"Things Fall Apart;" Blockchain Technology Can Hold: Exploring Blockchain Technology as a Tool for Preserving Tribal Cultural Heritage, A Decentralized Approach.

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Abstract: The incessant globalization and digitalization has resulted in merging up the societies, consequently their cultures have been mingling up so intricately with each other that it is becoming quite impossible to recognise their individual essences. This is indeed a threat, because the historical background constitutes a culture and losing a culture means losing one's history, one's ancestral identity and living the life of nobody. While the core cultures are facing the erosion, the threat of the same for the tribal cultures is quite alarming as with the extinction of their cultures they will extinct in the eyes of society and would be too vulnerable for exploitation. By leveraging Blockchain that is armed with transparency, immutability, and decentralized nature, and avails NFTs, the tribal communities can preserve and transmit their cultural heritage for their predecessors. This research paper seeks to explore the cultural challenges faced by tribes of West Bengal and potential of Blockchain technologies in safeguarding and preserving their cultures effectively. (162 words)

Key Words: TCH protection, Authenticity and documentation, Data privacy, IP rights protection.

Nomencleture:

NFT	Non-Fungible Tokens
TCH	Tribal Culture Heritage
ICT	Information and Communication Technology
IHM	Intelligent Heritage Management
TCH	Tangible Cultural Heritage
CHM	Cultural Heritage Management
SLR	Systematic Literature Review
LSD	Large Scale Development

Introduction:

"Cultural heritage is a term made known in the middle of the 20th century mainly by entities interested in its protection, such as the United Nations Educational, Scientific and Cultural Organization, hereinafter UNESCO, which defines it in its document resulting from the 1972 Convention for the Protection of the

World Cultural and Natural Heritage held in Paris, as all tangible and intangible cultural expressions" [1,2]. "Intangible cultural heritage is defined by UNESCO in the same document as the practices, representations, expressions, and knowledge that a country or region recognizes as part of its cultural heritage" [1]. "Globally, many countries have been concerned about preserving, disseminating and teaching new generations the cultural and intangible heritages they have in their territories, and found the use of information and communication technologies a very valuable tool to achieve that goal; these tools have been applied to publicize traditional places" [3,4] "as well as to teach the cultural richness of a country" [5,6], "disseminate traditional symbols specific to the culture of each region" [7,8], "teach about traditional music and dances" [9,10], "and as a method of digital protection of cultural and intangible heritage" [11,12]. Worldwide several unique technologies have been implemented for the conservation of tangible and intangible cultural tradition and heritage. It is an undeniable fact that ICT occupies a pivotal role in maintaining the cultural heritage and the incessant use of ICT in cultural documentation has introduced a new model in this said arena, titled IHM This model "has as its objectives and fundamental pillars the use of technology for the application of preventive maintenance of heritage, the improvement of energy efficiency, the characterization of the profile of tourists and visitors, the increase in security and surveillance of heritage and the promotion of preservation and dissemination work at the service of the conservation and dissemination of cultural heritage. [13] To know about popular technologies that are being used worldwide to preserve cultural heritage I went through several articles and research papers and concluded to the best of my knowledge that 3D modeling, 3D visualization, motion capture systems, Virtual Reality and Augmented Reality are mostly used to maintain TCH; in smart cities the popular technologies that aid cultural heritage preservations are 3D scanning techniques, Building Information Modeling (BIM), mobile applications for integrated management of asset preservation and sensors for the acquisition and analysis of data from collections in real time (14). Social media network also claims an applauding recognition in this said case as it offers range of alternatives for mass to opine about the process of CHM. All of these technologies are ensuring preservation as well as conservation of cultural tradition and heritage but none are offering the prevention of data from being hacked and manipulated, which the Blockchain technology ensures; the NFT feature of Blockchain technology records data in distributed public ledger and ensures an irreversible authenticity as well as ownership for the recorded asset.

