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ScholarSarthi: An Automated Web-Based Platform for Scholarship Discovery, Eligibility Matching and Deadline Tracking

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ABSTRACT: Accessing scholarships is hard for students because information is spread across websites. Manually searching and checking scholarship opportunities takes a lot of time. Students may miss scholarships or important deadlines. To solve these problems this paper presents ScholarSarthi, a web-based platform that helps students discover scholarships, match eligibility and track deadlines. ScholarSarthi automatically collects scholarship data from sources such as Buddy4Study, MahaDBT, UGC, AICTE and Vidyasaarathi so students do not need to manually search. It uses Requests to fetch web pages and BeautifulSoup4 to scrape scholarship details. For content in Marathi from MahaDBT the deep-translator library translates the information into English. The collected data is organized to make it consistent and easy to use. The automated data collection runs every three hours by default. The platform is developed using React.js, Python, and MongoDB database, integrating automated web scraping, data preprocessing, data mining, rule-based eligibility filtering, and the Google Gemini API to automate scholarship collection, match student eligibility, and provide direct links to official sites. A rule-based eligibility system checks scholarships, against students' levels like School, 10th, 12th, Undergraduate (UG) and Postgraduate (PG), caste/category and academic percentage. Based on these rules' scholarships are classified as Eligible, Not Eligible or Unclear. In addition, an AI-assisted module powered by the Google Gemini API generates scholarship summaries and eligibility insights to help students understand opportunities. By combining automated data collection, preprocessing, rule-based filtering and AI guidance ScholarSarthi aims to make scholarship discovery easier give students organized information and help students find financial aid faster.

KEYWORDS: Scholarship Discovery, Automated Web Scraping, Rule-Based Eligibility Matching, Deadline Tracking

I. INTRODUCTION

Scholarships are an important source of financial support for students because of the increased cost of higher education. However, finding suitable scholarship opportunities is often difficult because scholarship information is scattered across several government, private and education websites [1][2]. Students have to visit different portals, search through large amounts of information, check eligibility conditions, identify required documents, and track application deadlines manually. This process takes time and can cause students to miss good scholarship opportunities because of incomplete information, duplicate listings, changing deadlines, or lack of awareness [3]. The problem becomes more challenging when scholarship information is available in different formats and languages across different web sources. To address these challenges, ScholarSarthi is developed as a web-based scholarship discovery and aggregation platform that automatically collects, processes, organizes, and presents scholarship information in a structured form. The system uses web crawling [7] and web scraping [9] to periodically collect scholarship information from multiple sources, including Buddy4Study, MahaDBT, UGC, AICTE, and Vidyasaarathi. The gathered information contains information like scholarship name, provider, eligibility criteria, scholarship amount, application requirements, and deadline. The raw data may contain HTML tags, encoded characters, inconsistent whitespace, missing values, multilingual content and duplicate records as the information is collected from multiple sources. ScholarSarthi uses a data preprocessing pipeline to improve the quality of the collected information, which involves HTML cleaning, entity decoding, whitespace normalization, missing-value handling, Marathi-to-English translation, deduplication, and date standardization. These approaches change raw web data into a standardized, structured dataset for subsequent processing. The system then applies data mining [9] and rule-based filtering techniques [10] to analyze scholarship information according to the profile of each student such as educational qualification, category, income, state and

gender. Scholarship opportunities that match these criteria are identified and presented to the user. ScholarSarathi also provides profile creation, scholarship search, eligibility-based matching, required-document information, official application links, bookmarking and deadline tracking. ScholarSarathi aims to reduce the manual effort involved in scholarship discovery and provide students with more accessible, organized, and relevant scholarship information.

II. LITERATURE SURVEY

Madhan et al. built a scholarship platform that helps students find various scholarships and handle applications with minimum effort. Selenium collected the scholarship data, pandas cleaned it, and a rule-based filter matched scholarships to student profiles. The platform also tracked deadlines and checked if scholarships were genuine [1].

Sakhare et al. developed a web-based platform to make it easier for students to find scholarships that matches their individual academic background and interests. The platform allows the students to create accounts, filter various different scholarship opportunities, and visit official scholarship websites for further details. The web-based platform was developed using Node.js, EJS templates, and MongoDB Atlas, with a recommendation system based on different keywords and predefined rules. However, the system had some limitations, such as scholarship details needed regular updates through both automated data collection and manual efforts [2].

