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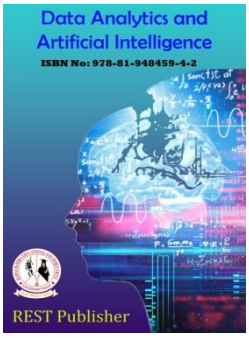


YouTube Clone by Using Ethereum Block Chain

***Soundharya .K, Madula.C, Sharmilabanu.N, Shobana.J, Sneha Deepthi.B**

veltech hightech dr.rangarajan dr,sakunthala engineering college, Chennai,TamilNadu, India.

*Corresponding Author Email: ksoundharyakannan@gmail.com

Abstract: *Decentralized video sharing structures are much like video sharing structures wherein creators post content material and customers view it. However, the primary distinction lies withinside the community in the back of the decentralized video sharing platform. A peer-to-peer (P2P) community of decentralized video sharing structures helps the steady switch of files. To make sure speedy facts switch, facts is break up into smaller blocks for less complicated switch and download, making sure quicker downloads and browsing. The decentralized video sharing platform transfers facts over a P2P community, however with an extra layer of blockchain era encryption. Less operational value, higher fault tolerance, much less consider necessities among garage carriers and facts owners, and much less vulnerability to attacks. An occasion in blockchain era has delivered a decentralized garage mode to the public. Video transcoding is extensively carried out in video streaming commerce, changing films into a couple of codecs for extraordinary audiences.*

Keywords: *Decentralized, Blockchain, Peer-to peer, encryption.*

1. INTRODUCTION

Problem Statement Today, there are numerous websites that broadcast videos, like Netflix and YouTube. These platforms employ a centralised client-server architecture in which video material is sent across the network from the server to the client. The centralised platforms create a risk for hacking and data theft. Additionally, in centralised systems, the platform that streams the video rather than the content creators' interests are typically served by the dissemination of video material and the generating of money. So, in order to assure smooth video transmission via peer-to-peer networks, video streaming needs an open and decentralised structure. The participating nodes in these P2P networks are how the data is dispersed. The problem of streaming video bandwidth is resolved in this way by utilising the same bandwidth. effectively, more cheaply, more quickly, and with less effort. Objective Blockchain holds great promise for video transmission and media streaming. This new paradigm in how we get our entertainment and media via blockchain technology makes it easy for us to enjoy the highest quality and speed of streaming video streaming is decentralized when a single entity cannot control a streaming service's content delivery. It's important to note the difference between decentralized and distributed video streaming. While distributed video streaming means that the content delivery network spreads across the globe with one entity behind it, decentralization removes that control entirely. Relatedwork: With the use of blockchain technology, this new paradigm in how we consume entertainment and information makes it simple for us to take advantage of streaming video at the fastest possible speeds. When a single organisation cannot manage the content delivery for a streaming service, video streaming is considered decentralised. It's crucial to understand the distinction between distributed and decentralized video streaming. While decentralisation completely removes such control, distributed video streaming implies that the content delivery network is spread throughout the world with a single organisation in charge. It establishes a network where users canagree on thenetwork's course of action, providing another level of democracy. and granting the neighborhood additional authority. Platforms for decentralised video streaming are typically community-owned. Block chains provide the ideal foundation for apps by enabling ownership within the platform and serving as the basis for decentralisation. A single decentralised ledger connects all the parts through the blockchain layer, which functions as a thin layer. All off-chain transactions must provide proof to the blockchain layer, which will then confirm the transaction's legitimacy. As a result, the blockchain becomes the only reliable source of information. Still, off-chain methods like IPFS or straightforward peer-to-peer storage make the data available because block chains cannot store complicated data sources like films or photographs.

Full decentralization requires a peer-to-peer protocol like IPFS or Bit Torrent, with the block chain serving as the base layer.

2. LITERATURE SURVEY

***Centralized Applications*:**Like Facebook, and YouTube in these types of applications everything is on one server, and every time whenever there is a request from the nodes these servers give data to the nodes. These Centralized applications are made of two things- The back End and Front end. Any standard application runs on a computer system operated by an organization. There may be many users on the node side but the backend is controlled by a single organization. These apps are useful when the developer needs full control over the apps and how it is used. It is much easier to upgrade a centralized app than adApps.

***Decentralized Applications*:**The application that runs on our P2P network is called a decentralized application. In this decentralized application, everything runs in all the nodes of the network. dApps are often built on the Ethereum platform and can be used for a variety of purposes These decentralized applications are made with two things smart contracts and the front end. They use a Smart contract to complete the transaction between two anonymous parties and the front end to interact with the system. People interested in free speech point out that apps can be developed as an alternative social media platform.

