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TECHTREK

AMBALIKA MAGAZINE

BLOCKCHAIN: YOUR PATH TO A DECENTRALIZED WORLD

DEPARTMENT OF INFORMATION TECHNOLOGY

BUILDING THE FUTURE WITH TECH

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MESSAGE FROM THE HOD

On behalf of the Information Technology Department, Ambalika Institute of Management & Technology, I am pleased to announce the launching of the January 2024 edition of the Technical Magazine of the Information Technology Department and to make it available to everyone. This Technical Magazine aims to disseminate achievements in research and developments while featuring new breakthroughs in the field of Information Technology.

The entire Editorial team did their best to provide a platform for distinguished faculties, researchers, industry experts and students to share the latest accomplishments with fellow researchers, faculties, Industry experts and students whereby disseminating the knowledge gained from their technical endeavors.

As HOD, I am open to exploring the opportunities for making this Technical Magazine an exciting and definitive forum for attracting and publishing high-impact research contributions that are innovative and transformative, and for making this technical magazine serve as a forum for disseminating timely and exciting ongoing research that can stimulate innovation. At the end, I would like to thank editorial board members, faculties, Industry experts and students and hope that our collective efforts stimulate further progress in this domain of activity with strong determination at both national and international levels.

MR. ALOK MISHRA
HOD IT

TABLE

CONTENTS

BLOCKCHAIN

A blockchain is a distributed database that is shared among the nodes of a computer network. As a database, a blockchain stores information electronically in digital format. Blockchains are best known for their crucial role in cryptocurrency systems, such as Bitcoin, for maintaining a secure and decentralized record of transactions.

The innovation with a blockchain is that it guarantees the fidelity and security of a record of data and generates trust without the need for a trusted third party.

A blockchain collects information together in groups, known as blocks, that hold sets of information. Blocks have certain storage capacities and, when filled, are closed and linked to the previously filled block, forming a chain of data known as the blockchain.

01

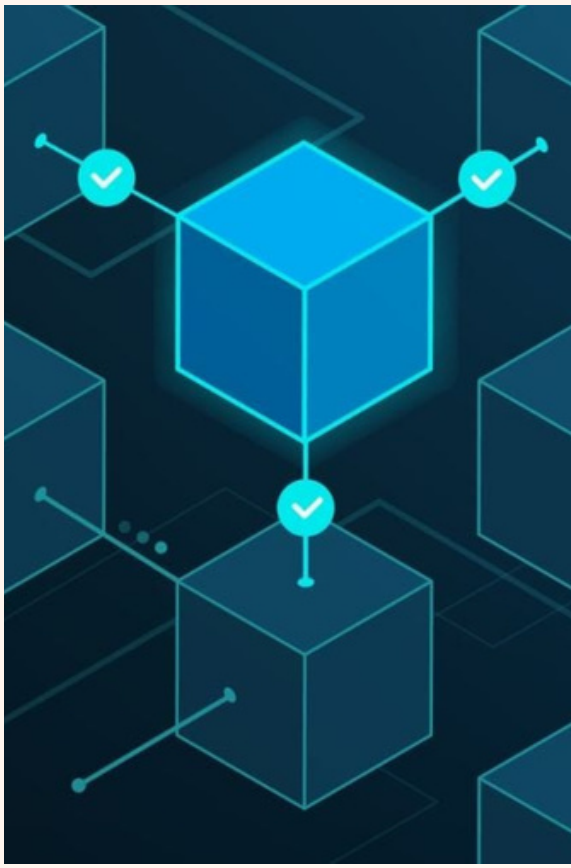
LEDGER

The technology uses an append only ledger to provide full transactional history. Unlike traditional databases, transactions and values in a blockchain are not overridden.

02

SECURE

Blockchains are cryptographically secure, ensuring that the data contained within the ledger has not been tampered with, and that the data within the ledger is attestable.



