure, enabling any phone user to join in seconds [53].

This ecosystem is empowered by its users. Every day, multiple projects are born on the MultiversX blockchain, and some of them get enough attention to get listed on xExchange (Decentralised Exchange). The amazing MultiversX community allows Calileo to perform exponentially, potentially reaching the ambition that's got xPortal.

This is what we aim for, the ability to unlock the capacity of a powerful ecosystem where all dApps created on MultiversX can be interconnected and grow with a very supportive community.

This interconnectivity allows Calileo users to easily transfer their creations on MultiversX that are stored on their xPortal wallet or other platforms of the MultiversX ecosystem.

xPortal has already more than 1M users and it keeps growing to the point that there is a real opportunity for Calileo to reuse the technology and some features to implement on our decentralised social media platform.

Alternatively, to earn CALs on the platform, the xExchange built on MultiversX will be the place where users can buy CAL tokens for things users want to do on the Calileo social platform, such as boosting their content or supporting creators and charities.

CAL tokens will be given value, by how much EGLD gets locked up in their pool. The more TVL (total value locked) that will occur on Calileo, the more valuable our native token will become. Therefore, we will implement a system of staking to unlock special features as multiple other dApps already do. We will talk about it further in chapter X.2 – Special Features.

If a user wants to support their favourite creator or charity, other than generating CALs doing things that will be outlined in chapter VI – Calileo Token, they would then go to the xExchange and trade some EGLD for Calileo (CAL) tokens. That user can then take those Calileo tokens over to the Calileo social platform and purchase a monthly subscription they need to support their creators or charities. So the Calileo pool, then loses some CALs, and gains some EGLD. Thus the Calileo pool grows a little in value, as does the Calileo token.

A lot of synergies are created between MultiversX and xExchange. As people bring their EGLD to xPortal to purchase CAL to do the things they want to be able to do on the social platform, EGLD and xPortal grow. This is also why, when EGLD drops or goes up in value, so will CAL that uses EGLD pools to facilitate our trading on xExchange.

And of course, the more dApps there are on the MultiversX network, the more people will buy EGLD, and the more they will use xExchange to get those dApp tokens, thus providing growth. So while it is difficult to know if any particular dApp will be successful, Calileo will only be as successful as far as people want to use it for example. Buying EGLD and ESDT tokens will gain value from the sum of all that happens on the MultiversX.

4 Herotag

As the MultiversX team said: "Herotags are your identity on MultiversX & the internet. They are unique and forever. Use

them to send and receive money. Use them to change the world." [54]

The xPortal digital wallet is one of the safest and most user-friendly digital asset wallets ever designed. The xPortal wallet is a revolution in the digital asset wallet sector, focusing on security and convenience. xPortal reduces the problem of the complex wallet address, in addition to its robust and uncompromising security. The formerly long, difficult alphanumeric string is replaced with an easy-to-read name or word when herotags are created utilising the Distributed Name System (DNS) [55].

The DNS functions as a translator, allowing complex pieces of data, such as a wallet address, to be linked to a human-readable name. This means you simply transfer money to a herotag like @ElonMusk instead of a big, difficult-to-remember string like erd10aukf24uufpk0ufgl7884ha... (eGold address) or 0x7a265F3Cd24d087FAB0Ae9582119... (Ethereum address). Gone are the days of inputting a long alphanumeric string, as well as the security dangers that come with copying and pasting it from one location to another. This will be extremely beneficial to the widespread adoption of truly decentralised social media systems [55].

This unique feature will help to onboard the next billion users. This is a clear ambition that MultiversX has with its xPortal product – Calileo will unlock this potential with social networking, using its own herotags-like called nametags. And giving a new use case for this feature. Allowing each nametag to represent a unique address and login detail to connect to other decentralised social platforms and connect with others from those apps, directly from Calileo.

The xPortal digital wallet is creating the world's most simple and powerful financial app that is both safe and simple to use. For digital assets, this will open up a whole new universe of possibilities. Digital assets can be used for a variety of different purposes, such as charitable donations, in addition to paying for goods and services with nametags.

Rather than worrying about whether users have the correct wallet address for their favourite charity or connecting to their Calileo profile, xPortal makes it simple and easy to send digital assets to organisations like the Red Cross by simply sending them to their unique but easy-to-read herotag @RedCross. All that is required of users is a mobile device and internet access. The xPortal wallet is a game changer in the field of safely keeping digital assets. The xPortal wallet will be the most straightforward, secure, and widely available way to acquire, store, stake, lend, and spend eGold. Calileo unlocks more possibilities with its herotag-like nametag. And this feature will help us in our ambition to deliver the best and most secure social network on the market. So as you would expect, Calileo offers the user to create a new handle separate from their herotag called nametag.

Most xPortal users utilising online platforms such as Xoxno, Deadrare, or even FrameIt, have to remain logged in with their mobile application opened on their smartphone. It would negatively impact the Calileo users if they had to keep xPortal open simultaneously. Calileo platform lets users the possibility to remain logged in for the long term like other platforms do, thanks to the progress made with the xPortal login technology.

5 Crypto Community

Around 80% of crypto investors and holders are between 18 and 44 years old [56]. Very much similar to social media users. And it is not a coincidence. People thought that the crypto community was largely made of men. They were wrong. Women currently comprise 44% of our beautiful ecosystem [56]. They, therefore, also share values of decentralisation models. It gives Calileo the opportunity to feminise its platform much more than its decentralised competitors, as boring and simple as men are.

The community is acquiring cryptocurrencies in many different ways, with no method being used by the majority of consumers. Peer-to-peer transfers and NFT sales represent 40% of the method used to get crypto [56]. They also mainly invest in crypto because they believe this is the future. Which is the main reason why Calileo will focus on the community to deliver its message and its features mostly rewarding everything with its native token CAL.

Over half (55%) of the crypto community would like to be paid in cryptocurrency if given the opportunity. This percentage is even higher in those aged under 45 and reaches 60% of those aged 18-24 [56]. Do you get the picture now? Calileo could be the future of social media when it comes to paying its creators.

The volatility of crypto's value is the main reason some people are hesitant about crypto being their main source of finance, with 32% of those who don't want to be paid their salary in crypto saying it is too risky not knowing what their salary would be, and 26% are worried about a price crash leaving them with no money [56]. This is why Calileo will offer the possibility to CALs owners to easily exchange the native token in USDC, the US dollar-pegged stablecoin on MultiversX. By bridging USDC to MultiversX, Calileo users will gain the ability to hedge against volatility and perform high speed and low-cost transfers of value that are denominated in a stable currency with high utility and global integration. The USDC token is already available on the MultiversX Mainnet as an ESDT [57].

The cryptocurrency community is not only characterised by its digital asset traders. In fact, 60% of 18-24 years old would like to get paid in cryptocurrencies outside trading [56]. The main segment of social media users is also the largest one interested in crypto projects. And it grows as the population gets younger. Cryptocurrencies are the future, and it already starts on social media. Calileo invests a considerable amount of time to seduce the cryptocurrency ecosystem before going global. And it will help the future goal of bringing hundreds of millions of users on board, as the cryptocurrency investor becomes younger over time.

6 Seduce the Lambda Social Media User

Some people are processing the cryptocurrency adoption in a way that puts terminologies like Web3 to the definition of being a marketing buzzword [58]. Because of what the cryptocurrency

market has shown in the past, these people are sceptical. And, in their minds, organisations that use the term Web3 typically provide little more than an attempt to turn every website into a digital gambling portal. They believe there is no technical benefit to end-users other than to persuade them to trade more cryptocurrencies.

It doesn't help when new entrants in the ecosystem use their life savings to invest in gambling projects and lose everything. Putting the whole ecosystem into the box of pyramid schemes – pouring new money in, inflating the fund, and so tempting new investors.

We have the cryptocurrency's future in our hands. And this is our duty, as web3 lovers, advocates, and magnates, to promote our ecosystem in a useful manner. Promoting the benefits of blockchain-based applications through the layout of real problem-solving features for a better and fairer social network will do greater good to the ecosystem itself and the big picture, the next billion users.

Decentralised applications, Calileo, cannot just buy a community. The market has crashed several times, and people will find out that they cannot pay for loyalty.

Giving people financial incentives to enjoy a product works fine when those financial incentives are present, but when the air is removed from the space and users are left with a naked and uninteresting platform, things look a little different. Play-to-earn gaming businesses have generated billions of dollars for games that are only enjoyable when you're rich and otherwise terrible in terms of playability and stress felt [59]. Meanwhile, venture capitalists have backed web3 media, magazines, and social networking platforms that are all unduly reliant on cryptocurrency speculation while delivering inadequate products.

Because it was a fantastic product, the founders of blockchain-based applications missed what it meant to love something and over-indexed on the sustainability of customer greed or financial desperation. Projects like Calileo can break down the boundaries imposed by corrupted parts of the world, allowing lambda (social media) users to reclaim ownership over their content rather than only their money.

Having a blockchain-based social media with purpose and fun to use will be the key to seduce non-crypto users, so important to the sustainability of Calileo.

V Ethos NFT Collection

1 The Artwork

ETHOS is considered as a "Mega-Trait" Collection, featuring 180+ total traits, compared to most projects which only employ about 120 traits. For a collection size of 3,000, ETHOS must portray uniqueness in every single NFT. When one mints a flawless hand-drawn Ethos, they put themself in a position to enjoy long-lasting success in the world of blockchain social media. Let us take a moment to focus on the art itself. Each trait has been meticulously crafted in a painstaking process occurring over months. This amount of detail and perfection can only be achieved through hard work and dedication. The traits themselves are ones the community can effortlessly connect and

resonate with, combining ideas from pop culture with ancient objects that have maintained their importance since the dawn of time. We represent some of the greatest creators in human history while adding our own personal hints of humour and "hipness".

The parent model is based on our transformative artistic recreation of the Statue of David, sculpted by Michelangelo at only 26 years old, completed in the year 1504. Michelangelo. David of Michelangelo. 1502–1504. Galleria dell'Accademia, Florence. The original David currently rests in the Accademia Gallery of Florence in Italy, with countless replicas scattered around the world. It is said that Michelangelo believed himself to be especially 'ugly', and that he was in turn given a gift to create the highest standard of ideal male beauty through this statue. David represents the fight for power from a place of vulnerability, recalled through the biblical story of David vs Goliath. Calileo views this statue as one of the most magnificent creations by a human being, taking the Italian Renaissance artist 2 years of labour and brilliance to sculpt from one single block of white marble, without a single flaw. This masterpiece represents everything Calileo wishes to portray with our Social Media Platform: Elegance, Confidence and Creation.

