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Blockchain and the Creative Economy

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Abstract

One of the pillars of creative economy is copyright, whose design was based on the scarcity of physical goods. With digitization and the internet, this economy was shaken and artists lost control over the circulation of their creations. The blockchain technology and the possibility of conducting transactions without intermediations provide creative economy and artists with new organization possibilities capable of offering creators solutions that allow them to regain control over their works and make their remuneration more transparent.

1. Introduction

The development of creative economy is closely linked to the emergence of intermediaries, who facilitate both the connection between creators and audience, and the distribution of the works, which can be verified throughout history. In the XVth century, for example, after Gutenberg invented movable types, an early editing industry gained momentum after those who printed books realized their potential gains and started to compete for copy sales (BRANCO, 2007).

It can be argued that this intermediation was crucial for these industries to gain scale. However, it ended up hurting, in part, creators' interests, as these collected an increasingly smaller share of the gains. Moreover, by acting as a gateway to the marketplace, intermediaries came to hold a great deal of power over artists' success. To reach a large audience, the latter had to produce content that would fit the formers' taste.

The internet and digitization promised liberation, which have only partially materialized. Indeed, there was a significant reduction in production and distribution costs, and an enhancement of public access to content. These benefits came with a high cost, though: loss of control over the work. By facilitating the replication of a file that preserves original quality, it has allowed the production of an infinite number of copies, many of which artists do not authorize or are not even aware of. The proliferation of illegal copies has shaken the creative industry, especially music, which was one of the first to experience the effects of content sharing, through Napster.

New business models then emerged to try to recreate the scarcity of physical artistic goods in the digital world, or at least minimize this unbridled reproducibility. Creators' complaints about losing control over their works and collecting an ever-smaller share

of the proceeds persisted or increased. Criticism about the lack of transparency in the distribution of proceeds also entered the agenda (TARAN, 2015). Relations within the artistic chain were reconfigured just to accommodate new intermediaries who could add content to the digital environment and make users' life easier, more convenient.

The blockchain technology emerged holding out a new promise of freedom. Its ability to allow transactions with no intermediation between parties unknown to each other can make this industry more transparent by clarifying and automating the distribution of proceeds. Some of the control over the works that had been lost can be returned to artists by making them autonomous and, therefore, repositioning them as the core of the creative industry.

This article analyzes problems facing artists in the framework of creative economy and alternatives provided by the blockchain technology. For this purpose, our methodology is literature review plus case studies of three platforms using blockchain and focusing creative content.

2. The blockchain technology

Blockchain was the name given to the technology that made Bitcoin possible and solved the problems of double spending (spending the same coin twice) and Byzantine Generals (establishment of consensus among people who do not trust one another), which hitherto hampered the development of a digital currency (ALEIXO; AGNER; ESTEVÃO, 2017).

It consists of a data registry stored in blocks linked together to form an immutable chain. This linkage is achieved by hashing the blocks, a cryptographic function that works as a unique identifier. By a process known as merkle tree, information on the transactions that will be stored in a block are hashed together to create a single hash, the merkle root. The block's hash is created based on this root, on a random number called nonce, on a block timestamp (date and time of creation), and on the previous block's hash (NAKAMOTO, 2008).

The new blocks are created by mining. Each mining node validates the last transactions received and tries to solve the proof of work, that is, to propose a block whose hash fits the difficulty established by the network. The mining nodes try incessantly until they can solve this proof and create a block with this hash, something that takes energy, time, and processing power. When a mining node solves the work proof, the block is created and transmitted to the other network nodes. In

case it is accepted, the miner receives a reward in bitcoins and the network starts to work on the next block (NAKAMOTO, 2008).

A blockchain is a decentralized peer-to-peer (P2P) network, as the chain of blocks is stored by the various nodes that make up the network and there is no hierarchical relationship whatsoever between them. This feature helps minimize costs and enhances the network resilience, as there is no single point of vulnerability. Asymmetric cryptographic keys are used to further enhance its safety: a public key, which can be disclosed for transfers to be made to that recipient, and a private key, which is secret and allows only that recipient to access values associated with that address.

