

“Intelligent Scholarship Portal”

Second year Mini Project Report

Submitted in partial fulfillment of the requirements of
the degree

**BACHELOR OF ENGINEERING IN COMPUTER
ENGINEERING**

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CERTIFICATE

This is to certify that the Mini Project entitled **“Intelligent Scholarship Portal”** is a bonafide work of **Kushl Alve, Neelkanth Khithani, Vedang Gambhire, Shivam Choubey, Atharva Hande** submitted to the University of Mumbai in partial fulfillment of the requirement for the award of the degree of **“Bachelor of Engineering”** in **“Computer Engineering”**.

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Abstract

As a part of the Digital India Initiative, the Government of India provides various services to the citizens. National Scholarship Portal is one among them, which focus on ensuring quick process of Government Scholarships to the needy students. Through this portal, students can apply only for Government Scholarships. For private scholarship one needs to apply separately to the individual organization, online or offline. So, the needy students are in a dilemma in search for these Scholarship Organizations and their deadline. The objective of this paper is to propose an Intelligent Scholarship Disbursement Module into the current National Portal, by incorporating both Government and Private Scholarship Organizations. The proposed module automates the entire Scholarship Process using the Aadhaar number by which the student registers with the Portal. The revamped Portal aims to relieve students from the financial insecurity which they experience during their studies and focus on studies.

Acknowledgement

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List of Abbreviations

NSP : National Scholarship Portal

ISP : Intelligent Scholarship Portal

UIDAI : Unique Identification Authority of India

TAN : Tax Deduction and Collection Account Number

PAN : Permanent Account Number

OTP : One Time Password

UTR No.. : Unique Transaction Reference Number

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1. Introduction

1.1) Introduction:

In today's rapidly evolving educational landscape, scholarships have become an indispensable resource for students aspiring to pursue higher education and achieve their academic and career goals. Given the rising costs of tuition and living expenses, the availability of scholarships can profoundly impact a student's access to quality education and open doors for personal and professional advancement. However, the process of identifying, applying for, and managing scholarships is frequently riddled with challenges. Students encounter difficulties in navigating the fragmented and intricate scholarship landscape, leading to frustration and heightened barriers to accessing educational resources.



Fig. 1. National Scholarship Portal

In 2015, the government initiated the Digital India program to digitize scholarship and government schemes. Therefore, our primary focus is also on digitalizing the scholarship processes to ensure alignment with this national initiative. Integrating both government and private scholarships, the "Intelligence Scholarship Portal" streamlines the application process, enhances transparency, and increases accessibility for students from diverse backgrounds. This innovative platform is designed to address the complexities of the scholarship ecosystem by providing a centralized hub that connects various stakeholders, including students, educational institutions, banks, scholarship organizations, and UIDAI. Through the utilization of technology and data-driven insights, the portal aims to revolutionize the scholarship landscape, making it easier, more efficient, and transparent for all parties involved. Ultimately, the portal seeks to empower students, simplify administrative processes for scholarship providers, and promote equitable access to education, aligning with the broader goal of fostering a more inclusive and accessible educational system.

1.2) Motivation:

The Intelligence scholarship portal is driven by several key challenges and inefficiencies inherent in the current scholarship ecosystem. First, the landscape is characterized by fragmentation and complexity, with the students often struggling to find comprehensive and up-to-date information about available scholarships . This fragmented approach leads to missed opportunities and increases the barriers to accessing educational resources for many students. Second, the existing application process for scholarships is often weighty and repetitive, requiring students to fill out similar information multiple times across different platforms. This inefficiency not only consumes valuable time and resources but also deters many potential applicants from pursuing scholarship opportunities due to the complexity and perceived burden of the application process.

1.3) Problem Statement & Objectives

The problem statement for our mini-project revolves around the limitations of the National Scholarship Portal (NSP), which currently only caters to government-related scholarships, neglecting private scholarships entirely. This lack of provision for private scholarships denies students the opportunity to access funding from private organizations, compelling them to resort to third-party portals, which may lack credibility and trustworthiness.

Furthermore, another issue arises in the cumbersome documentation process required for applying to scholarships through the NSP. Students are burdened with the task of collecting and uploading numerous documents, such as Income Tax Files, Domicile certificates, and others, adding to the complexity and stress of the application process.

In summary, the main problems identified are the exclusion of private scholarships from the NSP and the arduous documentation requirements, both of which hinder students' access to financial aid opportunities and create unnecessary obstacles in the scholarship application process.