Back in 2020 while I was engaging in a project I got the opportunity to converse with people hailing from *Santhal* community (a tribe living in West Bengal, India) and while I asked the children of that particular community about their basic religious practices I found that most of them are fumbling and a good number of teenager are ashamed of introducing them as *Santhal,* and to my surprise I found that the elders and olders of this said community have already forgotten Sido Murmu and Kanhu Murmu, the leaders of *Santhal* rebellion. This alarming discovery baffled me and I felt Oodgeroo Noonuccal appropriately recited, "...All the old ways gone and now scattered."(17) This decline of *Santhals* sufficiently expresses that there is a dire need of systematic preservation and conservation tribal culture as they are on the verge of losing their own identity. The irresistible snare of globalisation, modernism, digitalisation and cultural assimilation are acting as a snake in grass for the tribal communities trailing them towards cultural transformation. Once they lose their traditions, customs and heritage, they will lose their identity and soon will be extinct like Dodo bird. Therefore, this research paper strives to explore what are the challenges faced by tribes living in West Bengal in TCH preservation? How can we leverage Blockchain technology to protect and transmit TCH for their posterity?

Research Methodology: I opt for qualitative research methodology to proceed in this research work. A SLR has been done to acquire knowledge about the technologies participating in preservation of TCH, nowadays. The precise literature review validated by various specialized databases selected among the most acknowledged worldwide: Science Direct, Scopus, Web of Science (WoS) and IEEE that are relevant to this particular finding, mapped the horizon of the study and framed the above mentioned questions to sought the answer.

Figure1. Diagram of search strings during SLR

Descriptive and exploratory research methodologies have also been implemented to address the queries beginning with "What," "When," "Where," "Who," "Why," or "How". As a researcher I talked with people hailing from different tribal communities in West Bengal to know about the intensity of cultural erosion and the challenges they are facing exactly in TCH preservation. For sample I chose people belonging from *Santhal, Munda, Chero, Oraon, Paharia and Munas* community. They have been living and moving to towns and cities in order earn their sustainable bread and there they earn their livelihood by undertaking several menial works. A few of them who got the opportunity of enlightening themselves with education and establish themselves in so called prestigious occupation have baptised themselves in other beliefs mostly in Christianity. Evidently, the traditions and customs are thinning.

Challenges in TCH preservation: A tribe is a group of people living under primitive condition relying on their own beliefs, cultures and governance being othered by the so called civilised people. Each tribes are different from other regarding their motley cultures and beliefs; but the oppression and threat of extinction they have been getting incessantly from the 'civilised' society has made their struggle same. Prior digitalisation turned the globe into a global village the tribes used to be scapegoat of industrialisation and in this era of sheer digitalisation where the whole world is just one click away they have become scapegoat of entertainment and cultural assimilation. In the flood of reconstruction of culture by tangling one with another, the civilised who has othered the tribes so far has become so much enthusiastic in mingling their culture up with their own messed up culture. As a result global market is bulging up with *hunsuli haar, dokra goina, saki haar, angami haar, bichiya,dhimmana, oganiya, pejania, kamkada, kambar pati, panjan, kynjri ksiar,kardhani, tikuli* etc. The self proclaimed culturally sophisticated people are buying all these and trying to do a fusion dress up wearing all these jewelleries with their daily casual wear, office wear and party wear without knowing the history of the ornaments and without any faintest idea of the ornament belonging to which tribal culture. They furnish their drawing room with replica of *tirio, dhodro banam, phet banam, tumdak, singa, junko* just because they feel like so not caring a fig of their history. In this like manner the

motifs, the clothes, the dance forms and songs all are introducing in the global market in distorted forms. Dance forms and songs are losing their authenticity and purposeful imprint. It is becoming hard to preserve and transfer the values and tradition for the upcoming generation. While the 'civilised' are encompassing towards cultural erosion the tribes are also not rigid enough to hold their cultural values. The tribes nowadays are living like a hybrid of the primitive values and the modernisation; the customs and traditions have been abandoned, languages are decaying and the myths are forgotten, eventually the essence is lost. Other than the Frankenstein of modernisation and urbanisation there are several issues that challenge TCH preservation in West Bengal. Some of those issues inclue:

