



A System For Educational Institutes To Process Admissions: Ensuring Security With Blockchain

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Abstract: Blockchain technology has emerged as a highly applicable solution, offering a secure framework for managing data and transactions through decentralized, immutable, and distributed ledgers. While initially synonymous with financial operations, its utility extends far beyond. This paper advocates for the implementation of blockchain by educational institutions to streamline and secure the processing of student operations. In the current educational environment, prospective students need guarantees of security and privacy during the application process. Educational institutions are required to keep accurate and reliable records of the qualifications of applicants at the same time. Using blockchain technology offers a solid way to satisfy these shared requirements. Educational institutions can create a transparent and safe platform for managing student operations by utilizing blockchain technology. This includes tasks such as verification, authentication, and filtering of approved operations. Beyond its financial applications, blockchain ensures the integrity and privacy of student data, fostering trust among all stakeholders involved in the enrollment and admission processes. This paper delves into the practical applications of blockchain technology beyond traditional finance, illustrating how it can revolutionize student enrollment procedures. By adopting blockchain, educational institutions can create a seamless environment characterized by reduced processing times and enhanced security and transparency. Such a system not only benefits students by safeguarding their privacy but also empowers institutions with efficient and reliable data management capabilities.

Keywords: Blockchain Technology, Transparent, Authenticity, Translucency, Verification.

1. Introduction

The emergence of blockchain technology, usually connected to bitcoins, is currently being utilized for safe, rigid processes in various industries, including finance, healthcare, government, and corporate operations. Although this technology has gained notoriety as the foundation for cryptocurrencies like Bitcoin, its possibilities go well beyond that, allowing for the vast improvement of current technological activities as well as the stationing of new ones that weren't previously thought to be feasible. In an attempt deliver a safe and transparent system of processing student operations, this paper implies an independent, smart contract-based system of processing enrolments for students that takes benefit of blockchain technology's inherent security. Blockchain has previously been employed in a number of education-

related domains, such as A system to preserve archives of instruments and degrees. An enhanced operations and payment security system between two parties. A framework for promoting educational institutions cooperation. For the purpose of enrolling, confirming, and selecting students for engaging university courses, we suggest a blockchain-based system. The countries from which the student applicants hail may have distinct educational systems. Alternatively, various nations might have their own regulations about student visas and the associated paperwork and the procedure.

2. Related Work

Blockchain technology has grown increasingly useful and is being utilized more for financial operations due to its secure approach to preserving data and handling in



distributed, rigid checks. The promise of a transparent, safe, and safe platform that safeguards their personal information serves as vital for scholars applying to higher-education institutions. Nevertheless, educational establishments additionally need confirmation of the authenticity of the paperwork and the proof of eligibility. A safe and secure platform for reusing students operations can be offered by the use of institute blockchain and smart contracts that incorporate business sense for validating, verifying, and filtering of valid activities. It stimulates a perfect medium that has greater safety, more translucency, and a shorter reversal time [1].

While blockchain technology is decentralized, it has characteristics similar to those of integrity, obscurity, credibility, and independence of time and institution. Education is one of the current domains wherein blockchain technology is being used in implicit ways and has challenges. The emergence of this technology has the ability to enhance the complicated system of advanced education, which encounters numerous significant concerns [2].

The fundamental technology powering cryptocurrencies like bitcoin is called blockchain. Blockchain technology is an important aspect of the fourth artificial revolution, which began with the development of electricity, computers, and brume machines and has spread to many industries including banking, bar, and commerce. We can investigate how the blockchain system can be utilized to address certain education-related issues. Implicit educational operations exist [3].

Blockchain offers a creative approach for carrying out transactions, managing activities, storing data, and developing trust. Some consider Blockchain as a revolutionary innovation in the fields of cybersecurity and cryptography, with applications spanning from force-chain to smart contracts, Internet of affects, smart grid governance, and cryptocurrency to healthcare [4].

One of the most recent innovations that is getting more and more attention from numerous organizations across various fields—including the field of education—blockchain. Blockchain technology has the potential to be useful in education, which is why numerous proofs of concept are being produced. But before this technology is widely abandoned, there are still certain relevant technological, nonsupervisory, and educational challenges that need to be resolved [5].