Objectives of the Project:

- **Addressing Security Concerns:** Implement measures to reduce scholarship disbursement delays caused by security issues, ensuring timely and secure processing of scholarship payments.
- **Incorporating Private Scholarships:** Integrate private scholarships into the Scholarship Portal, enabling students to access and apply for schemes offered by private organizations, thereby expanding opportunities for financial assistance.
- **Streamlining Document Uploading Process:** Simplify the document uploading process by utilizing Aadhaar card verification as the sole method for verifying a student's identity, minimizing the burden of collecting and uploading multiple documents.
- **Enhancing User Experience:** Design a user-friendly and intuitive UI for the Scholarship Portal, allowing students to navigate seamlessly and perform tasks effortlessly, thereby enhancing overall user experience.
- **Registration of Private Organizations:** Facilitate the registration of private organizations on the portal by implementing a system that verifies organizations through their TAN (Tax Deduction and Collection Account Number) number.
- **Providing UTR Numbers:** Ensure transparency in scholarship disbursement by providing students and their respective institutes with Unique Transaction Reference (UTR) numbers after the completion of the disbursement process, enabling easy tracking and verification of payments.

2. Literature Survey

2.1 Survey of Existing System

A. National Scholarship Portal

National Scholarships Portal is a one-stop solution through which various services starting from student application, application receipt, processing, sanction and disbursal of various scholarships to Students are enabled. This initiative aims at providing a Simplified, Mission-oriented, Accountable, Responsive & Transparent 'SMART' System for faster & effective disposal of Scholarship applications and delivery of funds directly into beneficiaries account without any leakages.

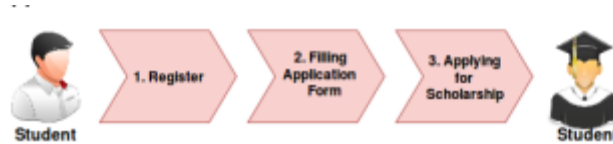


Fig 2. Easy Steps for Scholarship Process under NSP

Even though National Scholarship Portal does provide a one-stop solution for Scholarship Application Process, there lies several issues in the existing system. Firstly it provides only government scholarships. According to the current website there lies only a section for applying to central schemes, ugc / aicte schemes and state schemes. Also as the whole process depends upon online and offline verification of each document, thus the issue of authorizing each document for every application of scholarship is a time consuming process leading to either delay in the process as there might be corrections / reapplications. The applicants are in a difficult situation where they need to gather all the documents, get validated by the institution and then submit individually to each scholarship organization. Also as per UIDAI aadhaar card is mandatory for a person's identity and has to be maintained by everyone in India. But still the Aadhaar card has not been made mandatory in the NSP.



Fig 3. Government scholarships section in NSP [2024]

B. Private Scholarships Application

As per 2024, students are still facing financial difficulties in order to get themselves educated in esteemed colleges. This creates a gap between the students who are really willing to achieve a quality education and have motivation to reach greater heights. In order to help and recognize them, many organizations are coming forward to help the needy students by providing scholarships through their own terms and conditions. Now to flag a student eligible and give them concessions they have their own rules, deadlines and terms.

Now if a student wants to apply in multiple scholarships whether private or government to get benefits they need to jump or browse and find the private scholarships that fits them for their eligibility. This causes them to lose many of them due to either deadlines, ineligibility, inability to fetch the required application details, different set of required documents, trust issues etc. This causes them to lose their trust in the scholarship disbursement process and get backlashes in terms of financial insecurity. On a similar ground there are various State Governments and Private Organizations which announce scholarships to students for higher education. There even exist various other Scholarship Portals which act as mere informative websites. To avail any of these Scholarships, as mentioned earlier, student's need to apply separately to these organizations.

2.2 Limitation of Existing System or Research gap

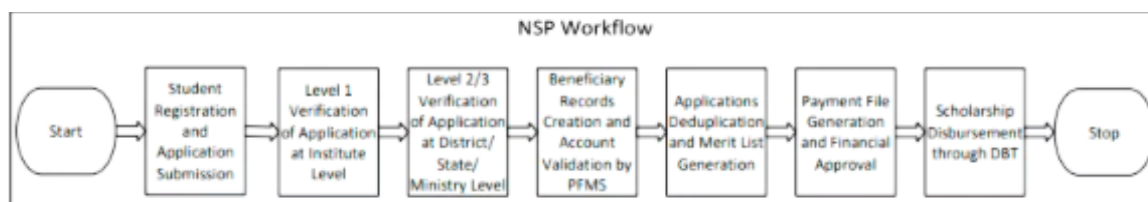


Fig 4. NSP workflow

As per the current workflow there are limitations as follows:

1. Aadhaar card number has still not been mandatory in the workflow of the process making the verification process slower.
2. The verification at Institute level is a very time consuming and tedious process as involvement of necessary documents for authorization are required.
3. Due to incorrect document uploading, the students get reverted back and need to reapply for the whole process again causing time wastage. Also this causes duplication of applications.
4. Lengthy and cumbersome paper-based applications.