Today there are other blockchain networks, such as Ethereum, and each consists of a different protocol, but all work in a very similar way to the one described above, with only a few variations.

Some consider blockchain a foundation technology, as it can deeply change online relationships, so much so that it is often compared to TCP/IP, information transmission protocols that were the basis for the Internet. It is a value transmission protocol that creates a decentralized, immutable, transparent, and secure information registry. Decentralized because it is distributed among several nodes between which there is no hierarchy. Immutable because, once registered, transactions cannot be reversed. Transparent because anyone can access all the information already available in the blockchain. Secure because the use of cryptographic processes and the way blocks are linked together virtually make fraud or attack impossible.

3. The creative economy context

Obtaining financial gains from an artistic work is justified by copyright, which, it is worth noting, arose from the attempt to reconcile intermediaries' economic interests (NETTO, 1998 apud BRANCO, 2007, p.16)[2]. After Gutenberg's invention, publishers started negotiating exclusivity rights over published works to avoid unfair competition, as the first edition required high investments. Over time, States legally recognized copyrights and the Bern Convention established in 1886 international principles based on which signatory countries would deal with this issue.

2 BRANCO, S. *Direitos autorais na internet e o uso de obras alheias*. Rio de Janeiro: Editora Lumen Juris, 2007.

We might say that copyright establishes a monopoly of economic exploitation of a work during a certain period of time (BRANCO, 2007). This monopoly worked quite well until a few decades ago, as the relevant legislation is based on controlling circulation and access to physical copies, such as books, CDs or DVDs, which had high production and distribution costs. Unauthorized copies were costly and of a lower quality. This represents a commodity economy, in which the work is associated with an objective and monetary value given in exchange for access (JENKINS; FORD; GREEN, 2013). In this context, intermediaries - major publishers, record labels, and distributors - ended up holding most of the proceeds, leaving a small proportion to artists. The Internet and digitization have shaken this model.

The transformation of artistic works into bits of binary information reduced reproduction and distribution costs and preserved their original quality. As forwarding a file to someone else does not necessarily imply losing it, the scarcity on which copyright was based disappeared, and the internet was flooded with unauthorized copies of different works. The unidirectional nature of the Internet links makes it very easy to appropriate a work without giving due credit or even to take credit for somebody else's work.

Reduced production costs were also a factor that led people to stop being passive consumers and start producing more content. Boundaries between creators and their audience grew increasingly tenuous, giving rise to a participatory culture in which consumers also produce. One of the most common examples of this culture are fanfics, works of fiction created from existing universes and characters, with a few changes, such as a number of films based on the Star Wars universe. It is a mistake to think that this phenomenon is limited to a niche of fanatics, as there is a wide range of content producers all over the internet whose publications range from unofficial profiles on social media that give voice to fictional characters to (both sponsored and spontaneous) videos advertising a brand and memes.

This content sharing economy usually violates copyright law by using creations without authors' permission. Creators sometimes even try to comply with the legislation and ask for permission, but information on right holders is hard to find, as it is scattered and not always up to date or correct. When this stage is overcome, licensing or assignment rules are very stringent and usually establish exorbitant payments. Let us point out that copyright legislation has not yet adapted to the reality of the internet and digitization. There is a mismatch between copyright and society's daily life, as people often do not even know they are violating these rights by sharing an image or text on social media, for example.

Business models designed to circumvent this indiscriminate use of artistic works -such as iTunes, Netflix, or Spotify- only increased the number of intermediaries with whom to share the proceeds, and artists' pay further decreased. The amount Spotify paid by stream to record labels in 2017 was U$0.00397 (THE TRICHORDIST, 2017), of which an average of 26% goes to artists (DREDGE, 2015). These players' lack of transparency, who do not usually share the data on work consumption and therefore distribute revenues without allowing artists to verify whether the correct amount is paid, only increased discontent among these latter.