Blockchain is a deliberately dispersed and decentralized ledger wherein nodes strive to document past sales using really distinct networks. When used to digital instrumentation, record keeping, and other advanced schooling tasks, this technology can be fairly useful. No

single paper discussing blockchain-based educational systems has been able to locate it, despite the topic having been covered in dozens. Thus, those are the most recent opportunities for developments in advanced education [6].

The Blockchain technology has lately attracted adding interests worldwide because of it's implicit to disrupt being businesses and to revise the way operations will be erected, operated, consumed and retailed in the near future. While this technology was originally designed as an inflexible and distributed tally for precluding the double spending of cryptocurrencies, it's now previsioned as the core backbone of enterprises by enabling the interoperability and collaboration between associations [7].

3. Proposed System

In the proposed admission processing system for educational institutions, the integration of blockchain with Django and MySQL database plays a pivotal role in ensuring security, transparency, and efficiency. Django, a robust web framework, is employed to develop both the frontend and backend components of the system, leveraging its Model-View-Template (MVT) architecture and built-in security features to create a user-friendly and secure platform.

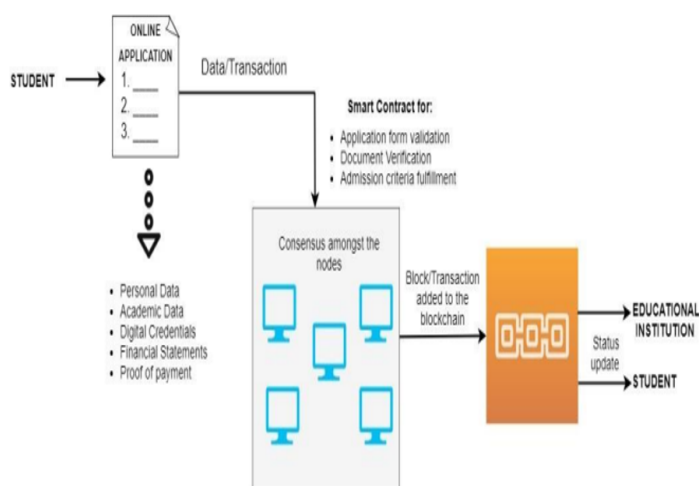


Fig.1 Blockchain based student application processing

MySQL database serves as the relational database management system for storing non-blockchain data, offering scalability, performance, and support for ACID properties. Transaction processing and verification are handled within the Django application, with smart contracts used to automate aspects of the admission process and ensure integrity. Sensitive admission data is maintained in both the blockchain and the MySQL database. To protect it, data privacy and security measures are put in place, such as encryption, access control, and

adherence to data protection laws.

4. Experimental Method

This Securing admission processing with blockchain requires a multi-layered, iterative methodology. This framework ensures a seamless blend of technology, security, and transparency into the student journey, from application submission to final decision. Each stage, from data protection protocols to smart contract design, is meticulously crafted to guarantee a secure, transparent, and efficient admissions experience for both students and institutions. By adopting this comprehensive approach, educational institutions can leverage the power of blockchain to revolutionize admissions processing, fostering trust, streamlining workflows, and building a more equitable future for education.

4.1. Blockchain Integration

4.1.1. Models: In Django, models define the structure of your database tables. Create a model in the models.py file.

```
from models class import django.db
User(models.Model):
    models = username.model
    email = CharField(max_length=255).
    Password for EmailField() = models.CharField where
    max_length is 255
```

4.1.2. Forms: Forms handle user input and validation. In the forms.py file linked with the model, create a form class.

```
from import forms for Django
import User
class UserForm(forms.ModelForm)
    from.models:class Meta:
        model = User
        fields =
        ['username','email','password']
```

4.1.3. Views: Views process user requests, interact with models and forms, and render templates.

```
from django.shortcuts import render,
redirect
from .models import User
from .forms import UserForm
def registration_view(request):
    if request.method == 'POST':
        form = UserForm(request.POST)
        if form.is_valid():
            form.save()
            return redirect('success_page')
# Adjust the redirect URL
else:
    form = UserForm()
    return render(request,
'registration.html', {'form': form})
```

4.1.4. Templates : Templates (HTML files) render views and display data.

```
{% extends 'base.html' %}
{% block content %}
<div class="container">
    <div class="form-container">
        <h2>Registration</h2>
        <form method="post">
            {% csrf_token %}
            {{ form.as_p }}
            <button
type="submit">Register</button>
        </form>
    </div>
</div>
{% endblock %}
```

4.1.5. URLs: Define URLs in the urls.py file to map views to specific URLs.

```
from django.urls import path
from .views import registration_view
urlpatterns = [
    path('register/', registration_view,
name='registration_view'),
    # Add more URL patterns as needed
]
```

4.2. Security Protocols Implementation

Ensuring the integrity and security of the Online Voting System is a top priority. Robust security protocols, including encryption methods and secure communication channels, are implemented to safeguard user data and prevent unauthorized access. The system undergoes rigorous testing to identify and address potential vulnerabilities. Security algorithm used here while creating blocks is SHA-256.