Need for an automated system that will handle all the tasks from start till the end. Need for a quick and easy applicable system. As the data of the students background is available to the government, the data input by the students only needs to be verified and checked from the databases of the stakeholders participating in the process.

2.3 Mini Project Contribution

Kushl Alve	Setting up the Postgres Database, defining API's, Connecting frontend with backend, server side routing, complete logic implementation and database connection. addition of virtual id aadhaar input in Application form, improved homepage, Documentation, Git & Github version control.
Neelkanth Khithani	Designing of the Frontend, Homepage, Declaration forms, Application / Registration Forms, Login Forms, Status Pages, Application List Page, Database design (Management), Literature research, Defining use cases, Documentation, Git & Github version control.
Vedang Gambhire	Created the Navigation box components on the homepage, sidebar for managing Student upon login and organization navigation sidebar, and data fetching functionality from the database.
Atharva Hande	Adding Scholarships Display Table and Notification board, information gathering.
Shivam Choubey	Gather information and documentation. Future scope brainstorming.

3. Proposed System

3.1 Introduction

The existing National Scholarship Portal does not have any provision for private scholarships. While the application is in progress, there is no cooperation between the stakeholders like Income Certificate Authority and the Institutions where these documents are validated. As the applicant needs to manage every document, get it validated by third parties and submit a copy to each office is a difficult task for them. Thus our solution is to create an option on this portal which will include all the private scholarship providers and also have proper coordination among the stakeholders which will save candidates' time and it will be easier for them to upload their documents at one single place.

3.2 Architecture / Framework

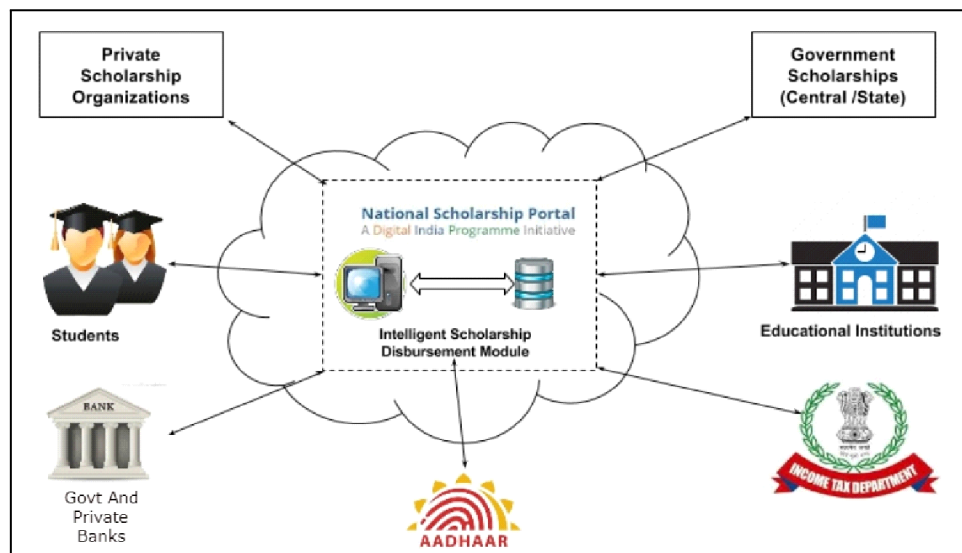


Fig 5. Stakeholders of the Proposed Intelligent Module in NSP

The various stakeholders associated with the portal are UIDAI (Unique Identification Authority of India), Income Tax Department, Government and Banks, Educational Institutions, Private Scholarship Organizations and the Applicants i.e Students.

The proposed module works hand in hand with the current National Scholarship Portal. Here, the Private Scholarship Organizations, registers with their TAN number. Once registered, they can explicitly decide the Scholarship eligibility criteria. Even interested student's register with their valid Aadhaar Number. Once registered, their personal details are retrieved from UIDAI, to calculate their parent's income. Then, as per the internal processing the eligible candidates are identified for a specific Scholarship and their names are forwarded to the concerned Scholarship organizations. Once the organization confirms the list, the process for fund transfer is activated. On completion of fund transfer, the Unique Transaction Reference (UTR) numbers are forwarded to the Income Tax department for generating 80G certificates for tax benefits. The students as well as their concerned educational institutions are notified with the respective UTR numbers.

