BridgeAI: A Multilingual AI-Based Opportunity Discovery Framework for Inclusive Educational Access

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ABSTRACT:

BridgeAI is an intelligent opportunity discovery tool that aims to close the knowledge gap that keeps many students from taking advantage of career, financial, and educational prospects. Due to low awareness, language barriers, and challenges comprehending eligibility requirements, many Indian students—especially those from rural areas, tier-2 cities, and linguistically diverse communities—often miss scholarships, government programs, internships, and international programs [1]. By offering a customized, multilingual, AI-powered system that links students with opportunities that fit their location, interests, goals, and academic background, BridgeAI tackles this problem.

The platform automates opportunity discovery and suggestion by combining artificial intelligence, multi-agent decision support, and contemporary web technologies [6]. Through voice-based communication, manual form filling, or document-assisted extraction, users can construct profiles [8]. An intelligent eligibility matching engine analyzes profile data, including qualifications, state, field of study, and expectations, to determine whether users and open positions are compatible. The method shows the best matches and ranks opportunities based on relevance rather than displaying copious amounts of irrelevant data.

In order to keep recommendations up to date and active, BridgeAI also has a Researcher Agent that conducts real-time online searches to find recent possibilities outside of the internal database. Additionally, a conversational copilot driven by AI offers contextual explanations, responds to eligibility inquiries, and assists users in comprehending the significance and prerequisites of each chance. The platform's multilingual accessibility, which supports Hindi, Tamil, and English, is one of its main features. As a result, students can communicate with the system in a language that suits them [7]. React and Vite for the front end, FastAPI and Python for the back end, MySQL for structured data management, Firebase authentication for safe access, and Google Generative AI for conversational intelligence make up the platform's contemporary full-stack design. BridgeAI revolutionizes the conventional method of opportunity discovery by fusing intelligent recommendation, multilingual interaction, real-time research, and personalized assistance.

It makes access more feasible, scalable, and inclusive while cutting down on time, uncertainty, and physical labor.

Keywords: Artificial Intelligence, BridgeAI, Opportunity Recommendation System, Educational Accessibility, Scholarships, Government Schemes, Multi-Agent System, Multilingual Platform, Personalized Recommendation, Student Support System.

I. INTRODUCTION:

Students' futures are shaped by their education and opportunities, which also contribute to social and economic advancement. Despite the increasing growth of digital platforms and online information sources, there is still unequal access to grants, internships, government programs, scholarships, and overseas educational opportunities. Many talented students frequently miss out on these possibilities, especially those from rural areas, tier-2 and tier-3 cities, and linguistically varied groups. This is due to low awareness, language hurdles, a lack of assistance, and trouble comprehending eligibility requirements rather than a lack of skill or academic aptitude [2]. Students frequently have to look through several websites, manually evaluate eligibility requirements, and take a long time to determine if they are eligible for a given opportunity. The procedure is frequently disjointed, monotonous, and perplexing. Users must independently sift and comprehend vast amounts of content because the majority of current portals deliver information in a generic way. This becomes a significant barrier for pupils who have little access to mentorship, internet literacy, or English language competency. As a result, a lot of worthwhile chances go unrealized or misused.

New approaches to this problem have been made possible by recent developments in recommendation systems, artificial intelligence, and personalized digital services. AI-based systems have been effectively used in decision-support and education platforms to enhance personalization, simplify searches, and assist users in navigating vast information spaces [3]. Comparably, voice-based interfaces, conversational AI, and multilingual interaction technologies have demonstrated significant promise in enhancing accessibility for a wide range of users [7], [8].

Many opportunity portals that are currently in use still primarily concentrate on static listings and keyword-based search, despite these technical advancements. They frequently lack contextual explanations of why a specific opportunity is pertinent to a student, multilingual accessibility, real-time discovery of freshly emerging opportunities, and individualized eligibility analysis. Particularly for students who need guided and interpretable guidance and first-generation learners, these constraints diminish practical effectiveness.