This context paved the way for the blossoming of a gift economy, which establishes a kind of not necessarily financial commitment between the parties. The name *gift* is a reference to giving someone something and expecting something in return, be it a gesture of affection or any other form of appreciation. Art works take on subjective value and the compensation depends on consumer's appreciation for the work. In the context of this online sharing economy, those who like a work usually compensate in order to broaden its reach and encourage the artist to continue working. Artists also started to create different ways of making their creations possible and disseminating them by developing a closer relationship with fans. It is a mistake to believe that these changes only involved independent artists. The famous band Radiohead, for example, made their album available for download using the pay-what-you-want strategy. Many fans still bought the CD later on, thus showing their admiration for the band and their work (JENKINS; FORD; GREEN, 2013).

4. Blockchain and the creative economy

In this creative context of new ways of making artistic works possible and establishing closer relations with the general public, blockchain proves a technology capable of transforming this cultural scene and allowing the creation of new business models that offer solutions to artists' complaints.

Because it is a database of immutable records, blockchain allows authors to register a file's hash, thus creating a permanent association between them and the work, something that would frustrate any attempts at committing authorship fraud and may serve as future legal evidence (COALA, 2016). An additional advantage is that this record is ease to create, as it does not require any bureaucratic steps. It should be stressed, however, that authorial disputes would not disappear, since someone other than an author could register the work in the blockchain before him/her, for example. Information about a work, including its

ownership history, rights holder, and year of creation, may also be associated with the work register and remain accessible and aggregated.

The main change, however, concerns work commercialization. By dispensing with intermediaries -such as banks or credit card companies- in transactions, blockchain allows artists to sell their works directly to consumers and retain 100% of the proceeds. Artists can display their work on a blockchain-based platform and allow public access upon payment of an amount in crypto-coins. As transaction costs are zero or close to zero, the network makes micropayments possible, allowing artists to charge very little for access and fans to make small donations. When someone conducts this transaction to access the work, the amount is directly transferred to the artist, without going through any banking intermediary, not even through the platform. In addition, smart contracts allow artists to determine how proceeds from each transaction are to be distributed, and can directly remunerate one or more associates with a percentage of the amount. In this scenario, even when platforms keeps a portion of the proceeds, the distribution thereof will be more transparent, as transactions are broken down by work.

Smart contracts are so called because they are self-executing, as they translate contractual conditions into a programming language. These contracts are written in blockchain blocks and condition certain results to the fulfillment of a number of conditions. The automation of licenses and assignments allows a customization that serves different purposes and needs of both artists and consumers. It is also possible to create contract models similar to CreativeCommons licenses, but with remuneration. Moreover, smart contracts can be a part of crowdfunding projects, automating rewards or offering gains linked to the performance of the work, which would turn those who contribute into investors (DE FILIPPI, 2015).

These uses of the blockchain technology may look like a distant reality, and, in part, they are indeed. This technology still requires improvement that would allow greater scalability as well as popularization. Widespread adoption by both artists and consumers depends on enhanced knowledge about this technology and regulatory changes to deal with these innovations. However, a number of applications and people are already using them. The best-known example is perhaps the British singer Imogen Heap's, who released the song "Tiny Human" for download through a blockchain platform called Ujo (BARLETT, 2015).

This way, using blockchain technology, artists can regain control over and increase proceeds from their own work. Those who use third-party works in their

creations can request license authorizations more easily as well as monetize their own creations. Therefore, blockchain has the potential to enable or facilitate new models of remuneration through copyright. It should be noted, however, that the use of blockchain technology would not solve all problems. Some of these, such as the percentage of proceeds record labels retain or restrictions on sharing on the Internet, are more closely linked with the current conception of copyright, largely based on XIXth century thinking.