3.3 Algorithm and Process Design

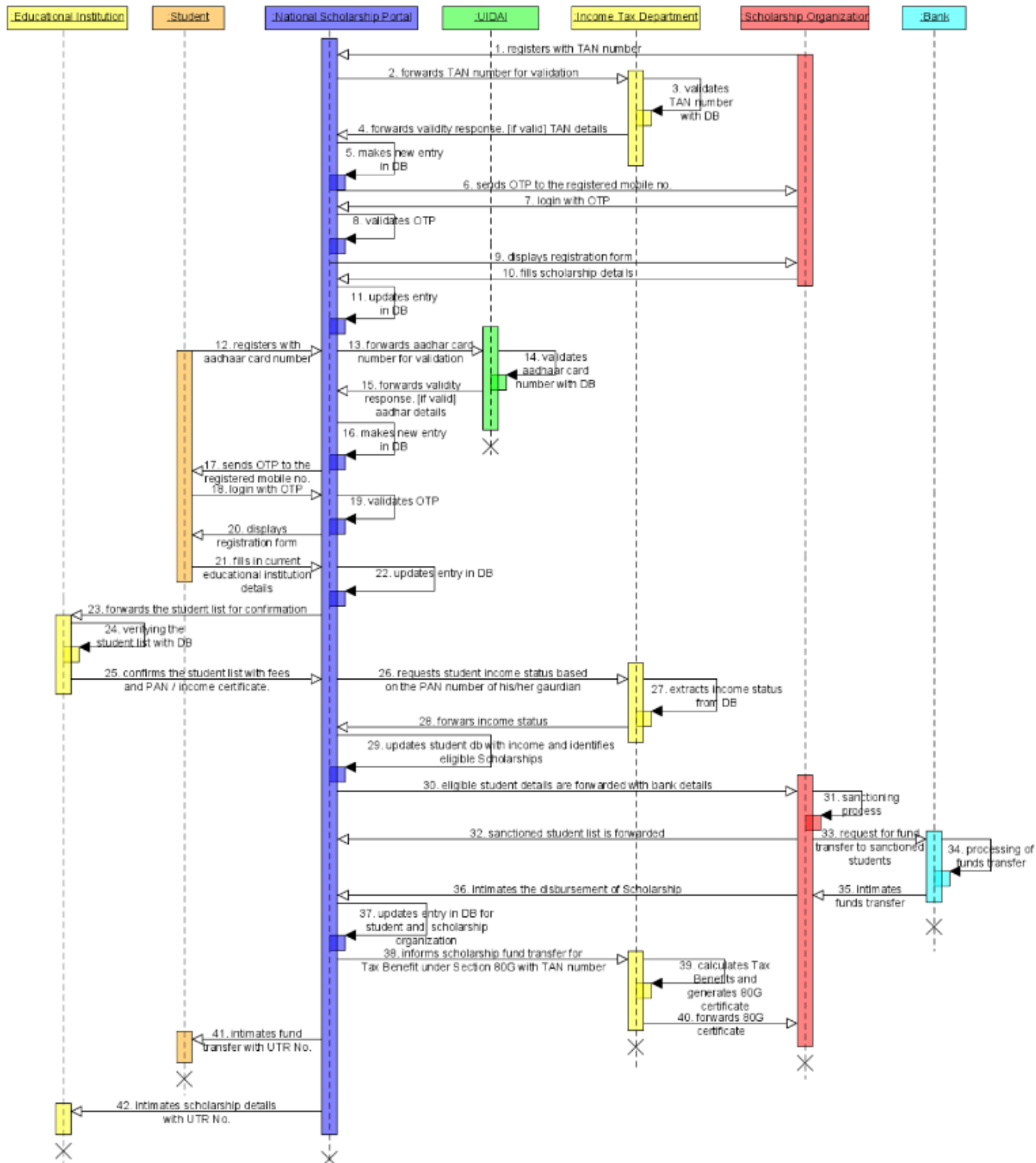


Fig 6. Sequence Diagram of the Proposed Intelligent Module in National Scholarship Portal

3.4 Details of Hardware and Software

Hardware	Software
Processor: Minimum Intel Pentium 4 or later. Internet Connection Required. Screen Resolution: 1280 x 1024 or larger. Application window size: 1024 x 680 or larger.	Frontend: React.js, HTML, CSS, JavaScript Backend: Node.js, Express.js Database: PostgreSQL Tools: VS Code & Web Browser

3.5 Experiment and Results

On the home page, we have three sections : Student Corner, Organisation Corner and Institute Corner for the respective stakeholders. We have a notice board for displaying latest news regarding schemes along with a table displaying all the registered schemes within the portal.

