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Blockchain in Education

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Abstract: This research paper gives an overview of the blockchain technology, when it should be used as well as how the technology really works. Later it indicates how this technology can be used in Education and how it will help in improving the real world problems.

Keywords: Blockchain, Education, Technology, Solution.

I. WHAT IS BLOCKCHAIN?

“The blockchain is an incorruptible digital ledger of economic transactions that can be programmed to record not just financial transactions but virtually everything of value.” – Don & Alex Tapscott, authors Blockchain Revolution (2016).

In simple terms, a blockchain is an immutable record of data on cluster of various computers owned by different entities.

A block is a unique record with a unique history stored across the network which gets added to a chain.

Applying the cryptographic principles on such multiple blocks of data, a chain is formed.

A blockchain is a shared network with no central authority, thus anyone and everyone can see the information.

Thus, anything that is based on the blockchain is transparent by its nature and everybody included is responsible for their own activities.

A blockchain does carry infrastructure cost but there is no transaction cost involved.

In order to pass the information from source to destination, a simple process of blockchain can be used. Here, the source party initiates transaction creating a block which is verified by thousands or millions of distributed computers across the network.

This verified block is then added to a chain which gets stored across the network creating a unique record with a unique history.

It is next to impossible to alter the entire chain in order to falsify a single record.

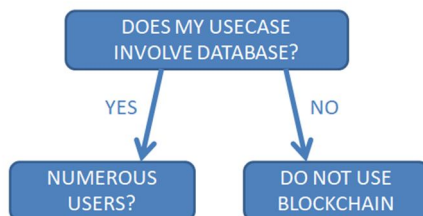
Blockchain's are free of cost. A blockchain can facilitate in transferring and storing money and also can replace all the processing and business models which are dependent on a small fee charged for a transaction.

II. WHEN TO USE BLOCKCHAIN?

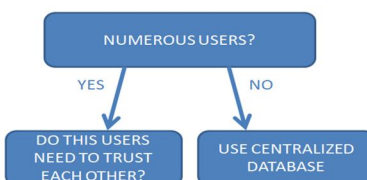
As the concept of blockchain is still evolving, it is confusing for the users to decide if using blockchain is beneficial to their business or not.

To solve this confusion ask yourself these few questions step by step:-

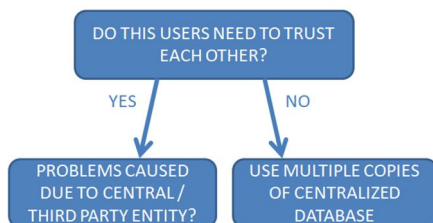
A. Does My Use case Involve Database?



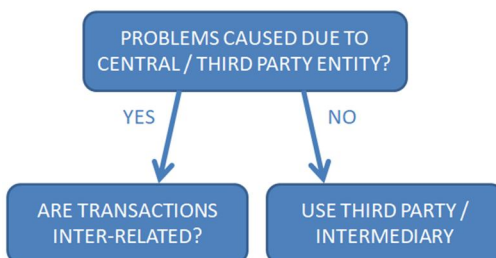
B. Are there Numerous Users?



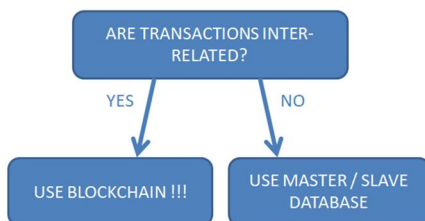
C. Do These Users Need to Trust Each Other?



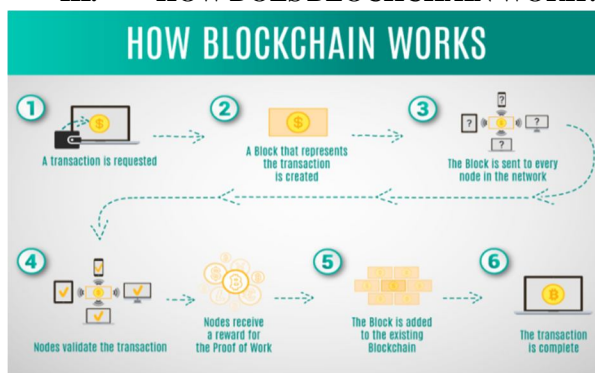
D. Are any Problems Caused Due to Central/third Party Entity?