This paper suggests BridgeAI, an intelligent and multilingual opportunity discovery tool intended to democratize access to financial and educational opportunities, as a solution to these problems. By matching students with opportunities that align with their academic background, location, hobbies, and objectives, the platform seeks to lessen linguistic and geographic obstacles. The suggested system integrates multi-agent reasoning, artificial intelligence, and contemporary web technology [6]. Users have three options for creating profiles: document-assisted extraction, voice-based on boarding, or manual input. An Eligibility Agent determines compatibility scores between students and accessible opportunities based on profile variables including qualification, state, and subject of study. After then, opportunities are sorted and filtered so that only pertinent matches are shown. A Researcher Agent also does real-time web searches to find new educational programs, schemes, and scholarships outside of the internal database.

BridgeAI's emphasis on inclusivity is one of its main contributions. Students can access material in their native tongues thanks to the platform's capability for multilingual interaction in Tamil, Hindi, and English [9]. A dynamic user interface and voice-assisted on boarding enhance accessibility even more for people who might find traditional form-based methods uncomfortable.

BridgeAI offers a useful and scalable method of lowering opportunity inequality by fusing tailored opportunity matching, live research capabilities, multilingual accessibility, and AI-assisted guidance. The platform serves as an example of how artificial intelligence can be applied to develop socially significant systems that improve student-centered, inclusive, and efficient access to opportunities.

II. ALGORITHM:

Input:

User profile U = {A,Q,S,D,E,L}, where A stands for age, Q for qualification, S for state or location, D for field of study, E for individual expectations, and L for preferred language.

Results:

Match score (M), suggested opportunities (Or), and advising insights (I).

The suggested BridgeAI system creates individualized professional, financial, and educational plans using an intelligent matching algorithm that integrates opportunity ranking, live research, profile analysis, and Agentic Artificial Intelligence. The method starts by generating a collection of user profiles:

U = {A, Q, S, D, E, L}

AI-assisted document extraction, manual form entry, or voice-based onboarding are the methods used to get the profile data. Preprocessing is done initially since user inputs can differ in terms of format, spelling, and language. This step transforms multilingual inputs into structured comparable features and normalizes textual values, state names, domain labels, and educational credentials.

The database contains a structured opportunity dataset. Every opportunity is shown as:

O = {T, Loc, Qr, Dr, Type, V}, where T stands for opportunity title, Loc for location, Qr for necessary qualification, Dr for necessary domain, Type for opportunity type, and V for value or reward amount.

The algorithm's ability to interpret features through structured profile mapping is a major improvement. The user's field of study, location, and educational background are converted into equivalent feature representations that can be directly matched with opportunity criteria. This conversion guarantees consistent comparison between opportunities that come from various sources.

An eligibility score framework serves as the foundation for the recommendation system. Location match, qualification match, and domain match are the three key matching components that are assessed separately.

Sl = 40 if S = Loc; otherwise, Sl = 10

Score for qualification:

Sq = 40 if Q is a part of Qr; else, Sq = 0.

Domain rating:

Sd = 20 if D is a part of Dr; else, Sd = 0.

The final match score is calculated as follows:

Sl + Sq + Sd = M

where M is less than 100.

Only when the suggested opportunity meets a minimum relevance level is it chosen. The expression for the filtering condition is:

Or = {Oi | Mi > 30}, where Or represents the last group of suggested chances.

After filtering, the opportunities are sorted by match score in descending order:

Or = sort(Or, M) such that the most pertinent opportunities show up first.

The algorithm incorporates a Researcher Agent to expand recommendation capabilities beyond the internal database. This module uses the context of the user profile to do real-time online searches. The formulation of the search query is:

Qs = f(Q, D, S)

Before being combined with the ranked recommendation list, the external opportunities that were collected are subjected to the same grading system.

