The Need to Adopt Blockchain in Marking and Grading of University of Nigeria, Nsukka Student's Examination or Projects

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Abstract: Blockchain is a modern technology in education platform. This new technology can help to solve problems in education sector such as enthroning transparency and trust in marking and grading student's scripts. Ideally, the use of this new technology shows great and positive results but what can be said about adopting Blockchain in marking and grading student's scripts in the University of Nigeria, Nsukka? In this study, the advantages of the new technology such as the transparency and trust because students and teachers are involve in the marking are elaborated. This study, therefore, looked into the would-be advantages of Blockchain (decentralized) over the conventional (centralized) in marking and grading student's scripts in the University of Nigeria, Nsukka.

INTRODUCTION

The Blockchain technology promises hope for staff and students in education. It can help to make evaluation in education system transparent, reliable and trustworthy. The new technology has the potentials to improve the marking and grading of students' scripts. However, adoption of Blockchain would involve high cost and having already trained personnel on ground in the University of Nigeria, Nsukka. The successful adoption of the Blockchain in the University is hinging on many factors, such as University Administration providing for the needed requirements before adopting the new technology and University Senate support and approval.

The concept of Blockchain was invented by Satoshi Nakamoto. It is a data structure of data blocks arranged in chronological order and it is a new type of dababase. The Blockchain technology is important in the modern education platform because it can help to solve or minimize the problems associated with the evaluation (marking and grading) student's scripts in education. The old platform (conventional) manual marking and grading lack transparency and trust because evaluation is teacher centred. How does the Blockchain technology work and solve these problems? The blockchain creates the blocks with different information. Each of these blocks relates to other blocks in this blockchain. When the new block is connected to the Blockchain it then becomes difficult to change or delete these blocks[1]. When the University Senate approves and the Management of the Institution has provided the necessary facilities; the management would then arrange on how staff and students should be trained on evaluation using digital technologies.

The users of the Blockchain can create the smart contracts and decentralized applications. This platform is dependent on the Ethereum. Ethereum is the second

largest crypto currency platform. It is decentralized open source blockchain featuring smart contract functionality[2]. Cryptocurrency is a new form of digital asset based on a network that is distributed across a large number of computers. This decentralized structure allows them to exist outside the control of central authority[3].

Blockchain using Ethereum helps to minimize problems associated with conventional marking and grading of students scripts which include lack of transparency or teacher centred in some cases determining marks based on sex and bribe, time consuming and stress, missing scripts and delay in releasing results[3].

The Blockchain technology is associated with cryptocurrency because the new technology is the root of cryptocurrency's work but it can be deployed through the use of bitcoin in many other areas. Such areas include market place, human resources, smart contracts, libraries and innovation learning platform in education.

The Blockchain technology can be used to create decentralized transcripts, identify registered certificate authorities and the hashes of certificates. They are stored in management system and streamline verification procedures which reduce fraudulent claims for other credentials of students and staff[4].

This research looked at the advantages of Blockchain platform over conventional platform in marking and grading student's scripts. It also looked particularly at the advantages and possible challenges of Blockchain technology in marking and grading student's scripts in the University of Nigeria, Nsukka.

Blockchain marking and grading student's scripts: In the new technology, Ethereum is built on a public blockchain which identify challenges and use smart contracts to calculate grades in an algorithmic manner. Algorithm is a finite list of instructions used to perform a task. Both lecturers and students partake in the marking. For example, when students submit their scripts to lecturer, instead of taking the scripts home or to personal office for marking and grading, the lecturer could collect the scripts and put them together and asks each student to take a random script and grade it with an answer key. This is known as transaction and it is the fundamental unit that makes up a blockchain. In this approach, one student, Ugwu Rosemary gives another student, Okeke John a grade of 76% (mark). Ugwu Rosemary becomes sender; Okeke John is the recipient while 76% (mark) is transaction. The lecturer through blockchain platform no longer needs to spend all his or her time on marking and grading but each student can mark and grade one other script without delay. When ethereum is built in private blockchain and used through smart contracts students are able to learn and know how to read or check their grades. Through, the use of same platform professors or lecturers and administrative personnel can record the grades. The

use of algorithmic in blockchain saves lecturers energy and time in calculating grades while the use of smart contracts enables students to read or check their grades without going to where the grades are posted. Then problem of stress, cost and delay is solved by blockchain platform.

