A Review: Blockchain for paper publishing

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ABSTRACT

The traditional methodology of publishing a research paper in the reputed publication industries has proved to be unpromising due to the various aspects. The outdatedness, costliness, and the lack of flexibility in the legacy systems demand to switch to decentralized ways. We are achieving this through blockchain technology which is widely known for its decentralized and immutable nature that indirectly maintains integrity, accountability, and confidentiality of the systems. Hence the blockchain is thoroughly responsible for demolishing the demerits of the traditional system. This paper presents a comprehensive survey of publishing, peer-reviewing, and also the profit-making ways to the author and the system simultaneously. Our long-term goal is to bring more transparency and profitability by introducing papercoins into the system to exchange papers between peers in the blockchain network. And hence, it will indirectly help in shifting the massive mob of researchers to this new reformative path, thus strengthening the blockchain applications.

Keywords— Blockchain, decentralization, transparency

I. INTRODUCTION

Writing research articles that get published in international peer-reviewed journals is not a new phenomenon, but a process that developed over several hundred years. The first journals came into existence in the 17th century in France, and Britain, to facilitate knowledge exchange among academics. The first peer-reviewed journal followed in the early 18th century, and by the end of this century, almost 500 peer-reviewed journals have been found. The journal paper boom first started in the mid-20th century, and in many disciplines and subjects, journals became the standard for publishing research. Since then, the writing and publishing activity has gained a lot of attraction. Surprisingly, this has led to a situation that feels as the number of papers being, published so far exceeds the researcher's and society's capacity to consume them. And hence, it led to a lot of criticism from within and outside of academia. The main culprits behind this were the presence of various loopholes in the traditional system. It included the lengthy and slow process, lack of transparency, threat of duplicity, presence of irrelevant content, money charges required for reviewing the research paper. Nobody tried to bring any change in this broken system as this was the only way to publish any type of research work and get recognition and fame for their work or invention or discovery.

Paperchain will help in resolving the issues in the traditional system by making use of blockchain technology. It removes the presence of a middleman that generally hampers the whole process by taking central control. Blockchain was first introduced in 2008 and implemented as the infrastructure of Bitcoin in 2009 by Satoshi Nakamoto, an unknown person or a group[1]. Blockchain is essentially a "distributed ledger or database" where all the transactions are documented regarding all the participating parties. The Blockchain-based technology runs on a peer-to-peer network, as shown in Figure 2, where a centralized trusted third party is not needed for managing the transactions. As issues such as double-spending are mitigated through consensus of miners, this system does not require an intermediary, that is, a centralized trusted third party, as shown in Figure 2 [2].
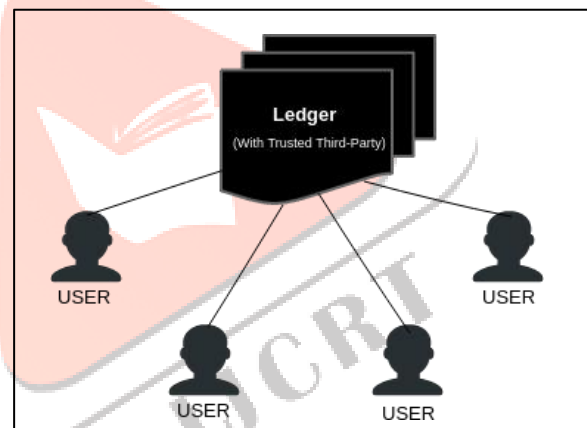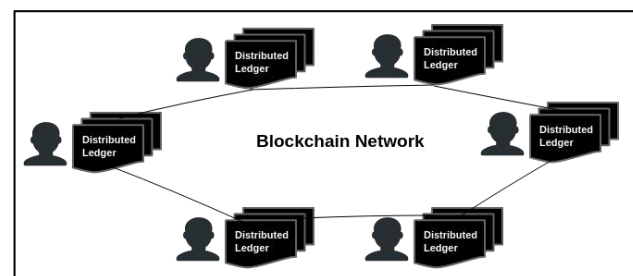

Fig: 01 (Ledger in centralized architecture)

Fig: 02 (Ledger in decentralized architecture)

In our proposed Paperchain system, the author will upload the research paper and, it will get published if it successfully passes the following checks. Miners are responsible for carrying out these checks and, they are listed below:

1. Plagiarism check
2. Citation error if any
3. Check for the standard format

This concept is similar to a bitcoin transaction where miners are supposed to solve the proof-of-work algorithm within 10 minutes using an enormous amount of computation power to make a valid transaction. Paperchain will let the author decide whether to keep it paid or free of cost before publishing the research paper. If someone wants to read or download the paid-paper in the paperchain then he/she has to purchase the research paper by exchanging tokens or Initial Coin Offering(ICO). These ICO are also known as papercoins in our system. Papercoin is like a currency(token) that is offered to publishers and reviewers as a reward. All the transaction-related work is going to happen with papercoin. Initially, when a user has to exchange their currency with papercoin they can use that to buy papercoin from anyone who is having it.