5. The platforms

This section presents a few platforms that use blockchain technology and are geared towards creative economy. This aims at providing a more tangible vision of its use and operation in the cultural sphere. Rather than an exhaustive list, these are only a few models, case studies capable of providing different examples.

As the platforms are presented based on their business models, it is adequate to briefly explain these latter's purpose and mechanisms. A business model is the representation of a firm's revenue logic, the way it sells and purchases goods and services (OSTRWALDER, 2004). The model adopted here includes nine elements:

(i) value proposition: products and services that generate some benefits for clients;

(ii) customer segment: consumer groups to whom companies offer value;

(iii) channels: means by which companies communicate with consumers;

(iv) customer relations: type of relationship established with consumers;

(v) key activities: most important actions to deliver value;

(vi) main resources: most important resources allowing companies to deliver value to consumers;

(vii) key partnerships: key suppliers and partners for the model's operation;

(viii) cost structure: costs involved in the model's operation;

(ix) revenue sources: ways through which companies generates revenue.

5.1 LBRY App[3]

LBRYApp was born in 2015 and aims to be a repository of all kinds of content, both written and audiovisual. It was created by LBRY Inc. and operates using its own protocol, called LBRY, its own blockchain, LBRY Blockchain, and a P2P network, LBRYNet, which hosts content in a distributed way.

Its differential is the treatment given to content names. Each work published on the network is associated with a unique name obtained through an auction. This process is registered to the blockchain, along with content metadata and all transactions. Authors may choose to publish free access content or they can charge an amount for the access, as well as choose whether to publish anonymously or otherwise. Another difference is that the payment is made directly to the author, who collects 100% of the proceeds. Transactions are made using the value token of the platform, LBCs, which can be obtained in a variety of ways, such as rewards to early users, used as incentives for network growth, or rewards for block mining.

LBRY Inc.'s business model is described below. The company's source of revenue and profit is the value token itself. The number of LBCs issued is limited by the code to 1 billion, but this issuance will be made over time, in a deflationary process, by mining. The first block, usually called genesis block, created 400 million LBCs, keeping 100 million to the company.

Another LBRY Inc.'s value proposition is offering free access and content publication, which enhances user autonomy relative as far as published works are concerned. No mention is made to moderation, but the company claims that published contents are subject to the rules of the Digital Millennium Copyright Act (DMCA), which governs copyright in the United States. A notification of illegal content on the platform may lead the company to block it on the app, but LBRY Inc. points out that metadata will still be registered to the blockchain.

3 Information obtained on the site <https://lbry.io/>

MAIN PARTNERSHIPS	KEY ACTIVITIES	VALUE PROPOSITION	CUSTOMER RELATIONSHIP	CUSTOMER SEGMENT
Organizations with similar interests (EFF and ACLU, for example Content producers LBRY-C (admirer and developer community)	Software and app development Dissemination of the protocol used to widen user network **Main resources** LBRY App LBRY Blockchain LBRY Protocolo LBRY Net LBC Credits	Digital library User-controlled decentralized network Freedom of access and content publishing 100% of revenue to creators Transparent information on content consumption	Customization Enhanced user control over the plataform Initial incentives (LBCs) to first users **Channels** LBRY App LBRY Site, Twitter, Facebook, GitHub, Discord, Reddit, and Telegram	Creative content producers (bloggers, vloggers, writers, musicians, etc.) Creative content consumers

COST STRUCTURE	REVENUE SOURCES
Operating costs Software development	LBC credits Today holds 93.900.000 LBCs Code established 10% total LBCs to LBRY Inc. to generate profit and cover costs

It is worth noting that LBRY is a protocol, that is, a set of rules that allows interaction between two computational systems. LBRY Inc. is responsible for creating, but encourages developers to use the protocol in new applications to make it a universal language in content commercialization. The LBRY App would thus be just a platform that uses it as its basis. The LBRY Blockchain is independent and, in case LBRY Inc. would cease to operate, it would still work.

