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HOW NFTs CAN REVOLUTIONIZE THE BOOK INDUSTRY

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Abstract - As the times are changing, physical books are also becoming old & a lot of young generations are preferring digital versions of physical books. The people who are most affected by these changes are the authors of those physical books. So the authors can adopt the NFTs which are unique tokens or digital representations of ownership of their book. They essentially turn their book into an NFT. This way the book can be digitally distributed as well as the author gets a lot of control over the distribution or sales of the book. This also garners the attention of the young generation. NFTs are our future and there are a lot of applications of NFT in the future.

Keywords: Blockchain, Smart Contracts, NFTs, Non-Fungible Tokens, ERC Tokens, ERC721 Tokens, Authors, Books, IPFS, Inter Planetary File System

I. INTRODUCTION

Currently, authors of physical books are facing some problems which are hindering their progress. If we observe closely then we will see that nowadays the craze for books & book fairs is decreasing due to the rise of digital media. These problems are

- **Less Money:** Publishers don't pay well. Sometimes authors get about 10% from sales and books tend to sell less than 10000 copies. So authors probably make less than his two weeks' salary for a book that took 52+ weeks to write.
- **Very Few Marketing support:** Many authors don't know how to take their books to the intended audience. Of course, money is a limited reason for this.
- **Long gestation period:** Writing takes a very long time for authors. Most authors start seeing signs of success after the third book or so.
- Most publishers look for well-established writers, so new writers find it difficult to break into print.

- In an effort to save royalty costs, publishers frequently conceal the true figures. Those who give royalty, do not reveal sales statistics.

II. TURNING DIGITAL BOOKS INTO NON-FUNGIBLE TOKENS

Non-fungible means unique and cannot be replaced with or by something else^[1] and token means a tradable, digital representation of ownership of an asset^[1]. So essentially what I am trying to say is that the author creates a digital book in pdf or similar text file formats & then he uploads it to a website that creates some unique digital ownership certificates. Those people who buy those digital ownership certificates can have access to the digital book itself. All the transactions stay forever online because they are stored in the blockchain^[2]. The NFT assets like the book & their cover image will be stored in IPFS, thus this way the books also stay online forever, only the ownership changes.

NFTs could be revolutionary for authors; the author can sell his/her NFT book to the digital audience directly without any secondary medium. He can even mint 100 NFTs which means 100 copies of the same book with different & unique token IDs. Just like in the physical world, where we buy a copy of a book, the readers buy the copy of the book as an NFT. However, the book's copyrights will be retained by the author. Thus those who own the copies can resell those copies to others. However now every time an NFT is resold the authors get a little bit of royalty for each resale. It will also attract a digital audience very much. NFTs & digital books are more appealing to young audiences because they prefer digital books rather than physical books. The growth of the millennial and Gen-Z population in the NFT space has a great role in the relative development of the community. This gives authors a lot more control over their output and its pricing. It also offers a direct revenue stream between themselves and readers that's not reliant on third parties. The author can reach a large number of audiences

who are actually interested in those books, cutting off the middlemen.

III. OVERVIEW OF NFTS & IPFS

Non-Fungible Tokens (NFTs)^[3] are ownership certificates of cryptographic assets on a blockchain^[4] with unique identification codes and metadata that distinguish them from each other.

There are two parts to an NFT^[3]:

- **NFT item** - The digital item associated with an NFT is described in an NFT's metadata (see next bullet). These items are typically stored off-chain, which means this item is not directly stored on a blockchain.
- **NFT metadata** (called a token) - NFT metadata is stored on a blockchain and typically includes information identifying the underlying NFT item, its location online, its ownership, and transaction information

Unlike crypto currencies^[5], NFTs cannot be traded or exchanged at equivalency. The difference between fungible and non-fungible goods is NFTs can represent real-world items like artwork and real estate. Tokenizing these real-world tangible assets makes buying, selling, and trading these assets more efficient. This also reduces the probability of fraud in a transparent, unhackable way^[6]. The magic in NFTs is in their ability to execute and exchange contracts between people. Some of these contracts can be executed with coding, like rent, official documents, and concert tickets for example. But you can get creative because code is very dynamic. So let's say you are a comic artist/author and you want to give value to your readers. You could create an NFT which would allow the NFT owner to come to Comic-Con for free for 5 years and talk to you backstage. This person could sell this NFT and every time someone resells it, you get 15% in royalties or whatever you put in the contract.

