hubii network

The Hubii Network
A blockchain-based decentralised content
marketplace
DRAFT

Jacobo Toll-Messia, jacobo@hubii.com
Jens Ivar Jørdre, jensivar@hubii.com
Mark Briscombe, mark@hubii.com
David Schlesinger, das@tripodadvisors.com
Torbjørn Kanestrom, tk@rcp.fund
Øyvind Pedersen Jr, oyvind@hubii.com
Frederico Mesquita, fred@hubii.com

July 31, 2017

Contents

Abstract

We are consuming more content than ever; 3.6 billion people read the news, listen to music or podcasts and watch videos and movies online every day.

Supply and demand of content is constantly growing, however the fundamental dynamics of the media industry are sub-optimal and a paradigm shift is required.

Writers, musicians, movie-makers and producers should be able to find and reward each other without the need for an intermediary (i.e. a media company), other than the platform upon which an article or video is published.

Hubii Network is a blockchain-based decentralised content marketplace that facilitates transactions between creators, distributors and consumers by leveraging the power of smart contracts[1]. Kickstarting this marketplace is Hubii's existing distribution network reaching out to over 50 million people.

By replacing the middlemen with an efficient infrastructure, content creators earn more, distributors pay less and consumers have more choices. Smart contracts and 'smart crowdfunding', all using our native cryptocurrency, Hubiits, will shape the content industry of the future.

---

[1]Ethereum whitepaper

1 Preface

Hubii is a Norwegian startup with headquarters in Bergen and subsidiaries in the USA and Singapore. We have received international recognition[2, 3] as a location-based news aggregator and established global partnerships with leading companies across the world[4, 5].

Hubii has been working between content creators and distributors (telecom operators, OEMs, and app developers), facilitating the development of their own products using Hubii's engine.

This has allowed Hubii to build a distribution network reaching out to 50m users every day. We have 560 publishers and syndication partners around the globe.

Hubii's team has been interacting with blockchains since mid-2011, but now we have the right business model and technology to aggressively deliver our ambitions.

This year, Hubii's team committed to building a blockchain-based decentralised content marketplace (specifically Ethereum-based), extending our content offering from text to include still images, audio and video.

---

[2]Red Herring 2013
[3]Red Herring 2015
[4]Mozilla blog
[5]Panasonic blog

2 Introduction

The number of internet users will exceed 3.8Bn in 2018[6] and is forecast to grow at a steady 10% per year[7]. This growth is mirrored in the amount of time spent online per user, which is growing by 5 to 6%.[8]

While the growing market means ever greater demand and reach for content, it is becoming all the more difficult for content creators to maintain control over their creative works and keep a fair share of the revenue generated. Another topical challenge is the concept of 'fake news' and the need to determine the provenance of content. The whole media industry is broken and blockchain technology will help us to fix it.

By 2020 the media industry as a whole will pick up to over $2 trillion[9] and it is Hubii's firm belief that the inefficiencies in the market and industry can be solved through the use of blockchain technology and the application of smart contracts.
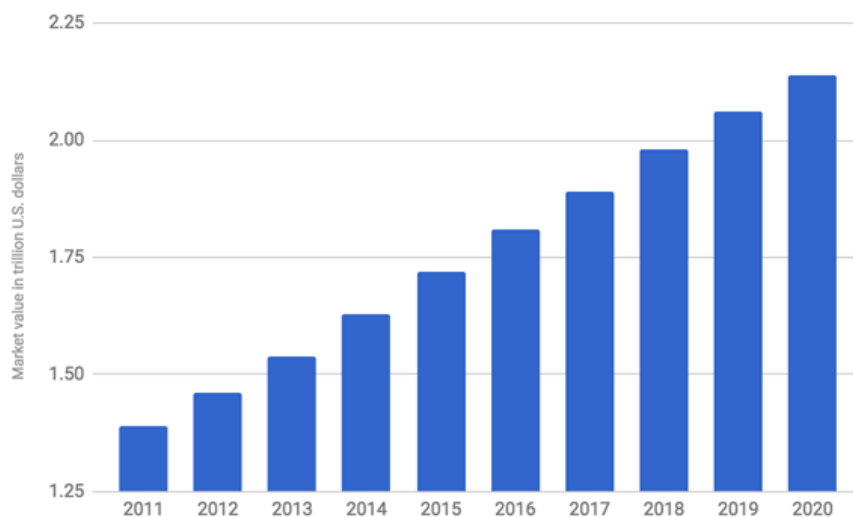
Figure 1: PwC's 2017 Global Entertainment & Media Outlook revenue forecast

Hubii's mission is to create a new leading Ethereum-based decentralised content marketplace where creators and rightsholders can meet distribution networks and reach content buyers directly, all while having total confidence in maintaining the integrity of their rights through the use of smart contracts.

---

[6]eMarketer, April 2016
[7]Internet World Stats
[8]GSMA Intelligence
[9]PwC's 2017 Global Entertainment & Media Outlook

Only a proven media partner with existing relationships can do the job - and thus building on our knowledge and connections of the past five years, we introduce Hubii Network.

3 Current Status of the Industry

The current status of the content industry can be analysed from many different angles. Here we shed more light on this.

3.1 Players and Their Pain Points

The three main actors in the value chain, creators, distributors and consumers, suffer from different pain points.

3.1.1 Content Creators

Content creators face the following issues :

- They often do not get sufficiently rewarded for their work and their compensation is not related to the revenue generated.

- They lose control of their works once their content is published.

- Separate engagements with multiple distributors add complexity to their sale process.

- There is a lack of data driven tools giving them insights into the consumer's interactions with their content.

3.1.2 Emerging Content Distributors

Emerging content distributors such as phone manufacturers, telecom operators and app developers, are embedding themselves as trusted content providers offering services to their users. This strategy is allowing them to leverage their large user base and offer value-added services engaging the users for longer periods of time and consequently monetising them.

They are, however, suffering the following pain points :

- They have to pay hefty fees to a variety of middlemen to get hold of content. This means they operate on small margins and this often pushes them to acquire lower quality content.