1. Displacement from ancient land: Tribes has become the scapegoats of LSD projects since the date difficult to remember. They had to sacrifice and they have been sacrificing till date their ancient habitat for the sake of industrialisation, mines, dams, infrastructure expansion. In most cases they were eradicated and the eradication led to the loss of the sacred places that held spiritual and cultural significance for the tribes.
2. Socio-economic Marginalization: The loss of ancient land consequently invites socio-economic marginalization and the limited access to education and healthcare catalyses the crises.
3. Lack of documentation: As the education and finance get limited the documentation of art, folklore, and rituals become nearly impossible.
4. Encroachment and Deforestation.
5. Cultural Appropriation: Commercial exploitation of tribal crafts, arts and language without proper acknowledgement are leading to the cultural decay.
6. Lack of awareness and support of government.
7. Intergenerational gap: This is the most alarming hindrance. The widening gap between older generations, who treasure traditional knowledge, and the younger generation, who are influenced by the reckon of external impressions are leading to the loss of cultural transmission.

A few jewelleries of *Santhal* community.

Hut of Mundas decked with beautiful motif

Dhodro Banam

Mundas stepping in joy

Graceful Oraon women walking in Surhul festival

Blockchain Technology: David Chaum, in his dissertation, "Computer Systems Established, Maintained, and Trusted by Mutually Suspicious Groups" (1982) proposed the concept of Blockchain technology that was first popularized in 2008 by Satoshi Nakamoto. Blockchain Technology records information and provides utmost security to prevent the information from being hacked or manipulated. It functions as a distributed digital ledger that replicates and imparts data across the computerised networks that participates in blockchain.