Client server Applications:Centralized system is in use for video uploading and sharing. Centralized systems are conventional (client-server) IT systems wherein a single authority controls the system and is solely in charge of all its operations. Users of a centralized system depend on a single source of a service. Online service providers, such as eBay, Google, Amazon and others use this common model of delivery of services. client and server model of centralized applications.Examples of centralized systems are Youtube, Dailymotion, Vimeo etc. YouTube is an American online video sharing and social media platform. YouTube primarily uses the VP9 and H.264/MPEG-4 AVC video codecs, and the Dynamic Adaptive Streaming over HTTP protocol. MPEG-4 Part 2 streams contained within 3GP containers are also provided for low bandwidth connections.

AVI Applications: YouTube had begun rolling out videos in AV1 format. In 2021 it was reported that the company was considering requiring AV1 in streaming hardware in order to decrease bandwidth and increase quality. Video is usually streamed alongside the Opus and AAC audio codecs.At launch in 2005, viewing YouTube videos on a personal computer required the Adobe Flash Player plug-in to be installed in the browser. In January 2010, YouTube launched an experimental version of the site that used the built-in multimedia capabilities of web browsers supporting the HTML5 standard.

3. EXISTING SYSTEM

YouTube videos on a personal computer required the Adobe Flash Player plug-in to be installed in the browser. In January 2010, YouTube launched an experimental version of the site that used the built-in multimedia capabilities of web browsers supportingthe HTML5 standard. This allowed videos to be viewed without requiring Adobe Flash Player or any other plug-in to be installed. On January 27, 2015, YouTube announced that HTML5 would be the default playback method on supported browsers. With the switch to HTML5 video streams using Dynamic Adaptive Streaming over HTTP (MPEG-DASH), an HTTP-based adaptive bit-rate streaming solution optimizes the bitrate and quality for the available network.

Disadvantages of ExistingSystem:Blockchain technology does not allow easy modification of data once recorded, and it requires rewriting the codes in all of the blocks, which is time-consuming and expensive.It is hard to correct a mistake or make any necessary adjustments.

4. PROPOSED SYSTEM

Youtube Clone with Blockchain is a decentralized video service that exists on a blockchain rather than a central server. Creators can use the service knowing that their data is safe. This has no central servers. All of the content is stored on a blockchain. By nature, a blockchain's data is verified between all of its members. This is an example of Distributed Hash Tables (DHT) and works similarly to peer-to-peer torrenting of information. Consequently, there is no one definitive video file in one place, more a shared agreement of what the video file contains. This makes it difficult, if not impossible, to tamper with video content on this. It is not the only online app looking into this kind of secure operation. If you've ever asked yourself whether a truly decentralized internet is possible, DTube is an example of it at work. Decentralized videos mean there's no simple way of removing content from the site. This could be a blessing or a curse.

For some users, however, the assurance that their content is not in the hands of a large organization is a big draw, and a reason to switch to DTube.

Advantages of Proposed System:Your data is sensitive and crucial, and blockchain can significantly change how your critical information is viewed. By creating a record that can't be altered and is encrypted end-to-end, blockchain helps prevent fraud and unauthorized activity. Without blockchain, each organization has to keep a separate database. Because blockchain uses a distributed ledger, transactions and data are recorded identically in multiple locations.Traditional paper-heavy processes are time-consuming, prone to human error, and often requires third-party mediation.Transactions can even be automated with "smart contracts," which increase your efficiency and speed the process even further. Once pre-specified conditions are met, the next step in transaction or process is automatically triggered.