- As emerging distributors, they do not have strong or well-formed content strategies.

- Their content is usually second-hand or non-premium.

- They require a combination of international and local content due to their user base.

3.1.3 Content Consumers

Content consumers suffer from the following problems :

- Users are hit with a constant wave of content where is it difficult to separate signal from noise.

- They have to use multiple platforms to get hold of different types of content.

- The content quality is below the desired standard.

- They are exposed to hundreds of ads a day.

3.2 New Trends

The developing world is rapidly growing and is thirsty for content; Thailand with 68 million inhabitants, Philippines with 100 million, Myanmar with 54 million, Malaysia with 10 million and Indonesia with 260 million inhabitants are examples of large markets that are coming online which will not follow the technology adoption path of most western countries. Furthermore, they are reshaping how content consumption takes place. Hubii's existing relationships in the developing world are extensive, giving us insight and a platform ripe for leverage.

From a content point of view, we are seeing an explosion in the numbers of content-creating smartphone apps entering the market, across a range of areas such as entertainment, education, communication and utility. Within 5 years, 80% of the adult world will have an smartphone.[10]

New business models have been opened up by the internet, and we have seen a surge in the number of value-added apps and services for smartphones and web.

As a result, these new players have the opportunity to amplify the content reach and offer services across a range of basic handsets, effectively catering to the needs of all their subscribers. Brands need to develop content which is device-agnostic, thereby maximising the number of customers being targeted. This approach is particularly effective when combined with localised content, tailored specifically to particular geographic regions or sets of users.

There is a need and space for a player that is willing to ease the existing pain points hereby presented, building the solution around content creators and rightholders; empowering journalists, musicians and movie makers with the ability to reach out to millions of users in a frictionless manner and monetise their works.

---

[10]GSMA Intelligence

4   Hubii Network

Hubii Network is an Ethereum-based decentralised content marketplace where the production, distribution and consumption of content is re-shaped by leveraging the mechanisms that Ethereum offers.

Hubii Network shall apply a market structure by nurturing and managing perfect competition[11] to thrive. In other words, a market should be free of monopoly and controlled by individual participants.

The trustless nature of cryptocurrency will allow all parties to make an exchange without the oversight or intermediation of a third party. This will reduce or even eliminate counterparty risk.

The objective is to establish a healthy ecosystem whereby creators can define their rules of engagement, distributors get access to a constant pool of content and consumers ultimately get hold of the content they desire.

Making use of smart contracts and smart properties will allow Hubii Network to fix the pain points in the industry and, furthermore, apply mechanisms never seen before in the market. All this will be delivered whilst having full transparency, accountability and security over the transactions using our own cryptocurrency, **Hubiits**[12] (HUBs).

The long term goal is for the entire Hubii Network to be open source and decentralised in nature.

4.1   Two Sided Marketplace Dynamics

We will utilise cross-side network effects in our marketplace. The value for a content creator joining Hubii Network is a function of the number of distributors and consumers that are present. Similarly, for distributors and consumers, the value is related to the number of content creators publishing their work within Hubii Network. Hubii has proven experience building this type of market already.

Demand liquidity is the single biggest challenge in any cross-side network effect platform, creating a chicken & egg problem; a band would not be willing to distribute their songs through the platform if there are not enough distributors/consumers in it. In our

---

[11]Where : (1) all firms sell an identical product, (2) all firms are price takers, (3) all firms have relatively small market share, (4) buyers have complete information about the product being sold and the prices charged by each firm and (5) the industry is characterized by freedom of entry and exit.

[12]Our fully featured ERC20 token

case that issue is already solved thanks to our existing distribution pipeline.

We already have a large set of distribution partners, reaching out to over **50 million daily users**, currently supplying content from Hubii. We believe this strength, together with the introduction of Hubiits and heavy use of smart contracts to secure the monetary transactions and IP rights, will act as an incentive to attract content producers.

Furthermore, we have the possibility to enable distribution partnerships that could reach out to over **800 million people daily**. Therefore, as the supply of content increases the marketplace could amplify its reach extremely rapidly.

The go-to-market strategy will require the motivation of both creators and distributors, using different approaches. We will expand our distribution network, signing exclusive deals with distributors in specific regions for a period of time in return for a minimum investment commitment. The distributor must purchase content from the Hubii Network and promote us within that region.

The Hubii Network will leverage the existing Hubii business. This product has helped connect content creators and distributors already. The aim is always to maximise revenue and enhance content consumption

To accelerate wide adoption and integration of Hubii Network we will foster openness of our platform by providing RESTful API's to the community of developers. Equally we will integrate with the best suppliers of various different decentralised technologies such as e-wallets and decentralised storage solutions; We do not see value in reinventing the wheel; we want to begin to change the world at the platform level first.

4.2 Business Model Guiding Principles

Hubii Network will replace a number of middleman in this industry and charge a small commission to the distributors. We intend for this to be a high volume, low margin market, which will make the content industry as a whole much more efficient. Distributors and ultimately customers will pay less for content, yet on the flip side content makers will get paid more.

Hubii will also have the potential to generate revenue through provision of liquidity for eliminating exchange rate risk as discussed later.

Within our existing portfolio of distribution partners we encounter a small number of them who mainly want low-quality and commodity content and have a policy of not

paying for content acquisition. In these cases we might apply server-side ad stitching and DAI[13] to monetise the content as it is being distributed.

4.3   Digital Rights Management

Any marketplace will only be successful if all sides can trust each other; the buyer has to know content rights are verified and the creator that content will not be pirated or redistributed without consent.

In order to protect the rights DRM[14] can be applied, when necessary, to relevant audio and video content. Thus, distribution endpoints can only be connected to by validated clients. Various patented DRM schemes are available to Hubii Network through our partners, which support this level of security and trust. An essential feature of the technology is that it can query the state of the content; verified or disputed. In other words, disputed content can be blocked at any point in the value chain.