The algorithm also includes an Agentic AI advice module to increase transparency and user confidence. In order to produce contextual insights like application guidance, appropriateness explanations, and tailored suggestions, this component examines the user profile, suggested opportunities, and eligibility scores.

The output of the advice is shown as:

I = g(U, Or, M), where g stands for the function of intelligent reasoning.

Ultimately, the algorithm generates the following output:

Output = {Or, M, I}

where Or represents the ranked list of opportunities, M denotes the match percentage, and I contains actionable advisory insights.

The system can be periodically updated with newly available opportunities and user interaction data in order to improve recommendation quality over time. This integrated approach enables BridgeAI to function as an intelligent, scalable, and accessible opportunity discovery platform that effectively connects students with scholarships, government schemes, internships, grants, and global educational

pathways aligned with their profile and aspirations [6].

III. PROPOSED SYSTEM:

In order to close the knowledge gap that keeps many students from taking advantage of government programs, grants, internships, scholarships, and overseas educational opportunities, this paper offers BridgeAI, an intelligent opportunity discovery and referral platform [1]. Even while a lot of digital platforms offer this kind of information, the majority serve primarily as static directories, requiring users to actively search through several websites, evaluate eligibility requirements, and understand application procedures. Students from rural areas, tier-2 and tier-3 cities, and linguistically varied communities—where accessibility, understanding, and advice are frequently lacking—find this procedure particularly challenging.

By combining multilingual communication, intelligent profile comprehension, eligibility-based recommendation, live opportunity discovery, and Agentic Artificial Intelligence into a single decision-support framework, the suggested approach tackles these issues. BridgeAI focuses on individualized opportunity matching based on a student's academic background, geography, topic of study, and aspirations, as contrast to traditional search-based systems that provide the same information to all users.

The gathering of user profiles forms the basis of the suggested system. BridgeAI gathers user data via a variety of accessible methods, such as AI-assisted document extraction, manual form filling, and voice-based onboarding. Details like age, education, state, field of study, expectations, and preferred language are recorded while creating a profile. Voice input support in Tamil, Hindi, and English enhances accessibility and lets users communicate with the platform in a language they are acquainted with [7]. This multi-modal strategy increases system inclusivity and lessens reliance on text-heavy interfaces. The gathered data is preprocessed and transformed into structured attributes for intelligent comparison following profile development. State names, educational requirements, and domain labels are all standardized through the use of normalization procedures. This ensures consistent comparison when user profiles are matched with opportunities collected from different sources.

Another crucial part of the system is a structured opportunity repository. Scholarships, government programs, grants, internships, and foreign initiatives are all included in the database. Features like title, location, eligibility requirements, necessary qualifications, domain, reward value, deadline, and application link are all included in each opportunity. Effective storing, filtering, and retrieval are made possible by this hierarchical form. The Eligibility Agent, which makes tailored recommendations using profile-based grading, is BridgeAI's central intellect.

The system assesses domain matching, qualification compatibility, and location relevance for each opportunity. The degree to which an opportunity fits a user's profile is determined by combining these factors into a weighted score. Opportunities are sorted in descending order of suitability after being filtered out if they fall below a minimal relevance level. By doing this, customers are guaranteed to receive relevant recommendations rather than copious volumes of irrelevant material.

The system also includes a Researcher Agent to provide flexibility and get around the drawbacks of a static database. In order to find fresh chances that might not yet be in the internal database, this module conducts real-time online searches. Before being combined with the suggestion list, the retrieved external opportunities are subjected to the same eligibility rating procedure based on the user's profile. This keeps the platform current and dynamic.

Additionally, BridgeAI incorporates an Agentic AI advisory layer that offers context-aware and explainable assistance [5]. The approach explains why a specific opportunity is pertinent to the student rather than just showing a list of matches. It produces tailored insights like eligibility justifications, application recommendations, and advice on enhancing application preparedness.