2 The Utility

All Ethos NFTs carry exclusive utilities on them. And some having more powers can be distinguished by the attributes they have. Look at the Ethos you minted, check its attributes. And if it has a trait called Moon/Diamond/Obsidian/Ruby or Jade Membership, then you secure the utilities explained down below. Note that all Ethos carry the base utility of the Standard Membership, which gives you DAO voting power, reward boost in $CAL on Calileo, a ticket to the $CAL private sale, and staking rewards.

There were two deeper problems which presented themselves alongside the proposed solution, which needed to be solved by the ETHOS collection. The First – Membership Details. What happens if one person owns more than 1 Ethos? If one owns a high ranked membership, would there be any incentive to keep lower ranked Ethos other than to flip? We needed to bring real utility to every single Ethos, even the lowest ranks. Is there a way to make ETHOS a fair playing ground for smaller investors while implementing a fix? If Calileo users each own an NFT representing the best membership, would they not sell the extras for less than face value, manipulating the floor price?

The Second – Whale Influence. A great deal of volume in most projects comes from a group of whales – fact. If one person buys 100 Ethos and creates daily and engaging content, do they receive an unfair amount of $CAL? How can the smaller investor or the less represented members of the MultiversX community receive their fair share of rewards?

Enter the ETHOS Boost System. Each Ethos in the collection will be provided with incentive to hold. The formula is as follows: The boost you receive will be calculated by adding the original boost percentage of your highest ranked membership, to half of the boost percentage of each subsequent Ethos you own, with a maximum $CAL reward boost of 600%. This

consequently helps content creators with less $EGLD in their wallets. Every extra Ethos that a whale holds, will have its boost percentage halved, allowing more rewards to be distributed to creators with only a few Ethos. The adjusted percentage boost can be applied to any Membership Rank in ETHOS, making the calculation simple. Here is an example of how the ETHOS boost program would work for two investors, one big, and one small:

- Bob owns 1 Moon Ethos and 10 Standard Ethos. His $CAL reward Boost would be (100% + (5%*10)) = 150% Total Boost.
- Alice owns 1 Diamond Ethos and 1 Ruby Ethos. Her $CAL reward Boost would be (80% + (20%*1)) =100% Total Boost.

Investors who own more than 1 Ethos will have the money from half of their extra boosts allocated to creators with fewer Ethos. If the reward batch for a specific day is 100,000 $CAL, less money will be rewarded to the whale for their extra Ethos, meaning the "saved" money must be divided amongst the remaining creators. The whale, although at a slight disadvantage, still has an opportunity to achieve a 600% reward boost. This allows for content creation to be extremely lucrative for those who have spare $EGLD to invest. The early stages of ETHOS will be important, with smart money taking full advantage of the boosts while the number of creators is still small.

3 Advantages

All The distribution method using the ETHOS Boost System gives NFT holders a very significant advantage over regular content creators. Here's how it works:

There is a set amount of $CAL token to be released linearly to content creators over 30 months. The set amount of $CAL to be rewarded will be divided amongst each individual user. (Creators will have the option to donate or redistribute any unwanted $CAL rewards to the community). An algorithm will first calculate the percentage of rewards each creator would receive, based on their contribution. If one creator accounts for 1% of the activity and engagement on Calileo, then they would receive 1% of the $CAL distribution. The boost system reweighs these percentages based on your share of ETHOS. Having a Moon Membership Boost does not mean your entire reward is doubled, but your contribution percentage is doubled and then reweighted amongst every other wallet receiving rewards. This mechanism is important to maintain token scarcity and maintain a very low inflation rate. Early ETHOS holders will be rewarded the most money as Calileo remains in its infancy. As the platform grows, the importance of owning ETHOS to maintain rewards will also grow, as new creators will also be fighting for their fair share of earnings. Any Ethos sitting on a marketplace address cannot be considered for the Boost System. The only way to compete with ETHOS holders in terms of rewards is to consistently deliver the highest quality content day in and day out to earn your fair share.

Here is an example calculation:

Imagine 20 Wallets each contribute an equal 5% of the creator activity and engagement on Calileo. Without the boost mechanism, each wallet would receive 5% of the $CAL rewards for that day. Now imagine one of these wallets owns an ETHOS Moon Membership. That wallet would now be considered to account for 10% of the creator activity and engagement. When reweighted, this one wallet would receive 9.52% of the $CAL rewards for that day, with the other 19 wallets receiving 4.76% each. The differences between wallets becomes less dramatic as more creators join Calileo and the rewards are spread amongst more users and ETHOS holders.

4 More Utility

All Accounts linked with ETHOS will be immediately noticed, as a form of membership distinction will appear on profiles holding an Etho. All ETHOS will have the option to be staked to earn more $CAL, with the Moon Membership receiving the highest percentage of allocated weekly rewards. We also are integrating memberships into Calileo's upcoming campaign: ETHOS International. More details coming soon. Here is an updated list of all of the game-changing features based on the level of membership that you mint:

Tier/Rarity	Advantages
Moon	- Voting Power Boost: 2x - $CAL Contribution Boost: +100% - Lifetime Calileo Moon* - Seed Token Sale WL - MVP Exclusive Access - Moon Verification Ticker
Diamond	- Voting Power Boost: 1.8x - $CAL Contribution Boost: +80% - 1-year Calileo Moon* - Seed Token Sale WL - MVP Exclusive Access
Obsidian	- Voting Power Boost: 1.6x - $CAL Contribution Boost: +60% - 9-month Calileo Moon* - Private Token Sale WL - Early Beta Access
Ruby	- Voting Power Boost: 1.4x - $CAL Contribution Boost: +40% - 6-month Calileo Moon* - Private Token Sale WL - Early Beta Access
Jade	- Voting Power Boost: 1.2x - $CAL Contribution Boost: +20%

- 3-month Calileo Moon*
- Private Token Sale WL
- Early Beta Access

	• Voting Power: 1x
Standard	• $CAL Contribution Boost: 10%
	• Private Token Sale WL

* Calileo Moon will be the equivalent of X+ (ex Twitter Blue) premium subscription.

From the team at Calileo, the precision and effort put into our NFT collection represent the quality of work associated with our Social Media Platform. We strive for the best possible products, improving and adapting on a day-to-day basis. Within the next year, we know we will build an ecosystem that everyone on MultiversX can call home.

VI CAL Token

1 Do-To-Earn (D2E)

Play-to-earn NFT games went ablaze in 2021. Gamers all over the world were ecstatic about the potential of earning from playing online games [68]. Then came projects like Stepn, move-to-earn games (aka move-to-earn crypto or move-to-earn NFTs) that are the up-and-coming way to reward players with cryptocurrency just for working out [69]. These games use technology to track players' movements, so you can literally earn just by going about your normal fitness routine.

Calileo will offer the exact same incentivisation model but will reward its users for doing things useful in the platform and for the whole Calileo community. Simple things such as supporting a creator, supporting other's users' mental health, produce great content, engage with others, and much more, will reward users in CALs.

Anything the user does in the platform that helps the social network to become a safe place poured with quality content will be incentivised in CALs. This is the Do-To-Earn (D2E). Having an impact online starts now.

2 Reward Content

Users expect their high-quality postings to be fairly valued, which is why a well-balanced compensation structure is critical. When Steem first started, the way its token distribution was managed resulted in significant voting power imbalance, with a handful of accounts controlling the majority of the platform's voting power. This was unavoidable, because the formation of a new, initially empty social platform with monetised actions offers a stronger incentive for abuse than for content development. Inflation was initially set at 100% per year, with 90% of new tokens going to original token owners and only 10% going to authors and curators as rewards [70].

The themes that received the greatest awards during the peak of Steemit activity were extremely diverse and quite reminiscent of more traditional blogs, although the payouts were frequently purely reliant on whether a whale had upvoted the user.

Only accounts with a high social relevance will be rewarded by the Calileo platform. A person can have millions of followers who do not interact with their content and receive nearly no CALs, or they can have a few thousand followers who actively upvote and like their posts and receive a significant reward.

This approach does not prevent Calileo from having inequity, as social network celebrities will receive far greater benefits than the general public, but it does ensure that all of those people are respected by the social network they utilise. For example, if you are a well-known Twitter user (e.g., Elon Musk), you will be rewarded handsomely because the vast majority of people are familiar with you and your tweets are well-received. If you're a new YouTube blogger with a rapidly rising audience, for example, you can expect a large prize, even if you're not a recognised celebrity. It is more important to pay attention to your content than it is to the amount of money or CAL tokens you have. This is known as equality of chances, and it is the most equitable method available. On Calileo, anybody gets the chance to write their own history.

3 Reward Engagement

Calileo will be focusing on rewarding its users on a platform where not only content creators are earning but also curators who are making sure the content is always of high quality (through upvotes for instance). The app is looking to replace news sources including Facebook and stop the spread of fake news. Calileo will have a whole system around it which includes accumulating a reputation score and limiting the influence of bad actors in their community. Such an evaluation system wouldn't be possible without blockchain which is removing the trust variable from the reputation ranking [71].

4 Reward Licensing

Artists and creators have more control over their work today. They can decide when it is available and where they could place it for sale. There is no middle man involved and they prefer it that way. But something is missing [72].

Creators have usually no idea how licensing works or what is expected, and ownership ends up going to intermediaries [73]. Interestingly enough, it is simpler than it appears to be, though not without some work. Calileo will make this process easier for creators.

Calileo will offer a decent typical market royalty to artists/creators for every content asset used by another user and even later. Businesses and brands posting content using the one from another user of the platform will split the revenue generated in CALs by the content originally created with the artist. It will give another source of revenue for creators that cannot get their content to a larger audience or have the same impact as larger brands and organisations. More of this will be explained in chapter VII.2 – Use case.

5 Open-source Code Contribution

This open-source system that the Internet has neglected for two decades now will shape the next generation [75]. It seems fair to allocate a part of the Calileo supply in his native token CAL to people that will audit and enhance the code of the platform.

This should give more transparency behind how Calileo works at its core and provide a form of incentivisation to contributors to improve the code regularly.

6 Support Creators

Money gives more power to individuals. We have all these monopolies, and these individuals need the same amount of opportunities. Calileo can achieve that in the long run. Give equal opportunities to creators as mentioned in chapter VI.2 – Reward content.

At its core, the Calileo app is designed to alter the way the world perceives social media, allowing creators to get rewarded with cryptocurrency directly from the content and engagement they create. Additionally, users will be able to support creators by writing their nametag once they register to the app, buy an NFT, or purchase a subscription. This is a method that has proved to work on video games.

