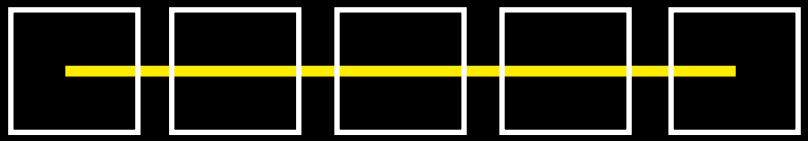
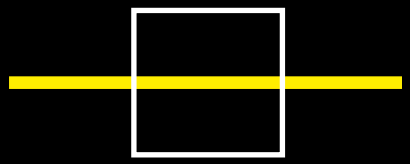
SEBASTIAN POSTH

What is Blockchain – Why and How Should the Content Industry Care?



RENODO

1. GENERAL PERSPECTIVE



Blockchain and cryptocurrencies trigger an explosion of innovation. The field is constantly evolving at a high pace. New projects are being launched almost every day. Developers and start-ups are moving into the field on a large scale. The number of blockchains, protocols, networks, platforms, software, tokens and other applications on decentralized networks is so large that it is hard to keep track. Doing research in the field of blockchain and cryptocurrencies will get you entirely lost. Consequently, at this point in time, detailed knowledge and expertise is rare in many industries. Mass adoption of this new technology and its applications is still a far-reaching goal. The number of active users of the most popular applications on the various networks is comparably low.

We are in the early days of distributed ledger technologies, where expectations are high but use and actual utility is low. But it is almost certain that blockchain and cryptocurrencies will have a major impact on literally every industry. Not only financial institutions and insurance companies already feel the pressure on their traditional business models. The logistics and transportation sector are actively investigating this technology and building pilot applications on the blockchain. Gaming and gambling

enterprises are seeing opportunities, while entertainment and media industries are starting to see risks. Even legal or governmental services on the blockchain are being discussed and promoted by institutions around the globe.

1.1
The promise of a revolution: from centralized to decentralized internet

Many blockchain projects promise a revolution: in e-commerce and customer relationships and methods of payment, in data protection and user account management, content ownership and rights management, in the distribution and supply of information, media content or any other kind of digital or physical goods, assets or properties. On the internet as we know it, most of these issues are considered to be commodities. This makes blockchain newbies or 'no-coiners' wonder why startups put so much effort into building the same applications on the blockchain that already exist and work sufficiently on the internet. What is it that makes blockchain applications so interesting and relevant?

In many ways, blockchain and cryptocurrencies will fundamentally change the way how many traditional businesses work and make money. The shift to blockchain and cryptocurrencies will be as significant as the shift that happened with the emergence of the internet. In a period of over 15 years trade went online and social interactions in the broadest sense have moved into the cloud. Most companies offer services or access to goods through applications on the web. But the business logic of centralized services and supply and demand on the web has led to an accumulation of power and control by a limited number of companies.

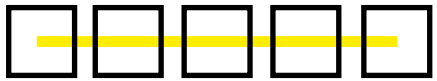
It seems all too obvious and legitimate that businesses need control; not only to perform their commercial activities, but also for legal reasons. With offering and running applications, connecting people or maintaining financial or other business transactions come legal responsibilities and obligations. Most businesses need to know their customers and have the power to exclude individuals from their services or refuse to offer them in the first place. Users, on the other hand, trust known and established brands with their money, data and privacy. In many cases they appreciate their services. In other cases they depend on them, like getting access to a bank account.

Considering the upsides and downsides of centralized services, their responsibilities and power reveal a rather delicate and fragile infrastructure. It is no coincidence that blockchain and distributed ledger technologies appear on the business landscape at a time when the flaws of the current centralized set-up are outnumbering its benefits. Evidence can be found by looking at the banking sector, e-commerce or social media platforms: trust is a value that does not stick, but has to be

earned and sustained in an iterating manner. And this is where blockchain comes into play.

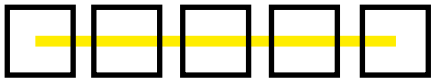
It is often said that blockchain can be considered as a new ‘layer of trust’, that is being added ‘on top’ of the internet. This is true in many ways. Just like the internet allows for the direct and immediate exchange of information and data, the blockchain allows for the direct and immediate exchange of value without a centralized and trusted third party or intermediaries. The term ‘value’ can be understood in the broadest sense: as money, property, licenses, engagement, time, labor, etc. Whereas the internet needed centralized and trusted institutions in order to ensure the integrity and legitimacy of transactions and the transfer of value and information, the blockchain networks might take over this role from now on.