The lists of stored chronological records are called blocks and using cryptology the blocks are kept encrypted. This is a decentralized approach as all the participants of a particular network hold the democratic right to maintain data and approve transactions that can take place on Blockchain Network thus converting it into a public approach. All the participants of a particular Blockchain Network can access the same ledger copy and in case one node gets corrupted on a particular participant computer, the others are get alerted at once so that they can rectify the issues earliest. By leveraging Blockchain based platforms it is possible to create tamper-proof and secure digital records of TCH cutting the hassle of unauthorized alterations.
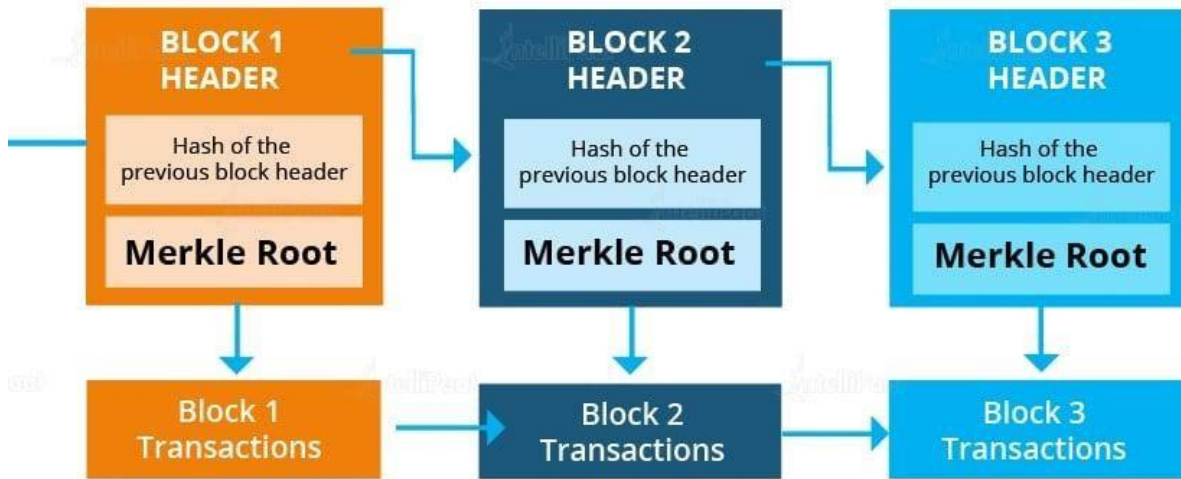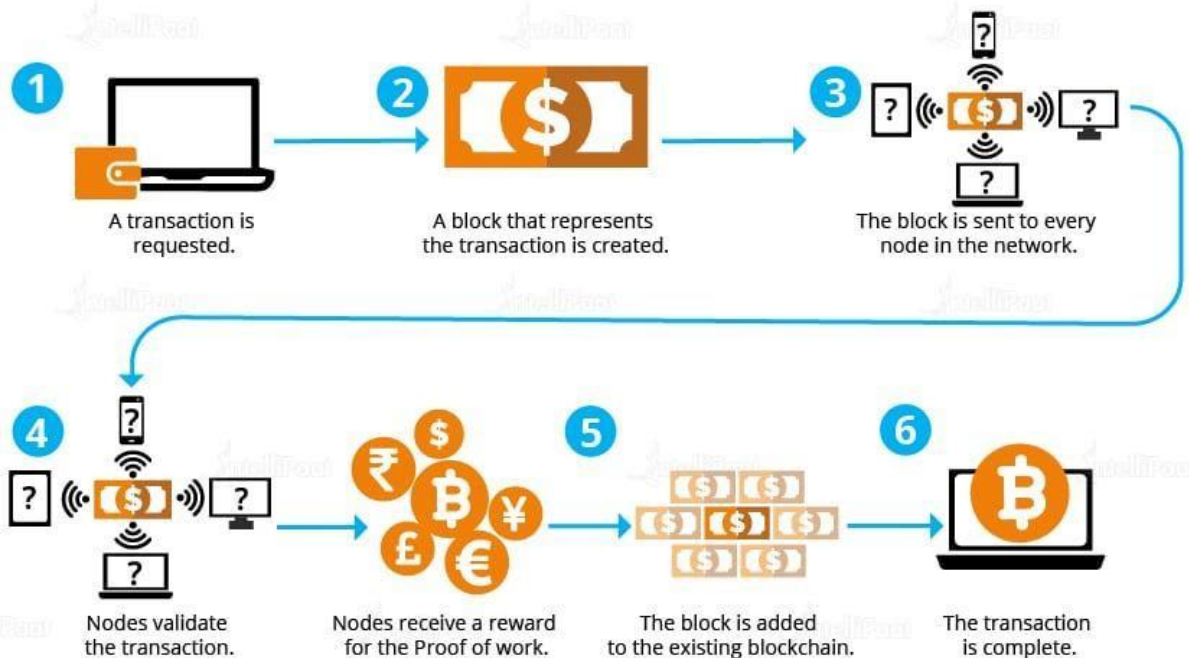
Blockchain Diagram on how blocks are connected.

Blockchain Diagram: Only when the transaction is verified and validated, values can be transferred to another place.

Intellectual Property Rights and Authenticity:

"Disruptive technologies such as Block-chain and the Internet of Things will have a profound impact in the way we live and work. They will require rapid adaptation in our workplaces"(18)

Shri Narendra Modi, Hon'ble Prime Minister of India

The decentralized approach of Blockchain technology assures an irrevocable authenticity of the recorded asset. It is impossible for any kinds of cyber attack to intrude into all shared ledger copies simultaneously and stain the authentic ledger due to this crowd sourcing approach. Thus DLT (distributed ledger technology) ensures infallible IP (intellectual property) registration and its protection.
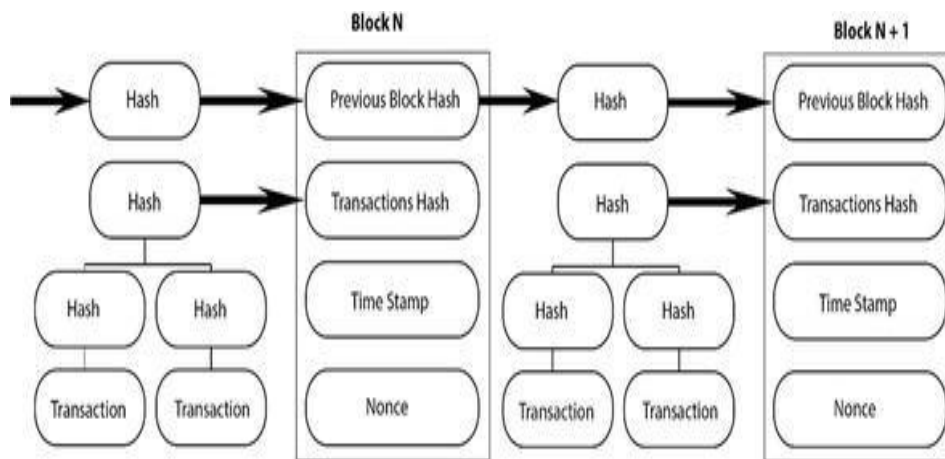