7 Payments and Tipping

Accepting cryptocurrency payments needs to be backed by stable money that will show the 'tangibility' of the payment made and the reward received from it [76]. Therefore Calileo will integrate USDC (ESDT) into its platform as a form of payment, tipping, swapping with CAL and much more. Fiat currencies could be added to the user's wallet thanks to technologies and ecosystem partners, like xMoney (Utrust), that we will investigate in the future.

Calileo enables users to tip other creators on their social profiles or their content, where they will be able to receive spontaneous tips in EGLD and USDC to begin with, and CAL later on, but also a monthly subscription in exchange for exclusive content from the creator in the future. Does that sound familiar? Calileo doesn't aim to be the blockchain-based OnlyFans, with all due respect to some of our readers. We will instead generate an NFT that the user subscribing to their favourite creator will hold in their wallet. This ownership will unlock perks and exclusive content delivered by the creator. There will be more outlined on this matter in chapter VIII.3 – Tools for creators.

8 Liquidity

Liquidity will be fundamental for Calileo in the MultiversX DeFi space. It will ensure that CAL tokens can easily be converted to another without causing a drastic change in the asset's price. In traditional finance, cash is seen as the most liquid asset, because people can easily exchange it for gold, stocks, bonds, and other assets [77]. However, cash is not easily converted to crypto. In the broader crypto space, eGold (EGLD) is currently a great liquid asset, because it is accepted and tradeable on nearly every centralised exchange. In the MultiversX DeFi ecosystem, eGold is the most liquid asset because it is MultiversX's native asset and accepted and tradeable on most decentralized exchange (DEX) on the MultiversX ecosystem, and particularly xExchange.

Another way to incentive the liquidity providers is yield farming — a method that has recently gained remarkable traction globally. The idea of yield farming is to use it with LP tokens in order to maximise earnings [78]. To understand how this works, let's look at the steps to farming the CAL token on the xExchange using EGLD:

- Deposit EGLD to Calileo's crypto liquidity pool
- Receive LP tokens
- Deposit received LP tokens to the Calileo staking pool
- Receive the CAL token

In this scenario, the user's EGLD would earn interest and fees in Calileo's crypto liquidity pool. At the same time, the LP token from the liquidity pool earns the user CAL tokens as a reward for staking. By using LP tokens, the user's liquidity works double-time — earning fees and farming yields.

9 Overall Impact

The goal of CAL token, and our parent organisation Calileo, is to spread love and support worldwide. Our community-driven platform caters to various charity categories; whether it is by feeding the homeless, reducing its carbon footprint, or supporting those affected by mental health issues, we want to make good things happen. We also maximise the reach and distribution of our impact by allowing users to select three charities to support when creating their accounts, spreading out donations evenly and sustainably. This allows our community to do a lot of good, together (note that this feature won't be rolled out from the start).

Calileo has great ambitions to empower all actors within our platform. CAL will be central to anything happening within the app. And it will pair up with users and creators to provide solutions for stability, sustainability, and equality. On and off.

VII Smart Contracts

1 SC Analysis

It is not necessary to understand how money is made or circulated in order to use it. However, before using blockchain technology, consumers must have a thorough understanding of cryptocurrencies [79]. Users must understand their private wallet key, what a blockchain is, how long transactions take to confirm, and how much transaction fees cost. People cannot evade this obligation since cryptocurrencies are decentralised, and users effectively become their own bank.

When someone transfers a cryptocurrency across the blockchain, for example, they're sending it to a hashed version of the "Public Key." The "Private Key," which is hidden from users, is another key. Basically, you give your public key to individuals who want to send you money, but your private key is kept hidden. Before entering fully into the world of cryptocurrencies, the notion of key management can be

complicated and demands a steep learning curve [80]. Smart contracts necessitate extra effort since they put the responsibility of confirmation on the customer [81], who must first download a cryptocurrency wallet software before making purchases. Receiving and sending transactions both necessitate user involvement.

The one thing our readers need to know is that blockchain technology can minimise the amount of trust required from any single actor in the system [82]. Since, it's already difficult to build trust with middlemen like banks, realtors or even digital platforms such as Airbnb or Instagram, blockchain technology aim to eliminate the trust factor. Smart contracts that rely on MultiversX help Calileo users to exchange money, property, shares, licenses, data or anything of value in a transparent, conflict-free way while avoiding the services of a middleman. Calileo itself won't be an intermediary. We solely act as technology providers.

When applied in our Calileo platform, blockchain technology could, for the first time, change the way users/creators perceive the concept of trust with other businesses/brands. It could change the way creators give away their artwork rights, their data utilisation, etc. People need a forward-thinking design to get there. But challenges lie ahead. When trying to design optimal experiences with the power of smart contracts, user experience is the main pain for any lambda human to use blockchain technology and decentralised applications [83]. It is like learning how to walk, the task is tenuous without absolute necessity or understanding. Smart contracts can bring good things to the Calileo platform and its users. But, while being unregulated like regular contracts, it can become an unsafe tool to use for uneducated users about the technology and how things work.

Calileo reshapes that experience through compelling use cases to ensure all users, using the given technology, find this great tool easy to use and secure. Otherwise, some people are going to send their smart contract to the wrong recipient. Calileo makes a functional and easy-to-operate tool using the power of smart contracts between creators in the app.

Calileo will have to educate its users on the possibilities of micro-transactions, being your bank, and other things that aren't possible with cash or credit cards. Education must still be a huge part of smart contract utilisation, even though it is the easiest way to operate that people have ever seen.

2 Use Case

For the implementation of user-friendly features using smart contracts on the platform, here is an example with a use case:

An artist performed on stage at an event. Sometimes they have to do extra interviews, giveaway the rights to their arts, and much more to attend this event and show their performance. If the artist has a Calileo profile as well as this event organiser, they will be able to share the monetisation of the artist's performance posted as a video on the event organiser's profile. The artist can share the monetisation of the same video published by the event organiser, thanks to the power of a smart contract that links both wallets of the event organiser and the artist.

Smart contracts will also be available to common creators with their brands. Or just two friends who want to share the performance of the publication they both appear on or contributed to. Calileo reshapes the use of smart contracts by giving it this UX boost/use case it has always needed for massive adoption, and it is on Calileo's social platform.

3 Collectives

Collectives will be the future of Collaborations. Calileo will have a built-in feature that lets creators manage their activities/businesses through the platform. It will help them and brands or journalists to share revenue when they collaborate but more importantly get important analytics. Calileo's feature called "Collectives", will help creators share analytics, revenue, and back-office tools so they can split ad and post-performance revenue.

The Collectives won't stop there. This will be an important feature for creators that will be furtherly developed into collaborating on merchandising, and much more.

VIII NFTs

1 NFT Integration

Blockchain is not meant to be leveraged by a few powerful parties to increase stickiness and ad revenue on their platforms, it's a technology that, when used correctly, empowers individuals—from artists to art lovers, and everyone in between [84].

Calileo features traditional social media functions, including profiles, comments and sharing posts. Here's the twist: it will be powered by NFTs that allows users to own their content. Users will have the ability to turn books, articles and other publications into NFTs, with a mint fee that will cost near 0 thanks to MultiversX. Moreover, it will get 'free' when using the Calileo platform extensively. Calileo will reward its users in CAL tokens for doing anything that brings value to the platform and the users. These earned CALs will be able to be swapped in EGLD seamlessly to pay the required gas fee for each NFT minted. (Note that in the near future, CAL token will be able to be used for gas).

2 A Bridge for NFTs

Web3 is venturing into new territory. People today are compelled by a strong desire to use digital items. You won't be able to persuade the average customer to abandon TikTok in order to assist usher in a new era of decentralisation, boost the creator economy, or combat inflation. They are unconcerned. They can't afford a cryptopunk or a BAYC.

What matters to the ordinary internet user is how they look and promote themselves on social media [85]. That's where the bridge is. NFTs will be the key to this bridge's success.

Sceptics are quick to point out that NFTs are worthless because they can simply right-click and save the underlying files. This is a temporary problem. Calileo will implement NFT

verification, allowing users to connect their wallets and display their verified NFTs on their profiles. Once Calileo users can display and use their unique, verified NFTs in their posts, the game completely changes because the social value of purchasing and broadcasting NFTs increases exponentially.

The NFT craze of 2021 was mostly centred on visual art, but music is the next frontier, and one that we feel will be far larger in the long run [72]. The emotions that drive a collector's behaviour are the same whether they are collecting real art or NFTs: the need to show one's aesthetic interests to peers; the want to display one's identity, either individual or group; and, in certain situations, the desire to make a profit [86]. Despite the speculative frenzy that accompanied the early NFT craze, we believe that self-expression and identity are the more fundamental motivations of art accumulation. Music is one of the most common ways for people to express their likes and identities [87]. TikTok began as a music video app, and music tracks are still a big part of the videos people share on the network. However, today's music is widely available. The same tracks are available to everyone. Imagine your favourite musician releasing a one-of-a-kind 60-second music track with a limited amount of NFTs accessible. You buy one and turn it into a great TikTok (Calileo) video. It spreads like wildfire. Suddenly, millions of people want to use that tune to create their own Calileo. However, there are only 100 copies available. You receive daily bids from people who want to buy your song, and you may choose whether to flip it or keep it for yourself. Fun!

People would spend virtually all of their disposable monthly income on fashion at the commencement of the Web 2.0 era, back in 2000. Their desire for fine clothes, such as designer jeans, stilettos, sunglasses, and handbags, was insatiable. However, as the majority of their social interactions have shifted to the internet over the last decade, their clothes spending has decreased. Aside from training gear, everyone really wants these days are a few bright tops for Zooms. Purchasing expensive clothing has lost its appeal. In 2022, things changed a little bit, and people did something unexpected. They've been known to spend $2,000 on a pair of sneakers they'll never wear. They aren't allowed to wear them because they are only available as an NFT. Wearables are set to usher in a new era of huge digital goods expenditure, which social media users will employ to groom their digital selves. Although most existing wearables activity in the NFT sector is connected to games and avatars, AR filters will be the killer use case that will let big audiences shift into the metaverse. Imagine Cristiano Ronaldo releasing a series of custom AR filters – a new Manchester United jersey, a brand-new boxer collection, a new haircut, a new textile, a trophy, and new sponsors — each one unique. If you buy one, you can use it exclusively in your Calileo videos/stories for as long as you like, then sell it when you're done with it.