03

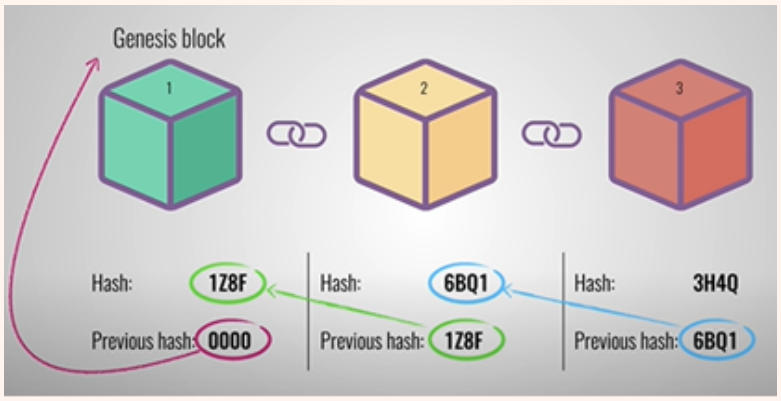
SHARED

The ledger is shared amongst multiple participants. This provides transparency across the node participants in the blockchain network.

04

DISTRIBUTED

The blockchain can be distributed. This allows for scaling the number of nodes of a blockchain network to make it more resilient to attacks by bad actors. By increasing the number of nodes, the ability of a bad actor to impact the consensus protocol used by the blockchain is reduced.



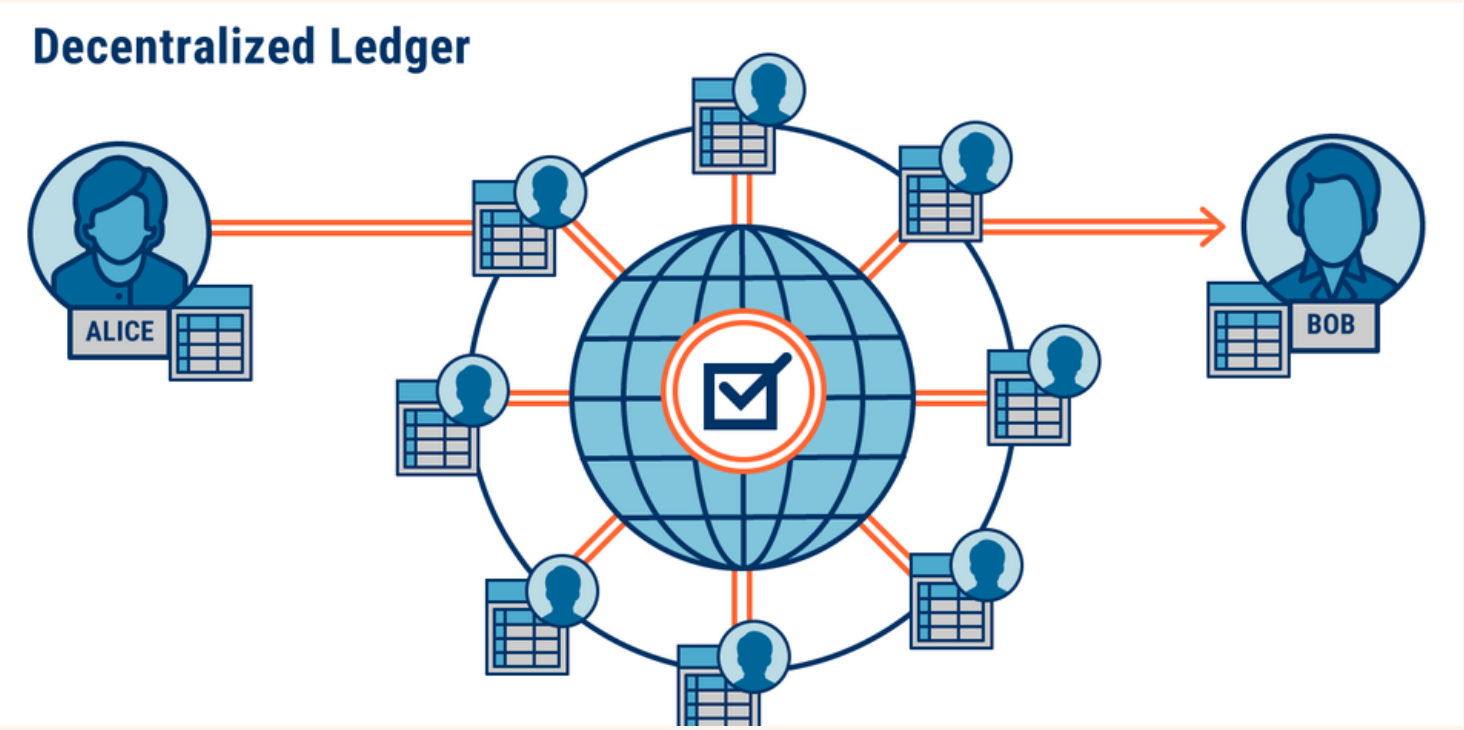
A database usually structures its data into tables, whereas a blockchain, like its name implies, structures its data into chunks (blocks) that are strung together.

