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FORMAT FOR STUDENT PROJECT PROPOSAL FOR THE
46thSERIES OF STUDENT PROJECT PROGRAMME

1.	**Project Title:** **Digital Document Authentication Using Blockchain**
2.	**Name of the College:** **KLE College of Engineering and Technology, Chikodi**
3.	**Branch: Computer Science and Engineering**
4.	**Name(s) of project guide(s):** **Name:** Prof. Suneel C Shinde **Email id:** suneel.shinde@klecet.edu.in **Contact No:** 9986755305
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6.	**Keywords:**

Blockchain, Hashing, Ethereum, Document Verification, Digital Signature, Cryptography, Distributed Ledger.

7.	**Introduction:**

Presently, the certificates are generated by various educational institutions and government agencies. These certificates are of great significance during admission procedures and while applying for jobs. Most of the educational Institutional certificates are in physical form across the country, which poses great difficulty in verifying the authenticity, in sharing the document to any agency for availing any services, in storage, and incurs high cost with a lot of manual distress [1]. However, if they want to verify, they can contact the university that the candidate attended and make an inquiry if the certificate is genuine. This process is long and is dependent on the university that the inquiry is made. In case the candidate colludes with the university to lie about the certificate, it would be very hard to detect fake certificates [2]. Besides to the risks of forged certificates, when the certificate holder applies for a specific job or completes postgraduate studies, the job side or the College of postgraduate Studies will request the validity of the issuance of this initial certificate submitted by the awarding side. This verification process is a complex , routine, tedious and causes a lot of delays and potential for manual error regardless of the cost [2]. 2 On the brighter side, technology can be used to devise measures to verify academic certificates if they are real or fake.

	Blockchain technology is a powerful and secure option for creating a certificate verification system [2]. Blockchain allows you to verify without having to be dependent on third parties. The data stored inside the blocks cannot be altered or deleted, which makes it unforgeable. Blockchain uses Distributed Ledger Technology (DLT), which is more reliable, more secure and cheaper compared to conventional cloud-based storage systems. With these advantages over conventional technologies, Blockchain would be an apt tool to create as to store, validate and share certificates in a secured manner, there by reducing the need for physical forms which in turn reduces cost, loss risks and mental distress [1]. Blockchain innovation guarantees benefits in believe capacity, collaboration, organization, identifying proof, validity, and transparency, as well as being a database in its own right. These solid suggestions for the long run of how to verify the authenticity of academic certificates because a paper based certification is fallible to manipulation and susceptible to fraud [3].
8.	**Objectives of the project:** The objective of the project is to get rid of the third party in the process of proving the validity of academic certificates issued by academic organizations, thus facilitating and accelerating this process and making it safer and less expensive. The project will focus on document verification using blockchain technology. In this research, the researchers will take a look at the authenticity of the certificates issued over the ethereum network and how to increase the authenticity of certificate issuer within the network instead of anyone being able to issue academic certificates. In general, the goal of project is to establish an effective management system for the process of issuing and verifying educational documents.
9.	**Methodology:** To begin, in order to create a blockchain, we must create and deploy a smart contract. The Front-end will be constructed based on the created smart contract. Then, using Web3, we make the smart contract and the frontend communicate with one another. The transactions are then completed through the use of a digital currency wallet.

The Ethereum blockchain's core and brain is the smart contract. Remix is used to generate the smart contract, which allows you to develop Solidity smart contracts, then run and deploy them. Right now, Remix is the finest Ethereum IDE for trying out Solidity smart contracts.