NFT avatars will gain dynamism, individuality, and mobility [88]. Calileo will encourage users to shoot selfies, after which an AI creates a one-of-a-kind, personalised 3D avatar that resembles their ideal self. Bitmoji-style, but better. They may change the character's expressions, positions, attire, and accessories, as well as make it dance and speak in their own voice, all by typing. Consider how much simpler it would be to write interesting social media postings that make users feel good about themselves. They might spend less time honing their acting and filmmaking skills and more time focusing on the message they want to deliver. Calileo dynamic avatars will be an opportunity to democratise self-expression on social media and will give voice to a much larger audience of creators.

Calileo aims to create with web3 a virtual reality where human interaction is, once again, fun.

3 Tools for Creators

Calileo will offer tools for creators that want to do good on their social platform. It will never be easier to reward fans and add extra value to their NFTs. Creators will be able to choose to attach exclusive benefits fans can claim, as they purchase one of their NFTs. This could be anything from:

- VIP access to an event
- Entry to a private community
- Monthly 1-on-1 or group calls
- Discounts on merchandise
- Early access to a book, album, or video game before public release
- Unlockable content such as music, an ebook, or a course that gets released upon purchase

The best part is, that creators just have to decide on what those benefits are. Calileo will do the rest for them.

There's never been a better time for creators and influencers to get in the NFT space [89]. With a platform like Calileo, creators will be able now to turn their content into NFTs with minimal effort and no cost. 100% of the profits stay with them, the creator. NFTs let creators build deeper relationships with their fans via exclusive rewards [90], while the platform does all the work for them in the background.

- Mint your NFTs for almost free on MultiversX
- Create your content and set your rewards
- Post, sit back, and relax

NFTs are the new way to create a legacy as an influencer [91]. And Calileo will be the simplest way for creators to build their own.

IX Social & Environnemental Impact
1 Social Impact

When Facebook first started, it was simple, but it was fun. When users logged on every few days, they would be reminded of their real friend's birthdays, see their latest cheesy profile pics and poke them. Then came the feed, mobile phones and algorithms, Instagram models, lattes and perfectly filtered lives, and somewhere along the way, the fun was subsumed by a kind of social slavery. Users keep scrolling through posts of people they barely know that make them feel bad, and they keep posting obnoxious things in return. Calileo doesn't want social media users to end in this spiral, which doesn't bring anything to social wellness and digital mental health.

When Mark Zuckerberg unveiled his vision for Meta, we could feel the collective eye roll. He's already ruined people's

lives with social media, and now he's going to kill their last remnants of physical connection and turn people into vegetables living in the Matrix. But the thing is, whatever the pros and cons, we are already on an inexorable march toward the metaverse. We are increasingly living virtual lives. What Calileo web3 will enable a richer experience in that virtual existence. One that will hopefully feel a little less hollow, a little more human.

Calileo disallows deteriorating contents on its platform. But as a platform where freedom of speech is determinant, Calileo will simply fight it with its community of users and creators. This is where Calileo and its native CAL token will play a great part in improving online abuse and mental health through a method of incentivisation as seen in chapter II.3 – Threat model. Social threat considerations will be taken as high importance with an improvement of quality content tackling cyberbullying, social media addiction, and mental health deterioration with negative body image, and more. Allowing the platform to be a safe place for every human.

Calileo will also improve how interactions are made on social networks. People can easily support each other and get to hang out either digitally or physically, safely. The platform will allow its messaging feature to provide an end-to-end encrypted counselling chat between creators/professionals and users in need. People feeling alone needing to travel for business or personal purposes can also directly connect with any Calileo user around them and decide to network/chat in the real world, allowing people to get off their screens for a bit and enhance real-world social interactions.

2 Carbon Footprint

MultiversX is leading a new wave of highly scalable and energy-efficient blockchain innovation. Since 2021, MultiversX has become carbon negative by offsetting more CO2 than the network accounts for [49]. What's big and instrumental, is that every transaction, NFT or DeFi product on the MultiversX will have a positive impact on the environment. MultiversX thus becomes a fertile ground for this generation of creators and innovators to seed the foundations of a digital network of trust for the generations to come. Calileo, as a future global social media platform, has no other choice to be built on MultiversX.

"Humanity's ability to progress beyond what we thought possible not so long ago can continue only if we are conscious about our impact on the environment and the next generations. Climate change is a serious challenge, but one we can decisively solve if we act immediately" said Beniamin Mincu, MultiversX CEO. [49]

Blockchain technology has been architected to address complex economic problems but its most popular implementations are extremely energy inefficient, handling only a minuscule fraction of the internet's transactional needs while using more electricity than a medium-sized country. By contrast, the MultiversX's current capacity of 15,000 transactions per second, scalable beyond 100,000 TPS, brings a 1000-fold improvement in throughput and execution speed,

while the energy required for processing a transaction is up to 6 million times lower.

Calileo is committed to ensuring that our technology is making a positive contribution to the planet, so we will be on MultiversX that have partnered with Offsetra to permanently stay ahead of their blockchain's carbon footprint.

"Future generations are waiting for our legacy. And this legacy must be sustainable by providing environmental-friendly solutions in everything we do, especially on our dear planet." said Dens Akoka, Calileo CEO.

The sustainability experts from Offsetra have conducted a rigorous analysis of the MultiversX blockchain's carbon footprint by measuring the energy consumption of more than 5,000 servers spread across 30 countries on 6 continents, the network linking them, and the additional impact generated by product development and operations. The observed 6M kg CO2 footprint was offset by retiring carbon units equivalent to 7.4M kg CO2, netting a 25% positive impact on the environment for the MultiversX blockchain [49]. The network has thus achieved carbon negative status, through the first in what will become a series of investments in verified green projects.

Taken in aggregate, the damage cost - incurred through repercussions on the environment - caused by the traditional social media industry and most blockchain implementations, could eventually send ripples of negative impact across time. By contrast, the positive impact of Calileo's carbon negative operations opens a radically different path thanks to MultiversX. One that could be a robust and sustainable foundation for growth, that will preserve the very planet it achieves progress for.

Calileo will bring more incentivisation with its CAL token to users that look after their environment. Users can earn CAL tokens by taking actions that contribute toward a sustainable future. Think alternative transport options, conscious food choices and smarter use of energy. Users that learn how our actions impact the planet are in return rewarded with CAL tokens. If they participate in workshops, visit online learning environments, and increase their knowledge and understanding of the challenges we face today, they get incentivised to earn CAL. As a reward, users can trade the CAL tokens they have earned for a range of inspiring products, services, or experiences promoted by the environmental activist charities and NGOs on Calileo. They will also be able to exchange their good actions for tickets to eco-friendly events; drive an electric car for the weekend; or receive discounts on subscriptions. They can even donate their CAL tokens to a charitable organisation on Calileo.

The CAL token will be a proven system to track, measure, and reward users' journey in sustainability and social impact. So, they can do good stuff, and get paid.

X Calileo Moon

People that use social media don't have a platform that builds power features that meet their needs. Well, that's about to change. Our team has made tremendous research this past year to get to the heart of social network users' expectations. Calileo

is developing and iterating upon other solutions and ideas that will give the people who use Calileo the most they are looking for: access to exclusive features and perks that will take their experience on Calileo to the next level on the web3.

And for those wondering, yes, a free Calileo is a top priority for our team. This subscription offering is simply meant to add enhanced and complementary features to the builders, creators, and professionals who want it.

1 Meet Calileo Moon

We know, that 'Moon' is the marketing buzzword used by multiple cryptocurrency ventures over 2021. But it has a meaning behind the Calileo project. Carrying the misspelt name of Galileo Galilei, the first man on Earth who saw the Moon from a different angle. His findings would totally overturn an ancient model of the universe, like Calileo.

In the future development of Calileo, we will be rolling out our first iteration of Calileo Moon in the key areas where Calileo will be present. Our hope with this model is to gain a deeper understanding of what will make our creators' and builders' experiences more customised, more expressive, and generally speaking more to them.

2 Special Features

Those who sign up for a Calileo Moon subscription will get a set of features and perks that include the following:

- Bookmark Folders – Users want an easy way to organise their saved content. We've already seen before on Google Chrome this feature, where you can bookmark your favourite URLs into well organised (can be messy sometimes) folders. Bookmark Folders let you organise the publications you've saved by letting you manage content so when you need it, you can find it easily and efficiently.
- Chat Labels – Users utilising the chat feature will be able to tidy their messages into categories to bring some order to their most important chats. They will be able to give these labels a colour to distinguish them better.
- Reader Mode – Reader Mode provides a more beautiful reading experience by getting rid of the noise. We are making it easier for you to keep up with long threads on Calileo by turning them into easy-to-read text so you can read all the latest content seamlessly.
- Custom navigation – If Calileo's navigation bar doesn't work properly for users, they can customise it and add bookmarks, lists, profiles, other dApps such as Audius (this is an example, no partnership has been made between us), and monetisation icons.

Subscribers will also get access to perks, such as customisable app icons for their device's home screen, fun colour themes for their Calileo app, pin conversations in their DMs, upload videos up to 2 hours long, *and* will have access to dedicated subscription customer support.

The premium features can also be acquired in another way rather than monthly paying fiat money from a traditional purse.

Future improvements and development will support us to accept eGold and other main cryptocurrencies from both the MultiversX ecosystem and the global crypto space to purchase Calileo Moon. In the meantime, we will implement a form of staking allowing to preserve the stability of the CAL token and CAL holders to get a Calileo Moon 'for free' and for as long as they keep their needed CALs staked.

3 Governance

In key decisions taken for the future of Calileo and our users, Calileo Moon subscribers will obtain more voting power than regular users. It is not a form of incitation to purchase the subscription. It will help our team to get the fairest feedback and decision taken from our community that uses the whole features-powered platform. However, to allow a fair vote weight distribution between Calileo Moon subscribers and regular users, the multiplicator for Moon users compared to their standard counterparts will only be 2. Therefore, one Calileo Moon subscribers will have more voting power than one regular Calileo user. This difference will apply to all decisions made on the platform with the jury-decision process as well.

4 Ads-free

Moon users will be able to read stories from their favourite journalist, an important newspaper, a local publisher, and more -- without advertisements. Watching videos without being bothered by YouTube telling them how awesome they are will also come to the platform for them. Any ads that break some sort of momentum taken on the platform when the user is focusing on content will be hidden. Note that 'ad-free' applies just to these situations and not elsewhere on Calileo.

Additionally, a piece of the users' subscription fee will go directly to these creators in CALs.

5 Additional Tools for Creators

Creators will find much more value in the Calileo Moon subscription. They will be able to add another form of 'Follow' on their profile to gain fans. Another button will be available to their network allowing them to be 'Subscribed' by their most tenacious fans. The Subscribe feature will remind you of what Patreon already provides to creators. Patreon gives the possibility to its creators to use its platform to integrate a direct monthly subscription button to be supported by people that follow their content [92]. Creators will be able to be supported by their fans monthly in selected fiat currencies (£, €, and $) to start. Then, integration in cryptocurrencies such as CAL, eGold and USDC.