In its most basic function the blockchain is a decentralized ledger of online transactions of value exchange. All transactions are being written in blocks that are being added to the chain. By permanently linking the blocks and distributing this chain of blocks to a large number of independent and distributed nodes, a blockchain network creates an immutable record of transactions of the past.



1.2
Different types of mining

The process of creating a new block and adding it to the chain is called mining or validating. This process is purposefully time and energy consuming, ensuring that the network converges on a consistent global view of its history and no value (e.g. money) will be transferred twice (double spending). There are many different concepts of mining or algorithms to reach a consensus on the legitimacy of a block. With proof-of-work mining, computers in the network are competing with each other by investing computational power in order to solve a cryptographic puzzle. In a proof-of-stake mining network participants can validate transactions by staking their wealth, deliberately including the risk of losing the stake in case of staking it on a block that is not accepted by the majority of nodes. The larger the network and the number of independent miners or validators, the more secure a blockchain will be. The ledger cannot be altered or forked, unless you spend more energy than 50% of the network or unless you are willing to risk your stake. In open and public blockchains the validation of transactions and the creation of blocks is always incentivised and compensated by receiving a reward or the transaction fee. This monetary incentive and the creation of coins and assets makes the aspect of cryptocurrency an essential part of the security model of the blockchain technology itself. An open blockchain without transaction fee's would not work. A blockchain has constrained resourses. If it would be open and without costs for everyone to utilize the resources, the blockchain could easily be congested and become useless. Blockchain networks can be understood as slow and expensive distributed databases, as many blockchains allow to include additional information or metadata in the blocks. They are very secure and not controlled by one system administrator or single organization.



1.3
Open blockchains

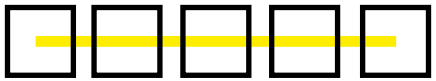
In general, blockchains are often being considered as open and decentralized networks without a single point of control. But in fact, there are various different types of blockchain protocols. Bitcoin is an archetypical open and decentralized network. ‘Open’ means that anyone can participate in the network, connect to it, read what has been written in the blocks and use it according to its protocol and specifications. All of this can be done regardless of the identity, credibility, location, social status or other categorical characteristics of the network participant. Open blockchains like Bitcoin are neutral and censorship-resistant, as formally valid content is routed without regard to the content itself, its source or destination. In many, if not most cases, open blockchains are being used to perform payment transactions or other means to exchange value peer-to-peer.

Companies can make use of these properties to build decentralized applications on the Bitcoin blockchain or other open and decentralized blockchain networks. Ethereum is another open and public blockchain network, that is explicitly designed as an internet service platform. It can facilitate business transactions but also handle more complex computational transactions on the Ethereum ‘world computer’. Ethereum has attracted hundreds of

startups and thousands of developers to make use of the protocol. A large amount of decentralized applications that are being launched are based on the Ethereum blockchain. According to stateofthedapps.com (as of November 2018) there are around 2.100 d'apps on the Ethereum blockchain, which are, in total, performing not more than 11.000 transactions per day.

Smart Contracts on the Ethereum blockchain allow decentralized applications to create their individual token systems for the transfer of value. Ethereum has drastically simplified the access to funding capital and innovative business opportunities. Transactions triggered by decentralized applications are settled on the native Ethereum blockchain, making use of the underlying security of the network and its existing infrastructure such as the global network, the broad distribution, the mining infrastructure and its financial incentives.