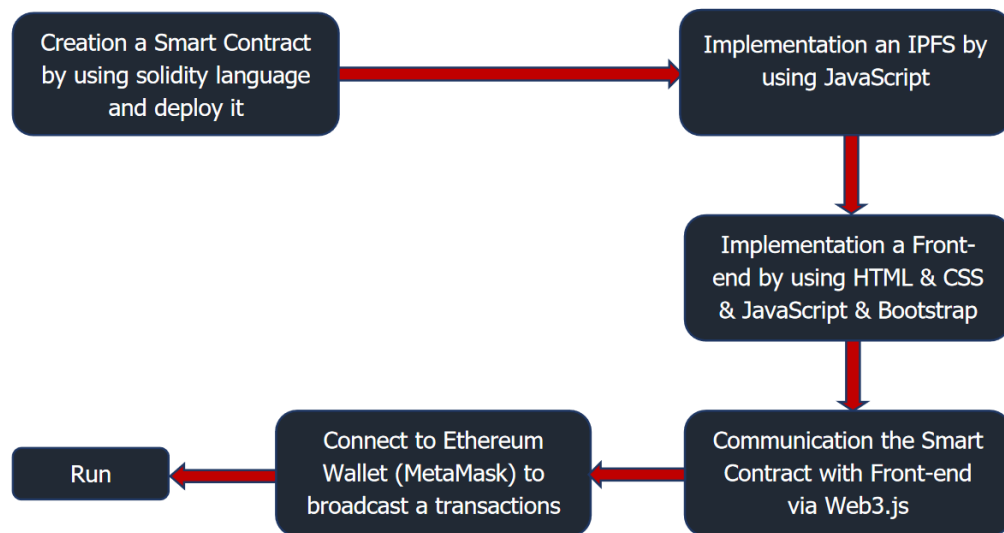The workflow is depicted in the diagram below:

Fig: Workflow of the System.

Our smart contract is multi-functional:

❖ Adding and editing document exporters; the smart contract's owner (University) can add and edit a document exporter that represents one of the university's colleges. When the document exporter exports his college students' documents to the blockchain, this function is invoked.

❖ Delete a document exporter; the smart contract's owner (University) has the authority to delete a document exporter. The exporter will be unable to upload documents to the blockchain if the owner deletes the exporter.

❖ Upload a document; this function is only accessible to exporters, as it is used when each exporter from each college in the university uploads the documents of his college students to the blockchain and offers the student a copy of the document or QR code.

❖ Verification of documents; this function verifies the validity of documents issued by this university. When the verifier requests that a document be validated, this function is invoked.

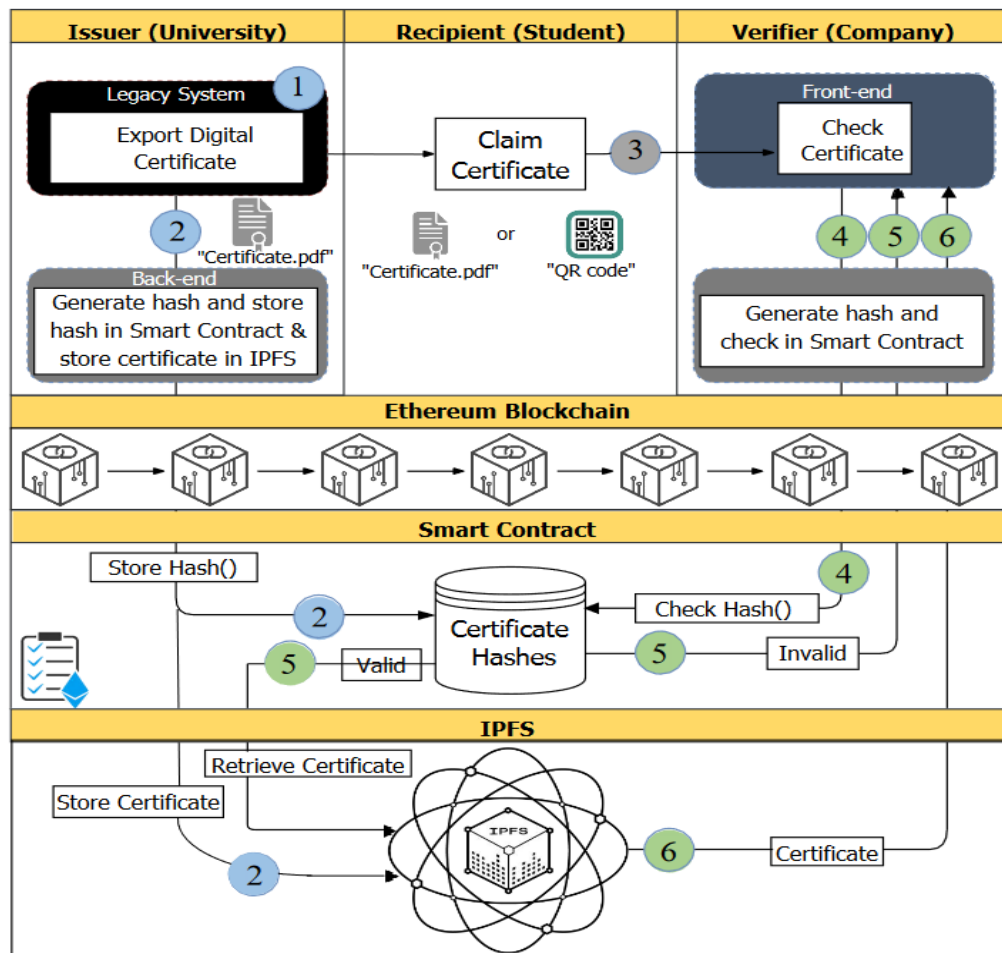❖ Delete a document; the owner or one of the exporters has the authority to delete a previously exported document.