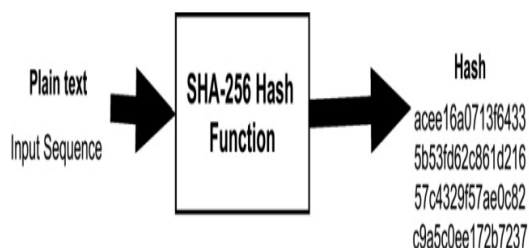


Fig.2 Basic Function of the SHA-256 Hash

SHA-256, part of the SHA-2 (Secure Hash Algorithm 2) family, stands as a cornerstone in the realm of cryptographic hash functions, offering robust security and integrity to data in the digital age. SHA-256 belongs to the SHA-2 family, known for its cryptographic strength. Its 256-bit output size provides an astronomical number of possible hash values, making it computationally infeasible to reverse engineer or find collisions (different inputs producing the same hash). This cryptographic strength forms a formidable barrier against various attacks, including pre-image attacks and collision attacks.



5. Results and Discussion

The results of implementing the blockchain for admission processing in educational institutions project using Django showcase a user-friendly and intuitive platform. Applicants can easily navigate through the system to submit their applications, upload required documents, and track the progress of their admission process.

The interface provides clear prompts and instructions, ensuring a smooth user experience. Administrators have access to a dashboard where they can manage incoming applications, verify documents, and make admission decisions efficiently.