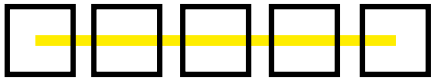
Usually these tokens are issued through an ICO (initial coin offering), sold for established cryptocurrencies or given away in other ways. It is worth noting that tokens created on the Ethereum blockchain are issued by one Smart Contract, which is controlled and established by one address (in most cases belonging to one person, group or organization) literally "printing money" of uncertain value when issuing the tokens. In contrast to the native ETH currency, these tokens cannot be mined and also do not contribute to the security of the underlying blockchain itself. Despite the fact that some tokens are being introduced as utility tokens, providing users with future access to a product or service, the fact that they are issued by defined (although not necessarily known) organizations, can make them be considered as securities, nonetheless. Financial authorities and regulators around the globe are having a close look at the various ICO's that are being performed, coming up with different regulatory and legal approaches. At this moment, the field is a grey area for businesses, launching a dApp via ICO, and a highly speculative field for users who are buying into these coins and tokens for other reasons than for their proposed use cases.



1.4
Private blockchains

Other types of blockchain are permissioned and private. With closed access, they are usually controlled and maintained by one or a definite number of centralized parties, companies or organizations. Private blockchains can be called an intranet of transactions. Their blocks are validated instead of being mined by the participants, which means that the validation does not require time and power consuming proof of work. Large and established corporations appreciate the advantages of private or permissioned blockchains. They supposedly offer immutability, recordability, audibility of transactions, e.g. in a logistics supply chain. On the other hand, private blockchains lack the key characteristics attributed to blockchain technology: being open, decentralized, neutral, borderless and censorship-resistant.

By restricting access to read or write on the blockchain, individual companies or a consortium of companies maintain control of the network. This can be a business or legal requirement. But it is - rightfully - often criticized that, from a technical perspective, it would be much more efficient and purposeful for projects using private blockchains to make use of cloud based and centralized databases and applications



2.
BLOCKCHAINS FOR THE MEDIA INDUSTRIES

Just like any other industry, media companies and organizations are looking into blockchain technology. But dealing with innovation can sometimes be difficult, especially when confronted with a fundamental and structural change - which is likely to happen in the context of decentralization. Sticking to familiar patterns and trusted models is a common way to respond and relate to new settings and challenges. It may not always be the best way to succeed.

To give an example: trade book publishing shifted to digital in various waves. When it was certain that e-books would stay for good, publishers considered e-books all too often as mere digital books. Accordingly, they converted the content of printed books to a digital format, sold the digital files via established retail partners and applied a similar financial model. Most publishers engaged in digital publishing only insofar that it would not hurt or cannibalize their established and existing business. A comparable way of dealing with innovation happened when news or films went online, moving a large portion of the industries' businesses from the offline world to digital.

2.1
The most likely first step

It is most likely that the adoption of blockchain technology and cryptocurrencies will first happen as skeuomorphic representations of already existing applications on the internet being rebuilt with blockchain and crypto-technology included. If we look at the current discourse and the applications that are primarily being discussed within the media industries, we will quickly realize that many of the offered solutions already exist as centralized services on the internet, but promising:

- More cost efficient micropayments and transaction settlement;
- Better copyright protection and support for DRM (Digital Rights Management);
- Optimization of distribution and other processes, like production, peer-review;
- Solutions for pre-sales, crowdfunding or otherwise raising funds.

In many cases, blockchain will improve existing products, solutions or services or streamline processes and financial transactions. Even critics of the current blockchain hype might change their mind when having a closer and unbiased look at where blockchain might be an improvement in comparison to what can be achieved without the new technology.

2.2
Blockchain as transformation driver for the book sector

But distributed ledger technology (DLT) offers a potential to enhance these existing solutions in a much more significant way. It is fair to assume that it will offer even more options and opportunities for the industries, evolve existing business as such and trigger the potential of innovative applications. Blockchain technology needs to be considered as a transformation of the playing field and the game itself, rather than just as a migration from one space to the other with already existing rules in play.

Publishers and other organizations in the media and creative industries should start thinking 'outside of their box' and explore the full potential of the new technology and evaluate the *native applications, products or services* on the blockchain within the following fields:

- De/centralization of distribution and trading infrastructure;
- Global, borderless, trustless and censorship resistant transactions;
- Universal distribution, leading to a universal discoverability of content and services;
- New and innovative models to access content;
- Emergence of new publishing opportunities, like new ways of bundling and curating content;

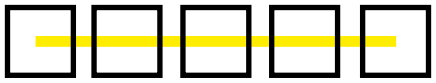
- Support for innovative payment models;
- Sovereignty of user data and privacy through a new account and identity management;
- Changes in customer, community as well as brand reputation management;
- New opportunities for innovative content marketing;
- New opportunities for data analytics and market research;
- Sophisticated rights and license management;
- Tokenization of assets;
- Reward programs or loyalty tokens;
- Innovative transactional models via non-fungible tokens or digital limited editions that offer digital goods with real digital scarcity.