5.2 imusify[4]

The imusify platform proposition is to be a unique environment for music business: to publish and sell music, fund works, disseminate news, foster networking and be a discussion forum.

Each registered person receives a unique identification, to which different people are associated according to how they will use the platform: consumer persona, artist persona, collaborating persona (executive, producer, etc.) or venue persona (performance spaces, for example). Each content or project that is created also receives a unique ID, associated with data such as rights holders and user who uploaded it. Musicians are paid

4 Information obtained on the site <https://imusify.com/> and whitepaper.

by stream, remuneration that is automatically distributed among those who hold rights over that work. Imusify also allows crowdfunding for albums, videos and tours. All this information and all actions taken by users are recorded onto the blockchain using hashes.

Imusify pays special attention to the issue of copyright and licenses. On the one hand, the payment is made directly to copyright holders according to percentages established by the person who uploaded the work. On the other hand, the platform provides for the creation of tools for managing rights and licenses within the platform itself, which would facilitate contracting and authorizing the use of a song in a movie, for example.

MAIN PARTNERSHIPS

Content producers

allcoinWiki, Crypto Valley, Blueprint, Mad Ruk, Legion of Creatives, Trapcity, and Rondo

NEO blockchain

KEY ACTIVITIES

Software development

Main resources

Imusify platform

IMU tokens

VALUE PROPOSITION

Transparent information on content consumption

Automatic and transparent royalty payment

Licenses and rights management

Single platform for music economy: crowdfunding, streaming, media and social media sharing

CUSTOMER RELATIONSHIP

Customization

Enhanced user control over the platform

Channels

Imusify platform

imusify Medium, Telegram, Discord, Reddit, Facebook, GitHub, Twitter, and Instagram

CUSTOMER SEGMENT

Musical content creators (artists, producers, and executives)

Musical content consumers

Crypto community

Music influencers

COST STRUCTURE

Operating costs
Software development

REVENUE SOURCES

LBC credits
Today holds 93.900.000 LBCs
Code established 10% total LBCs to LBRY Inc. to generate profit and cover costs

The platform has its own value token for transactions, the IMU, but uses an existing blockchain to record information, the NEO blockchain. To verify the blocks that are created, it uses the proof of concept, an alternative to the Bitcoin work test algorithm, and the platform's code is open source. The company's revenue source is the sale of 50% of the tokens issued in an Initial Coin Offering - ICO. IMUs are utilitarians. As such, they serve only as currency within the platform and do not give their owners any rights to proceeds.

5.3 Viuly[5]

Viuly is a platform devoted to publishing videos and aiming at remunerating both creators and consumers. It is based on the Ethereum blockchain and has its own value token, the VIU, whose issuance was limited to 1 billion. Simply put, all actions are registered onto the blockchain, which enhances transparency and allows auditing by users or third parties, whereas content is hosted in a distributed way by a P2P network that uses a protocol fit for this purpose, IPFS (InterPlanetary File System).

Creators publish a video and may choose to charge a fee for access and collect 90% of the proceeds or allow free access and show 30 second ads or not. If they choose not to show ads, the video page will display a button allowing you to donate to authors. If authors choose to show ads, they get 65% of the advertiser-determined cost value, whereas 25% goes to consumers. In the cases above, except for donation, the platform charges a 10% fee on the amount.

Viuly aims to increase creators' proceeds by encouraging them to develop higher quality content, to compensate users for the attention they paid to ads, and to optimize advertisers' spending by avoiding click fraud and offering a more guaranteed way to reach the target audience. The platform chose to hold an ICO to raise funds.