Furthermore, creators will be given the possibility to add more options to receive tips on their profiles. Calileo Moon will enable them to add other cryptocurrency addresses that are not MultiversX powered. Allowing creators that would like to receive tips in Ethereum, or even in Bitcoin for example to enable it for their follower-base.

Creators and social media platforms haven't always had a symbiotic relationship [93]. On the one hand, social media gave

creators an opportunity to grow their following and more widely distribute their work. On the other, creators have long argued they weren't receiving their fair share of the profits they brought in on those platforms.

XI Understanding the Real Problems

1 Centralised vs Decentralised

Blockchain was initially instantiated as an alternative to the centralised financial system of systems [94]. Even if the freedom and anonymity of distributed architectures remain an undisputed advantage, the performance has to be analysed on a global scale in a real-world environment.

Centralised organisations are operated by one central authority that manages a network of transactions. The company in charge is responsible for holding a ledger, executing transactions, securing user data, and the other responsibilities that come with managing a social network [95]. Good examples are centralised social media such as Facebook and TikTok that people use daily. Have Instagram in your smartphone? The issuing company, Meta, is the centralised authority.

Decentralised organisations are the animals of the blockchain and were first used with Bitcoin for peer-to-peer transactions. They don't rely on any bank, company, or other centralised authority, but instead use an interwoven system of users and their devices. By widely distributing the network, it gives each user an equal share in the ownership and eliminates dependence on any third party [96].

2 Social Media Giants

Half of the world's population has a social media profile. But what they are using is built by monopolies, privately managed by a small group of shareholders, transferring their economic power into political power through lobbying [97]. By owning the platforms on which material is published, they have an important influence over public opinion and activism itself. We believe a small clique of private companies shouldn't have so much power over the structure and content of public debate. The power of deciding the way in which you receive information needs to be taken back.

Social platforms are increasingly running on a set of private servers that remove anything they don't want people to see, silencing the user [98]. For example, American conservatives get routinely discriminated against for their content. The owners of those private servers can make decisions - based on shareholder interest or the political views of the founders - that materially change the nature and balance of public debate [99]. And no one will ever know. You may cheer when your enemies are banned on Facebook or Twitter, but never forget that you could be next.

3 Dependency on Centralised Platforms

Local newspapers rely heavily on these platforms, even though they change their algorithms continuously and are a nightmare for publishers [100]. A news company can be perfectly performing one day but be shut down the next, just by one change in Facebook's algorithm. And this is just another example of what can happen to many other professions.

Social companies like Facebook have been caught providing inaccurate information about user data [101]. And yet, they claim that their philosophy is to care about the people first. Users blindly give their rights to the people running these platforms, that sell their data for advertising purposes, with them not receiving a penny. This is unfair. Especially for communities such as creators, businesses, and other professions that rely on these platforms as their income.

Conglomerates monopolise the social media market along with users' data. Other 'decentralised' social platforms like Steemit are attempting to answer this problem. However, the users don't have a high-quality social platform they can trust and use for the same purpose as they use Instagram or Twitter, just for pure fun. Crypto users have always sought new ways to invest their time while networking on social media. Currently, there is no social platform that brings this together; the fun of using social media, along with owning the valuable data generated, and customising your feed's algorithm, plus earning fair revenues from it.

4 Blockchain for Good

We're fortunate to be writing in the luxury of a stable democracy, but in vast swathes of the world, restrictive governments deny their citizens anything like freedom of conscience or expression. Encryption helps protect individuals, including journalists, who are of course vital in a democracy [102].

Equally there are myriad positive uses for Calileos (CALs). Being able to own its data and privacy online will be liberating for people in countries with over-leveraged surveillance on social media platforms run by politicians.

Let's imagine a blockchain-based social media platform (there are already versions of this, like Minds), in which posts are simultaneously hosted on multiple decentralised blockchain databases. Facebook runs on servers that sit in massive data centres controlled by the company – meaning that it can delete or edit what its users see. A blockchain social media platform would be untouchable. No government would be able to edit or remove any sort of speech unless the whole network was somehow vaporised. The users will moderate their own content with the Calileo team.

5 Say Hello to the Future of Social Network

Messina separates Sicily from the Italian mainland. According to the legend, on one side was Scylla, a terrifying sea monster that devoured any ships that strayed too close. Attempting to steer clear of this would, however, take the ship close to an equally dangerous hazard on the other side of the strait – a deadly whirlpool called Charybdis. Digital technology is behind the slow unravelling of power and control in democracies. The obvious monster is Scylla turbocharged inequality and social breakdown. But in trying to avoid it, democracies could end up in the thrall of Charybdis, a digitally

powered techno-authoritarian, and wind up with China and Russia undermining democracy in the name of order and harmony. Democracy somehow needs to hold a course, as it always has done, between the two gravitational pulls of control and freedom. That means to embrace the technology that can make us better off, healthier and more fulfilled, but also ensure that it is subject to democratic control and works in the public interest.

6 Save Democracy

We all know there is a significant volume of hateful content online. And while many lawmakers are demanding that companies do more to tackle this problem, there is a danger that they might over-regulate the net, damaging free speech or privacy. We must beware of turning social media into a sanitised public square, entirely policed by Silicon Valley companies and algorithms trained to spot offensive content. However, when a democratically elected government demands content be taken offline, or shared with the authorities, this must be done swiftly – and large fines handed down if action is not taken.

It is very easy to blame others, but all of us have a responsibility to uphold decorum online. A helpful starting point is to make a concerted effort to listen to what your opponents are saying, rather than dismissing them or suspecting them of having the wrong ideas.

As they say, 'If you're not paying, you're the product'. An internet economy run on the ad-based model is turning us into data points, and this has to stop. But it only works because of our complicity. Support this change with your political voice - look for greater transparency and use services that don't collect and sell personal data (consider more paid-for premium systems).

As it stands, social media platforms are defined as "mere conduits" of information, meaning they don't have full legal liability for what they host [103]. Some governments are considering changing that status, making them more like traditional publishers who are legally responsible for what they print. This would potentially require that every piece of content uploaded be vetted beforehand - which is unrealistic and unreasonable. A better approach is to distinguish between user content and paid advertising content. When social media platforms are paid to host content, this should be considered a form of publishing, with legal liability resting with the platform.

We users have built the modern mega-monopolies, and our ongoing addiction to free digital services is making them stronger. Some of the responsibility lies with people who use these apps or services. We need to be aware that cheap or free services have invisible costs: whether that's your own rights or those of the workers who are employed by the companies that run them. We need to break the monopolies through our online choices - we can stop feeding the data monsters. We call this 'data activism'.

Calileo will have ethical data usage, share profits fairly with users will be peer-to-peer and open-source. The more people will use the social platform, the better it will be. Calileo remembers that good journalism needs to be paid for, and so does good content. Users will be able to make a point of subscribing or donating to it. That includes local businesses, which are both a source of local accountability and a training ground for the next generation.

Giving citizens the right to ask companies to give them any data held about them should be mandatory. This is an important power, but few people will do it because in isolation it won't achieve much. Therefore Calileo will make it easier for citizens to reclaim their data through the platform – and help them choose who can access it, and on what terms. This citizen-led data industry could help new start-ups who often need data to design services.

In a similar vein, there are many exciting new ways to involve people more in political decision-making itself, including secure online voting, and these needed to be explored and piloted. Votes every week on every subject in Calileo will happen – a so-called direct digital democracy – is a dreadful idea and will almost certainly exacerbate some of the problems we've examined in this paper. But there are plenty of other ways for the democratic process to become more in tune with the expectations of Calileo. One example is the vote itself: why not, at each large-scale decision, invite users to rank or grade each decision? This would be a new way of providing better signals about what users care about.

XII Token Economics

1 Distribution

There are planned to be a total of 10,000,000,000 CAL tokens to be distributed over a period of at least 4 years. The token release schedule will be:

Table 1. CAL tokens distribution

Category	Allocation	Cliff & Vesting	Lockup
Core Team Advisors	1,000,000,000 **12%**	9 months cliff 42 months vesting	12 months
Sales Seed Private Public	1,000,000,000 **10%**	Varies	Varies
Treasury Marketing Ecosystem Resources	1,500,000,000 **15%**	100% at TGE	N/A
Community Liquidity Airdrops Workdrops Referral	2,300,000,000 **23%**	Varies	6 months

18

Social Rewards **40%**	4,000,000,000	2.5% at month 2 49 months vesting	3 months

Creators
Curators
Moderation
Jury
DAO Vote

Total	10,000,000,000 **100%**		

(1) Core supply:
- Team – 1bn (10%) – Remaining balance released gradually over 42 months post-cliff.
- Advisors – 200m (2%) – Remaining balance released gradually over 42 months post-cliff.

(2) Sales supply:
- Seed – 100m (1%) – 75% of tokens distributed at TGE and 25% after a 6-month cliff period.
- Private – 300m (9%) – Cliff for 3 months, then linear vesting over the next 6 months.
- Public – 600m (6%) – 50 at TGE, 50% at month 7, with 50% in a 6-month lockup. Launchpad TBA.

(3) Treasury supply:
- Marketing – 500m (5%) – Instant availability to support initial platform growth and development.
- Ecosystem and development – 500m (5%) – Instant availability to support initial platform growth and development.
- Resources – 500m (5%) – Instant availability to support initial platform growth and development.

(4) Community supply:
- Liquidity Pools – 1.5bn (15%) – Remaining 70% released via exponential decay over 36 months.
- Airdrops – 400m (4%) – Remaining balance released gradually over 48 months.
- Workdrops – 200m (2%) – Directly supports community engagement and work-based contributions.
- Referral – 200m (2%) – Exponential decay over 45 months.