2.3
Entering a new territory

By looking into blockchain and crypto-economics, publishers and other organizations in the media and creative industries have to reckon with everything, beyond the known and established business models, because blockchain technology will certainly offer them different ones by design - on new layers and levels, with new players and new participants.

Consequently, blockchain will confront publishers with new, inherent obstacles and questions: about identity and governance; about laws and regulations; about transactions and revenue models; about crypto-currencies and currency-conversions; about crypto-economics and financial incentives; about censorship and borders - and a lot of things they might have never thought of before. Media publishers need to be open, curious and informed about things they might be unfamiliar with at this point in time.

It is important to understand that most, if not all, possible use of, or business cases on the blockchain require an individual technical approach - or a different blockchain, a different currency, a different setup - that will serve the individual case best. There is not *one* case, *one* model, *one* blockchain or *one* currency that will fit all conceivable models. On the contrary, there are dozens of different chains and models, and thousands of currencies, serving their dedicated need and utility. And if there is a demand from the industry with no solution yet, publishers and other media companies can be sure that some start-up or initiative around the globe will provide them with the right tool or solution to serve their needs. And in some cases, it might just not be the issue or innovation that they have been expecting, seen from a current business perspective.

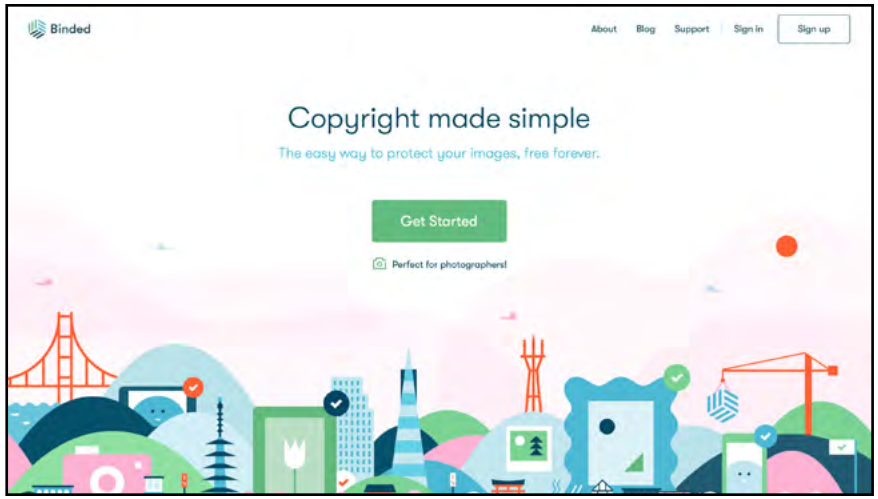


3.
SELECTION OF BLOCKCHAIN PROJECTS RELEVANT TO PUBLISHERS

The following short profiles are presented in alphabetical order and based on information, that is publicly available. The references to selected projects are for informational purposes only. They must not be understood as a recommendation or financial advice to invest, participate or otherwise engage into the mentioned projects. The focus of the projects might be subject to change over time.

Binded

- Binded is offering a service for timestamping content (with a focus on images).
- The project is utilizing the Bitcoin blockchain.

