**PROJECT REPORT**

**Decentralized Application for**

**Digital Certification**

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**1. Project Overview**

One of the great promises of blockchain technology is that it can serve as a decentralized permanent unalterable store of all types of information or assets, not just as a currency or payment system. The project comprises of an application which would provide information about the certification of student’s educational qualification which is digitally signed by the university/Education Board using blockchain technology. This is also applied to POA or POI documents as well. Similar to the idea of an eAadhar but with a different use of technology.

**2. Purpose of the Project**

* **Problem Statement**

Many aspirants like to pursue higher education at countries which specialize in a particular domain. Application to such universities requires document verification which is done by contacting the respective schools and colleges to provide confirmation about the applicant’s qualification.

Similarly, in business companies perform background and educational verification of their employees. The reason behind such verification is that across the globe there are numerous fraudulent cases. Employee and students are found to have duped or lied in their resume about the certifications. This confirmation is done only done in the later stages of the verification process and would have given enough time for the fraudulent to have taken advantage over the company or university.

Time is wasted upon performing such tasks. On paper nothing seems to be believable unless confirmed by the board or institution. There are many such cases even in India. For instance the Dr. BR Ambedkar University in Agra is alleged to have handed out thousands of fake degrees. Over 100s of fake degrees have been to relatives of the employees of the university. This wasn’t confirmed until mid 2015.

To prevent such fraudulent cases and also provide an ease of presentation of information to the respective organization is one of the reasons behind such a project.

* **Motivation**

It was the Hacker Earth Blockchain workshop which initiated the motivation to build such a product. They demonstrated how Blockchain is used for linking and securing blocks of information about crypto currency such as Bitcoins. Any transaction performed through the Blockchain a permanent and verified, which means that information cannot be modified and is digitally signed by an organization.

Blockchain is designed to be secure as it operates on a peer-to-peer decentralised network , that is the information is linked through ledgers which share the information and are geographically separate from one another. This is what they call Decentralised storage.

By utilising such a feature data cannot be accessed easily by hackers and there are various ledgers which are connected by pointers. Once transaction is completed, then the information cannot be modified. This enables the Education Board or University to permanently certify a student and his/her certificate can be presented to any university.

The process of verify this certificate is much quicker than the previous methods and is more convincing. Such technology is already being implemented in many countries. For instance MIT Lab has taken the initiative to even provide open source their project called BlockCerts. For even participation of workshops such certification is awarded. But Indian educational board hasn’t taken that step forward yet. Thus to enable it to move forward is what motivated us to come up with such a project.

**3.Goals of the project**

* To deliver hassle free data verification for organization bodies.
* To provide digitally accurate records of official records.
* Use of a smart phone to provide records/documents instead of numerous files of paper.
* Secure and prevent the records from any alteration/fraud.
* Permanent and indestructible records unlike paper documents.

**4. Known issues and Challenges**

* Investment for decentralised ledgers.
* Requires maintenance and synchronization between servers.
* Requires more computation and increases network size.
* More complicated than usual server technologies.
* Immutability isn’t always a boon.
* Transaction costs and network speed.

**5. Conclusion**

Blockchain is a technology that clearly has applications in the world of learning at the individual, institutional, group, national and international levels. It is relevant in all sorts of contexts: schools, colleges, universities, MOOCs, CPD, corporate, apprenticeships, and knowledge bases.

Rather than the old hierarchical structures, the technology becomes the focus, with trust migrating towards the technology, not the institutions. It is really is a disintermediation technology.

Traditionally institutions have been a source of trust: universities, for example, are trusted “brands”. In finance, where blockchain is nowadays a ubiquitous hot topic, banks exist to enact transactions, creating an environment in which blockchain’s advantages are readily obvious.

In education, however, there needs to be trust beyond the technology. We are looking, I think, at a hybrid model rather than a wholesale blockchain takeover. Reputation will still matter, and this will continue to be derived from the quality of the instruction, teachers, research, and so on. However, blockchain can play a role here, too, as one could imagine a sort of web of teachers and learners that deploys blockchain to cut out institutions. This, in my view, is not impossible, but it is unlikely.

It must also be recognized and conceded that blockchain is not without its problems. There are data-regulation issues, and a cloud has been created over the technology by the fact that one of the exchanges in the Bitcoin system – which is based on blockchain – saw $500 million disappear. And last but certainly not least, after considerable difficulty, US authorities were able to close down the infamous “Silk Road” drug-dealing exchange, which was also blockchain based.

Yet the biggest obstacle to blockchain’s more widespread use is cultural. Education is a slow learner and a very slow adopter. Despite its obvious advantages, the learning world is likely to be slow in implementing this technology, as most of the funding and culture is centred around the individual institution. Bologna was dead the day it was signed as nobody really wanted to lose their students and suffer financially, but it nonetheless became the framework for European higher education. This indicates clearly that the stimulus for change will have to come from elsewhere.

Despite the known issues and compromises from using Blockchain technology for certification, the technology is still in its development. As more researches advance, the technology can be optimized and be more widespread than it already is. Until it tackles sensitive issues, it can be used to solve some general and domestic problems.