IPFS or Inter Planetary File System is a distributed file storage system that stores and accesses files, websites, applications, and data. It is a peer-to-peer hypermedia protocol that is designed to preserve and grow information by making the web upgradeable & resilient. Normally file downloads over HTTP happen from one server at a time however IPFS which is peer-to-peer, retrieves pieces of that file from multiple nodes at once, which helps substantial bandwidth savings. IPFS makes distributing high volumes of data without any duplication of that data very efficient. IPFS provides an open, flat web.^[7]

IV. HOW A AUTHOR MINTS A NFT OFF HIS BOOK

Most users create and buy NFTs on various NFT marketplaces. The user uploads a digital file of the item, and through the use of smart contracts^[8], the NFT is "minted" or recorded on a blockchain. The uploaded image is of the

cover of the book & the uploaded file is the pdf version of the book itself. Then a JSON file is created for making the metadata. Finally, the token is minted & the NFT address as well as token Id is returned back to the author. Then the author can use that address & token id to list his NFT for sale in any NFT marketplace^[3].

An NFT marketplace is a platform where NFTs are sold and exchanged, similar to exchanges dedicated to crypto currencies. Some NFT marketplaces accept payments in government-issued currency, such as the U.S. dollar, but most strictly accept crypto currency. Some NFT marketplace operators pay royalties to creators after each sale, enabling continued income for artists and other content creators as NFTs of their content are transferred and re-sold.^[3] Popular NFT Marketplaces are OpenSea, Axie Infinity, CryptoPunks, Atomic Market, etc.^[9] Below is Figure 1 which depicts the flowchart of how an author mints an NFT from his book.

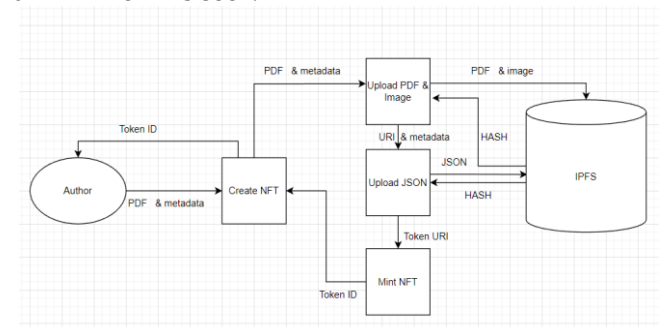


Figure 1: Author mints a NFT off his Book

V. A BASIC NFT SMART CONTRACT

A basic NFT smart contract means a smart contract that inherits an ERC721 token. Each token will have a name & initials. Below mentioned Figure 2 has "Abhikb" as the name of the token & "AB" as the initials needed. It takes an IPFS URI to mint a token where the token is minted & that IPFS URI is set as a token URI for a particular token id. Then the token id is incremented by 1.

A smart contract is a software program that lives in a decentralized environment i.e Blockchain. This type of code is immutable (cannot be changed), transparent, and automated — meaning everyone can see it but no one can change or update it, and it can automatically execute by itself without needing any third-party intervention^[10].



```
// SPDX-License-Identifier: MIT
pragma solidity ^0.8.7;
import "@openzeppelin/contracts/token/ERC721/extensions/ERC721URIStorage.sol";

contract BasicNft is ERC721URIStorage {
    uint256 private s_tokenCounter;

    event NftMinted(uint256 indexed tokenId);

    constructor() ERC721("Abhikb", "AB") {
        s_tokenCounter = 0;
    }

    function mintNft(string memory newtokenURI) public {
        _safeMint(msg.sender, s_tokenCounter);
        _setTokenURI(s_tokenCounter, newtokenURI);
        emit NftMinted(s_tokenCounter);
        s_tokenCounter = s_tokenCounter + 1;
    }

    function getTokenCounter() public view returns (uint256) {
        return s_tokenCounter;
    }
}
```

Figure 2 : A Basic NFT Smart Contract

ERC721 is a standard followed for representing ownership of non-fungible tokens, where each token is unique. It provides functionalities like transferring tokens from one account to another, retrieving the current token balance of an account, getting the owner of a specific token, and the total supply of the token available on the network. Besides these, it also approves that a third-party account can move a token from an account.^[11]

When an individual purchase an NFT, the NFT item, such as the image file, appears in the user's digital wallet^[3] through an application programming interface (API), which allows software applications to communicate and share data.

VI. FUTURE OF NFTS

Any context where we need to reliably track and verify authenticity or ownership is a potential application for NFTs^[1]. NFTs are going to be big in 2023 & have seen new applications such as loyalty programs, ticketing, and metaverse applications, apart from improvements in incentive-based gaming, PFP collections, and financial applications, in Fashion & Art^[5]. NFTs can be used to verify documents such as certificates, diplomas, medical records, passports, collectibles, artwork, gaming, and other markets^[12]. For example, hiring managers can quickly check a job candidate's certifications and degrees regarding academic credentials. This is a significant step forward in preventing fraud and making the verification process run more precisely. Today's art JPEG is tomorrow's marriage contract, mortgage, home purchase, vehicle purchase, or concert ticket.