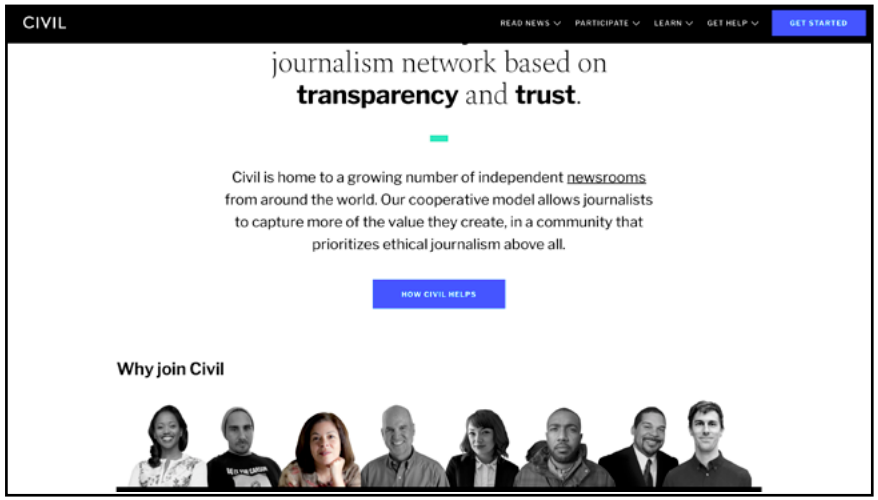


Chainprint

- Chainprint is offering a private blockchain infrastructure, based on Hyperledger, to manage the book production and printing processes.

Civil

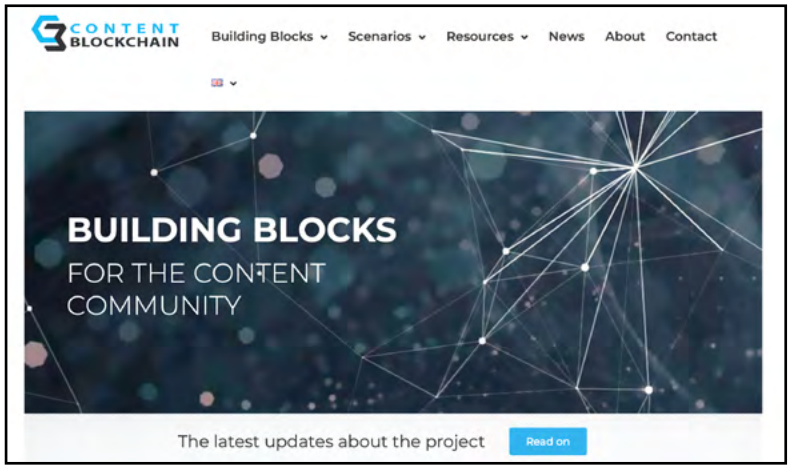
- Civil is a self-claimed decentralized marketplace for sustainable journalism. The platform is intended to support independent newsmakers and newsrooms.
- The CVL utility token is based on the Ethereum blockchain protocol.



Content Blockchain Project

Disclosure: The author is co-initiator of the Content Blockchain Project.

- The Content Blockchain Project was initiated in 2016 by a consortium of publishing, law and IT companies, based in Germany and the Netherlands. In 2016, the project received an initial funding from Google's Digital News Initiative to do research and development on the opportunities of blockchain technology and build the foundational technologies for the media industry.
- The Content Blockchain Project envisions an open and decentralized ecosystem, dedicated to content identification, content licensing and transactions on the blockchain. Its goal is to create a decentralized, global, digital infrastructure for the creative community to discover, register, navigate, offer, sell and license digital media content and otherwise exchange value over the network.

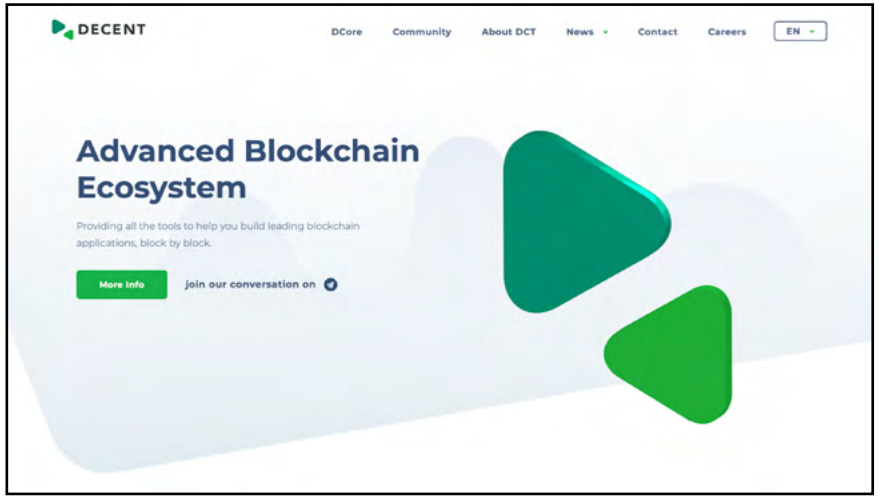


Crea

- The CREA network is a decentralized platform for the registration and distribution of content licenses.
- he blockchain can be used to certify content registrations, their tokens to rewards authors and curators for their work.