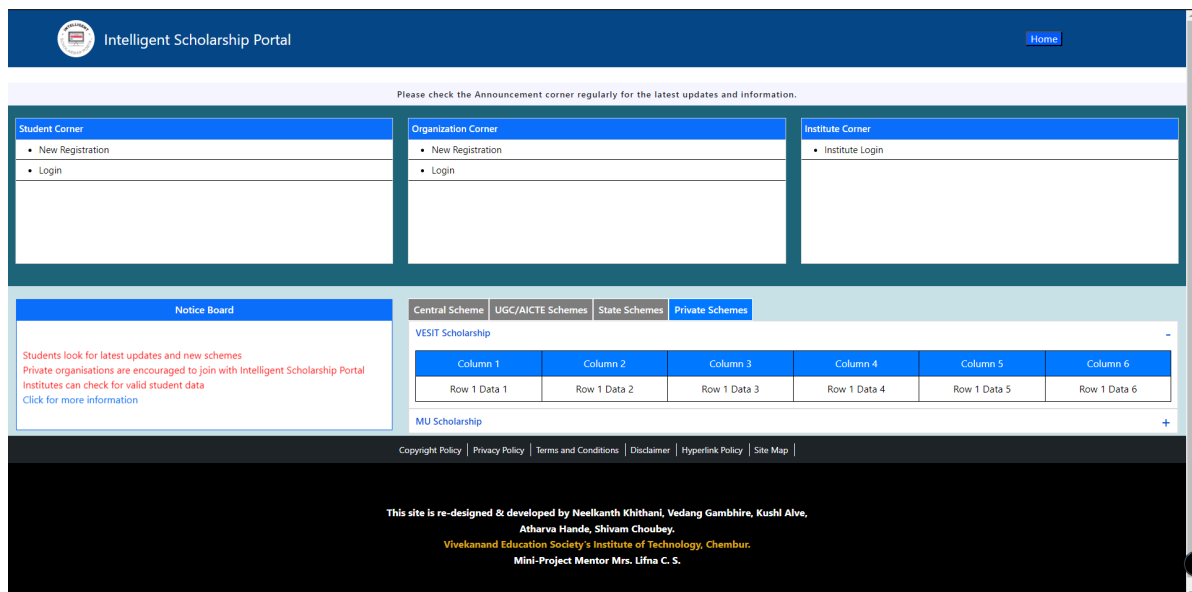


Fig 7. Re-designed Homepage for NSP

Here we have added a section named “Private Schemes” where the scholarships posted by private organizations will be visible to the students.

Central Scheme

UGC/AICTE Schemes

State Schemes

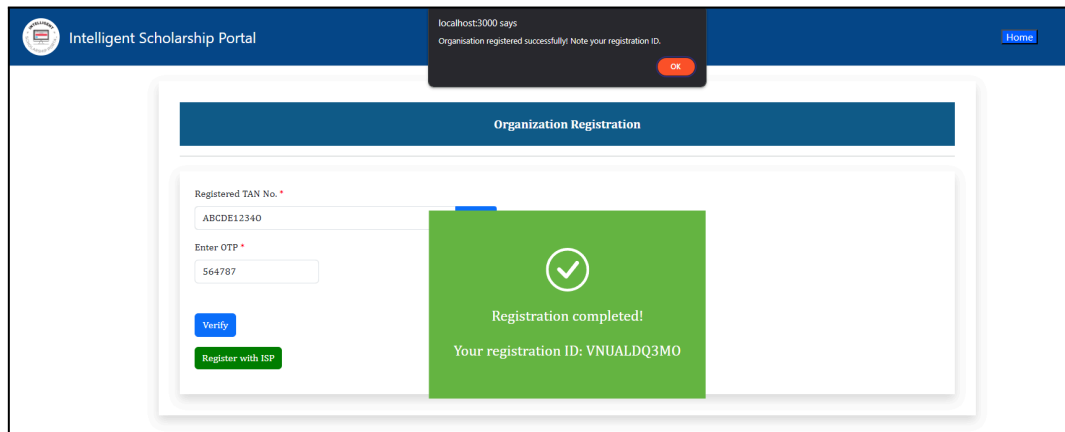
Private Schemes

VESIT Scholarship

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Row 1 Data 1	Row 1 Data 2	Row 1 Data 3	Row 1 Data 4	Row 1 Data 5	Row 1 Data 6