MAIN PARTNERSHIPS	KEY ACTIVITIES	VALUE PROPOSITION	CUSTOMER RELATIONSHIP	CUSTOMER SEGMENT
Advertisers	Software development	Allocating a higher percentage of proceeds to creators	Customization	On-line advertisers
Content producers		Remunerating user attention	Enhanced user control over the platform	Content creators (vloggers)
Ethereum blockchain	**Main resources**	Optimizing add visualisation (cutting costs and avoiding fraud)	**Channels**	Content consumers
	Viuly platform	Transparent information on content consumption	Plataforma Viuly	
	VIU tokens		Viuly Twitter, Telegram, Medium, Reddit, Facebook, and Bitcointalk	

COST STRUCTURE	REVENUE SOURCES
Operating costs Software development	VIU tokens (55% ICO) 10% tokens allocated to a development fund Transaction fee

5 Information obtained on the site <https://viuly.com/> and whitepaper.

5.4 Considerations on the platforms presented

A comparison between the three platforms points to a few common aspects besides using blockchain technology. First, the concern about transparency, as shown by the importance attached to the auditability of recorded information, mainly value transactions, and by the use of open source by two platforms.

The use of distributed networks to store content gives users greater control over the network and decreases platform responsibility over what is disseminated, as it hinders blocking or deleting content. The very participation as network nodes, even if not miners, enhances the role of user control in checking blockchain transactions.

Company funding is also strongly linked to the value token itself, which suggests that financial health and increased earning possibilities are closely linked with an increase in the number of users and the resulting appreciation of tokens. Their key activities and cost structure are also very similar, focusing on software development but including other aspects, such as application marketing.

Finally, a wide range of communication channels serves as a means to clarify doubts about technical features and promote platforms, blockchain technology, solutions offered to authors' problems, and transparency through code dissemination. These channels are used to reach the crypto community -which is more in tune with technological advances and enthusiast about many of these platforms- as well as the artistic and content-producing community.

There are, however, crucial differences as to their strategies and the ways they address specific problems. Viuly focuses on videos and tries to turn ad dissemination into something more positive for both creators, who now collect a higher percentage of proceeds, and users, who are paid for watching commercials. Advertisers also benefit from this, as costs are minimized and used more effectively. The company used an existing blockchain, the Ethereum, for its development.

The imusify platform is devoted to music, but with a broader view of the actions it supports in order to meet all the music market demands. It focuses on the treatment of rights and licenses, by automating the remuneration of all those who contributed to the creation of a work or who hold rights over it, in addition to formatting tools to facilitate the management of use authorizations. Like Viuly, imusify also uses an existing blockchain, NEO.

LBRY, on the other hand, creates all its basic technology, from blockchain to protocol, and aspires to universal adoption through the use of its technological base for several other applications. The platform does not focus on any particular media, and creator's full compensation is its strength.

6. Conclusion

So that authors could be financially compensated for their creations, the law granted them a temporary monopoly on the economic exploitation of their works. This formal construction took place in the XIXth century, with the Bern Convention, and was based on control over the physical copies of the works; until then, this was how these circulated in society. With the internet and digitization, the works became a set of easily reproducible bits, which reduced the costs of production and distribution, expanding access. Other intermediaries emerged, but artists' complaints persisted or increased –collecting a small share of the proceeds, lack of transparency in revenue distribution, and loss of control over their work.

The blockchain technology elicits a transformation in the way relations between the different players in the creative economy develop. As an immutable and public record, it provides transparency in value transactions, bringing clarity to the distribution of proceeds and allowing increased control over the work. In the context of gift economy, artists themselves have created alternatives to the traditional model of remuneration for copyright when they sought solutions to their problems. The blockchain technology is, therefore, a tool capable of further fostering such creativity and enabling new business models that can address creators' problems and offer different options regarding remuneration and copyright management (licenses and assignments).

Solutions for some of artists' ailments are presented, and it is once again possible for them to hold more power in the cultural industry. Other problems, however, are rather related to current legislation and power asymmetries in trade negotiations.

Relations between consumers and creators are disintermediated insofar as transactions between them take place directly and creators manage directly the use of their works. It should be noted, however, that platforms that enable the creation of networks are new intermediaries, sometimes keeping part of transaction proceeds for themselves; after all, they are responsible for providing the technology and develop the interface that offers the space where creators and consumers meet.

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