PM launches blockchain-based digital degrees at IIT Kanpur

By IASToppers | 2021-12-29 17:25:00

PM launches blockchain-based digital degrees at IIT Kanpur

Prime Minister of India launched a system to award blockchain-based educational degrees in digital form to students of IIT Kanpur.

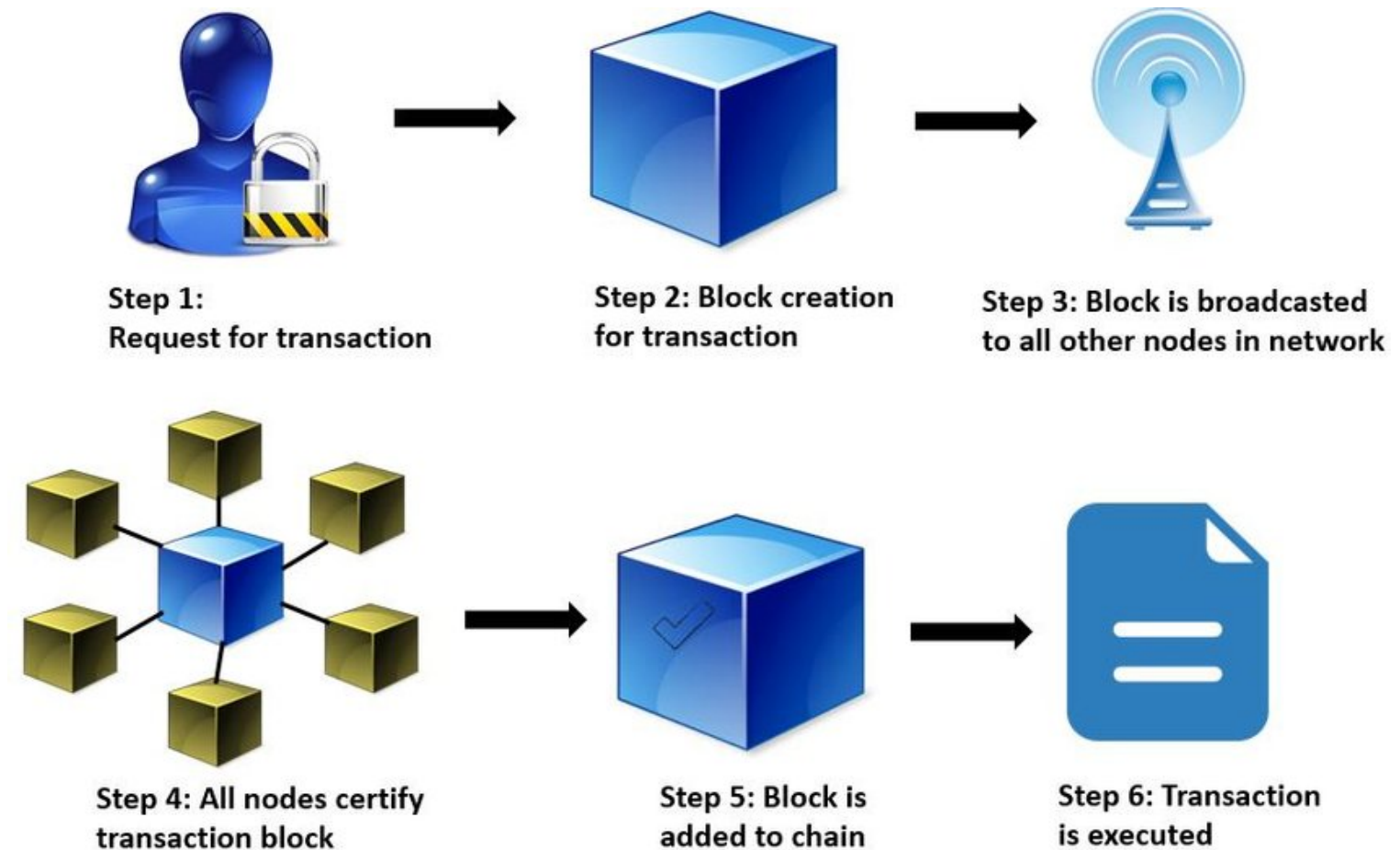[*Ref: Hindustan Times*]

Blockchain Technology:

- A blockchain is a **database** that **stores encrypted blocks of data** then **chains** them **together** to form a chronological single-source-of-truth for the data.
- Blockchain is one type of Distributed Ledger Technology (DLT).
- It makes the history of any digital asset unalterable and transparent through the use of **decentralization and cryptographic hashing.**

Features:

- The three key principles of blockchain technology are **transparency, decentralization and accountability.**
- **In this, digital assets are distributed** instead of copied or transferred, creating an immutable record of an asset
- The asset is **decentralized,** allowing full real-time access and transparency to the public.
- A transparent ledger of changes preserves integrity of the document, which creates trust in the asset.

Working of Blockchain:

Blockchain consists of three important concepts: blocks, nodes and miners.

Step 1: Request for transaction

Step 2: Block creation for transaction

Step 3: Block is broadcasted to all other nodes in network

Step 4: All nodes certify transaction block

Step 5: Block is added to chain

Step 6: Transaction is executed

[*Ref: ResearchGate*]

Blocks

- Every chain consists of multiple blocks and each block has **three basic elements:**
    - The **data** in the block.
    - A **32-bit** whole number called a **nonce.**

Nodes:

- Nodes can be any kind of **electronic device** that **maintains copies of the blockchain** and keeps the network functioning.

Miners:

- Miners **create new blocks** on the chain through a process called mining.

Significance of Blockchain Technology:

- The principle of **decentralization** means that the control is not in the hands of a central agency, but to a distributed network of nodes.
    - This will help in keeping the **data safe** even if any specific node is compromised.
- The information in a blockchain is recorded and stored sequentially along with an exact timestamp.

- The previous information can't be altered, only amended by adding a new block.
  - This makes **tampering** with a transcript **very hard**.

Public Procurement / Government Contracting:

- A blockchain-based process can **facilitate third-party oversight of transactions** and provide greater objectivity and uniformity through automated contracts.
- There also would be more **transparency and accountability** of transactions and participants.

Land Title Registries:

- Blockchain is a way to **increase efficiency in land title registries.**
- Blockchain-based land registries could provide a **secure, decentralized, publicly verifiable, and immutable record system** where people could prove their land rights.

Electronic Voting:

- Governments are considering **blockchain-based voting platforms** due to concerns about **election security, voter registration integrity, poll accessibility, and voter turnout.**
- Blockchain's information security qualities could help **address election tampering and increase poll accessibility.**
- A limitation would be blockchain's vulnerability to cyberattacks and other security issues.

Beneficial Corporate Ownership Registries:

- Blockchain can develop **central registries to help track conflicts** of interest and criminal activity.
- It also could provide **transparency and disclosure.**
- However, there are **several limitations** as most countries don't require companies to maintain beneficial ownership information themselves.
  - Also, a blockchain-based registry would **require buy-in** from **politicians, lawyers, banks, and big business**, which may be a heavy lift in some locations.

Grant Disbursements

- Blockchain could **reduce the number of actors and managers**, could **streamline the process**, and improve verification.
- A **limitation** would be among the **less technologically savvy** who might be excluded from grant disbursement processes.

Challenges of Blockchain Technology:

- **Security** is one of the primary challenges of using the blockchain technology for any purpose.
  - It also eliminates the possibility of modifying student records for legitimate purposes.
- There is a **limitation with scaling the system** beyond a certain level.
- Increasing the network means adding more blocks, which will **slow down the speed** of transaction as each transaction requires peer-to-peer verification.