An easy-to-use web-based dashboard that shows top matched opportunities, saved opportunities, notifications, and searchable discovery sections is used to convey the results. Match percentages, eligibility information, deadlines, and direct application links are all visible to users.

All things considered, the suggested BridgeAI architecture offers an inclusive, scalable, and useful approach to opportunity finding. Through the integration of intelligent recommendation, live

research capacity, multilingual interaction, and explainable AI support, the system reduces educational disparity while transforming traditional opportunity search into a personalized and accessible experiece [6].

IV.FLOWCHART:

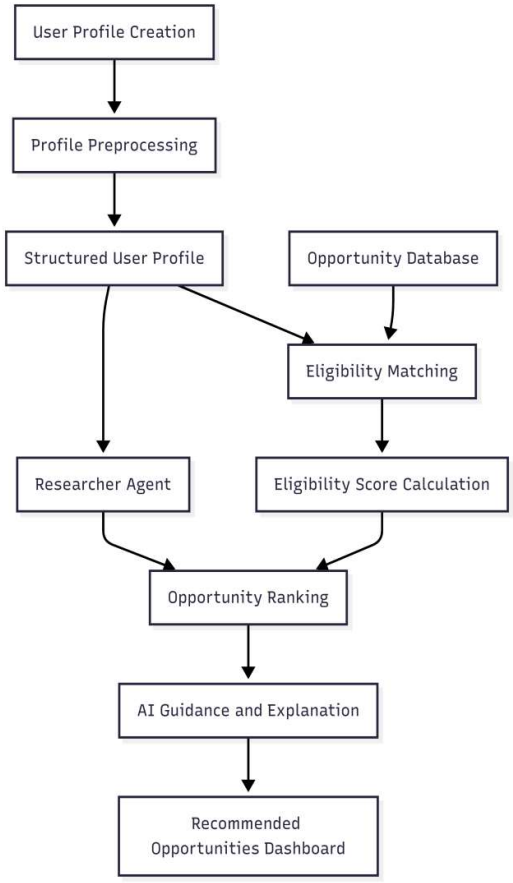


Figure 1. BridgeAI System Workflow for Intelligent Opportunity Discovery and Recommendation

V. EXPERIMENTAL RESULT:

Through intelligent suggestion, multilingual contact, and AI-assisted guiding, this experimental project aims to assess how well the proposed BridgeAI system connects students with pertinent educational and financial prospects. The studies were intended to evaluate the system from a variety of angles, such as the effectiveness of profile acquisition, the quality of recommendations, real-time adaptation, and the interpretability of outputs produced by AI. The goal is to show that BridgeAI is useful to real-world users in addition to operating efficiently from a technological standpoint.

To illustrate the behavior of the eligibility-based matching mechanism, Table 1 presents an example of opportunity ranking generated for a sample user profile.

User Profile	Opportunity	Match Score
Tamil Nadu, B.Tech, Computer Science	Tamil Nadu Govt Engineering Scholarship	100%
Tamil Nadu, B.Tech, Computer Science	National Internship Program	70%
Tamil Nadu, B.Tech, Computer Science	Agriculture State Scheme	30%

The BridgeAI eligibility scoring mechanism's behavior is shown in the table. Opportunities near the top of the recommendation list and with higher scores are those that closely match the user's location, qualifications, and academic field. While weakly related possibilities stay close to the relevance criterion and may be eliminated, opportunities with only partial alignment obtain moderate scores. This illustration shows that the suggested method places more emphasis on insightful suggestions than on providing a lot of irrelevant data.