Figure4. Time stamp and Blockchain structure

This figure is a macrocosmic demonstration of how recorded data transmits through block. The remarkable events, valuable myths, customs, traditions of a tribe could be profoundly recorded in different hashes that are included in a block. The individual block includes a stamp that confesses the time of the occurred event justifiably protecting IP rights. Thus this technology transparently allows the traceability of cultural artefacts ensuring fair trade and preventing the illicit trade of stolen heritage items.
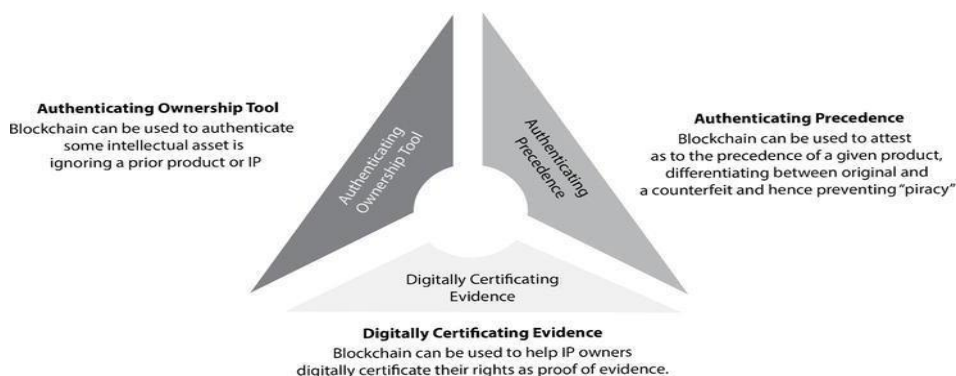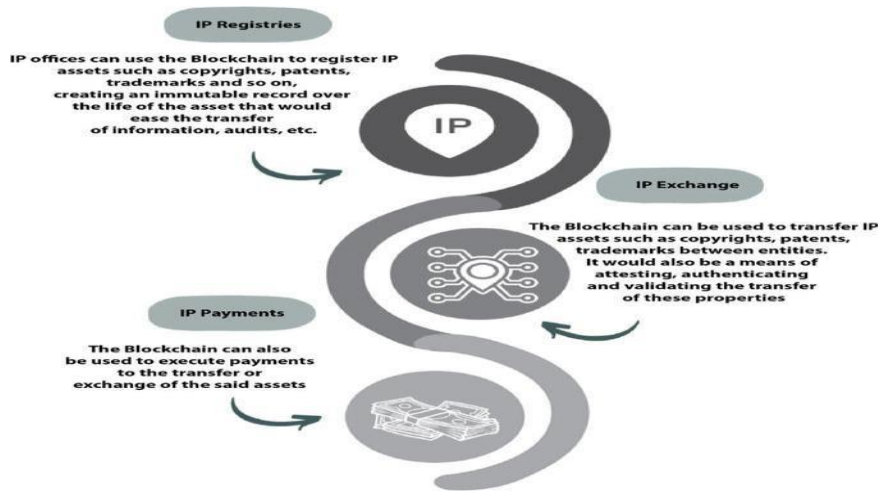