Khedekar et al. developed a Scholarship Seek website to help students find relevant government and private scholarships that they may not know about. The platform was written in languages HTML, CSS, PHP, and SQL. It filters scholarships for each student and used the Analytical Hierarchy Process (AHP) to help providers evaluate applicants against their criteria, so it served both sides of the process.[3]

Ablen et al. presented a SMART-Scholar Tracking System to improve how scholarship students are managed in Ormoc City, where manual processes of Scholarships had made record-keeping, application handling and communication very difficult. They followed an Agile methodology of using ReactJS and Flutter for the web and mobile interfaces and a Supabase for various different backend services. User testing and performance analysis were part of the evaluation, and the paper reported positive feedback on usability and time savings. Even so, the system was designed to manage existing programmes within a local government, not to help students find opportunities from outside sources. [4]. Sowndhariyaa and Nithya proposed an online application system to replace the hassle of paper-based scholarship processing. Content-based and collaborative filtering sorts scholarships of student based on characteristics such as academic performance, social status, and financial background. The system runs on PHP, AJAX, JavaScript, HTML, and MySQL, and it supports online applications and email notifications. [5].

Sinco and Ammaqui built a tracking system for Cagayan State University–Lal-lo Campus so administration could manage scholarship records and generate reports and send updates to students. It uses PHP, MySQL, MariaDB database and an SMS API and its quality was checked against the ISO/IEC 25010 model. Coordinators could easily notify individual students or groups of recipients, which made the communication much easier. On the downside, the system only handled the administration of existing scholarships but had no automated reply feature for student queries and problems [6].

G. Engin et al. developed a rule-based expert system to help university students to identify various scholarships for which they were eligible. The system used Oracle Policy Automation (OPA) to evaluate student information like GPA, income, skills and university preferences against predefined scholarship requirements. It also provided eligibility decisions and explained which criteria students were failed to meet. However, collecting information about some scholarship requirements was challenging because some opportunities lacked publicly available information and the system only used scholarships whose eligibility criteria could be identified [7].

III. METHODOLOGY

The ScholarSarathi system is designed to help students who struggle to find the scholarships on many different websites. The ScholarSarathi system gathers scholarship information from portals cleans the data and saves it in one central database. Students can look at scholarship details without having to log in. The ScholarSarathi system uses profile-based filtering to match scholarships with each student's eligibility. The ScholarSarathi system pulls data from the web pulls out the parts prepares the data and pulls new data regularly so that scholarship information stays tidy. The ScholarSarathi

system processes the data to make it consistent and useful before it is saved in the database. The ScholarSarathi system follows the step.

A. Web Crawling and Data Extraction: As shown in Fig. 1 The ScholarSarathi system starts with scholarship websites that share details, about scholarship schemes. The ScholarSarathi system uses a web crawler to visit these websites and gather the page content through web scraping. From those pages the ScholarSarathi system pulls out the information: scholarship names, eligibility criteria, application deadlines, scholarship amounts and official links when they exist. This work brings scholarship information from sources into the ScholarSarathi system for the next steps.

B. Data Preprocessing and Database Storage After the ScholarSarathi system extracts the data the ScholarSarathi system cleans it to raise quality and consistency. The ScholarSarathi system removes HTML tags and other unwanted content, fixes spaces and treats missing or incomplete values carefully. The ScholarSarathi system spots duplicate scholarship records to cut down on repeats. It standardizes date formats wherever possible. If scholarship information appears in Marathi the ScholarSarathi system can translate it into English when needed. Finally, the ScholarSarathi system puts the cleaned data into the central scholarship database so it can be fetched and shown on the ScholarSarathi portal.