Hubii Network's content storage, distribution, encryption and acquisition processes will be MPAA[15] certified and server-side monetisation will be based on various existing DRM schemes.

As every device in the chain would be a validated client, consumption patterns and related transactions can be tracked and fed back to the content creators.

This data can be of high value to the creator and therefore be added to the contract as requirement. Since everything in the distribution chain is based on encryption a high degree of trust can be accomplished. In order to address potential privacy issues each party seller, buyer, advertiser can anonymise it's data while maintaining transaction integrity.

DRM will not be applied to all content. DRM can be expensive and not always useful. Vlogs and podcasts, for example, have little need for DRM and it could even harm their distribution.

---

[13]Dynamic Ad Insertion
[14]Digital Rights Management
[15]MPAA content protection

5   Use Cases

With the intention to provide tangible examples on how Hubii Network will re-shape content production, distribution and consumption we have included a set of use cases.

Please note that the intention is to describe, from a high level perspective, how the main workflow of the Use Case would take place and the use of smart properties and smart contracts affect it.

5.1   Content Production

This Use Case is applicable to Text, Audio and Video. For the purpose of this example we will apply it to Audio.

Alice, a content creator, decides to publish her latest Podcast within Hubii Network. At that time Alice establishes the smart contract for the Podcast indicating *when the Podcast is played 'X' number of times she will get paid 'Y' Hubiits.*

Bob, upon accepting the rules indicated within the smart contract, decides to distribute the Podcast through his network. Thus, as the Podcast is being played, when it reaches 'X' number of plays, 'Y' Hubiits will be paid to Alice.

Note that the content creator can track rights and usage data in real time on a global scale each time a file is accessed, and get paid instantly based on the rules she has established within the smart contract. This will require the use of oracles[16] to get real world data into the smart contracts.

5.2   Amplifying Content Reach

This Use Case is applicable to Text, Audio and Video. For the purpose of this example we will apply it to Text.

A journalist, Alice, decides to publish a high quality article within Hubii Network. While defining the smart contract, Alice establishes that they will share *'X' percentage of the earnings for every 'Y' reads produced by influencers distributing her article through their social channels.*

A social influencer, Bob, upon accepting the smart contract conditions, redistributes the news article through his thousands of followers in different social media channels.

---

[16]An Oracle is a third party service which can be used to get real-world data into smart contracts

Once the article shared through the social media channels is read 'Y' number of times, 'X' percent of the earnings will be automatically paid to Bob. Again, this will require use of oracles.

It is important to note that in both examples the monetary transaction is based on rules that are decided by the content creator and stored within the blockchain, are transparent to both parties and do not require a mediator.

It is possible for the Hubii Network to take a contract arbitration role if there is a requirement. Assume a smart contract where a creator could request a payment from a distributors (locked up) funds for every 1,000 impressions; using a 2-of-3 multisig model could allow Hubii to step in as a neutral observer to process or cancel that transaction if a creator and distributor were to disagree or if there was a question over oracle data. This would entail a slightly higher commission for Hubii Network.

5.3 Fake News Detection

This Use Case is applicable to Text, Audio and Video. For the purpose of this example we will apply it to Text.

A journalist, Alice, publishes an article within Hubii Network and would like the facts to be verified by the community to minimise the risk of being labelled 'Fake News'.

Thus, at publishing time, Alice requests verification of a set of facts within the article. This verification is crowdsourced from within the community. According to the rules of the smart contract, *'X' percent of the earnings of the article will be shared among the verifiers.*

5.4 Tipping

This Use Case is applicable to Text, Audio and Video. For the purpose of this example we will apply it to Music.

A consumer, Alice, while listening to a song from her favorite band, Bob and the Doges[17], decides that she would like to tip the band for their work. Alice can directly tip *'X' number of Hubiits to the band for that song.* This could be enabled within the Hubii Network or a distributor platform.

---

[17]A popular band comprising of Shiba Inus

5.5 Smart Crowdfunding

This Use Case is applicable to Text, Audio and Video. In this case we will show two examples; one for Music and one for Movie making.

Example A : A movie director, Alice, is seeking funding for her next Hollywood blockbuster. She decides to announce a Smart Crowdfunding in Hubii Network whereby they are seeking *'X' number of Hubiits in exchange for 'Y' percent of the future earnings which will be proportionally split among the 'Z' backers of the movie. Furthermore, backers of the project might have access to the premiere via Hubii Network.*

Example B : Bob and the Doges, the band, are seeking funding for their next summer tour. They announce a Smart Crowdfunding in Hubii Network whereby would like to raise *'X' number of Hubiits in exchange for 'Y' percent of the revenue obtained through the tour (tickets and merchandising). Furthermore, backers of the project will have a discount should they attend to the concert or will be able to virtually attend to concert which will be streamed live via the Hubii Network.*

6 Road Map

Hubii envisions 4 major releases through our roadmap across a period of 18 months covering text, still images, audio and video.

The following roadmap describes a timeline which will be met given we raise a fairly ambitious $40M through our token sale. If we do not raise this amount then the roadmap will not change, but timing will be much more reliant on further traditional investment. There will be no further token sales or token releases; if required, we shall seek conventional venture capital.

We have determined that our scaling plans fit in with the general scaling plans of the Ethereum network. In the worst case, clever use of payment channels will reduce our load on the network and also reduce fees.

This roadmap comprises technical development together with business development as we intend to keep on growing our distribution partnerships while the development of the platform takes place.

Figure 2: Road Map

- R1; ETA, End Q4 2017 :
    - A digital wallet will be implemented within the Hubii Network.
    - Transparency dashboard; all parties involved in Hubii Network can see the development of the main KPI's affecting the performance of the business and the Hubiits cryptocurrency.
    - Creator and distributor dashboard for content ingestion, distribution and configuration of the smart contracts.
    - SDK for distribution Partners.

- Textual content ingestion and distribution within the blockchain supporting a set of main smart contract use Cases.

- Deploy a pilot in South East Asia and Brazil for 1 month to, approximately 15M users. Upon successful pilot, we shall deploy world-wide.