E. Are Transactions Inter-Related?



III. HOW DOES BLOCKCHAIN WORK?



Every new block to be added in the blockchain goes through these 6 steps:-

- 1) A transaction is requested.
- 2) A block that represents the transaction is created.
- 3) The block is sent to every node in the network.
- 4) Node validates its transaction.
- 5) The block is added to the existing blockchain.
- 6) The transaction is complete.

There is a distributed consensus model which allows blockchain to run as a distributed ledger without any unified or central authority validating the transactions.

So, whenever there is a change in an existing transaction or a new transaction comes into a blockchain, majority of the blockchain nodes must execute some algorithms to verify and evaluate the history of the proposed block in the blockchain.

If majority of the nodes agree to the validation of the signature and history, then the proposed block is accepted into the ledger and subsequently gets added to the chain.

On the contrary, if majority of the nodes disagree to the modification and addition of the ledger entry, it is rejected and not added to the chain.

IV. APPLICATIONS OF BLOCKCHAIN.

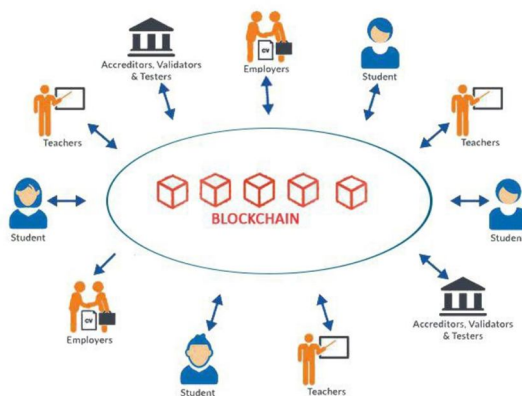
- 1) *Banking*: Banking would be faster as well as a cheaper way to transfer money through a decentralization approach provided by blockchain. It would be a more secure way to store records.
- 2) *Healthcare*: Storing records in a blockchain from the time of birth to the time of death would prove beneficial in many ways including during the time of emergencies.
- 3) *Education*: Blockchain can be used for maintaining academic records, badges, student records which could be beneficial for students as well as employers.
- 4) *Voting*: Security provided by blockchain for the voting system would be unhackable. The process from registration of the voter to tallying of votes, the system can be made indisputable.
- 5) *Security*: Blockchain is based on advanced cryptography which is virtually unhackable.
- 6) *Music & Literature*: Blockchain cuts the middleman and thus the agencies publishing and releasing cost decreases helping the true artist earn the real benefits.

These are some of the applications while there are many others too. Now, let us take a look at the application of “Blockchain In Education” in brief.

V. BLOCKCHAIN IN EDUCATION.

Managing data has been an issue in each and every field. Educational degrees and certificates are inconvenient to be maintained and managed as they are needed every now and then.

Verification of these records are necessary as they can be falsified and presented which might even take away opportunity from someone who is more deserving.



A. Students Perspective

Every time a student has to take an admission in any university or college for any course, a minimal requirement is to fill forms with personal details and past qualifications, the marks obtained at each level and so on. Every time the student sign-ups for a new course in same or different university, the requirement to fill these forms would become more tiresome. Imagine you want to take an admission for some master course in XYZ University, you will have to fill your personal details as well as enter all the qualifications and marks obtained from 10th standard to degree college scores.

By using blockchain, students record representing as a block will be added to the blockchain by various entities (schools, colleges, universities, or any private institute) acting like nodes. Thus, whenever the student wishes to register to any course in any university his/hers data will be directly fetched from the blockchain database instead of manually entering it. This would make students life easier.



B. Employers Perspective

When an interviewee comes for an interview he/she has to carry a folder full of multiple qualifying documents. These documents are his/her qualifications and various certificates. Using blockchain the employer could easily find the details of the interviewee making less of paper scattered around and even the interviewee will not have to worry about carrying multiple documents.

C. Legal Perspective

Falsified certificates can be easily detected by using blockchain.

D. Copyright and Digital Rights Protection

Professors, researchers and faculty members creates various teaching materials, and other Intellectual properties, shares them and even wishes to control the use of them. Blockchain has the capability to manage, share and protect the digital contents which helps them fulfil this requirement.

E. Technological Perspective

Using blockchain technology in learning chatbot app could help students in preparing for their tests where the chatbot could answer questions and recommend resources also by keeping track of the students progress.

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