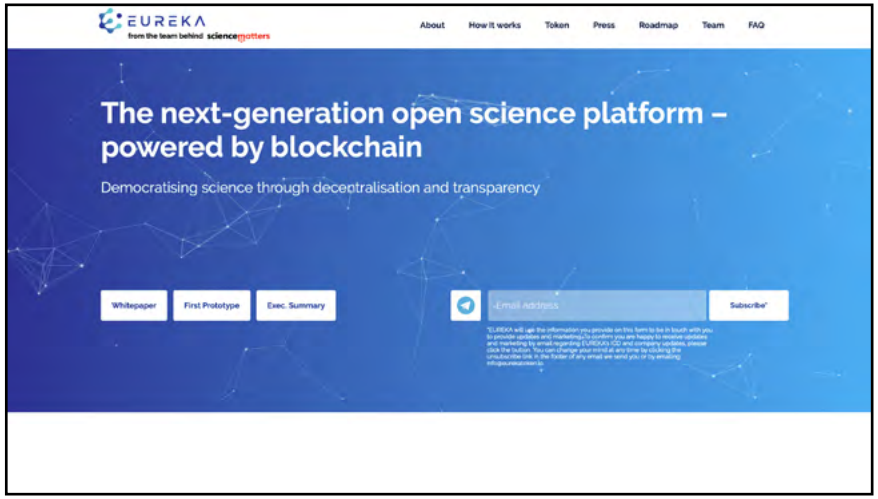
Decent.ch

- DECENT is offering a decentralized, open-source content distribution platform, called the DCore platform. It can be used to create or migrate applications into a blockchain environment.
- To validate transactions on their own network, DECENT uses a modified Proof of Stake (POS) consensus algorithm.



Eureka

- EUREKA is a platform to support open publishing, peer review and editorial assessment in academic publishing.
- It is supposed to support timestamping and the publication of granular content.
- EUREKA is using the Ethereum blockchain as its main infrastructure.

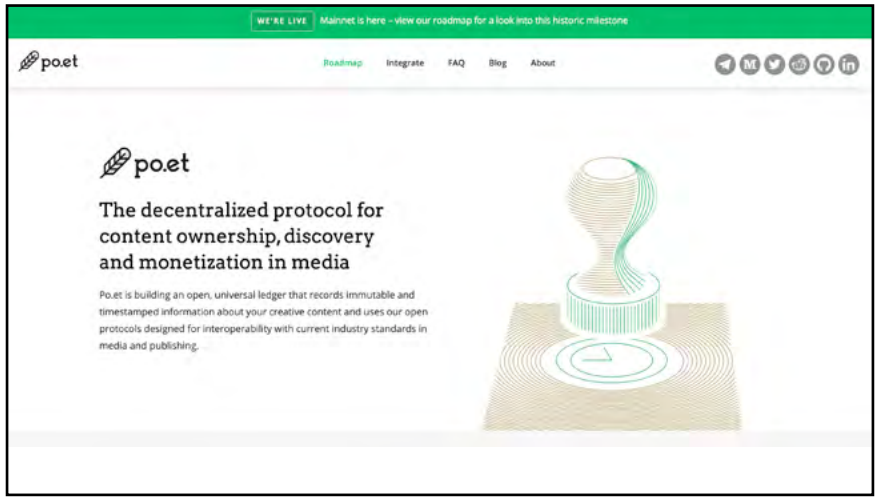


Narrative

- Narrative is a content platform where members and brands can create and curate content and share their stories.
- It is a social network where users, companies and brands are rewarded for their contributions.