FINANCIAL APPLICATIONS

It is very expensive to take a company public. A syndicate of banks must work tounderwrite the deal and attract investors. The stock exchanges list company shares forsecondary market to function securely with trades settling and clearing in a timely manner.

It is now theoretically possible for companies to directly issue the shares via the blockchain. These shares can then be purchased and sold in a secondary market that sits on the top of the blockchain.

Medici is being developed as a securities exchange that uses the Counter party implementations of Bitcoin 2.0.



> **NASDAQ launched its Private Equity Exchange in 2014 .**

This is meant to provide the key functionalities like Cap table and investor relationship management for the pre-IPO or private companies.

The current process of tradingstocks in this exchange is inefficient and slow due to involvement of multiple 3rd parties.

NASDAQ has joined hands with a San Francisco based Start-up called chain.com to 7 implement private equity exchange on top of BlockChain.com is implementingBlockChain based smart contracts to implement exchange functionality.

NON-FINANCIAL APPLICATIONS:

Verifying authenticity of the document can be done using blockchain and eliminates theneed for centralized authority. The document certification service helps in Proof ofOwnership (who authored it), Proof of Existence (at a certain time) and Proof of Integrity(not tampered) of the documents.

Since it is counterfeit-proof and can be verified byindependent third parties these services are legally binding.

Using blockchain fornotarization secures the privacy of the document and those who seek certification. Bypublishing proof of publication using cryptographic hashes of files into block chain takesthe notary timestamping to new level.

EDITORIAL TEAM

FACULTY COORDINATOR

MR. VIPIN RAWAT

STUDENT COORDINATOR

AYUSH DEV

AKHILESH YADAV

MANISH

EDITORS MESSAGE

Blockchains are tamper evident and tamper resistant digital ledgers implemented in a distributedfashion (i.e., without a central repository) and usually without a central authority (i.e., a bank,company, or government). At their basic level, they enable a community of users to recordtransactions in a shared ledger within that community, such that under normal operation of theblockchain network no transaction can be changed once published. In 2008, the blockchain ideawas combined with several other technologies and computing concepts to create moderncryptocurrencies: electronic cash protected through cryptographic mechanisms instead of acentral repository or authority. The first such blockchain based cryptocurrency was Bitcoin.Within the Bitcoin blockchain, information representing electronic cash is attached to a digitaladdress. Bitcoin users can digitally sign and transfer rights to that information to another userand the Bitcoin blockchain records this transfer publicly, allowing all participants of the networkto independently verify the validity of the transactions. The Bitcoin blockchain is stored,maintained, and collaboratively managed by a distributed group of participants. This, along withcertain cryptographic mechanisms, makes the blockchain resilient to attempts to alter the ledgerlater (modifying blocks or forging transactions).Because there are countless news articles and videos describing the "magic" of blockchaintechnology, this magazine aims to describe the method behind the magic (i.e., how blockchaintechnology works).. There is hype around the use of blockchaintechnology, yet the technology is not well understood. It is not magical; it will not solve allproblems. As with all new technology, there is a tendency to want to apply it to every sector inevery way imaginable. To help promote correct application, this document provides information
necessary to develop a high-level understanding of the technology.
Blockchain technology is the foundation of modern cryptocurrencies, so named because of theheavy usage of cryptographic functions. Users utilize public and private keys to digitally signand securely transact within the system.