MU Scholarship

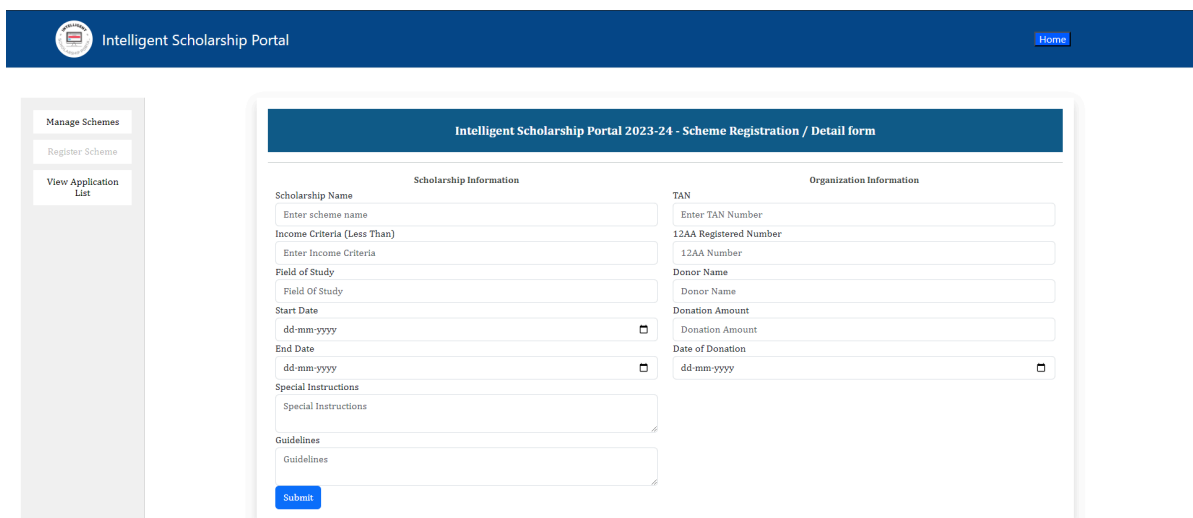
Fig 8. Integration of the Private schemes section into NSP



The screenshot shows the 'Intelligent Scholarship Portal' header with a logo on the left and a 'Home' link on the right. A dark notification banner at the top center reads 'localhost:3000 says Organisation registered successfully! Note your registration ID.' with an 'OK' button. The main content area is titled 'Organization Registration'. It contains a form with two input fields: 'Registered TAN No.' with the value 'ABCDE12340' and 'Enter OTP' with the value '564787'. Below these are 'Verify' and 'Register with ISP' buttons. To the right of the form is a large green box with a white checkmark icon, the text 'Registration completed!', and 'Your registration ID: VNUALDQ3MO'.

Fig 9. Organization Registration with TAN number.

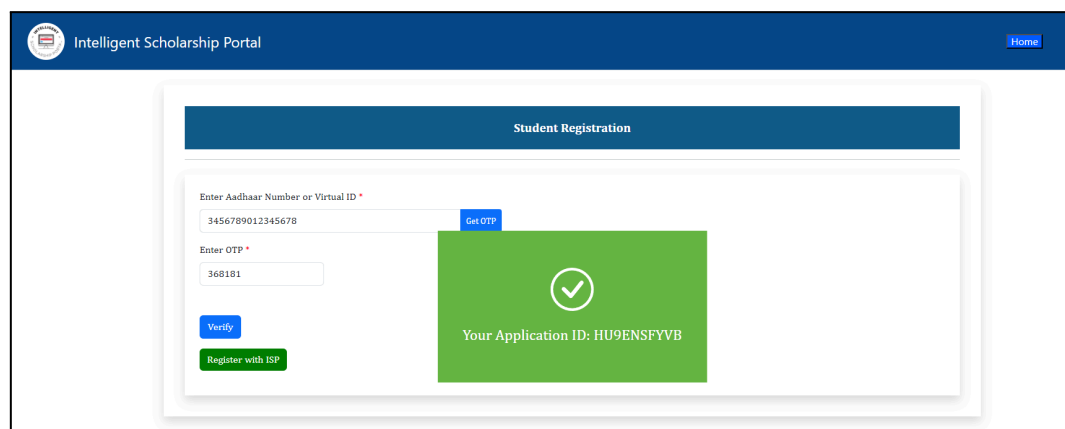
When the organization registers with the system, it gets a Registration ID which will be used for logging into the portal.



The screenshot shows the 'Intelligent Scholarship Portal' header. On the left is a sidebar with three links: 'Manage Schemes', 'Register Scheme', and 'View Application List'. The main content area is titled 'Intelligent Scholarship Portal 2023-24 - Scheme Registration / Detail form'. It is divided into two columns: 'Scholarship Information' and 'Organization Information'. The 'Scholarship Information' column includes fields for 'Scholarship Name', 'Income Criteria (Less Than)', 'Field of Study', 'Start Date', 'End Date', 'Special Instructions', and 'Guidelines'. The 'Organization Information' column includes fields for 'TAN', '12AA Registered Number', '12AA Number', 'Donor Name', 'Donation Amount', and 'Date of Donation'. A 'Submit' button is located at the bottom left of the form.

Fig 10. Organization Dashboard

After registering or logging in, the organizations will be directed to a dashboard where they have 3 options: Managing their schemes (updating or deleting scheme), Registering a new scheme and Viewing the students who apply to their scholarships.



The screenshot shows the 'Intelligent Scholarship Portal' header. The main content area is titled 'Student Registration'. It contains a form with two input fields: 'Enter Aadhaar Number or Virtual ID' with the value '3456789012345678' and 'Enter OTP' with the value '368181'. There is a 'Get OTP' button next to the first field. Below these are 'Verify' and 'Register with ISP' buttons. To the right of the form is a large green box with a white checkmark icon, the text 'Your Application ID: HU9ENSFYVB'.