Contrary to the conventional that use manual that connote same system, blockchain use different designs and requirements depending on the systems and features provided by the blockchain. Though, the new technology is cost intensive, it should help to eliminate many inadequacies associated with manual (centralized) platform through the following advantages of blockchain:

Advantages
Transparency: The transparency of the Blockchain is achieved on transactions (marks) copying process. When the transaction (mark) is connected to the Blockchain all the participants become aware and each transaction (mark) is copied to either computer in the Blockchain network. Also, when teacher collect scripts and involve each student to take a random script and grade it with an answer key the teacher will be aware of what the student is doing. Each action is shown to participants of the Blockchain[1]. It implies that none of the participant can do anything without other participants knowing about it.

Immutability: The immutable is achieved because participants agreed on the transaction (mark) awarded to each student and all the marks put together are shared across the blockchain. When the transaction (mark) is connected to the Blockchain, it would not be possible to change or delete it. Since, is decentralized (obviating third party), each transaction (mark) which is joined to the Blockchain is copied to each computer in the Blockchain network. This benefit makes the Blockchain unalterable and indestructible[5]. This implies that none of the participant can alter any mark already given.

Traceability: The Blockchain is designed in a way that it can show problems and correct them if it is necessary. This implies that one hardly sees mistakes in scores or marks given because many are involve.

FASTER PROCESSING

The use of Blockchain technology helps to reduce the time for the processing. This implies that the work is done by many which help to save time[1].

CONVENTIONAL (MANUAL) MARKING AND GRADING

In conventional (manual, centralized) marking platform, teacher/lecturer marks all assignments

(examinations, tests or projects). The lecturer (centralized) gives report each semester and ensures that no student cheats to maintain integrity. This (centralized platform) provides room for written comments as feedback that students could use to improve their work. This comment could be evaluative or descriptive. Evaluative feedback is written praise or criticism which judges student work. The descriptive feedback provides information about how a student can be more competent on subject or course[6].

However, centralized or conventional method goes with inherent flaws which include inefficiency: when a lecturer is to mark and grade 50 scripts at once, the scripts can sometimes take a week or more before the lecturer could finish the marking or grading of the scripts is sometimes risky.

Sometimes a lecturer might lose a student's script or paper or scripts get ruined by floods or other natural disasters. Lecturer handling, so many scripts and as a result might make mistake in marking or grading corruption is possible in the process a lecturer may be lured into using sex and bribes to award marks is time consuming. Marking and grading scripts take a lot of lecturer's time which they would prefer spending in some other things they might considered more important in their teaching and research.

In conventional platform, it takes a lot of energy to mark scripts, arrange and calculate grades by lecturers. Lecturers, according to Hamsatu *et al*.[7] would spend weeks marking scripts manually which require a lot of energy, time and carefulness to record grades of students. In this platform the authors noted that students have to go to notice boards or where the results are placed to check their grades. This approach is not only time consuming but the prints may not be clear for the students to see the grades posted. The platform is concerns about lecturers or teachers thereby making the assessment entirely teacher centred and consequently lacks transparent. This paper seeks ways in which human element in marking can be reduced by exploring the possibilities of adopting blockchain.

A new platform (blockchain) is needed to reduce queries and biases by marker in the conventional platform. It also needed not only to leverage lecturers from these inherent flaws of conventional (manual, centralized) marking but also to enable students to be part of assessment exercise in University of Nigeria, Nsukka thereby making the assessment transparent.

POSSIBLE CHALLENGES IN ADOPTING BLOCKCHAIN PLATFORM EVALUATION CHALLENGES

There may be challenges in designing blockchain systems for application in marking and grading student's scripts. These challenges would arise because blockchains are infrastructural and one would intend to create new ways of doing things-ways that can challenge fundamental existing systems that people are used to. This is because change always associates with challenges.

Challenge of likely high cost of energy: The consumption of power is needed for keeping a real-time ledger. Everytime the new node is created and in the same time it communicate with each and other node which help to create transparency. As miners attempt to solve a lot of solutions per seconds in efforts to validate transactions (marks) they use substantial amounts of computer that consume much power[8].

CONCLUSION

The blockchain is a data structure of data blocks arranged in chronological order which should solve some problems in conventional (centralized) system. In this platform student participate in evaluating, marking and grading student's scripts where transactions (marks) already given should not be unintentional or purposely deleted or modified in the blockchain. With the advantages of the new technology such as the transparency, traceable because students and teachers are involve in marking (transacting) due to decentralized system, the blockchain technology is reliable. This implies that the mark (transaction) is immutable and indestructible. The blockchain technology guaranties future hope for staff and students of University of Nigeria, Nsukka that would minimize problems associated with (conventional) manual marking and grading due to the benefits of the Blockchain technology. The staff and students must be trained on evaluation (marking and grading) using digital technologies if Blockchain should be adopted in University of Nigeria, Nsukka because blockchain can bring fulfillment of the purpose of education in our educational system. Though the challenges are there in adopting the new technology but the benefits are greater than the challenges.

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