

# "Education Degree Fraud Detection and Student Certificate Verification Using Blockchain"

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*Abstract— To verify the authenticity of academic certificates we propose employing a digital signature scheme and timestamps using blockchain technology. While the number of universities, tertiary education students and number of graduates per year constantly increase, the need to easily verify degree certificates generates new business opportunities. The irruption of blockchain, and its implementation based in the blockcerts software, provides a straightforward solution that demands to explore plausible business models. In this paper we project two financial models balancing where the price for the service is balanced between the graduate and the employer as the main stakeholders of that service. Students demand a proof-of-certification at low cost and easy to check, employers also demand quick and trustable verification of degrees when recruiting..*

## Introduction

To unequivocally demonstrate having an academic certificate (university degree, doctorate, or any studies certification) is a process that changes in each country or educational institution.

Some academic centers allow verifying the authenticity of their certificates by a quick and simple online query without even asking who is requiring that information. Other delegate the task to third parties (either by choice or because of regulations requiring it) or market the service. Finally, there are times when there is no alternative but to directly contact the academic secretary's office at the educational institution, so that we can confirm whether or not a diploma or

qualification is valid. Meanwhile, academic certificate fraud is a reality and comes both by counterfeiting, and through the complicity of institution's authorities and staff. The frequency of these events is even enough for companies dedicated to detect it to emerge.

## Internal Fraud

The fraud consists of adding to the tutorial records of an

academic establishment to people that truly didn't graduated or certified with success.

Often, though not necessarily be so, with the complicity of someone who is part of the academic organization. If the fraud takes place on the same date of the alleged graduation or certification, technology does not provide a clear solution when the person involved has control over

the non-public keys required in an exceedingly digital signature theme.

But if someone tries to show as graduated in the past to whom

is not, a solution is to use a timestamp next to the digital

signature of each diploma. Thus, if a person claims to have obtained a university degree a decade ago, then the digital signature with its timestamp has to indicate that it was indeed a decade ago. In this way, the generation of fake degrees in the

future by editing university records or databases is prevented. The problem with traditional timestamp technology, besides its cost, is that it requires availability and trust in third parties (Time Stamping Authority) certifying the date..

The blockchain technology opens today opportunities to deliver new business models on quite consolidated markets. The use of blockchain in the education sector is one of the most challenging areas where results in the mid and long term can be achieved. The easy, trustable and cheap verification of official documents, such as university degrees, is one of the areas where blockchain can provide a timely and solid solution thanks to the use of widely extended cryptocurrencies. Bitcoin, Ethereum or Swarm are consolidated cryptocurrencies that offer a stable public blockchain that can be used for secondary uses such as a verification tool in several markets. Here, the selection of an appropriate public blockchain in terms of availability, flexibility and cost is crucial to develop a sustainable business model on top. In this paper we analyze the problem to develop an economically sustainable solution to automatically verify university degrees...

### **Blockchain technology**

Blockchain may be a novel technology sanctioning new varieties of distributed computer code architectures, wherever parts will notice agreements on their shared states for decentralized and transactional knowledge sharing across an outsized

network of untrusted participants, while not looking forward to a central integration purpose that ought to be trustworthy by each part at intervals the system.

The blockchain organisation may be a time-stamped list of blocks, that records and aggregates knowledge regarding transactions that have ever occurred at intervals the blockchain network.

Thus, the blockchain provides associate changeless knowledge storage, that solely permits inserting dealings while not change or deleting any existing transaction on the blockchain to stop change of state and revision.

The most famous application of Blockchain are cryptocurrencies, which have been a huge phenomenon during the last year because of their promising use of the technology. The biggest and most important of them is Bitcoin [6], and along with newer ones like Ethereum, they are leading the cryptocurrency market with more than 1.600 different currencies at the 4 moment, with a market cap that has been close to a trillion dollars last year, now sitting over 300 billion. As stated in the original Bitcoin paper [6], Satoshi Nakamoto remarks:

A strictly peer-to-peer version of electronic money would permit on-line payments to be sent directly from one party to a different while not looking a institution.

Digital signatures give a part of the answer, however the most edges square measure lost if a sure third party remains needed to forestall double-spending.

We propose an answer to the double-spending downside employing a peer-to-peer network.

The network timestamps transactions by hashing them into associate current chain of hash-based proof-of-work, forming a record that can't be modified while not redoing the proof-of-work.

The longest chain not solely is proof of the sequence of events witnessed, however proof that it came from the biggest pool of electronic equipment power.

As long as a majority of electronic equipment power is controlled by nodes that aren't cooperating to attack the network, they'll generate the longest chain and surpass attackers.

The network itself requires minimal structure....

### **Scope Of Project**

Blockchain technology is a growing area of interest for many industries and universities in Europe and beyond.

As a comparatively recent innovation in technology, blockchain could be a international, cross-industry and riotous technology that is forecast to fuel the expansion of the world economy for the next several decades

According to various researches about one million graduates passing out each year, the certificate issuing authorities are seems to be compromised for the security credentials of student data. Due to the lack of effective antiforge mechanism, events that cause the graduation certificate to be forged often get noticed. In order to solve this problem these systems are introduced even though security issues are still exist. Blockchain is one of the most recent technology that can be adopted for the data security. The unmodifiable property of the block chain helps to overcome the problem of certificate forgery....

### **Literature review of any published literature on:**

- Applications of blockchain technology to education.
- Non-financial applications of blockchain technology more generally.
- Digital methods for storing, securing, sharing and verifying academic credentials. Desk Research utilising primary sources covering
- Technical specifications of products released by vendors offering products built on top of blockchain technology, as well as of their governing structure, operations and intellectual property arrangements...

### **The objectives of the systems development and event management are:**

1. Digital certificate which adopts digital signature technology, presents to the user by the authority to confirm the user himself in the digital fields used to confirm a user's

identity and access authorization to the network resources.

2. It provides the transparency for employers for verifying the employees educational degree at recruitment process and saves the time of educational document verification....

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### **Conclusion**

The proposed platform takes the advantage of the blockchain in order to create a globally trusted higher education credit and grading system. As a proof of concept, we presented a prototype implementation of the system platform which is based on the open-source Ark blockchain platform. The proposed system platform addresses a globally unified viewpoint for students and organizations. Students benefit from a single and transparent view of their completed courses, while have access to up to date data regardless of a student's educational origins. Other beneficiaries of the proposed system are potential employers, who can directly validate the information provided by students. The proposed solution is based on the distributed P2P network system.

It transfers the upper education grading system from this real-world physical records or ancient digital ones (e.g. databases) to an efficient, simplified, ubiquitous version, based on blockchain technology.

It is anticipated that such a system might doubtless evolve into a unified, simplified and globally omnipresent educational activity credit and grading system.

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