Fig 11. Student Registration with Aadhaar Card No.

Similar to registration for organizations, student registration form gives an option to the student to register themselves with either their Aadhaar Number or Virtual ID (which can be generated from UIDAI website). After registering, they are provided with an Application ID which will be used for logging in.

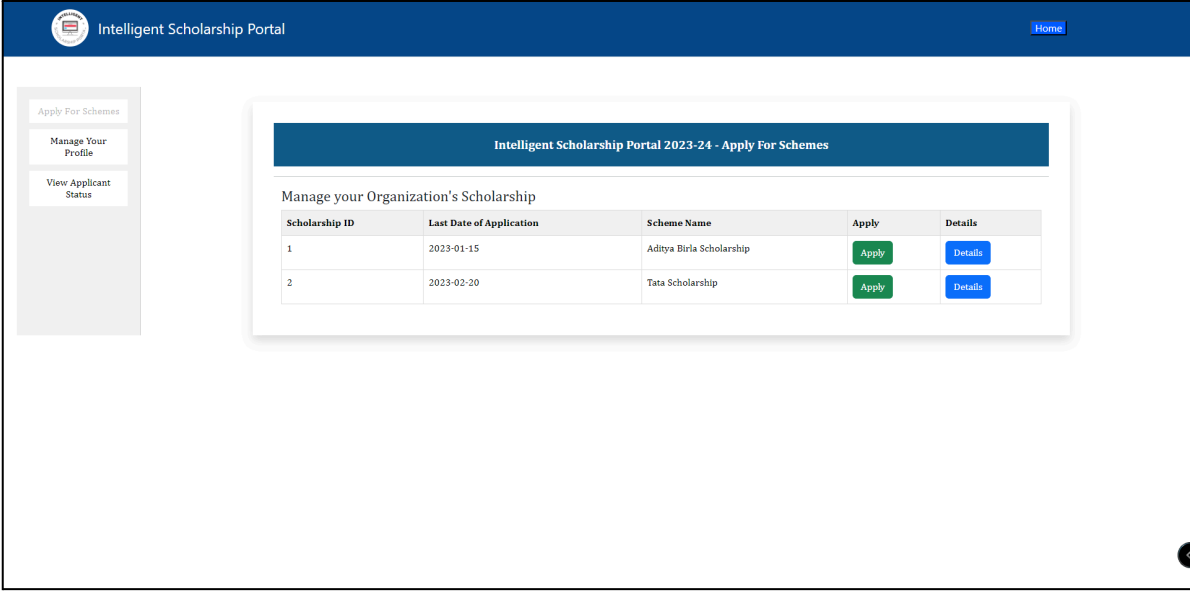


Fig 12. Student Dashboard

After registering or logging in, a dashboard opens up for the students which currently has three options: Apply for a scheme, Manage student profile and View status for applied schemes.

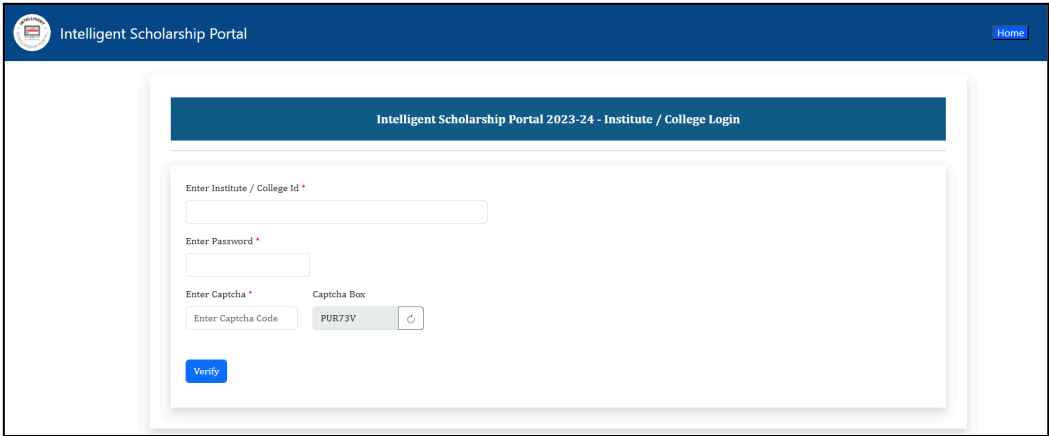


Fig 13. Institute Login using Institute Id & password.

Institutes have to enter their credentials such as college ID and password for verification.