Our system thereby makes a fair treatment with all the researchers and the reviewers around the globe because of the papercoin mechanism. This proposed system drastically deviates the main control from the publishing industry to the authors and reviewers thereby elevating blockchain applications and cybersecurity.

II. LITERATURE SURVEY

[3] MUSICOIN: A decentralized platform revolutionizing: creation, distribution and consumption of music. Musicoin is a decentralized platform that leverages the power of blockchain technology in empowering musicians to take full ownership of their content and finances. This platform is built on a transparent Peer-to-Peer network powered by programmable smart contracts to enable fair remuneration for all musical content and services. In recent years, the recording music industry has seen a considerable boom in revenue due to rising digital sales. IFPI (International Federation of the Phonographic Industry) reported an industry growth of 5.9% in revenue in 2016, the fastest rate of growth since 1997. Streaming has become the most prevalent form of music consumption in the modern music industry, fueling growth in almost all major markets and beginning to unlock the phenomenal potential within developing territories. The streaming companies have free-streaming tiers to promote platform adoption. Free streaming encourages growth in user-base and advertisements generate revenue. Deezer amassed 7 million users within its first two years [4] and Pandora earns as much as 88% of its revenue from ads alone

[5] However, despite massive growth, their 10 business model is unsustainable. After its first year of service, Spotify doubled its loss from $2.2 million to $4.4 million USD [6]. Pandora saw negative operating leverage during its first two years after a switch of service to music streaming [7]; and SoundCloud is criticized as a company of material uncertainty because it is heavily reliant on capital investments to operate[8].

One of the reasons behind their unsustainable business model is the rising content acquisition costs. They are highly variable, and are mainly associated with the type of content and licensing agreements with record labels[9]. In 2015, the amount that Spotify had to pay for royalties and distribution fees climbed by 85%, to about $1.8 billion USD. In other words, expenses grew more than revenues did[10]. To put this into perspective, of every dollar that Spotify brings in the door in revenues, about 85 cents goes right back out the door in the form of payments to the intermediaries[11]. And since intermediaries primarily decide the percentage of revenue share from streaming companies, any disagreement could result in both parties being embroiled in a protracted legal dispute[12]. In some cases, a losing lawsuit could result in discriminatory treatment of streaming companies with hikes in royalty rates, as it happened to Pandora[13]. This pressures streaming companies to increase monetized revenue sources to stay afloat, like paid-streaming tiers, which in turn diminishes user base. In the case on Pandora, as studied by Music Business Research[14],

The streaming industry is ripe for disruption by blockchain technology and Musicoin is the first platform in the cryptocurrency space that is unleashing the power of blockchain technology to heal the woes that afflicts the music industry. Our primary goal is to remove all middlemen and close the gap between the musician and the listener. In the process, Musicoin will abolish the pernicious problems plaguing today's music industry as outlined above, by decentralizing distribution and consumption of music, making musical contracts fair and automated, and paving the way for a self-sustaining business model. Musicoin, by fairly rewarding all participants on the platform, aspires to be the leading global ecosystem for goods and services built around music. [15] The Impact of Blockchain on the Music Industry: Sitonio, Camila

Nucciarelli, Alberto: 29th European Regional Conference of the International Telecommunications Society (ITS): "Towards a Digital Future: Turning Technology into Markets?", Trento, Italy, 1st - 4th August, 2018. This paper explores the impact of blockchain on the music industry with a focus on the implications technology can have for artists. By investigating the industry's supply chain, we argue that the on-demand streaming platforms (e.g. Spotify and Apple Music) have allowed consumers to easily access music products but have introduced a level of intermediation between artists and customers leading to inefficiency of the royalty payments systems. The goal of this research is to identify blockchain applications that would enable the disintermediation of the industry, allowing artists to create and capture more value from their own products. This paper discusses some applications and concepts related to blockchain, including smart contracts, record keeping, revenue management, and metadata analysis. By presenting some examples, we assess the current state of the technology's development in the music industry, how companies are introducing this new model into the market, and some limitations these models may have.

[16] Using Blockchain for Online Multimedia Management: Characteristics of Existing Platforms: Bikram Shrestha, Malka

N. Halgamuge, Horst Treiblmaier. In this descriptive study we investigate the use of blockchain in the online multimedia industry. We analyze the content of 30 peer-reviewed academic publications, white papers and industry websites published between 2016 and 2018 which report the application of blockchain for multimedia management. This includes diverse use cases in the music and advertising industries, healthcare, social media, and content delivery networks. Ethereum was found to be the most popular blockchain and proof of work the favorite consensus mechanism. More than half of the platforms reward their users for content curation and community development. The majority of the platforms have implemented tokens and smart contracts to automate the distribution of earnings or to enable data access. Our study further shows that the majority of multimedia blockchain platforms have already implemented monetization capabilities.