Figure: System Architecture

| 10. | **Results and Conclusion:** |

Basically, an advanced and efficient technology that is far from the norm is needed to accomplish our daily dealings. Blockchain technology is a great and unparalleled invention for such a need. Blockchain is one of the most popular and recent growing technology that is underuse in different sectors such as health care, insurance, banking, e-voting, supply chain management and certificate verification and digital identity etc.

Blockchain is considered secure technology, which stands in publically distributed and peer to peer networks. Blockchain allows storing excessive amounts of data due to complex network architecture. We are very impressed with this trendy technique so we are studying and learning more about this technique. We are experiencing a unique experience in our graduation project.

Our project is based on the Ethereum blockchain platform. Our system automates the process of generating Certificates and reduces the manual

work needed for the verification of the same. Students are also at a comparatively low risk of losing the certificate. By using an additional hashing algorithm we are decreasing the percentage of data being tampered with. The SHA3 hash function has so far proven to be safe, which means that no two different inputs resulted in the same output. At the same time, it is not possible to generate real information from a hash, where the same document can not be retrieved by the produced hash. Retrieval of the same document is only done by IPFS.

Ethereum blockchain has many advantages over the traditional method of verifying educational certificates, the current process is expensive, time-consuming and inefficient.

- Data security and privacy are the prominent features of the Ethereum blockchain.

- Ethereum blockchain consumes much less time than any other background checking system out there today. Organizations can instantly check the authenticity of documents to be verified. Most current background checks take a long time, which can delay the process.

- Ethereum blockchain reduces transaction fees, this low-fees back-check will help organizations verify the basic details of applicants.

- Ethereum blockchain is very effective in verifying documents submitted by a job applicant. The hash values of the document entered into the blockchain cannot be tampered with. Most current background check systems are done manually and are prone to errors or tampering. But, our system will work efficiently by overcoming all the problems of the manual process.

- Our system can include organizations from any country in the world. Document Verification using Ethereum blockchain is not just restricted to any one geographic location, thus the process of applicants becomes easy. We are ambitious to achieve more and more features to improve our system. Through our journey to achieve this, we tried to reach fewer transaction fees. When we deploy our smart contract on the Polygon network, we have noticed significant progress in reducing transaction

	fees. This is a step forward.
11.	**Scope for Future Work:** There are possible additions and improvements for future works. More creative requirements are needed to drive the project forward. The project supervisor can submit our purposed ideas as a future graduation project in the coming years, or a senior propose them to project supervisors as an idea for his graduation project. IPFS necessitates the use of long-term memory for File storage to can be recovered later. As a result, our recommended future plan will be to store document files on servers located throughout the region of interest. This is a significant step forward in terms of reliability and efficiency.