<div>  Intelligent Scholarship Portal <div>Home</div> </div>											
List of applied Students for application year 2023-24											
Sr. No.	College Reg No.	Application ID	Scholarship Name	Category	Candidate Name	PAN No.	Income Certificate No.	Date of Application	Fees Paid to College	Current Year of Study	Check
1	895622	VE48120WSADCD	Merit Scholarship	General	Anita Satish Thakur	ABCDE1234F	INC123456789	2024-02-02	₹69,349	2	<input type="checkbox"/>
2	478956	AP21784UAH5YA	Need-based Scholarship	Economically Weaker Section	Rohan Manish Solanki	PQRS5678G	INC987654321	2024-02-01	₹70,240	4	<input type="checkbox"/>
3	123456	AS12345	Merit Scholarship	General	Sneha Patel	XYZW1234A	INC555555555	2024-02-03	₹60,000	3	<input type="checkbox"/>
4	789012	NB67890	Need-based Scholarship	Economically Weaker Section	Amit Kumar	LMNO5678B	INC777777777	2024-02-04	₹45,000	1	<input type="checkbox"/>
5	345678	ME34567	Merit Scholarship	General	Priya Sharma	EFGH1234C	INC999999999	2024-02-05	₹55,000	2	<input type="checkbox"/>
6	901234	NE23456	Need-based Scholarship	Economically Weaker Section	Rajesh Patel	IJKL5678D	INC111111111	2024-02-06	₹48,000	3	<input type="checkbox"/>
7	567890	ME45678	Merit Scholarship	General	Divya Singh	MNOP1234E	INC222222222	2024-02-07	₹62,000	4	<input type="checkbox"/>
8	234567	NB34567	Need-based Scholarship	Economically Weaker Section	Sanjay Kumar	QRST5678F	INC333333333	2024-02-08	₹47,000	1	<input type="checkbox"/>
9	890123	ME56789	Merit Scholarship	General	Anjali Gupta	UVWX1234G	INC444444444	2024-02-09	₹59,000	2	<input type="checkbox"/>
10	456789	NB45678	Need-based Scholarship	Economically Weaker Section	Ritu Sharma	YZAB5678H	INC555555555	2024-02-10	₹50,000	3	<input type="checkbox"/>
11	012345	ME67890	Merit Scholarship	General	Amit Singh	CDEF1234I	INC666666666	2024-02-11	₹63,000	4	<input type="checkbox"/>
12	678901	NB56789	Need-based Scholarship	Economically Weaker Section	Sunita Devi	GHIJ5678J	INC777777777	2024-02-12	₹48,000	1	<input type="checkbox"/>
<div> Print Table Submit Confirm Student List </div>											

Fig 14. Application List displayed to the Institute

After logging in, the institute gets displayed a list of students from their institute who apply for various scholarships. They can print the student list for record.

3.6 Conclusion and Future Work

In Conclusion the development of an intelligent scholarship portal using a PERN (PostgreSQL, Express.js, React.js, Node.js) framework represents an inclusion of both private and government scholarships on the portal. The streamlined registration process, facilitated by the submission of Aadhaar number or virtual ID for applicants and TAN number for private organizations, enhances efficiency and user experience.

Future Work

We have decided to introduce blockchain into the existing system of the Intelligent Scholarship Portal. The next phase of development will explore the implementation of a hybrid blockchain architecture. By leveraging a hybrid blockchain approach, we aim to combine the benefits of both public and private blockchains, offering enhanced scalability, flexibility, and control over data access. The proposed system incorporates smart contracts that operate within the framework and perform transactions between stakeholders, providing transparency, security, and immutability.

The introduction of blockchain in the existing system will address the following key points:

Transparency and Trust:

Blockchain provides an immutable ledger that records all scholarship transactions transparently. Stakeholders, including students, educational institutions, and government bodies, can verify scholarship disbursements, ensuring trust in the system.

Security and Fraud Prevention:

The decentralized nature of blockchain ensures that scholarship data is securely stored and tamper-proof. Smart contracts automate the disbursement process based on predefined criteria, reducing the risk of fraud or manipulation.

Efficiency and Automation:

Smart contracts streamline the scholarship disbursement process, automating tasks such as eligibility verification, selection, and fund allocation. This automation reduces administrative overhead, accelerates the distribution timeline, and ensures timely delivery of funds to deserving students.

Data Integrity and Privacy:

Blockchain technology ensures data integrity by maintaining a single source of truth for scholarship records. Students' sensitive information, such as academic records and financial details, can be securely stored on the blockchain while preserving privacy through encryption and permissioned access.

Inclusion and Accessibility:

Blockchain can enable greater inclusivity by providing a transparent and accessible platform for managing scholarships. It facilitates the integration of private scholarships from external organizations, broadening the range of opportunities available to students.

Auditing and Accountability:

The transparent and auditable nature of blockchain enhances accountability in scholarship distribution. Stakeholders can easily trace the flow of funds, track disbursement activities, and generate audit reports for regulatory compliance and transparency purposes.

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