Figure5. Proof of IP ownership
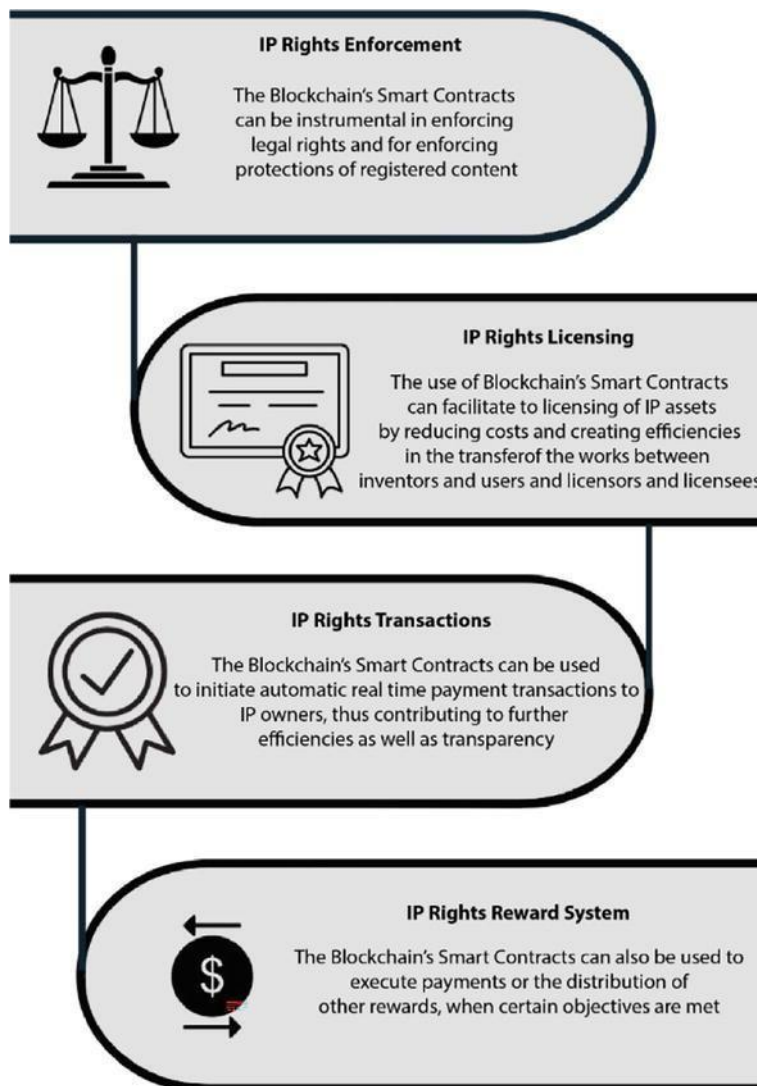
Figure6. Enabling IP marketplace

Figure7. Smart contracts in the IP space

Conclusion: I initiated this research work with a question, "what are the challenges faced by tribes living in West Bengal in TCH preservation?" After finding out the answer to my proposed question I sought to find out the means for the preservation of TCH till date. Authenticity is a non negotiable factor in cultural preservation. As Blockchain technology is known worldwide for its irrevocable enforcement of authenticity I tried to delve into the world of this particular technology to know how it works. And the outcome of my study framed my second question. The figures that I included in this research paper clearly states that this unique technology can revolutionize in this sector. Each tribal community can create a digital archive of their own and through NFTs (non fungible tokens) can restrict the ownership of this decentralized approach.

Limitation and Future Scope of this Research Article: There is no scope to argue that illiteracy is an undeniable issue in a third world country like India. West Bengal, where the tribes are struggling to earn their daily breads it sounds like a reverie to think that they will be able to implement such novel technology for the preservation of their TCH. I could not ponder on the question of literacy and the issue of digital divide in this study. Future researchers can take into account how can the present generation of the tribes be made technologically sound? The research can also delve into the features of Blockchain technology and find more advanced way for TCH preservation. This research has been completely qualitative. Further quantitative approach can be applied to this study to find out exactly how many tribes are using Blockchain Technology in preservation of TCH.

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