Example: Let's say someone buys a Nike NFT which contractually binds itself to gift only to holders of this token with exclusive limited sneaker drops. They are creating value through scarcity and authenticity while building community & branding. When someone buys 4 Nike NFTs and gets 4 exclusive drops delivered to my door every 10 weeks, he/she can then auction that off to other sneaker heads. Not only does it bring value long-term to its holders

(the good projects), but it allows a source of crowd funding without sacrificing equity through big investors.

NBA Top Shots are collections of videos & pictures of top NBA moments & much more for fans. Sports Organizations are looking for innovative ways to enhance fan engagement through NFT^[1] such as tickets, fractionalized team ownership, etc. Tickets as NFTs solve multiple concerns with traditional tickets, including verifying authenticity, reducing barriers for resale when a ticket holder cannot attend a game, and allowing markets to price tickets dynamically. NFTs allow athletes to monetize their brand, which includes NIL, i.e. their name, image, and likeness. Athletes' brands are often connected to their league and team. With NFTs, athletes are encouraged to engage with their personal brand and popularity by creating unique images and special fan experiences that eliminate intermediaries.

More and more musicians are adopting NFTs to get along with their fans. A few marketplaces have already started selling partial ownership music NFTs^[13] in partnership with famous music producers. In the future colleges can transfer the degree certificate of students as NFT to students as owners. No student can fake those degrees if degrees are NFT. Your diploma will come as an NFT because we'll know it was Harvard that minted it.

VII. CONCLUSION

This paper explores one of the limitless applications of NFT. This paper also reviews the existing research papers on NFTs. Through this paper, the authors try to bring forward how an ordinary author can mint his/her own NFT from his book. Authors can go to an NFT Marketplace & mint their book as NFT. Then he can sell that NFT to potential buyers for the desired price. The concept of ownership of authentic purchased digital assets like images or artworks, videos, and music or songs excited a lot of collectors & thus it helped the sudden growth in the NFT market. Authors can leverage this market to solve the problems they face in the current situations.

It is important to state the limitations of this paper. The main limitation of this research paper is that only seven papers were reviewed while preparing this paper. Secondly, there are very few marketplaces that allow minting metadata along with the image for NFT. It is this metadata that will have the link to the pdf or digital book. The study has scope to be further extended by including more literature from this area as well as some other areas.

VIII. REFERENCES

- [1]. Baker, B., Pizzo, A., & Su, Y. (2022). Non-Fungible Tokens: A Research Primer and Implications for Sport Management. *Sports Innovation Journal*, 3, 1-15.



- [2]. What is blockchain? A beginner's guide for 2021. (2021). Columbia Engineering. <https://bootcamp.cvn.columbia.edu/blog/what-isblockchain-beginners-guide/>
- [3]. Busch, K. E. (2022). Congress. Congressional Research Service. Retrieved January 25, 2023, from <https://crsreports.congress.gov/product/pdf/R/R47189>
- [4]. Hayes, A. (2022, December 19). Blockchain facts: What is it, how it works, and how it can be used. Investopedia. Retrieved January 25, 2023, from <https://www.investopedia.com/terms/b/blockchain.asp>
- [5]. Frankenfield, J. (2023, January 24). Cryptocurrency explained with pros and cons for investment. Investopedia. Retrieved January 25, 2023, from <https://www.investopedia.com/terms/c/cryptocurrency.asp>
- [6]. Sharma, R. (2023, January 24). Non-fungible token (NFT): What it means and how it works. Investopedia. Retrieved January 25, 2023, from <https://www.investopedia.com/non-fungible-tokens-nft-5115211>
- [7]. IPFS powers the distributed web. IPFS Powers the Distributed Web. (n.d.). Retrieved January 25, 2023, from <https://ipfs.tech/>
- [8]. Buterin, V. (2014). A next-generation smart contract and decentralized application platform. white paper, 3(37), 2-1.
- [9]. Rehman, W., e Zainab, H., Imran, J., &Bawany, N. Z. (2021, December). Nfts: Applications and challenges. In 2021 22nd International Arab Conference on Information Technology (ACIT) (pp. 1-7). IEEE.
- [10]. Bhattacharya, A., &Bhattacharjee, S. A REVIEW ON APPLICATIONS OF BLOCKCHAIN IN BANKING SECTORS.
- [11]. Developer Docs, E. (2023). ERC-721 non-fungible token standard. ethereum.org. Retrieved January 25, 2023, from <https://ethereum.org/en/developers/docs/standards/tokens/erc-721/>
- [12]. Bao, H., &Roubaud, D. (2022). Non-Fungible Token: A Systematic Review and Research Agenda. Journal of Risk and Financial Management, 15(5), 215.
- [13]. Folgieri, R., Arnold, P., & Buda, A. G. (2022). NFTs In Music Industry: Potentiality and Challenge. Proceedings of EVA London 2022, 63-64.

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