5. ARCHITECTURE DIAGRAM

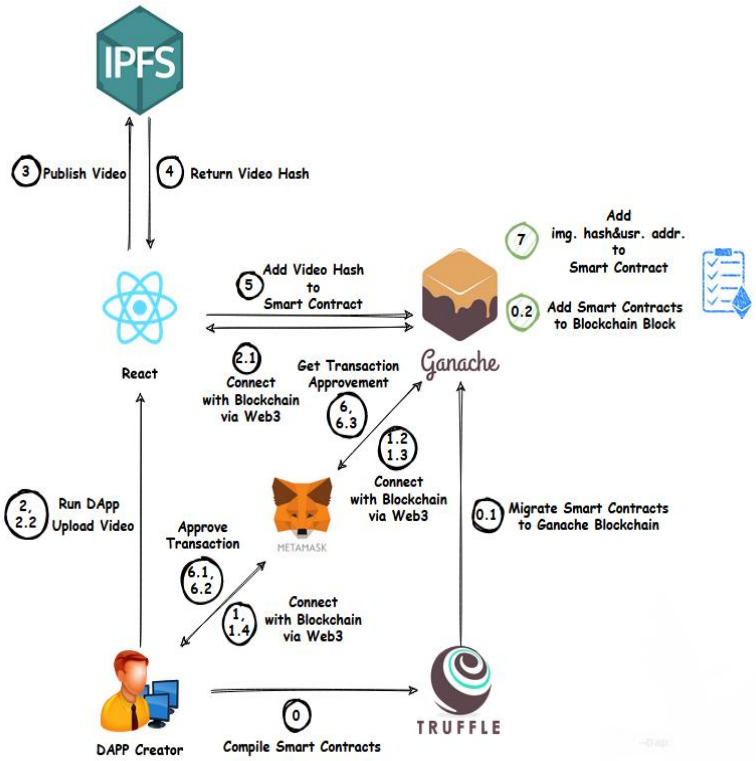


FIGURE 1. Architecture diagram of proposed system architecture

***Algorithm: Hashing Algorithm*:**Hashing or hash is a common term when discussing blockchain technology. Hashing refers to the transformation and generation of input data of any length into a string of a fixed size, which is performed by a specific algorithm. In particular, the Bitcoin hash algorithm is SHA-256 or Secure Hashing Algorithm 256 bits. This algorithm is a one-way cryptographic function as the original data cannot be retrieved via decryption. **Uses of** SHA-256 in blockchain:SHA-256 is one of the first and most prominently used hashing algorithms in blockchains like Bitcoin, Bitcoin Cash, and Bitcoin SV. SHA-256 is used in various stages in a blockchain, most prominently:

Consensus mechanism: Miners calculate the hash of new blocks to be created using SHA-256 by varying the value of nonce in a bitcoin block until they reach the hash below the threshold. Then that block can be accepted into the ledger.

Chains of blocks: Each block in the ledger contains a hash generated by SHA-256 referring to the preceding block in the chain.

Digital signatures: Transactions use digital signatures to maintain integrity, the information used in the transaction is hashed using SHA-256, and then it is encrypted with the sender's private key to generate a signature. The miner then verifies this signature to validate the transaction

Codec Algorithm:Codec is a 'coder-decoder' algorithm used for compression of audio or video. H.264 has mostly used the codec.H.264 provides interoperability between the different platforms.H.264.It consists of four stages.Divide the video frame into pixel blocks for the processing. Remove the redundancy in content by using prediction, transform, quantization and entropy coding techniques.Removal of Temporal dependencies by motion estimation and compensation.

Consensus Algorithm: Consensus is the process by which a group of peers – or nodes – on a network determine which blockchain transactions are valid and which are not. Consensus mechanisms are the methodologies used to achieve this agreement. It's these sets of rules that help to protect networks from malicious behaviour and hacking attacks. There are many different types of consensus mechanisms, depending on the block chain and its application. While they differ in their energy usage, security, and scalability, they all share one purpose: to ensure that records are true and honest. Here's an overview of some of the best known types of consensus mechanisms used by distributed systems to reach consensus. A consensus mechanism refers to any number of methodologies used to achieve agreement, trust, and security across a decentralized computer network. The consensus is a common agreement that ensures that previously present blocks in block chain agree with newly added block. Also, the trust between new blocks and existing blocks in the distributed network.

6. MODULES

Truffle: Truffle is a world-class development environment, testing framework and asset pipeline for blockchains using the Ethereum Virtual Machine (EVM), aiming to make life as a developer easier. Truffle is widely considered the most popular tool for blockchain application development with over 1.5 million lifetime downloads. Truffle supports developers across the full lifecycle of their projects, whether they are looking to build on Ethereum, Hyperledger, Quorum, or one of an ever-growing list of other supported platforms. Paired with Ganache, a personal blockchain, and Drizzle, a front-end dApp development kit, the full Truffle suite of tools promises to be an end-to-end dApp development platform.

A. Ganache: Ganache is a private Ethereum blockchain environment that allows to you emulate the Ethereum blockchain so that you can interact with smart contracts inyour own private blockchain.

B. Metatask: An Ethereum Wallet in your Browser MetaMask is an extension for accessing Ethereum enabled distributed applications, or "Dapps" in your browser!

C. Web 3: In web3, developers don't usually build and deploy applications that run on a single server or that store their data in a single database web3 applications either run on blockchains, decentralized networks of many peer to peer nodes (servers), or a combination of the two that forms a crypto economic protocol. These apps are often referred to as dapps (decentralized apps), Web3 enhances the internet as we know it today with a few other added characteristics. web3 is:Verifiable, Trustles, Self-governing, Permissionless, Distributed and robust, Stateful, Native built-in payments.

D. IPFS: The Inter Planetary File System (IPFS): is a protocol, hypermedia and file sharing peer-to-peer network for storing and sharing data in a distributed file system. IPFS uses content-addressing to uniquely identify each file in a global namespace connecting IPFS hosts.IPFS allows users to host and receive content in a manner similar to BitTorrent. As opposed to a centrally located server, IPFS is built around a decentralized system[7] of user-operators who hold a portion of the overall data, creating a resilient system of file storage and sharing. Any user in the network can serve a file by its content address, and other peers in the network can find and request that content from any node who has it using a distributed hash table (DHT).