- R2; ETA, End Q1 2018 :

  - Release of market analytics tools; forecasting and audience matching supported by machine learning and image recognition algorithms.

  - Integrate with VOD streaming platforms for ingestion and distribution and run pilot tests.

  - Integrate with music streaming services for ingestion and distribution - run pilot tests.

  - Image ingestion and distribution through the blockchain supporting smart contract use cases.

  - Smart Crowdfunding; Apply crowdfunding smart contracts for music/movie artists and journalists where backers can obtain a return on their investment based on the smart contract rules.

  - Smart contracts to manage exchange rate risk

- R3; ETA, End Q2 2018 :

  - Audio ingestion and distribution within the blockchain; main smart contract use cases are implemented.

  - Deliver audio (music and podcasts) via distribution channels to music streaming services.

  - Paid crowdsourced content curation

- R4; ETA, End Q3 2018 :

  - Video ingestion and distribution.

  - Deliver video via distribution channels and VOD platforms.

  - Server-side ad-stitching technology for video and audio

  - Deliver AR, VR and e-sports content through distribution

- No fixed plans, dependent upon funding :

– Deprecation of our ERC20 token; All owners of ERC20 tokens would retain the same fraction of the new replacement cryptocurrency. This might be necessary to fully decentralise some unique features of the platform. However, it is also critical that this is not done before the mechanisms have been fully optimised.

– Fog Computing; depending on the performance and latency obtained by using the blockchain we will perform R&D to implement a Fog Computing solution to improve system response time, minimise network and internet latency and reduce amounts of data sent.

7 Feedback from Within the Industry

This is some of the feedback we have obtained from within the Industry;

> **❝** The media industry is in turmoil, with traditional relationships between creators and distributors broken and standard measures of value unreliable. Blockchain, by disintermediating gatekeeper companies, can redefine the industry for the 21st century, put control in the hands of makers and users, and allow a true marketplace to establish value. **❞**

David Schlesinger, former Editor-in-Chief, Reuters

> **❝** At Telenor we aspire to be customers' favourite partner in digital life. One of the great experiences delivering on this ambition and giving people the full benefit of being connected is WowBox - Telenor's greatly successful lifestyle app and service in our Asian markets.
>
> For Telenor it is critical that all our services scales across multiple markets to our 170 million subscriber base both technically but especially also on the content sourcing side. Hubii has been an integral part of making Wowbox the big success that it is today reaching out to our vast user base with their global content distribution network.
>
> It is our view that the team at Hubii really understands how to scale solutions on a global level and make content distribution more effective. Their help has been really valuable for Telenor and we wish them great success also in the future. **❞**

Telenor, Hubii's business partner

8 Storage

Hubii's current storage needs (text only) are 25GB per day. Still images add an extra 5Gb per day which are stored in a CDN[18].

We foresee increasing data retention to much higher limits plus we shall add audio and video files. That would easily increase the data storage needs up to Petabytes within a few months. This situation still does not take into consideration the streaming capabilities required to serve audio and, specially, video files to millions of users.

Fully decentralised storage systems are a work-in-progress, therefore conventional storage methods are unavoidable. However, there is tantalising progress. We shall establish early dialog with blockchain-based storage companies such as Storj, Sia, Filecoin, Burst and Maidsafe to present and discuss our data volume requirements at each phase, for text, audio and video both from storage and streaming perspectives.

Our ultimate goal is to use a fully 'on-chain' solution, but considering the existing limitations of these services, we have to be open minded and acknowledge we will have to focus on providing an optimal service to our end users.

---

[18]Content delivery network

9 Removing Exchange Rate Risk

One potential obstacle to crypto-commerce is the volatility of tokens with respect to user's everyday currency (e.g. USD).[19] If a user is happy to deposit and trade in Hubiits, then there is no issue. However, if they do not want to be exposed to exchange rate risk then they might not be happy trading in Hubiits. On the Hubii Network this problem will be minimised with hedging contracts.

If a customer deposits USD onto the platform and they want to keep their USD purchasing power static then we will hedge their risk. In order to interact with the platform and its smart contracts, users must use Hubiits. If they choose to interact in USD, then we will use their USD to purchase Hubiits, but their interaction with the platform will still be displayed and maintained in USD terms. They are effectively taking a long position on Hubiits behind the scenes. In order for the user to not be exposed to the Hubiits volatility, we will then hedge their position in the background, by opening a short on their behalf. In this way, the user will no longer be impacted by price fluctuations. The cost to service this system will depend upon the spread, trading fees and interest rate. Hubii can also take a fee. However, we may in fact choose to subsidise the cost until there is sufficient liquidity to make this extremely low cost. Token holders will lend their tokens into a smart contract to fund this short position and receive an interest rate as payment.

For complex contracts, if we find that users are reluctant to engage with the platform and agree to ongoing contractual payments in Hubiits we will address this issue by integrating easily understood two-way, automated futures contracts. This will similarly allow users to lock in prices in their chosen currency (e.g. USD) throughout the smart contract duration. Token holders will be able to stake into this system and potentially profit from price movements.

These contracts will be fully decentralised in nature, except for the necessary exchange rate information. We will have solid liquidity partners acting as oracles for this purpose.

Using these methodologies and without manual intervention, user's balance and all interactions can be denoted in USD. There is a fully transparent and visible (low) cost to the user for this security.

Hubii will keep 5% of the total produced tokens to act as a liquidity pool for such contracts. However, we will also allow individuals who hold tokens to stake into this

---

[19]Ethereum whitepaper - see 'Financial derivatives and Stable-Value Currencies'

system and earn interest from users hedging and profit from futures trading. All of this will be based on competitive market pricing.