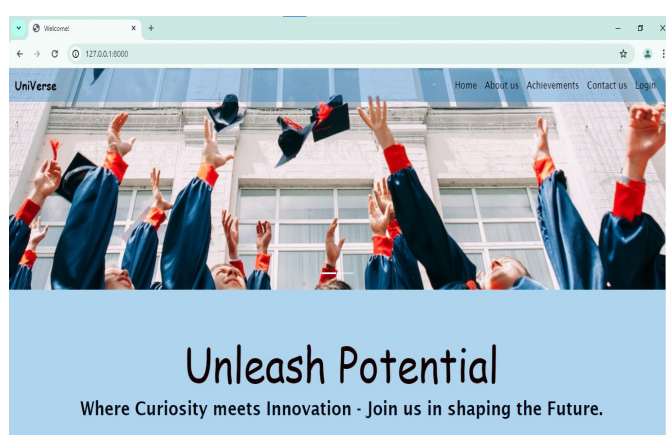


Fig.3 Dashboard

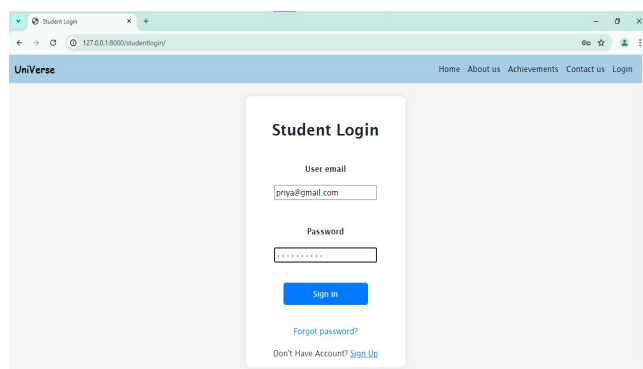


Fig.4 Student Login Page

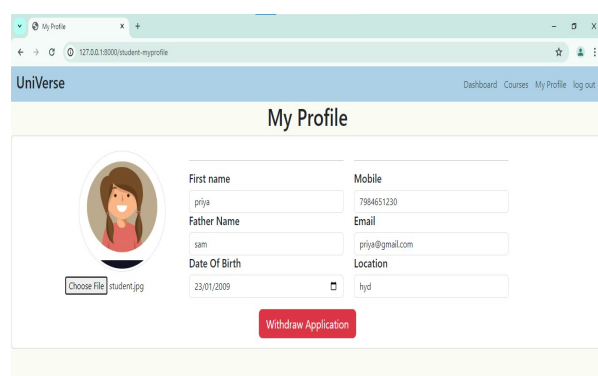


Fig.5 Student Profile

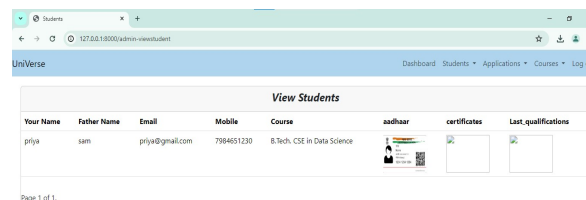


Fig.5 Student Details

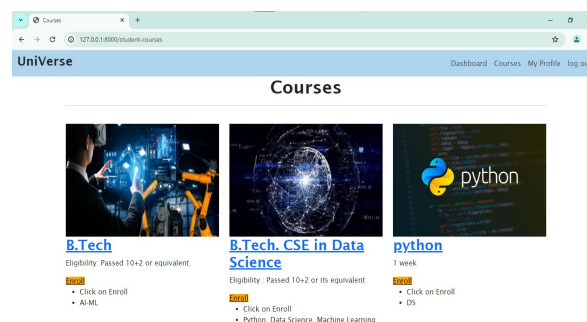


Fig. 6 Courses

The interface also integrates blockchain technology seamlessly in the background, providing enhanced security and transparency without complicating the user experience. Overall, the Django-based interface enhances the admission process by providing a streamlined and secure platform for both applicants and administrators.

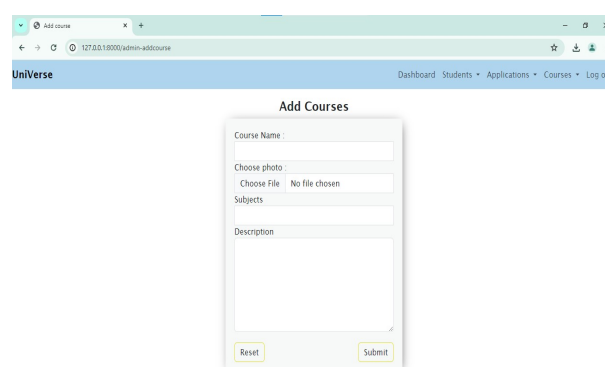


Fig.7 Add Courses on Admin side

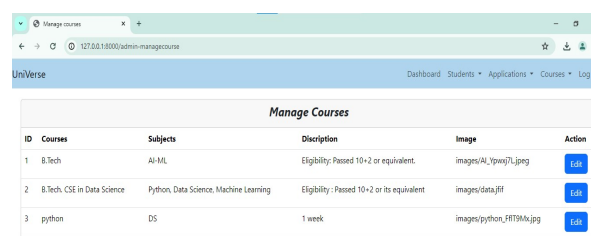


Fig.8 Manage Courses on Admin Side

6. Conclusion and Future Scope

Each Consortium blockchain, a secure and transparent technology, is poised to rewrite the narrative. Imagine a distributed ledger where applications are tamper-proof,

accessible only to authorized parties. Smart contracts automate verification, eliminating human error and bias. Instantaneous acceptance letters replace agonizing waits. This is the future of admissions, powered by blockchain. Beyond efficiency, blockchain offers unparalleled security and transparency. Data immutability ensures fairness, preventing fraud and bias. Every step is visible, fostering trust between students and institutions. This open platform levels the playing field, creating a more equitable admissions landscape. Challenges exist. Implementing and maintaining a consortium blockchain requires technical expertise and financial resources. Integrating it with existing systems can be complex. Balancing data accessibility with student privacy demands robust security measures. Scalability and cost remain concerns. Yet, the potential is undeniable. Consortium blockchain offers a secure, transparent, and efficient system that empowers both students and institutions. By addressing challenges and fostering collaboration, this technology can revolutionize admissions, making it faster, less stressful, and more equitable for everyone. The future of education is on the blockchain.

Author Contributions

IMR: Conceptualization, drafting, data collection and analysis, Writing and method, Supervision and Editing;
BDA: Methodology and review, writing and Data Collection, Supervision and Editing
US: Drafting, Interpretation and Data Collection.
BA: Drafting, , Data Collection and Analysis, Writing and Data Collection;

Declaration

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