III.   TRADITIONAL METHODOLOGY

A research paper is a culmination and final product of an involved process of research, critical thinking, source evaluation, organization, and composition. It is, perhaps, helpful to think of the research paper as a living thing, which grows and changes as the student explores, interprets, and evaluates sources related to a specific topic [17]. As we know paper publication is the best way to share our knowledge or ideas with the world. Currently, there is a centralized process of paper publishing which has some drawbacks. But firstly, what is the ongoing process of paper publishing?

1. Select topic and perform research work
First of all, choose the field or topic you want to perform research on and gather the required information about that topic. Read available research papers, visit websites, interact with experts.

2. Select Journal
If you are ready with the topic find out the best journal suitable for publishing your work. Each publication has its own audience and tone of writing. So decide which journal is the best fit for the topic. This guide will also tell you how to submit your paper and will provide details of the review process [18]. Some Journals can be paid or unpaid. Some of them are IEEE, Springer, IJISRT, IJSRD, and ACM.

3. Select Journal article
Based on the topic selected for research categorize the type of journal article. Some journal articles are original research, short reports, review article, case studies, and methodologies [19].

4. Prepare manuscript
This is the main part of paper publishing. It is the body of your research paper. The manuscript describes how a paper should look like. The standard structure of a manuscript contains title, abstract, keywords, introduction, proposed system, result, conclusion, and references. Format your research paper so it fits the guidelines for that publication. Most journals provide a document called "Instruction to Authors" or "Author's Guide" that offers specific instructions about layout, type font, and length [20].

5. Submit manuscript
Go to the journal's website to review its submission requirements. Once you are satisfied with the paper and if your paper meets all of the guidelines set by publications, then submit the paper. Some journals allow online submission through their website, while some prefer a hard copy.

6. Peer-Review
After submitting the manuscript paper is reviewed by an editorial board of subject experts who review and evaluate submitted articles before accepting them for publication.

7. Decision-based on peer review
Based on the excellence, novelty, and significance of the research or ideas reviewer give a decision which anyone among the followings.

8. Publication done
If all goes well then well done your paper is published.

Drawbacks -
After diving deep into the traditional methodology we can conclude that this old process of publishing a research paper has the following issues :-
Publishing a paper on any platform is a really cumbersome and lengthy process at the same time it takes a much longer period to get published.
Neither the reviewer nor the writer gets profited for their work as the whole amount is consumed by the publishing platform.
The threat of duplicity also exists which again takes a quite long time to get verified and become lawful.
Similarly, the presence of any irrelevant content like pornographic or anything out of the desired box is also faced in publishing a paper.

IV.   PROPOSED MODEL

The solution lies in the blockchain technology itself. You don't need any third party as a trusted counsellor to make the transaction happen. In our case, there is no need of publisher. The chain can take care of itself. Author can write the paper and publish on the network. The reviewer can review it before pushing it to the final blockchain and at the very end the reader community can read the paper accordingly from the blockchain itself and they don't need to pay any kind of charges to any third party organization, just for keeping the track of publication. Even if the reader pays any kind of fee,

that money will go in the pocket of the author who invests so much of his personal time writing the paper, doing all the research and at the end making it in proper format so that the reader can get the perspective. After that, the reader can also be author and do advancement in the same research area and publish it on the same blockchain network.
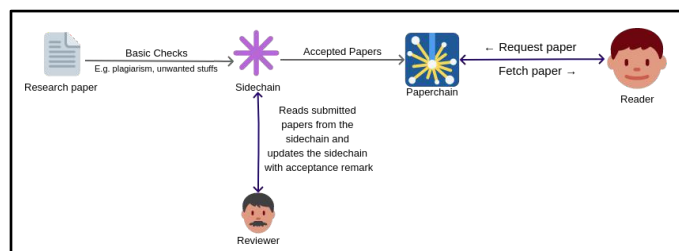

Fig: 03 (Paperchain proposed model)

Having seen the power of blockchain, watching the traditional paper publishing may seem a bit of complicating a simple task.

V. CONCLUSION:

The primary goal of the paperchain is to remove all middlemen and minimize the gap between the author and the reader. By decentralizing distribution and making contracts fair and automated, this project will prove to be the self-sustaining business model. Moreover, instead of using centralized servers, Paperchain is storing and distributing its content through a decentralized P2P file distribution system which makes this system even more secure and reliable. Considering all the facts, Paperchain would be the best platform for publishing research papers and journals.

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