10 Verification of Content Rights in Hubii Smart Contracts

10.1 Protecting Intellectual Property

It is critical that we check that content uploaded by a user is actually their own intellectual property. We will develop a framework here that will decentralise this content verification, however we must accept that, although our solution will be open-source, it will be semi-decentralised at first. The transition to a truly decentralised system is only possible once we deprecate our ERC20 tokens. This system will prove to be a difficult optimisation problem, which will take time to prove itself. When the equity of the system has been demonstrated at scale we will switch to a more heavily customised token, or perhaps our own blockchain if it is deemed necessary.

We will allow token holders to stake their tokens into smart contracts which allow content to be flagged as either 'Verified' or 'Disputed'. These users will be our network validators. 'Verified' or 'Disputed' is a binary condition once achieved, but content begins life with neither designation. We will use a system to reward validators for correctly verifying content, whilst simultaneously punishing an incorrect validation. This will allow the system to rapidly converge on one truth. Tokens staked into the system by creators will build up a Reputation Weight as the creator submits more 'Verified' content. This functionality is not included in an ERC20 token; we therefore require a somewhat centralised solution at first.

We also must always ensure that tokens are fungible, in other words no token has more value than any other. Therefore upon transfer, a token must shed its accrued reputation.

The incentive for participating in the task of content validation is a small revenue share to those users who successfully validate a piece of content. The revenue share will be time-limited and potentially capped in value. This positive incentive is balanced by the risk associated with staking tokens against an unsuccessful validation. The justification for this downside risk is easy to understand; if the system only ever rewarded token holders for validating content and never punished them when they were wrong, it would be rational for token holders to try and validate every piece of content. As such, there must be a significant penalty for wrongly identifying the content - namely, the loss of staked tokens. Our content validation system will therefore converge rapidly towards truth, provided that the market for staking tokens is liquid and the rewards and punishments sufficiently great. Any lost tokens will therefore be split and distributed between correct validators, further incentivising participation in

the system. Similarly, this process might limit the required value of the revenue share, potentially to the point whereby users will participate in content validation even when no revenue sharing is offered.

10.2 Rapid Consensus

Each piece of content will rapidly reach consensus on validity as there is a race to be among the verifiers. Consequently, there is also a race to invalidate invalid content and steal any falsely staked tokens. Until content is validated it cannot be offered to distributors. After a consensus is determined to have been reached, content with 'Disputed' status, is removed from the platform. This also occurs if the content is uploaded to the platform, yet is not validated by anybody within a time period. At some point all valid content will be classed as 'Verified'. When content is verified, it must remain verified for a period of time in order for creators and validators to receive their revenue share. Earned funds will essentially be locked up during this period. Having reached and maintained 'Verified' status for the required amount of time, another time limited revenue share will then begin to be diverted into a 'e-verification bounty' fund. It is assumed at this point that those token holders who staked correctly were acting to the best of their knowledge and as such, their tokens are returned to them safely. The stakers will also now receive their revenue share. Any tokens staked incorrectly will be seized and distributed proportionally amongst the correctly staked tokens.

Creators must stake a nominal quantity of tokens (or even a fraction of a token), in order to build a reputation on their 'profile'. Eventually they will be a 'Verified' creator and the revenue share for validators from these users will decrease. A negative verification can damage their reputation and move them below the 'Verified' threshold, in which case the future revenue share for validators will increase again. However, it will be expensive for other parties to falsely attack the reputation of a creator. This is one reason we may later deprecate our ERC20 tokens for a new token which can carry a 'reputational weight'. This would allow this system to also be fully decentralised.

10.3 De-verifying Content

Now let's imagine a case where a content creator has submitted a video of a cat on a skateboard and it was verified for the required period of time. Let's also assume later that somebody else provides public and indisputable evidence that the cat video is in fact their own content. There must exist a mechanism whereby content can become de-verified. We achieve this by restarting the process again once a piece of content has been verified, but with a couple of subtle differences. This time the content already has a 'Verified' status and there is also a 'De-verification Bounty'. A token holder who believes the content should now be disputed, must have an incentive to stake their

tokens and this is access to a share of the 'De-verification Bounty', if proven to be correct. Once users start to stake that the content is 'Disputed' then users who disagree may wish to stake that the content is still 'Verified', in an attempt to steal the tokens from the new tokens staking for 'Disputed'. If the new batch of stakers successfully change the status of the content to 'Disputed', then the content is 'Quarantined' from the platform and any contracts on it are paused. Content must remain in 'Quarantined' status for a period of time before the token holders who staked 'Disputed' will collect the 'De-verification bounty' and share the tokens that are now staked for 'Verified', if there are any. If the content never manages to reach 'Quarantined' status for a period of time then the tokens staking for 'Validated' are rewarded with the 'Disputed' tokens.

Lastly, if content remains 'Verified' for a long period of time then there will still be a 'De-verification Bounty' held in reserve. It is assumed at some point in the distant future that the content is not going to be disputed any more and so eventually the bounty is returned to the content creator.

10.4 'Fake News'

As discussed in our use cases, we can also use this system for the verification of news and facts contained within content. This is a more challenging application to deliver as people can have very different opinions on 'facts', particularly where they are political in nature. There may be powerful and wealthy entities willing to expend significant effort and spend a lot of money to compromise this use case in particular. However, despite this challenge, an optimised verification process can solve this.

10.5 Illegal Content

The challenge with illegal content is that it may have different legality status in different countries. In addition, some content may be age restricted. Country and age related issues can in many ways be solved at the user interface level. For overtly illegal content, a separate, yet similar, verification process to that described above will be required. The process can resolve this issue given sufficient optimisation and perhaps added functionality. However, there must be a centralised system to begin with, as there is with all other content platforms. The intention is not to arbitrarily censor any content, except in flagrant violations.

10.6 Vulnerability to Sybil Attack

In order for this system to be resistant to Sybil attack, then the reward for poor verifications must be small whilst the penalty for lying is large. We must also lock the benefits up for sufficient time in order to make a Sybil attack extremely expensive to maintain.

As bad actors attack the system, the potential reward for truthful people grows rapidly. This effectively skews the payoff matrix in favour of 'defecting', i.e. creating an incentive for bad actors to 'change sides' in light of the much greater potential rewards. As such, the system contains a natural limit beyond which Sybil attacks become uneconomic.