Figure 1. CAL tokens distribution

- Core
- Sales
- Treasury
- Community
- Social Rewards
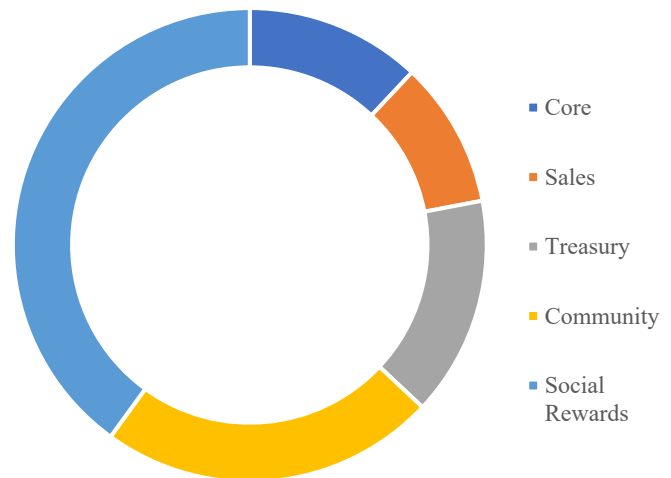
2 Release Schedule

CAL tokens will be released over a period of 51 months (4+ years) with, for instance, the team getting its first tokens once the final platform is launched. TGE, or Token Generation Event, is programmed for late April 2024. Bear in mind that it can change over time depending on how the development of Calileo evolves. Calileo tokenomics uses release techniques such as exponential decay and the s-curve model. Allowing the token to reward first believers better and adapt itself to the market volatility.

The latest and always updated CAL tokenomics release schedule can be found in this public google sheet.

XIII Roadmap

Calileo will hasten the mass adoption of blockchain technology and the MultiversX ecosystem. With decentralised social media, everyone can start to earn and know about tokens and cryptocurrency by themselves, while enhancing their experience as a creator or a simple user. They will realise the benefits of globally and efficient transactions and many more utilities of decentralised applications that they have never seen anywhere else before. This is the second mission of Calileo.

- **2022, Q2** – Design of Calileo's resources (Whitepaper, Litepaper). Development of our community. Team expansion. First funds unlocked.
- **2022, Q3** – More funds unlocked. Development of the team. Legal procedures. Prototype finished. Platform development. Marketing campaign. Community development. Team expansion. NFT Collection of 3,000 Cartoon-designed characters called Ethos NFTs which will allow when minted to participate in key decisions for the development of Calileo and to get unique lucrative perks.

- **2022, Q4** – Acceleration of the development. Finalisation of all legal procedures. Partnerships around the platform. MVP Development.
- **2023, Q3** – MVP release. Creators can receive tips in ESDT tokens and other first crucial features.
- **2023, Q4** – Development of the Beta platform. Implementation of other features. MultiversX Hackathon (Calileo finished at the 2nd place).
- **2024, Q1** – Further features development. Start to look for Venture Capitalists. Hiring new team members, developers, and world-class advisors.
- **2024, Q2** – Beta platform release. Implementation of other features. Seed & Private CAL sales. Ethos Staking. CAL implementation on Calileo.
- **2024, Q3** – New features. CAL public sale.
- **2024, Q4** – New features, cross-chain expansion.
- **2025+** – Metaverse application. Investment in R&D. Other opportunities explored.

Disclaimer: Calileo's roadmap that links to this statement is intended to outline our general direction. This message is intended for information purposes only. This message should not be relied upon in making purchasing decisions. The development, release, and timing of any features or functionality described for Calileo remain at the sole discretion of Calileo. You may find an accurate features roadmap in our public Notion.

Thanks again for being here and following Calileo's development.

XIV People

The early success of Calileo will be credited to Dens Akoka and his future team who are passionate about improving the way we socialise online. Within the Calileo team will be experienced professionals in blockchain development, social media, and FinTech. The team is predominantly distributed throughout France, the United Kingdom, Lithuania, Portugal, Romania, Ireland, Canada, and more.

Below are the people that will make Calileo the world's leading web3 social network platform. The first of its kind that will seduce the global market and help the MultiversX ecosystem to bring a billion users.

1 Executive Team

Dénis (Dens) Akoka | Calileo Founder – The main strategic driver of the company. He will be responsible for the success of the business. He is the think tank of the company but will also be assisted by his executive committee team.

Dénis Akoka, 26, has eight years of experience in social media optimisation and advertising through his studies toping with his expertise in software engineering he's had for seven years. His other interests include anything that is innovative-oriented and any frictionless technology such as cryptocurrencies as a tool to improve community-centred organisations.

Dens has always been on a journey to bring something to humanity using current technologies and trends. He believes we all have to change the world for good, and together. Profits and business sustainability shouldn't come before bringing value to communities and online users. People come first, always.

2 Core Team

Calileo is always looking for the brightest leaders in the blockchain industry. This chapter will showcase the next leaders that will shape the social media industry with the last web3 tools:

- **Viktor | CTO & Core Developer** – CBDO at Idenfy, Co-Founder at Combased & JewelSwap, created the first referral based smart contract on MultiversX, LKMEX distribution. 4+ years of traditional software development. Almost 4 years building on MultiversX. Right now, does not code actively and only supervises;
- **JB | Head of Community** – JB, from Ireland, been hanging around this space a while, Personal Trainer & Nutritionist who plays as a goalkeeper in his spare time, excited by the Calileo mission and the challenge of bringing it to fruition;
- **Wesley | Head of Brand** – Graphic Designer at Calileo & Founder of Studio.wkc and Brand Designer based in Wales, UK. 5+ years experience in delivering projects across Brand, Print & Digital. Active creator and Web3 enthusiast with a huge passion for timeless design. Focused on enabling freelancers across the world and building the creative community in Web3.
- **Alex | Ambassador for France** – Community Manager & French Ambassador at Calileo & BH Network. MultiversX community builder and educator. Content creator on Twitch & YouTube;

3 Advisors

Calileo is always looking for the brightest advisors in the blockchain industry. This chapter will showcase the next advisors that will help Calileo in reshaping the social media industry with the last web3 tools:

- **Florian | Strategic Advisor** – Working on Calileo's growth strategy. Contributing to guidance and operational plans toward blockchain technology, tokenomics, branding and revenue model;
- **Razvan | Web3 Advisor** – Razvan just loves to build & help others build stuff on MultiversX. Co-Founded Giants Village, web3print, and more. He's also founded the xDev Hub as a collection of useful resources for developers.

4 Strategic Partnerships

Calileo has secured multiple strategic partnerships with leaders in the MultiversX ecosystem with key strengths:

- **Combased** – Community-focused blockchain services provider, Combased is our Technical and Development partner;

- **Jujotte** – UX Design Agency, we work side by side together to bring the most user-friendly social media platform to MultiversX;
- **Itheum** – Calileo utilises Itheum's data NFT technology, enabling users to tokenise their personal data as NFTs. This collaboration ensures secure and transparent data ownership and exchange. Calileo and Itheum plan to further enhance their partnership, focusing on innovative data monetisation and privacy solutions.

5 Future Partnerships

Calileo is always looking for the brightest partnerships in the blockchain industry. This chapter will showcase the next partnerships that will help Calileo in reshaping the social media industry with the last web3 tools. Partners that Calileo will have in the pipeline are:
- **MultiversX** – The Internet Scale Blockchain is a logic partnership for Calileo that we will be looking for as soon as we have progressed in the development of the project;
- **xPortal** – It will allow Calileo to get his CAL token listed on xPortal mobile application and xExchange for liquidity pool, farming, metabonding, and who knows what else the MultiversX team will come up with. A strategic partnership will be looked to enable the login other possibilities;
- **xMoney (Utrust)** – The crypto payment enabler xMoney (Utrust) has recently joined the MultiversX ecosystem and will potentially help us to allow Calileo users and especially creators to accept cryptocurrencies payments using the different features we have outlined in chapter X – Calileo Moon. This partnership will be investigated in the future;

Thanks to the above partners, Calileo will be able to unlock the full potential of having a real decentralised social media, and scalable. The best is, that these organisations are all existing in MultiversX.

XV Conclusion

1 Decentralisation

Users spend time building unique selfhood across these Web2 media platforms, even though they know they are antiquated, centralised systems. Web3 brings forth a renewed hope for what social media can be. It offers the ability for users to control how their content is used. There's no doubt there's interest from both investment funds and advertising giants for decentralised social media apps. However, not all projects will attract the same interest, and, like with their traditional counterparts, there will be a small number of leaders who are going to get the most audiences. It's in our nature to choose the winners among all, but this time being part of a winning platform automatically gives you part of the winning power through decentralisation.

While Calileo could be the winning potential, copying the current leaders doesn't make us winners yet. Decentralisation is much more than putting everything on the blockchain which is not even technically viable at this point. Decentralisation is about profit-sharing and revenue tokenisation.

Traditional social media is far from dead. There are websites which have been here with us for almost two decades, counting billions of users. Anyway, some could argue that they reached their peak and, how they've seen exponential growth in the previous years, they might experience an exponential decline in the number of new users and platform activity in the incoming years.

Following the idea that users are leaving the centralised platforms, their attention should move to another place. That another place could be decentralised social apps because the switch is seamless, but the benefits are way more attractive.

Blockchain is offering users the opportunity to earn passive income for their participation. Regardless if decentralisation will win over centralisation in the social media space, the rewards that people can earn by using today's decentralised apps are tangible and can stack up easily. It started with mining, it continued with yield farming and social apps look like the natural step in the evolution of cryptocurrency earning.

2 Research Conclusion

Social media has proven to be an incredible opportunity for businesses and creators to advertise their work, collaborate, and change the world together. They benefit from unlimited technology provided by social platforms. The problem is, that these platforms have been given value thanks to the people creating outstanding content, defying all creativity. The content creators, the users, don't receive anything back from the technology provider, Instagram, or TikTok.

Calileo is here to change the social media industry, with the creator in mind. With the help of Web3 technologies and the MultiversX ecosystem, the new social network will reshape what has been lost during what was supposed to be the journey to empower the people online and facilitate fun digital interactions.

3 Ongoing and Future Research

Our team is constantly re-evaluating and improving Calileo's design, in an effort to make this one of the most compelling decentralised social media platform; solving scalability via the MultiversX blockchain, while maintaining freedom and high user experience, and tackling bots off platforms. Some of our next directions of improvement include:

1) Web3 popularisation: we aim to increase the efficiency of the blockchain technology adoption process by allocating more time for improving our web3 features and making them more user friendly;
2) Sovereign shard: creating our own network deciding of specific rules for a decentralised social platform to thrive, as well as future projects with the same objectives. Account abstraction, near 0 fees, and so forth.
3) AI supervision: an AI supervisor that detects malicious behavioural patterns has been implemented to Calileo; it is still uncertain how this feature can be integrated into

the platform without disrupting the decentralisation. The early day of Calileo will be a learning curve to analyse this and improve step by step;

4) Private Proof of Humanity: make it possible to create private Sybil-resistant identities. Investigate the feasibility through the use of Traceable Ring Signature or other using zero-knowledge proof mechanisms to preserve users privacy through the signing up process;

5) Cross-chain interoperability: implements MultiversX standards to allow other blockchain-based DApps to be integrated on Calileo and contribute to decentralised applications adoption;

6) Premium features: implement the Calileo Moon subscription model and analyse the performance of crypto-made payments versus fiat-made payments, and emphasise on the most important one used by the community while preserving the sustainability of Calileo.