Methodology

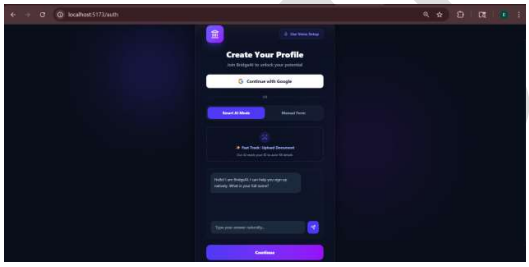
Both frontend and backend components make up the experimental setup. React was used to create the front-end interface, which includes modules for opportunity browsing, voice-based on boarding, language interaction, and profile generation. FastAPI was used to create the backend, and MySQL was utilized for connection pooling and structured data storage. Opportunities gathered from grants, scholarships, government initiatives, internships, and overseas educational programs are included in the evaluation dataset. Structured

attributes like location, qualification requirements, domain, category, application deadline, and award value are used to describe each opportunity. Three methods were used to construct user profiles: voice-based communication, document-assisted information extraction, and manual form filling [11]. State names, educational credentials, and domain labels were standardized by normalizing user inputs after preprocessing.

After that, the eligibility engine used weighted comparison to calculate match scores based on domain alignment, qualification compatibility, and geographical relevance.

The experimental evaluation focused on four major aspects of the proposed BridgeAI system. First, the study examined the effectiveness of profile acquisition through manual entry, voice-based onboarding, and document-assisted input. Second, it evaluated the quality of opportunity recommendations generated by the eligibility-based matching mechanism. Third, the experiments assessed the effectiveness of multilingual and voice-based interaction in improving accessibility and user engagement[14]. Finally, the usefulness of AI-generated advisory explanations was analyzed to determine how well the system supported user understanding and decision-making.

Experiment 1: Creating a Profile and Gathering Information



Verifying the efficacy of the profile acquisition procedure was the aim of this investigation. The accuracy of the final product is significantly impacted by the completeness and quality of user profile data because BridgeAI relies on tailored recommendations. Three input techniques were assessed in the experiment: AI-assisted document extraction, voice-based onboarding, and manual form filling. Details including age, education, state, topic of study, expectations, and preferred language were requested of users.

In all three modes, the profile acquisition module was successful in gathering user data. While voice-based onboarding proved especially helpful for users who preferred conversational contact over typing, manual form entry offered structured and dependable input. Users were able to provide information in Hindi, Tamil, and English with ease thanks to the multilingual assistance [7]. By automatically completing specific profile fields from uploaded papers, the document-assisted extraction module significantly decreased manual work the platform's applicability for various student groups.

Experiment 2: Performance of Opportunity Recommendations

This experiment was designed to assess how well the eligibility-based recommendation engine identified pertinent opportunities.

The opportunity database was compared to a collection of user profiles with different educational backgrounds, states, and domains. The system used weighted profile comparison based on location relevance, qualification compatibility, and domain matching to calculate match scores for each user.

Outcomes:

The recommendation engine was successful in removing low-quality matches and ranking possibilities based on relevance. Opportunities at the top of the ranking list were always those that closely matched user profiles.

Different profile features were successfully balanced using the weighted scoring system. Academic suitability was guaranteed by qualification and domain matching, while location-based relevance enhanced regional customisation. Using a simple criterion improved the final product's quality and significantly reduced the number of unnecessary recommendations.

This experiment shows how BridgeAI can effectively convert structured user data into relevant and customized opportunity recommendations. The technique concentrates users' attention on opportunities that are more likely to be appropriate and actionable rather than flooding them with irrelevant information [2].

Experiment 3: Dynamic Opportunity Discovery and Real-Time Research

The performance of the Researcher Agent, which conducts real-time web searches to find

opportunities that aren't already in the internal database, was assessed in this experiment.

Based on characteristics of the user profile, including qualification, domain, and state, the agent created search queries. The same eligibility rating system employed by the internal recommendation engine was then applied to the opportunities that were retrieved [12], [13].