E. React for UI: The web application is developed with ReactJS with Web3 to build a React dapp that can be used in a browser with injected web3, such as when using MetaMask. Web3.js is a JavaScript library that allows us to communicate with the Ethereum blockchain. It connects users to MetaMask or any wallet from the UI and turns our React application into a blockchain enabled application.Once we run the React application in the browser, it will trigger Metamask to interact with your blockchain network.

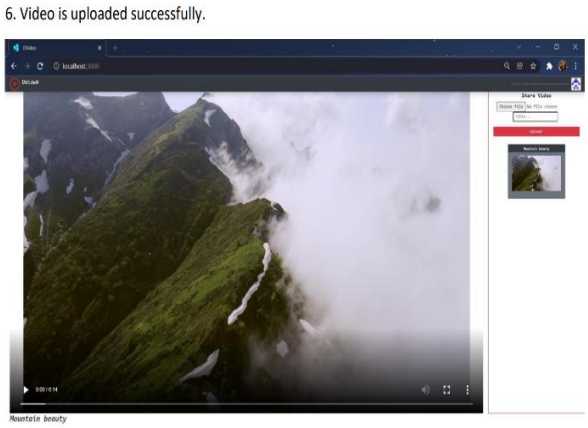
F. Smart Contract: A smart contract is a self-executing contract with the terms of the agreement between buyer and seller being directly written into lines of code. The code and the agreements contained therein exist across a distributed, decentralized blockchain network. The code controls the execution, and transactions are trackable and irreversible.Smart contracts permit trusted transactions and agreements to be carried out among disparate, anonymous parties without the need for a central authority, legal system, or external enforcement mechanism.While blockchain technology has come to be thought of primarily as the foundation for bitcoin, it has evolved far beyond underpinning the virtual currency

G. Solidty: Solidity is an object-oriented programming language for writing smart contracts. It is used for implementing smart contracts. It is a Javascript-like language developed specifically for writing smart contracts. Solidity is statically typed, supports inheritance, libraries and complex user-defined types among other features. The solidity compiler turns code into EVM bytecode, which can then be sent to the Ethereum network as a deployment transaction. Such deployments have more substantial transaction fees than smart contract interactions and must be paid by the owner of the contract.

H. Result: Blockchain technology is revolutionary. It will make life simpler and safer, changing the way personal information is stored and how transactions for goods and services are made. Blockchain technology creates a permanent and immutable record of every transaction. In this way, a decentralized youtube system is created. This is an example of Distributed Hash Tables (DHT) and works similarly to peer-to-peer torrenting of information. Consequently, there is no

one definitive video file in one place, more a shared agreement of what the video file contains. This makes it difficult, if not impossible, to tamper with video content on DTube. It is not the ononline app looking into this kind of secure operation Dapps are still in the early stages of development.

7. VII. OUTPUT



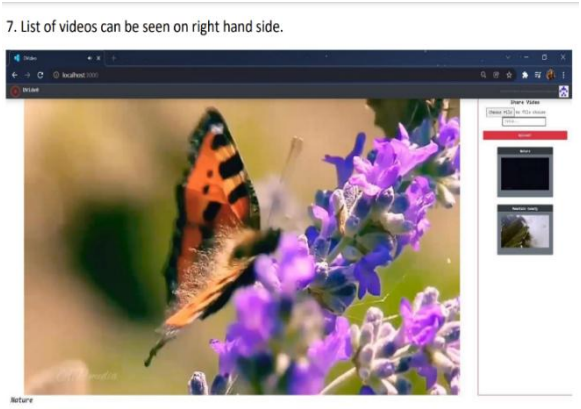


FIGURE 2. Video cloning; **FIGURE3.** You tube cloning

8. CONCLUSION

Biased censorship could be eliminated thanks to social media platforms powered by dApps, making the internet a safer place for everyone. When we recognise the need to protect our privacy, keep our personal information secure, and create a P2P culture in every aspect of our digital lives, the potential of decentralised apps in today's world is unparalleled. With more development and research, dApps might soon be able to completely replace traditional apps.

9. FUTURE SCOPE

Decentralized exchanges (DEXs) will likely become more important. Developers of DApps can expect to create more DEXs. They code Ethereum smart contracts for this . Centralized crypto exchanges are just centralized applications. While users trade cryptocurrencies on them, a central authority manages these websites. They wanted to use this new technology to create an open-source ecosystem of platforms, apps, and networks without a “single point of failure” (SPOF). Blockchain-crypto enthusiasts wanted to avoid the scenario where a large company like Google controls the Internet. We can expect to see more stable coins in the future. What’s more, we might expect to see these digital currencies use innovative price-stability mechanisms.

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