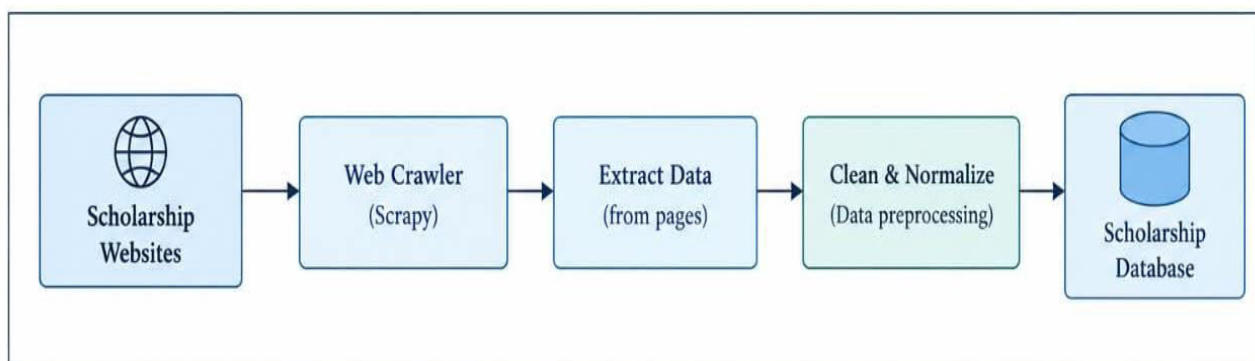


Fig. 1 Web Crawling

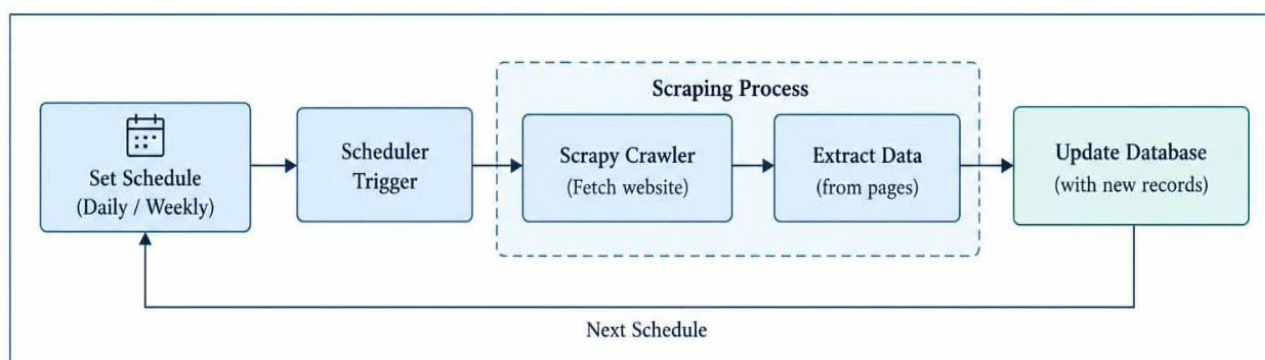


Fig.2. Periodic Web Scraping and Scheduling Process

C. Periodic Web Scraping and Database Updates

As shown in Fig. 2 The system works in a way to gather fresh scholarship details. The plan starts the process of collecting data, which starts the crawler to go to the chosen websites and get the data that's there. The data that is collected is then used to add entries to the scholarship database. Once the update is done the process waits for the time the plan runs. This regular way of working helps the system get scholarship details and keep the database up to date over time.

IV. IMPLEMENTATION

The ScholarSarathi portal uses web development and data processing tools to gather, sort and show scholarship details. The technology used helps with the end getting the scholarship data preparing the data and updating the database on a regular basis. The main tools used in the system are explained below:

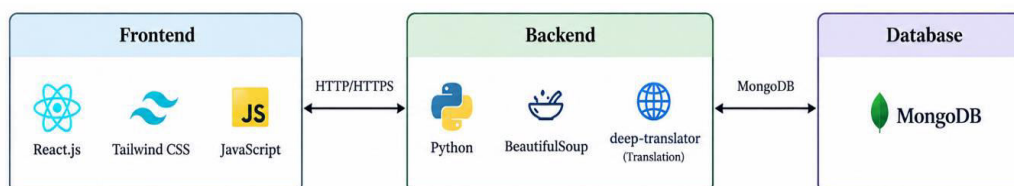


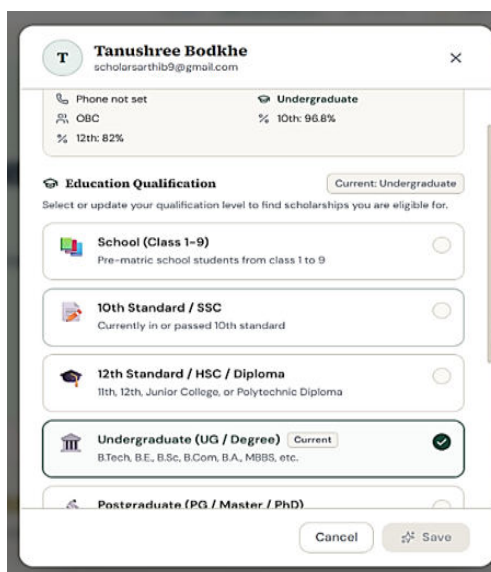
Fig3- TechStack of ScholarSarathi

V. EXPERIMENTAL RESULTS

The results demonstrate the different features and functionalities of the ScholarSarathi portal and how the different parts of the system work together in making user interactions and discovery of scholarships easier. The ScholarSarathi system provides a centralized web interface for scholarship discovery and eligibility-based filtering. The following figures illustrate the key interfaces and functionalities of the developed system.