The system must be thoroughly tested and optimised, working under all market conditions and with sufficient speed (via off-chain transactions). It must also work even if the content is of extremely high value. It is critical that we trial this system for some time before we consider deprecating our tokens. As such, this system will be an open-sourced but temporarily centralised solution.

11 Transparency

With the intention of fostering trust and transparency, the dynamics and KPI's affecting Hubii Network will be fully visible and accessible to anyone. This way users will have access to live statistics of the key parameters affecting the trading of Hubiits through our **Transparency Dashboard**.

Thus, Gross Market Volume (GMV) describing the total Hubiits being transacted within Hubii Network, Net Promoter Score (NPS) covering the supply and demand with creators, distributors and consumers, Fulfillment Rate (FR) describing the fraction of customer demand that is met through immediate stock availability and Consumer Growth Rate (CGR) will be available within the Transparency Dashboard.

12 Key Team Members

- Jacobo Toll-Messia, CEO & Founder.

- Jens Ivar Jørdre, PhD, CTO.

- Mark Briscombe, MPhys, Special Adviser.

- Øyvind Pedersen Jr, Special Adviser.

- Barbara Hüppe, PhD, Communication Director.

- Federico Mesquida, PhD, Special Adviser.

- David Schlesinger, Former Reuters global Editor-in-Chief, Key Adviser in Journalism Content Creation.

- Torbjørn Kanestrøm, Managing Partner RCP.fund; Key Adviser in Content and Distribution strategies.

- John Paton, Founder and former CEO of Digital First Media, Director of The Guardian, El Pais and Prisa, Chairman and Managing Partner of IVA Ventures.

- Ash Crick, iflix Founding CTO, Global Head of Labs, Data Intelligence and Content Technology at iflix; Key Adviser in Video and Content Distribution Strategies.

- Hans Hvide, PhD, Professor of Economics and Finance.

- Arturo Duran, former Chief Innovation Officer for Digital First Media, Managing Partner of IVA Ventures.

- Pablo Yabo, CoinFabrik, Blockchain Adviser.

- Dag Syrrist, Vision Capital, Adviser.

- Geraldo Maroniene, Chief Revenue Officer at Navegg; Key Adviser in Data Management Platform Strategies.

13   Token Launch

Hubii Network is specifying a hidden maximum cap of USD to be raised in the token sale. When we talk of a USD amount, this will in reality be a fixed amount of Ether (ETH), set according to the price of ETH before the sale contract is deployed to the Ethereum network. The hidden maximum target would allow the Hubii Network to scale quickly and maximise our potential to build a significant network effect before competition arose. Our stated road map is assuming an ambitious sum of $40m raised. However, if we raise more than this, it will allow us to develop more relationships with partners on the content creation and distribution side. This will exponentially increase our growth rate and add value to the network.

We will be setting a minimum target of $5m. This minimum target would still allow the team to develop some minimum viable products, but it is likely that extra funding would be needed, by more conventional venture capital routes. There will not be another token sale for Hubiits and the Hubiits generated by the token sale will be all the Hubiits that ever exist.

The sale will be open for 2 weeks from the opening block number. The maximum cap will be divided into a number of phases of $5m. Each time $5m is raised the next phase maximum is revealed. The total number of $5m mini-caps will not be revealed until the sale is ended.

We will accept a maximum value equivalent to $5m for any single transaction; we will state this in ETH terms before the sale and this will not be inclusive of gas. Any amount larger than $5m after fees, will be rejected. Of course, a single entity could send multiple transactions of $5m, but this should at least help mitigate large quantities of tokens being bought by a single individual. If $5m is sent and there is only $2m left in the current phase, then $3m will automatically roll over into the next phase. However, if we are already in the last phase then the $3m will be refunded.

We will publicly reveal and set the maximum cap once we reach the last phase. The smart contract will require a transaction to be sent, which will set the cap and allow the sale to terminate. In case of network delay for the closing transaction, ETH received is accepted and the cap will extend by another phase. We will ensure that a suitable gas price is chosen to minimise the risk of a delay here.

All transactions will be treated on a first-come-first-serve basis, but also according to the wills of the miners who include the transactions in their block.

The fraction of total generated tokens that are for sale in this project is **70%**.

10% of the generated tokens will be reserved for key team members and advisors.

5% of the tokens will be held as a liquidity pool for the platform.

5% of the tokens will be used in the first year in building partnerships which will be critical for the success of the platform.

The remaining **10%** of tokens will have vesting periods attached to them and will be used as further platform funding as well as for building partnerships. **5%** will be locked up for exactly one year from the date of the sale. **5%** will be locked up for 2 years from the sale date.
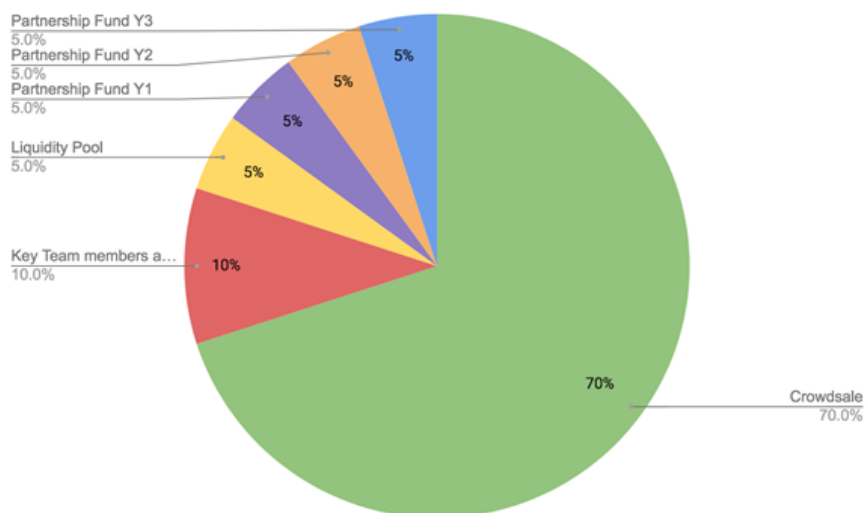
Below is a chart showing the token splits :

Figure 3: Token splits

The following figures are based on an ETH price as of 14th July - $200

13.1   Minimum target

25,000 ETH

13.2   Phase value

25,000 ETH

13.3 ETH volatility

As the price of ETH is extremely volatile currently, and we are setting a fixed goal in USD, we cannot guarantee the exact number of ETH that would equate to our targets. As is the standard approach, we will take the ETH USD price as close as possible to the token sale and lock in the number of ETH to be accepted at that point. This price lock-in will be made public before the sale begins.