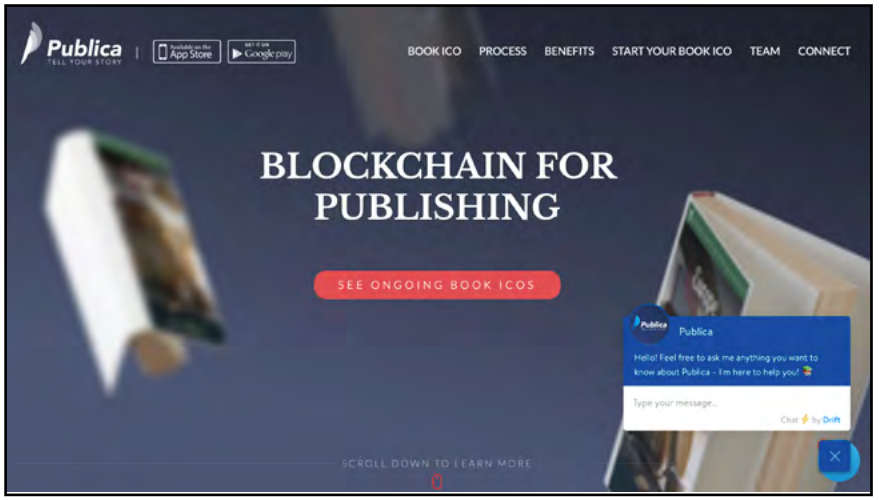
Po.et

- Po.et aims to create an open blockchain network in order to automate the content licensing process.
- The Po.et token is based on the Ethereum blockchain, utilizing the Bitcoin blockchain for certain functions like ‘proof of existence’ timestamping.



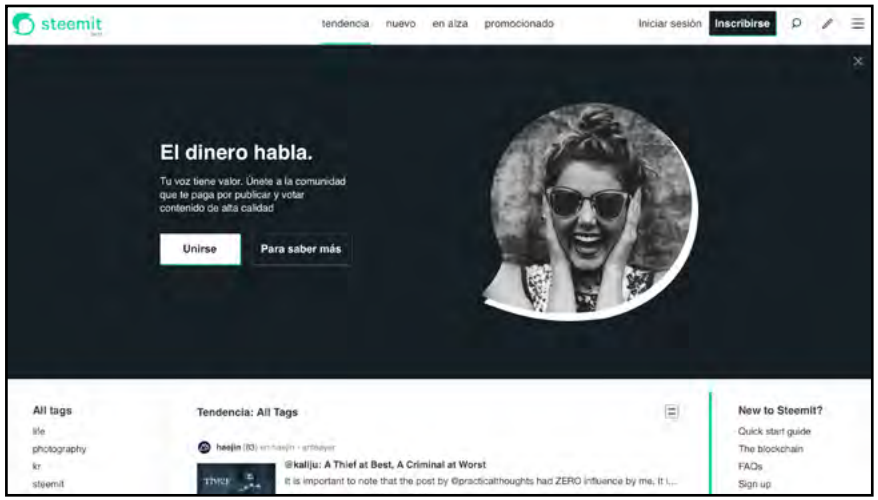
Publica

- Publica is a crowd-funding and distribution platform for self-publishers. Authors and publishers can create an individual book ICO that grants readers direct access to the content.
- The PBL token has been issued as smart contract on the Ethereum protocol.



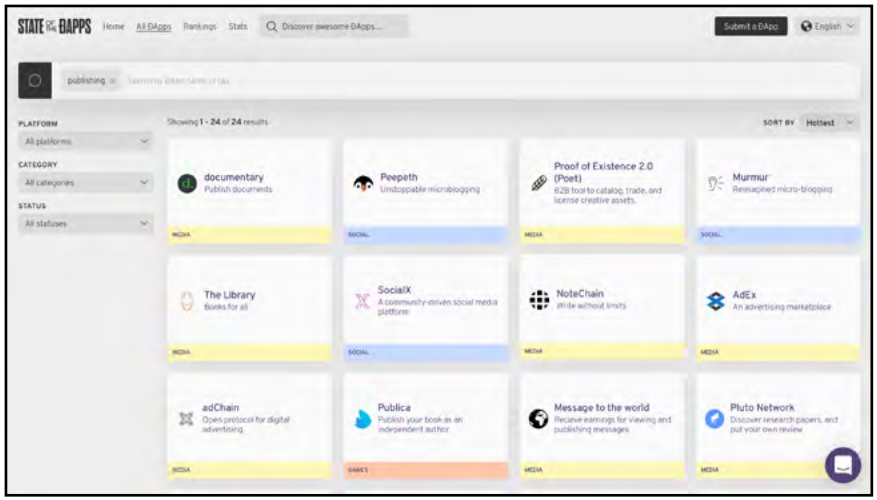
Steemit

- Steemit is a blockchain-based rewards platform for the creation and curation of content. It supports community building and social interactions on the platform by incentivizing users to create, rate and curate content by receiving token rewards.
- It is running on the steem blockchain utilizing the SMT (Smart Media Token) to simplify decentralized distribution and monetization of content.