Fig 4 shows the student profile interface that collects the personal details needed for eligibility-based scholarship filtering. These details may include the student's education level, course or stream, marks, category, income, state, gender. The gathered information is the foundation for matching a student profile with the eligibility conditions required for the existing scholarships.

Fig 5. shows the interface of scholarship listing. It displays the available scholarship opportunities in cards format with the information available for each scholarship such as its name, provider and a brief description. The system simplifies the discovery process by aggregating scholarship information from various sources on one platform and decreases the need for students to search different websites individually. Students can see the list of opportunities and learn more about scholarships that suit their educational needs.



The screenshot shows a mobile app interface for creating a student profile. At the top, the user's name 'Tanushree Bodkhe' and email 'scholarsarathi9@gmail.com' are displayed. Below this, there are fields for 'Phone not set', 'Undergraduate' status, 'OBC' category, and '10th: 96.6%' and '12th: 82%' marks. A section titled 'Education Qualification' allows the user to select their current level: 'School (Class 1-9)', '10th Standard / SSC', '12th Standard / HSC / Diploma', 'Undergraduate (UG / Degree)' (which is selected and marked 'Current'), and 'Postgraduate (PG / Master / PhD)'. Each option has a brief description. At the bottom, there are 'Cancel' and 'Save' buttons.

Fig.4 Create Student Profile & Eligibility Fields

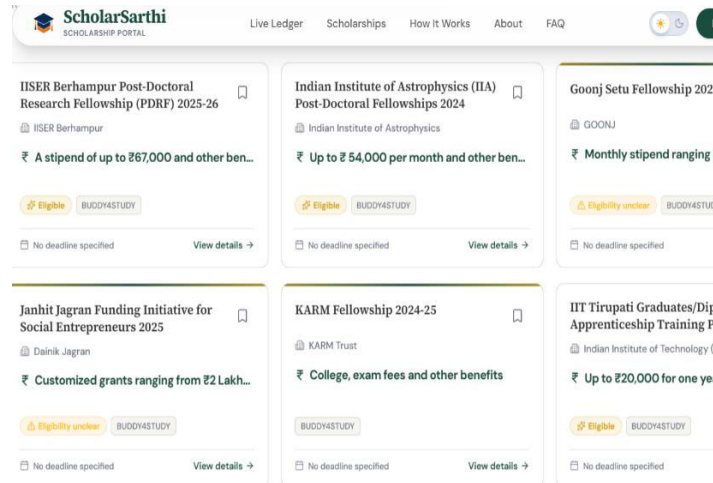


Fig.5. Scholarship Listing

Fig 6 displays the screen that shows the filtered results. The screen shows scholarship options based on the students chosen profile information. It also applies predefined rules to compare the student's profile details with the eligibility conditions of each scholarship. This process helps in finding scholarships that the student might be eligible for.

Fig. 7 Shows the details of a scholarship. The eligibility information that is available with an application link lets students read the scholarship requirements and go to the official source for more details, about the scholarship. The official link lets users go to the scholarship website and finish the scholarship application.