13.4 Exchange rate

The exchange rate of Hubiits to ETH will be set at 1,000.

13.5 Tokens generated

We cannot guarantee the total number of tokens to be generated by the sale, as this will depend upon the prevailing price of ETH in USD. However assuming the above figures then we would have a minimum of 35,714,286 HUB generated and 35,714,286 HUB per extra phase (including the tokens not for public sale).

13.6 Launch date and time

The token sale will go live at approximately 16:00 (CET) 17th August 2017. As the sale timing will be determined by a block number, we cannot exactly guarantee the time. **The exact block number for the beginning of the sale will be visible when the contract is deployed to the network for public audit. We will also publish this on the website before the sale begins**.

13.7 Contract address

In order to take part in the sale a purchaser must send ETH to an address which will be published for public audit.

13.8 Gas Limit

Along with the contract address, a recommended gas limit to be sent as part of the transaction will also be published. This will ensure that nobody misses out on the sale due to the gas requirements of the contract.

13.9 Refunds

Any ETH that is sent before the contract begins, or after the target has been reached, will be rejected. However, we cannot refund the transaction gas, as this will be consumed by the miners.

13.10 Sale timing

Due to the complex situation surrounding the Bitcoin ecosystem at this time and during the early part of August, there is a small chance we might be forced to postpone the sale. **This will only happen in a worst case scenario** where it is difficult for people to move around their bitcoin on the lead up to the actual sale.

14 Hubiit FAQs

14.1 What is a Hubiit?

A Hubiit is an ERC20 token and will be the native currency of the Hubii Network. They will be sold to potential users of the Hubii Network to be utilised on the platform. The tokens will be non-refundable. They do not represent any equity in the company. They will be the only way to engage with various platform features. There is no guarantee that Hubiits will have any particular value in the future and should be purchased only for their utility and not as an investment.

14.2 Will there be any future Hubiit token sales?

No, this is a one time event. Once all Hubiits are issued then no more will be generated. These tokens will find their true market value and enable the trading of the best content in the world. As discussed previously the number of tokens produced will depend upon the value of ETH at the time of the sale, as we have a fixed target in USD.

14.3 What currencies will be accepted to purchase Hubiits?

You must purchase Hubiits using ETH, sent to the smart contract as described above.

14.4 Why does the Hubii Network need a native token?

Innovation in the ecosystem has so far been very heavily focused at the protocol level. However, in order to drive this ecosystem forward it is time to focus on practical and real world usage of those protocols that have been developed. Bitcoin was, and is, a leading example of how a cryptocurrency can exhibit all the characteristics that are needed for a currency. Ethereum is a platform upon which we can build a token. All the parts are now in place to disrupt entire industries. The token will have utility in the platform's verification system and also in mitigating exchange rate risk. One other powerful reason for a native cryptocurrency or token to be used on the Hubii Network is that we can provide real time information on the media trade volume that is passing through the system. Also key to our choice is an intention to later deprecate our ERC20 token as we want to fully decentralise our more unique platform features.

14.5 Why are we confident Hubii can change the industry?

The content industry will never be ruled by a monopoly. Furthermore there are data points indicating that a content agnostic platform is what consumers prefer. Blockchain plays a key role in maximising the efficiency of the marketplace in the future. The

system will develop a strong and necessary network effect and this is why Hubii has aggressive plans to roll out and scale.

14.6 How will Hubii hold the funds collected?

Hubii will hold the ETH raised according to best practices, so a hardware wallet and multisig addresses.

14.7 What safeguards are in place to ensure the contract is correct?

Hubii are employing some of the best contract creators in the space. We are also ensuring that we undertake a full audit and testing of the contract. This is key to why Hubii is also choosing to follow the ERC20 token standards. Details of the smart contract audit report will be revealed before the sale.

14.8 Will Hubiits be transferrable?

In order for the currency to find its own value, it is critical that Hubiits are transferable without any restrictions.

14.9 How ambitious are we?

We are extremely ambitious and confident that we can succeed in our endeavours. As an example of our ambition, we have suggested that we can crowdfund movies, allowing revenues to be shared back to token holders. This is not a trustless solution; you are relying on the people who received funding to actually make the movie and then distribute profits back to the investors.

We suggest that eventually the Hubii Network will allow funding to be released to the movie-makers in various stages, perhaps with investors voting to disseminate funds. This can help limit the risk of the movie-makers failing to deliver on their promises.

However, how do we ensure that we give revenue back to the token holders? We enforce this by taking this revenue at source. The point-of-sale terminal at the cinema will automatically cash into the Hubii Network and distribute revenue live to the investors. This would be a classic use case for payment channels. The POS[20] device would open up a payment channel for the maximum revenue share from a single screening of the movie. As tickets were purchased, a small fraction of the revenue can be sent

---

[20]Point of sale

directly to the investor's fund. Once the movie is fully booked, or is closed to further sales, the payment channel can be closed. This means that potentially hundreds of microtransactions can take place for minimal cost and can be done with just two on chain transactions.

We feel confident in our approach and philosophy therefore, should we raise a minimum of $15M through our token sale, we shall create a smart contract within Hubii Network whereby if an article published within the platform ought to win the Pulitzer prize, the author will be rewarded with $100,000. We expect this would add much more than $100,000 of value to the platform, purely in terms of publicity.