7) Sustainability and scalability: continuously analyse the new social media trends to be implemented and provide the best tools for creators, businesses, and users.

4 Overall Conclusions

The true mass-market potential of blockchain will be unlocked with the merger of Web2 and Web3. We believe the most exciting opportunity lies at the intersection of these two worlds. It's tempting to look at the energy, talent and resources being poured into Web3 and harken back to the early days of the internet. For those of us who have been around Silicon Valley long enough to remember, the similarities are undeniable. Except this time, the rate of growth seems exponentially higher. Web3 pundits point to these facts to support the argument that Web3 is the future of the internet, and that Web2 will soon be dead.

Acknowledgements

References

[1] Urena, R., Kou, G., Dong, Y., Chiclana, F. and Herrera-Viedma, E., 2019. A review on trust propagation and opinion dynamics in social networks and group decision making frameworks. *Information Sciences*, *478*, pp.461-475.

[2] Third, A. and Domingue, J., 2021. Decentralised Verification Technologies and the Web. In *Media, Technology and Education in a Post-Truth Society*. Emerald Publishing Limited.

[3] Swart, J., Peters, C. and Broersma, M., 2018. Shedding light on the dark social: The connective role of news and journalism in social media communities. *new media & society*, *20*(11), pp.4329-4345.

[4] Hoofnagle, C.J., van der Sloot, B. and Borgesius, F.Z., 2019. The European Union general data protection regulation: what it is and what it means. *Information & Communications Technology Law*, *28*(1), pp.65-98.

[5] Aswad, E.M., 2018. The future of freedom of expression online. *Duke L. & Tech. Rev.*, *17*, p.26.

[6] Abraham, R., Schneider, J. and Vom Brocke, J., 2019. Data governance: A conceptual framework, structured review, and research agenda. *International Journal of Information Management*, *49*, pp.424-438.

[7] Dutta, S. and Saini, K., 2020. Blockchain and social media. *Blockchain technology and applications*, pp.101-114.

[8] Kaspar, K. and Müller-Jensen, M., 2021. Information seeking behavior on Facebook: The role of censorship endorsement and personality. *Current Psychology*, *40*(8), pp.3848-3859.

[9] O'Reilly, M., Dogra, N., Whiteman, N., Hughes, J., Eruyar, S. and Reilly, P., 2018. Is social media bad for mental health and wellbeing? Exploring the perspectives of adolescents. *Clinical child psychology and psychiatry*, *23*(4), pp.601-613.

[10] Woodward, K., Kanjo, E., Brown, D., McGinnity, T.M., Inkster, B., MacIntyre, D. and Tsanas, T., 2020. Beyond mobile apps: a survey of technologies for mental well-being. *IEEE Transactions on Affective Computing*.

[11] Ņikiforova, O., Zabiniako, V., Kornienko, J., Gasparoviča-Asīte, M. and Siliņa, A., 2021. Mapping of source and target data for application to machine learning driven discovery of IS usability problems. *Applied Computer Systems*, *26*(1), pp.22-30.

[12] Thompson, S.A. and Warzel, C., 2019. Twelve million phones, one dataset, zero privacy. In *Ethics of Data and Analytics* (pp. 161-169). Auerbach Publications.

[13] Wu, C.J., Brooks, D., Chen, K., Chen, D., Choudhury, S., Dukhan, M., Hazelwood, K., Isaac, E., Jia, Y., Jia, B. and Leyvand, T., 2019, February. Machine learning at facebook: Understanding inference at the edge. In *2019 IEEE International Symposium on High Performance Computer Architecture (HPCA)* (pp. 331-344). IEEE.

[14] Chandrasekaran, G., Nguyen, T.N. and Hemanth D, J., 2021. Multimodal sentimental analysis for social media applications: A comprehensive review. *Wiley Interdisciplinary Reviews: Data Mining and Knowledge Discovery*, *11*(5), p.e1415.

[15] Li, C. and Palanisamy, B., 2019, June. Incentivized blockchain-based social media platforms: A case study of steemit. In *Proceedings of the 10th ACM conference on web science* (pp. 145-154).

[16] Pfeiffer123, A., Kriglstein45, S., Wernbacher, T. and Bezzina, S., 2020, July. Blockchain technologies and social media: A snapshot. In *ECSM 2020 8th European Conference on Social Media* (p. 196). Academic Conferences and publishing limited.

[17] Averin, A. and Averina, O., 2019, October. Review of blockchain technology vulnerabilities and blockchain-system attacks. In *2019 International Multi-Conference on Industrial Engineering and Modern Technologies (FarEastCon)* (pp. 1-6). IEEE.

[18] Lamonica, T., 2020. *Peer-to-Peer Decentralized Social Media Platform Using Second-Layer Blockchain Technology* (Doctoral dissertation, Université d'Ottawa/University of Ottawa).

[19] Guidi, B., 2020. When blockchain meets online social networks. Pervasive and Mobile Computing, 62, p.101131.

[20] Minds, 2022. Tokens. [online] Minds. Available at: https://www.minds.com/token.

[21] Matsakis, L., 2018. Minds is the anti-Facebook that Pays Users for Their Time. *Wired*.

[22] Biggs, J., 2018. Minds, the blockchain-based social network, grabs a $6M Series A. *TechCrunch*.

[23] Cox, J., 2015. The Social Network Supposedly Endorsed by Anonymous Isn't So Secure After All. *Vice*.

[24] Biggs, J., 2018. Minds aims to decentralize the social network. *TechCrunch*.

[25] López, C., 2018. Tucker Carlson promotes another social media platform full of bigotry. *Media Matters for America*.

[26] Makuch, B., and Pearson, J., 2019. Minds, the 'Anti-Facebook,' Has No Idea What to Do About All the Neo-Nazis. *Vice*.

[27] Duwe, M., 2020. Daryl Davis: the black musician who converts Ku Klux Klan members. *The Guardian*.

[28] Popper, N., 2021. They Found a Way to Limit Big Tech's Power: Using the Design of Bitcoin. *The New York Times*. ISSN 0362-4331.

[29] Awan, M.J., Yasin, A., Nobanee, H., Ali, A.A., Shahzad, Z., Nabeel, M., Zain, A.M. and Shahzad, H.M.F., 2021. Fake news data exploration and analytics. *Electronics*, 10(19), p.2326.

[30] Xiong, W. and Xiong, L., 2019. Smart contract based data trading mode using blockchain and machine learning. *IEEE Access*, 7, pp.102331-102344.

[31] Choi, T.M., Guo, S. and Luo, S., 2020. When blockchain meets social-media: Will the result benefit social media analytics for supply chain operations management?. *Transportation Research Part E: Logistics and Transportation Review*, 135, p.101860.

[32] Bucher, T., 2017. The algorithmic imaginary: exploring the ordinary affects of Facebook algorithms. *Information, communication & society*, 20(1), pp.30-44.

[33] Poongodi, T., Sujatha, R., Sumathi, D., Suresh, P. and Balamurugan, B., 2020. Blockchain in social networking. *Cryptocurrencies and Blockchain Technology Applications*, pp.55-76.

[34] Anwar, S., Shukla, V.K., Rao, S.S., Sharma, B.K. and Sharma, P., 2019, November. Framework for financial auditing process through blockchain technology, using identity based cryptography. In *2019 Sixth HCT Information Technology Trends (ITT)* (pp. 099-103). IEEE.

[35] Yu, Y. and Tan, C.H., 2022. Bitcoin Blockchain Explained: Development and Challenges. In *Financial Management in the Digital Economy* (pp. 1-21).

[36] Jabbar, S., Lloyd, H., Hammoudeh, M., Adebisi, B. and Raza, U., 2021. Blockchain-enabled supply chain: analysis, challenges, and future directions. *Multimedia Systems*, 27(4), pp.787-806.

[37] Freni, P., Ferro, E. and Ceci, G., 2020, September. Fixing social media with the blockchain. In *Proceedings of the 6th EAI international conference on smart objects and technologies for social good* (pp. 175-180).

[38] Tan, J. (2021). *Social Media on the Blockchain (SocialFi) Could Be Key to Mass Adoption*. [online] Nasdaq.com. Available at: https://www.nasdaq.com/articles/social-media-on-the-blockchain-socialfi-could-be-key-to-mass-adoption.

[39] Al-Saqaf, W. and Seidler, N., 2017. Blockchain technology for social impact: opportunities and challenges ahead. *Journal of Cyber Policy*, 2(3), pp.338-354.

[40] Cai, W., Wang, Z., Ernst, J.B., Hong, Z., Feng, C. and Leung, V.C., 2018. Decentralized applications: The blockchain-empowered software system. *IEEE Access*, 6, pp.53019-53033.

[41] Papadopoulos, P., Pitropakis, N. and Buchanan, W.J., 2022. Decentralized Privacy: A Distributed Ledger Approach. In *Handbook of Smart Materials, Technologies, and Devices: Applications of Industry 4.0* (pp. 1-26). Cham: Springer International Publishing.

[42] De Filippi, P., 2016. The interplay between decentralization and privacy: the case of blockchain technologies. *Journal of Peer Production, Issue*, (7).

[43] Muneeza, A., Arshad, N.A. and Arifin, A.T., 2018. The application of blockchain technology in crowdfunding: towards financial inclusion via technology. *International journal of management and applied research*, 5(2), pp.82-98.

[44] Abadi, J. and Brunnermeier, M., 2018. *Blockchain economics* (No. w25407). National Bureau of Economic Research.

[45] Elrond, 2019. *Elrond A Highly Scalable Public Blockchain via Adaptive State Sharding and Secure Proof of Stake*. [online] *https://elrond.com/*. Available at: https://elrond.com/assets/files/elrond-whitepaper.pdf.

[46] Cooper, P., 2019. *28 Twitter Statistics All Marketers Should Know in 2019*. [online] Hootsuite Social Media Management. Available at: https://blog.hootsuite.com/twitter-statistics/.

[47] McLachlan, S., 2022. *24+ Instagram Statistics That Matter to Marketers in 2019*. [online] Hootsuite Social Media Management. Available at: https://blog.hootsuite.com/instagram-statistics/.

[48] Tyagi, S. and Kathuria, M., 2021, August. Study on Blockchain Scalability Solutions. In *2021 Thirteenth International Conference on Contemporary Computing (IC3-2021)*, pp.394-401.