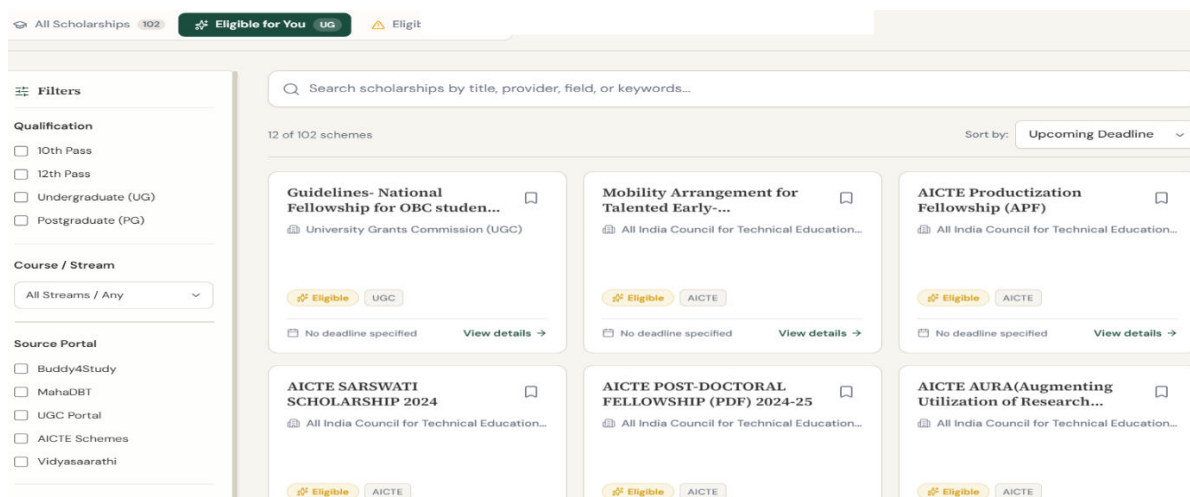


Fig.6. Filtered Scholarship Results

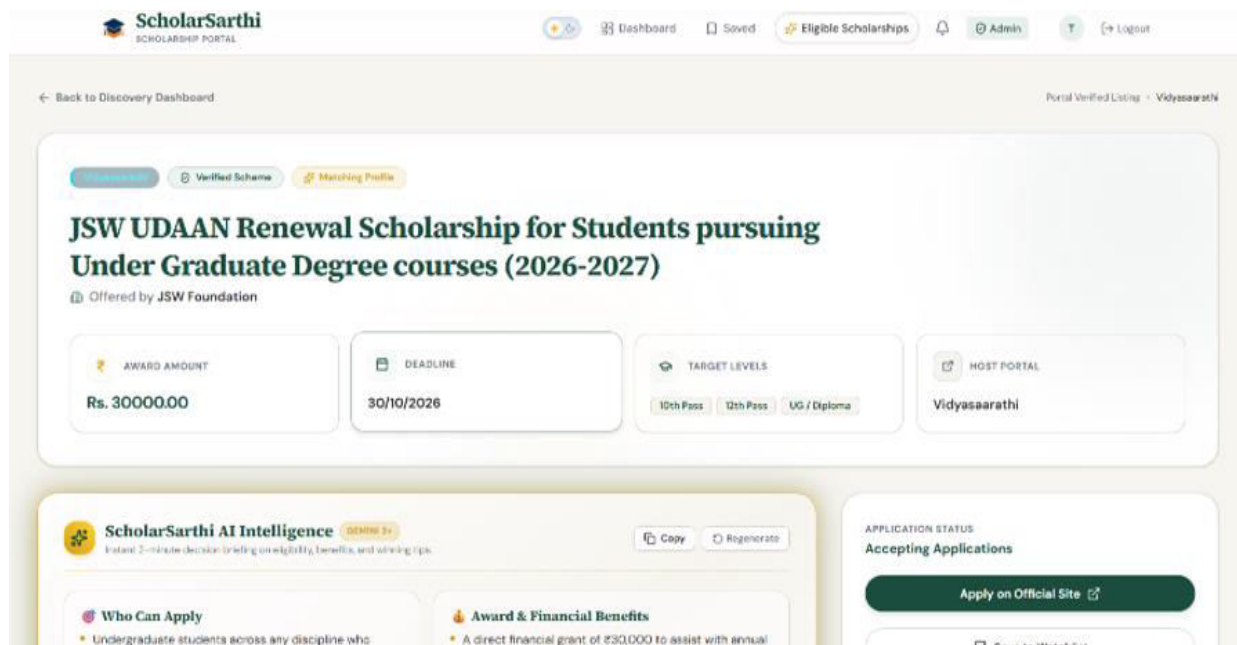


Fig.7. Scholarship Details and Official Application Link

VI. CONCLUSION

ScholarSarathi is a platform for smart scholarship discovery, eligibility matching, and deadline aggregation & tracking. The website uses automated web scraping to collect scholarship information and organizes the scholarship data through preprocessing & translation and stores them into a database. The system uses a rule-based eligibility filtration algorithm to help the students identify scholarships that are relevant to them based upon their academic scores, educational qualification, and their categories. ScholarSarathi uses ai-assistance to obtain scholarship information such as grant amount and other details that cannot be obtained normally and also serves as a deadline aggregator platform, helping students bookmark their selected scholarships. Periodic web scraping helps the platform retain relevant and updated information about scholarships. This reduces the burden on students by eliminating the need to repeatedly search multiple websites for updated scholarship information. Thus, ScholarSarathi aims at helping students to find the right scholarships so that financial aid becomes more accessible to them.

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