14.10 Philosophy

We believe in open source and fully decentralised solutions. This will not be immediately possible, but we will eventually make the entire product this way. We trust that our network effect, industry support and experience will make us the default option amongst our competitors and clones.

We will need to use the best available solutions for all aspects of the platform. There is no point reinventing the wheel and so we will use third parties to assist where possible. This could be a fully decentralised and open source storage solution, but it could also be an integrated digital wallet and decentralised exchange built on the best available service. This would give many potential benefits such as increased liquidity, greater functionality and interoperability.

We want to make this platform incredibly intuitive and easy to use. We intend that the platform is easy for any users to interact with. Smart contracts will be simple processes where the user selects a template and a few simple options. Purchasing content or entering into a contract will be clear, easy and quick.

15 Budget Allocation

We foresee the following allocation of funds for the development of Hubii Network.

- Development Team; consisting of 14 engineers working in the development of Hubii Network.

- Business Development Team; consisting of 6 Senior BD people establishing distribution partnerships and focusing on content acquisition and monetisation.

- Administration; Accounting and other administration costs.

- Contingency; Unforeseen costs.

- Community; If we raise over 50% of our target we will set up a content creation foundation of 0.7% of our finances. The foundation will be a community based initiative.
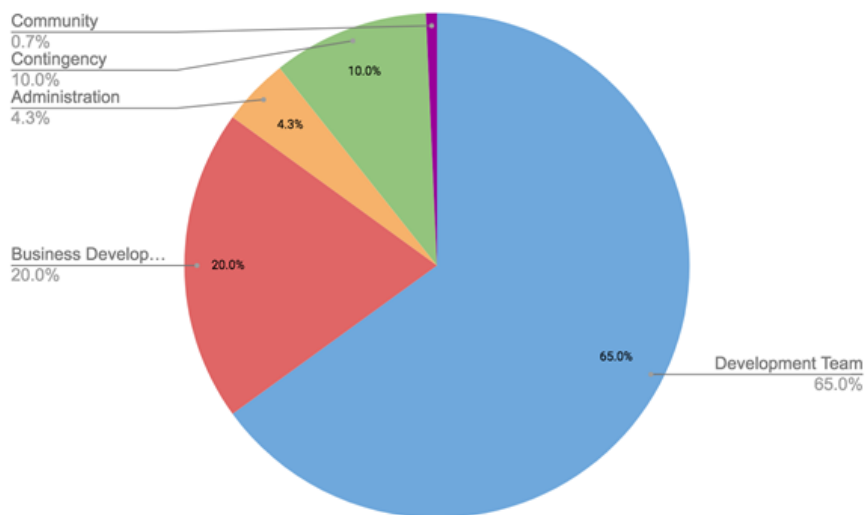

Figure 4: Funding allocation

16 Afterword

❝ In 2017 it is too easy to come up with examples of why online media and publishing is broken. It is not only 'fake news' and diminishing trust, nor is it only failing newspapers or creators not being compensated well.

The fundamental model of a 'distributor and content creator' as a credible source, the concept of an 'curator' who decides what gets published, creators contracted to produce a certain amount of content before a deadline, the business and revenue models designed for the offline world. It is all disappearing.

Instead there is Hubii Network, promising a level playing field for creators, distributors and consumers, where the crowd is incentivised to validate all content, where credibility of a source is earned – not purchased, and where the vast majority of value created goes to the active participants. We like to think of Hubii Network as the 'democratisation' of the online content marketplace, a democracy ensured by transparency and sound marketplace mechanisms, by IP rights and authenticity where the 'attention economy' works to the benefit of all participants. ❞

Torbjørn Kanestrøm

17 Appendix

17.1 Volatility of Hubiits

A deep dive into the dynamics of virtual currencies was recently carried out by economists Bolt and van Oordt.[21] In particular the exchange rates of virtual currencies relative to fiat currencies was found to depend on the following three components:

- The use of the currency as a medium of exchange, i.e., to make payments

- Investors' buying the currency for speculative reasons, and thus effectively regulating the amount of currency used to settle payments

- Elements that drive future consumer adoption and merchant acceptance of the currency

Their analysis was discussed recently in the context of the Basic Attention Token (BAT)[22], and the conclusions equally well apply for Hubiits.

A key finding of Bolt and van Oordt's study is that virtual currencies exchange rates to fiat currencies increase proportionally to the volume of payments carried out with the virtual currency and inversely proportional to the fraction of the total amount of currency in circulation. In other words, the currency not held in speculative positions by investors. Thus with increased number of transactions the exchange rates are dominated by transactions rather than by speculative positions, a pattern that has been observed in seasoned virtual currencies. The analysis argues for long term price stability in token mediated economies such as the one of Hubii Network, which aims to primarily be a platform for exchange of content.

Core metrics describing the usage and long term trends of Hubiits will be displayed in a transparency dashboard implementation for the benefit of users, merchants and speculators alike. The beauty of using a native token on the Hubii Network is that we can demonstrate the extent to which Hubiits is used to mediate trade volume on our network. All token holders can use the Equation of Exchange along with this information to estimate a fair price level for the token. It is natural that a virtual currency can exhibit a speculative value, as fiat currencies also can, but market participants will be able to estimate the price level for below which there might be upwards market pressure.

---

[21]Bolt, Wilko and van Oordt, Maarten R.C.: On the Value of Virtual Currencies (September 23, 2016). De Nederlandsche Bank Working Paper No. 521.

[22]Brave Software: Basic Attention Token (BAT), Blockchain Based Digital Advertising (May 29, 2017)

We expect that until the market grows sufficiently for Hubiits to be primarily a medium of exchange (and not a speculative asset), we will have to explore ways of showing prices in a user's familiar currency of choice. As described above in 'Removing exchange rate risk', we will offer the facility for stakeholders to 'lock' their network activity to some fiat currencies. As we see, Bitcoin is still very volatile after 8 years (which is great for speculators). As such, we do not expect Hubiits volatility to be only short term.