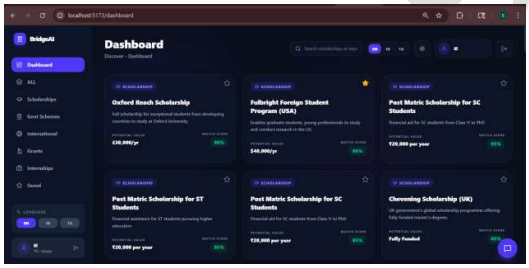
Outcomes:

Relevant external opportunities were successfully found by the Researcher Agent, who then incorporated them into the recommendation pipeline. This dynamic discovery method decreased reliance on static database items and increased the range of recommendations.

From a theoretical standpoint, this experiment confirms the significance of integrating real-time external discovery with structured internal knowledge. Opportunities for education are always changing, and new internships, programs, and scholarships may appear at any time. The platform stays up to date and flexible by constantly investigating live sources.

This experiment demonstrates that BridgeAI can preserve personalization quality while maintaining suggestion freshness and adapting to shifting opportunity landscapes.

Experiment 4: User Interaction and Dashboard Visualization



This experiment was designed to evaluate how well the system uses the user interface to provide suggestions and insights produced by AI.

Top matched opportunities, stored opportunities, notifications, and discoverable opportunities with filtering support are all shown on the dashboard. Match percentages, eligibility information, application dates, and direct application links are all visible to users.

Outcomes:

The dashboard effectively displayed tailored suggestions in an easy-to-understand manner. Important information was presented in a way that minimized user effort when making decisions, including match percentage, eligibility requirements, deadlines, and application links.

Accessibility for users with varying linguistic backgrounds was enhanced by the multilingual interface Compatibility with dark mode and responsive design significantly enhanced usability across devices. Users might view changes immediately following profile adjustments or newly found opportunities thanks to real-time updates.

From the standpoint of user engagement, this experiment shows how well the platform transforms computational results into information that is understandable and useful. In order to ensure that technological intelligence can be converted into useful user benefits, a well-designed interface is crucial.

Experiment 5: Advisory Analysis of Agentic AI

The Agentic AI advisory layer, which offers recommendations that are context-aware and explicable, was the subject of the final experiment.

The advising module produced individualized justifications for each suggested opportunity, outlining how it fit the user profile. It also offered advice on how to evaluate eligibility, prepare applications, and take other necessary preparations[15].

Outcomes:

Contextual recommendations and insightful explanations were effectively generated by the advising module. Instead of seeing suggestions as inexplicable results, users were able to comprehend the logic behind them.

Theoretically, explainable AI increases decision confidence, transparency, and trust. The platform becomes more user-centered and supportive by transforming raw eligibility ratings into logic that is comprehensible to humans. Students who might not have access to mentors, counselors, or knowledgeable advice networks will find this very helpful [5].

This experiment emphasizes how crucial it is to combine explainable guidance with intelligent

recommendations for user trust and practical adoption.

The experimental findings show that the suggested BridgeAI framework effectively combines explainable AI support, eligibility-based recommendation, intelligent profile acquisition, and live opportunity discovery into a single platform.

By enhancing accessibility, customisation, adaptability, and interpretability, the system overcomes the main drawbacks of traditional opportunity search platforms. BridgeAI is a useful and scalable solution for assisting students in finding opportunities that align with their academic background, goals, and potential since it combines multilingual interaction, real-time discovery, and AI-driven reasoning.

VI. CONTRIBUTIONS TO EDUCATIONAL ACCESSIBILITY

By filling in the knowledge gap that keeps many students from learning about grants, internships, government programs, scholarships, and overseas learning possibilities, the proposed BridgeAI system advances educational accessibility. Students must carefully search, comprehend eligibility requirements, and compare various sources because traditional opportunity platforms frequently offer information in a general and static manner. Students with limited access to assistance, digital literacy, or English language competency may find this approach challenging. BridgeAI uses an intelligent, inclusive, and user-centered framework to overcome these constraints.

1. Tailored Opportunity Identification

Personalized opportunity recommendation is one of BridgeAI's main contributions. The system examines each user's unique profile information, including qualification, state, topic of study, and personal expectations, rather than offering the identical set of chances to every user. The Eligibility Agent assesses opportunities based on appropriateness and determines relevance ratings based on these characteristics. This lets students concentrate on options that closely align with their background and objectives and minimizes needless search effort.