[49] Mincu, B., 2021. *Elrond Becomes The First Carbon Negative European Blockchain, Opening A New Wave Of Sustainable Innovation In Line With The European Climate Policy*. [online] elrond.com. Available at: https://elrond.com/blog/elrond-carbon-negative-offsetra/.

[50] Heldt, A., 2019. Let's Meet Halfway: Sharing New Responsibilities in a Digital Age. *Journal of Information Policy*, 9(1), pp.336-369.

[51] Maiar, 2022. *Maiar Tweet*. [online] Twitter. Available at: https://twitter.com/getMaiar/status/1505863058664611841.

[52] Elrond, 2022. *Elrond | Explorer*. [online] explorer.elrond.com. Available at: https://explorer.elrond.com/accounts.

[53] Todea, L., 2022. *What is Maiar?* [online] help.maiar.com. Available at: https://help.maiar.com/en/articles/4328680-what-is-maiar.

[54] Maiar, 2021. *Herotags are your identity on Elrond & the internet*. [online] Twitter. Available at: https://twitter.com/getMaiar/status/1355568105741836292.

[55] Mincu, B., 2021. *Foundations For The Internet Of Value via The Elrond Distributed Name Service*. [online] elrond.com. Available at: https://elrond.com/blog/elrond-distributed-name-service/.

[56] Sapio Research, 2021. *Inside the crypto community: Plotting the journey to mass adoption*. [online] Paysafe. Available at: https://www.paysafe.com/fileadmin/user_upload/Paysafe_White_Paper_-_Inside_the_crypto_community.pdf.

[57] Serb, D., 2021. *Interoperability Boost: Elrond Integrates With Chainge Finance, Enabling Assets From 13 Other Chains To Roam Freely To And From The Elrond Mainnet*. [online] elrond.com. Available at: https://elrond.com/blog/elrond-integrates-chainge-finance-interoperability/.

[58] Newitz, A., 2022. Web3 is a fantasy, but it can still hurt you. *New Scientist*, 253(3376), p.28.

[59] De Jesus, S.B., Austria, D., Marcelo, D.R., Ocampo, C., Tibudan, A.J. and Tus, J., 2022. Play-to-Earn: A Qualitative Analysis of the Experiences and Challenges Faced By Axie Infinity Online Gamers Amidst the COVID-19 Pandemic.

[60] Arjomandi-Nezhad, A., Fotuhi-Firuzabad, M., Dorri, A. and Dehghanian, P., 2021. Proof of humanity: A tax-aware society-centric consensus algorithm for blockchains. *Peer-to-Peer Networking and Applications*, 14(6), pp.3634-3646.

[61] Viswanath, B., Post, A., Gummadi, K.P. and Mislove, A., 2010. An analysis of social network-based sybil defenses. *ACM SIGCOMM Computer Communication Review*, 40(4), pp.363-374.

[62] Buterin, V., Hitzig, Z. and Weyl, E.G., 2019. A flexible design for funding public goods. *Management Science*, 65(11), pp.5171-5187.

[63] Lesavre, L., Varin, P., Mell, P., Davidson, M. and Shook, J., 2019. A taxonomic approach to understanding emerging blockchain identity management systems. *arXiv preprint arXiv:1908.00929*.

[64] Momtaz, P.P., 2021. The pricing and performance of cryptocurrency. *The European Journal of Finance*, 27(4-5), pp.367-380.

[65] Siddarth, D., Ivliev, S., Siri, S. and Berman, P., 2020. Who watches the watchmen? a review of subjective approaches for sybil-resistance in proof of personhood protocols. *Frontiers in Blockchain*, p.46.

[66] Reynaga, G., Chiasson, S. and van Oorschot, P.C., 2015, February. Exploring the usability of captchas on smartphones: Comparisons and recommendations. In *NDSS Workshop on Usable Security USEC* (Vol. 112).

[67] Bergquist, J., Laszka, A., Sturm, M. and Dubey, A., 2017, December. On the design of communication and transaction anonymity in blockchain-based transactive microgrids. In *Proceedings of the 1st Workshop on Scalable and Resilient Infrastructures for Distributed Ledgers* (pp. 1-6).

[68] Hackl, C., Lueth, D. and Di Bartolo, T., 2022. *Navigating the Metaverse: A Guide to Limitless Possibilities in a Web 3.0 World*. John Wiley & Sons.

[69] Kalpen, B. (2022). *STEPN Announces Public Beta Launch of First Move2Earn Mobile NFT Gaming Platform*. [online] finance.yahoo.com. Available at: https://finance.yahoo.com/news/stepn-announces-public-beta-launch-210300551.html [Accessed 4 Jun. 2022].

[70] Steem (2018). *An incentivized, blockchain-based, public content platform*. [online] Available at: https://steem.com/steem-whitepaper.pdf.

[71] Shalini, R. and Manoharan, R., 2022. Trust Model for Effective Consensus in Blockchain. *EAI Endorsed Transactions on Scalable Information Systems*, pp.e40-e40.

[72] Chalmers, D., Fisch, C., Matthews, R., Quinn, W. and Recker, J., 2022. Beyond the bubble: Will NFTs and digital proof of ownership empower creative industry entrepreneurs?. *Journal of Business Venturing Insights*, 17, p.e00309.

[73] Litman, J., 2018. What We Don't See When We See Copyright as Property. *The Cambridge Law Journal*, 77(3), pp.536-558.

[74] O'Reilly, M., Dogra, N., Whiteman, N., Hughes, J., Eruyar, S. and Reilly, P., 2018. Is social media bad for mental health and wellbeing? Exploring the perspectives of adolescents. *Clinical child psychology and psychiatry*, 23(4), pp.601-613.

[75] Rey, S.J., 2009. Show me the code: spatial analysis and open source. *Journal of Geographical Systems*, 11(2), pp.191-207.

[76] Franzen, J., 2020. Cryptocurrencies: An Overview, Investment Investigation, Comparative Analysis, and Regulatory Proposals.

[77] Foy, J., 2019. Financial Accounting Classification of Cryptocurrency.

[78] Wang, Z., Qin, K., Minh, D.V. and Gervais, A., 2022. Speculative Multipliers on DeFi: Quantifying On-Chain Leverage Risks. *Financial Cryptography and Data Security*.

[79] Albayati, H., Kim, S.K. and Rho, J.J., 2020. Accepting financial transactions using blockchain technology and cryptocurrency: A customer perspective approach. *Technology in Society*, 62, p.101320.

[80] Liu, Y., Lu, Q., Paik, H.Y. and Xu, X., 2020, July. Design patterns for blockchain-based self-sovereign identity. In *Proceedings of the European Conference on Pattern Languages of Programs 2020* (pp. 1-14).

[81] Grimmelmann, J., 2019. All smart contracts are ambiguous. *JL & Innovation*, 2, p.1.

[82] De Filippi, P., Mannan, M. and Reijers, W., 2020. Blockchain as a confidence machine: The problem of trust & challenges of governance. *Technology in Society*, 62, p.101284.

[83] Dwivedi, V., Pattanaik, V., Deval, V., Dixit, A., Norta, A. and Draheim, D., 2021. Legally enforceable smart-contract languages: A systematic literature review. *ACM Computing Surveys (CSUR)*, 54(5), pp.1-34.

[84] O'Dair, M., 2018. *Distributed creativity: how blockchain technology will transform the creative economy*. Springer.

[85] Gerbaudo, P., 2018. Social media and populism: an elective affinity?. *Media, culture & society*, 40(5), pp.745-753.

[86] Reverberi, S., 2021. NFT and the work of art in the era of digital reproduction: insiders' perspective on blockchain's effects in the digital art domain.

[87] DeNora, T., 1999. Music as a technology of the self. *Poetics*, 27(1), pp.31-56.

[88] Ynag, Q., Zhao, Y., Huang, H. and Zheng, Z., 2022. Fusing Blockchain and AI with Metaverse: A Survey. *arXiv preprint arXiv:2201.03201*.

[89] van Rijmenam, M., 2022. *Step into the Metaverse: How the Immersive Internet Will Unlock a Trillion-Dollar Social Economy*. John Wiley & Sons.

[90] Wilson, K.B., Karg, A. and Ghaderi, H., 2021. Prospecting non-fungible tokens in the digital economy: Stakeholders and ecosystem, risk and opportunity. *Business Horizons*.

[91] Grau, S.L., 2022. *Celebrity 2.0: The Role of Social Media Influencer Marketing in Building Brands*. Business Expert Press.

[92] Bonifacio, R., Hair, L. and Wohn, D.Y., 2021. Beyond fans: The relational labor and communication practices of creators on Patreon. *New Media & Society*, p.14614448211027961.

[93] Cunningham, S. and Craig, D., 2021. Creator Rights and Governance. *Creator Culture: An Introduction to Global Social Media Entertainment*, p.271.

[94] Nakamoto, S., 2008. Bitcoin: A peer-to-peer electronic cash system. *Decentralized Business Review*, p.21260.

[95] Antal, C., Cioara, T., Anghel, I., Antal, M. and Salomie, I., 2021. Distributed ledger technology review and decentralized applications development guidelines. *Future Internet*, 13(3), p.62.

[96] Davidson, S., De Filippi, P. and Potts, J., 2018. Blockchains and the economic institutions of capitalism. *Journal of Institutional Economics*, 14(4), pp.639-658.

[97] Trottier, D. and Fuchs, C., 2015. Theorising social media, politics and the state. *Social media, politics and the state. Protests, revolutions, riots, crime and policing in the age of Facebook, Twitter and YouTube*, pp.3-38.

[98] Haimson, O.L., Delmonaco, D., Nie, P. and Wegner, A., 2021. Disproportionate Removals and Differing Content Moderation Experiences for Conservative, Transgender, and Black Social Media Users: Marginalization and Moderation Gray Areas. *Proceedings of the ACM on Human-Computer Interaction*, 5(CSCW2), pp.1-35.

[99] Kosakowski, J., 2022. Delete and Repeat: The Problem of Protecting Social Media Users' Free Speech from the Moderation Machine. *Suffolk UL Rev.*, 55, p.65.

[100] Cornia, A.C., Sehl, A., Levy, D.A. and Nielsen, R.K., 2018. Private sector news, social media distribution, and algorithm change.

[101] Dance, G.J., LaForgia, M. and Confessore, N., 2018. As Facebook raised a privacy wall, it carved an opening for tech giants. *The New York Times*, 18.

[102] Mills, A. and Sarikakis, K., 2016. Reluctant activists? The impact of legislative and structural attempts of surveillance on investigative journalism. *Big Data & Society*, 3(2), p.2053951716669381.

[103] Gillespie, T., 2018. Custodians of the Internet. In *Custodians of the Internet*. Yale University Press.