Overview of d'Apps on the Ethereum Blockchain

https://www.stateofthedapps.com/dapps/tagged/publishing/tab/most-relevant



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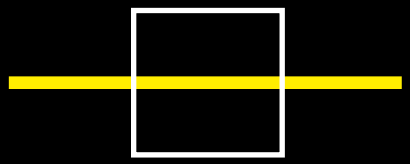
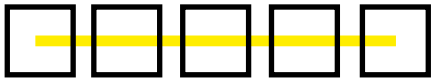
HOW TO GET INVOLVED?



Publishers and other media companies will continue to be confronted with new and innovative products, services, tools or apps that promise to revolutionize the business - or at least solve one or the other issue of current business. Yet how should they react? How can they oversee the continuous development of emerging applications and technology? How can they respond to the overwhelming development of the field?

Instead of reacting, this time they could get active. It is crucial to stay informed and evaluate blockchain or cryptocurrency projects in a critical manner. Just like most media companies have established a division for e-commerce, online sales and marketing, it is recommended to set up a working group in-house or give at least one person the time and freedom (and financial resources) to dive deep into blockchain technology and cryptocurrencies. Of course, it is also possible to reach out to the experts in the field for consulting services.



4.1
Evaluating the proposals

Apart from building up or hiring knowledge, a few simple steps enable to evaluate projects or start-ups that offer decentralized services, tools or apps on the blockchain. Reading the project's whitepapers is the first and most important step. Whitepapers are written to inform technical and non-technical readers as well as possible adopters coherently and comprehensively about the projects goals, the used technology and its inherent business logics. In case projects are introducing a dedicated utility coin, looking at the token issuer and the issuance scheme will quickly reveal the commercial incentives of the projects.

Furthermore, investigating who is involved in the project by looking at the founder cv, that of their team and possible advisor's resumes as well as track records in the respective field of operation, will tell media companies about the accomplishments of the project members in serving the bespoke needs of the industry.

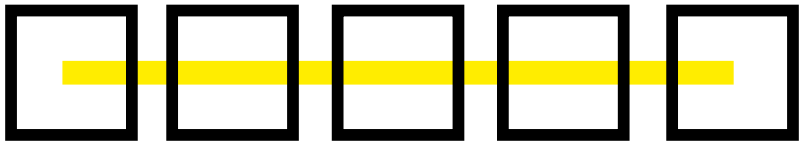
The blockchain community has established a way of being attainable. It should be easy for anyone to reach out to the management or developer team through email, LinkedIn or social media. Having a look at the Github repositories will inform about the activity level of the project, the

engagement and contributions of internal or external developers. The Twitter feeds or Telegram group chats - common in the field - will reveal whether the project marketing and user communication is in line with what users expect and appreciate. The reputation of a project within the blockchain or crypto-community can be evaluated through comments on social media platforms like Reddit. Moreover, there are dozens of websites that help companies find out whether a project is offering a reliable service and trustworthy business model, or whether it is most likely a product with the intention to scam the users.

Is the project really decentralized? This is one of the crucial questions to be asked in order to make sure that a decentralized solution or dapp really lives up to its promised standards. After any review process it should be clear what motivation drives the development of the project and how value is gained and distributed in the long-term, what is being promised and whether it is worth the engagement.

As important as the evaluation of possible new services and partners, is specifying the critical issues of the current business. Surely, the first question to ask is whether one needs a blockchain solution at all. Companies will find several decision models on the internet that will help them to ask the right questions on whether blockchain can improve a current business set-up, and if so, what blockchain technology or project to look at.

Last but not least: blockchain is too complex to understand on a theoretical level only. A good way to get a more detailed understanding of the technology and its implications is to experiment with the services, tools and solutions and to build pilots and prototypes.



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Actividad subvencionada por el Ministerio de Educación, Cultura y Deporte