2. Diminished Inequality of Information

The system's ability to lessen information disparity is one of its major contributions. Many worthy students lose out on important opportunities only because they don't know about them or don't know where to look. BridgeAI increases exposure and makes crucial financial and educational resources more accessible for marginalized populations by automatically gathering, screening, and presenting pertinent opportunities.

3. Interaction that is inclusive and multilingual

Through multilingual communication in Hindi, Tamil, and English, BridgeAI improves accessibility. In a language that suits them, students can connect with the platform, discover opportunities, and establish profiles [9]. This lessens the language hurdles that frequently impede the efficient use of digital services. By enabling users to input profile information verbally rather than solely through typing or form-based interaction, voice-based onboarding further enhances inclusivit.

4. Instantaneous Opportunity Identification

Beyond the internal database, dynamic opportunity discovery is added through the integration of the Researcher Agent. The system finds recently offered scholarships, programs, internships, and educational opportunities from other sources through real-time web searches. This guarantees that suggestions are up to date and flexible in response to shifting opportunities. Students thus have access to new prospects that might not yet be found in traditional databases.

5. Explainable AI-Powered Advice

The addition of explainable AI via the Agentic AI advisory layer is another significant advance. In addition to suggesting options, the site discusses why a specific job fits a student's profile. It offers contextual assistance, application recommendations, and justification for eligibility. This enhances openness, boosts user confidence, and helps kids who might not have access to counselors or mentors [5].

6. Useful and Expandable Digital Access

BridgeAI's scalable and useful system architecture also makes a contribution. The platform may be utilized by a variety of user groups and geographical areas because to its intelligent recommendation, multilingual support, responsive interface design, and web-based accessibility. Future extension to other languages, opportunity categories, and bigger datasets is made possible by the architecture's lightweight and flexible design.

VII. CONCLUSION:

In order to close the knowledge gap that keeps many students from taking advantage of government programs, grants, internships, scholarships, and overseas educational opportunities, this study introduced BridgeAI, an intelligent opportunity discovery and referral platform. Due to low awareness, language barriers, and the difficulty of comprehending eligibility requirements, many capable students—especially those from rural areas, tier-2 and tier-3 cities, and linguistically diverse communities—often miss out on important opportunities. This study addressed a significant issue in the educational landscape. lligence can be applied not only for technical automation but also for lowering educational disparities and increasing access to possibilities that can change people's lives [9].

The proposed approach incorporates agentic artificial intelligence, multilingual communication, intelligent suggestion, and real-time opportunity discovery into a unified decision-support framework [3]. BridgeAI uses voice-based onboarding, manual entry, and AI-assisted document extraction to collect user profile data [8]. While the experimental findings demonstrate efficient profile development and opportunity ranking based on user suitability, the Eligibility Agent leverages this data to match users with pertinent opportunities.

While the Agentic AI advisory layer enhances interpretability by offering contextual explanations and tailored assistance [4], the Researcher Agent increases system adaptability by using live web search to find newly available opportunities. When combined, these elements make traditional opportunity search more relevant and user-focused.

BridgeAI's emphasis on inclusivity is one of its main advantages. The software is more usable for a variety of student demographics because to voice-based accessibility and support for multilingual interaction in Tamil, Hindi, and English. The approach provides targeted recommendations that are simpler to comprehend and implement, rather than requiring students to browse complicated and dispersed information sources.

All things considered, the proposed BridgeAI architecture offers a practical, scalable, and socially relevant solution for education. By combining accessible design principles with artificial intelligence, the platform reduces educational inequity [10] and improves the efficacy of opportunity discovery. It serves as an example of how technology could ensure that student eligibility and potential—rather than geography, language, or ignorance—determine access to opportunities.

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