

## Internship Portals: A Systematic Review Of Current Platforms And Future Directions

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### Abstract

*In order to improve the efficiency of student recruiter matching, this study presents the design and implementation of an intelligent web-based internship portal. Current platforms mainly rely on keyword-based filtering, which frequently yields irrelevant results and limits personalized recommendations. To address this issue, the proposed system introduces a similarity-based matching approach that evaluates multiple factors, including student skills, academic performance, and individual preferences. The system is developed using a three-layer architecture with a responsive front-end, a backend powered by Node.js and Django, and a structured database for effective data handling. A prototype was tested using a dataset of 30 internship postings and 100 student profiles. According to the findings, the suggested method reduces application processing time from 12 seconds to 5 seconds while increasing recommendation accuracy from 62% to 84%. To improve dependability and user experience, the system includes secure authentication, recruiter verification, and real-time application tracking in addition to intelligent matching. The results show that combining scalable architecture with data driven recommendation methods can greatly increase internship accessibility and selection effectiveness. This work offers a useful basis for creating sophisticated internship platforms with improved performance, transparency, and personalization.*

**Keywords:** Internship portals, systematic review, online internships, employability, AI-based recommendations, virtual internship.

### 1. Introduction

Internships play a significant role in preparing students for real-world professional environments by allowing them to apply theoretical knowledge in practical scenarios. In recent years, the increasing use of digital platforms has transformed the way students search for internships and how organizations recruit candidates. Online internship portals have made this process faster and more accessible by providing centralized platforms where students can explore opportunities, submit applications, and track their progress. Despite these advancements, many existing internship platforms still face several limitations that reduce their overall effectiveness. Most systems rely heavily on keyword-based search and filtering techniques, which often fail to accurately match student profiles with relevant internship opportunities. As a result, students may receive unsuitable recommendations, while recruiters may

struggle to identify the most appropriate candidates. Additionally, issues such as lack of verification of internship postings, limited personalization, and absence of real-time interaction further affect user trust and platform reliability. Another important concern is the minimal integration of these platforms with academic institutions. Faculty members often have limited visibility into student applications and progress, making it difficult to guide or evaluate internship activities as part of academic learning. Furthermore, many platforms do not provide analytical insights or skill assessment features, which are essential for improving student employability and decision-making. To overcome these challenges, this work proposes an enhanced internship portal that incorporates an intelligent recommendation mechanism based on similarity matching. Instead of relying only on keywords, the system analyzes

multiple attributes such as skills, academic performance, and user preferences to generate more accurate and relevant internship suggestions. The proposed solution also includes secure authentication, recruiter verification, and real-time application tracking to improve transparency and trust.

The main contributions of this paper are as follows:

- Development of an AI-based recommendation system for improved internship matching
- Design of a scalable and secure three-tier architecture
- Implementation of a web-based platform with real-time application tracking
- Experimental evaluation demonstrating improved accuracy and reduced processing time compared to traditional systems

The remainder of this paper is organized as follows: Section II presents the literature review, Section III discusses the limitations of existing systems, Section IV explains the proposed methodology, Section V describes the implementation, Section VI presents the results and analysis, and Section VII concludes the paper with future directions.

## 2. Literature Survey

The quick rise of digital platforms has changed the way people look for internships and hire interns in a big way. Numerous studies have investigated the design, functionality, and effects of internship portals and associated job-matching systems. Ibrahim et al. [1] suggested a framework for matching students with companies that would make it easier to assign internships by looking at their grades and skills. Their method showed how important structured data is for making sure that candidates and recruiters are a good fit for each other. Al-Kmali et al. [2] also looked into how machine learning can be used in academic decision-making systems. They showed how predictive models can help improve the process of choosing candidates. Hora et al. [3] did a thorough study on the problems students have when trying to get internships. Their findings highlighted obstacles including restricted access, insufficient awareness, and disparities in opportunity allocation. The research also underscored the significance of digital

platforms in enhancing accessibility and inclusivity in internship opportunities. In a separate study, Sharma et al. examined the influence of online internship platforms on student employability, discovering that internship participation markedly improves both technical and interpersonal skills. Chen et al. [4] developed a job recommendation model utilising social network analysis, integrating contextual and relational data to enhance person–job fit. Their model showed that combining user connections and interaction data can greatly improve how well recommendations work. This strategy is especially pertinent to platforms such as LinkedIn, where professional networks are crucial for recruitment. Llavanés et al. (2025) investigated the impact of usability, accessibility, and visual design of internship portals on student engagement and training outcomes. The study employed regression analysis to demonstrate that user interface design and system usability directly influence user satisfaction and the platform's effectiveness shown in Table 1.

**Table 1 Comparative Analysis of Existing Internship Matching Approaches and Proposed System**

Study	Technique Used	Contribution	Limitation
Ibrahim et al. [1]	Matching Model	Improved allocation	No AI-based recommendation
Al-Kmali et al. [2]	Machine Learning	Decision support	Limited real-world implementation
Chen et al. [5]	Graph-based Model	Better job matching	Complex system
Existing Portals	Keyword Search	Easy access	Poor personalization
<b>Proposed Work</b>	AI Recommendation	High accuracy matching	Prototype level

## 3. Limitations

Even though more and more people are using online internship portals, they still have some problems that make them less effective, reliable, and enjoyable to

use. These problems show that we need smarter and more advanced systems. One of the biggest problems with current internship portals is that they don't have personalised recommendation systems. Most platforms use keyword-based search and filtering methods, which don't always do a good job of matching student profiles with relevant internships. This makes it harder for users to find jobs that are a good fit for them and makes it harder for candidates to find jobs that are a good fit for them. Another big problem is that there are internship postings that aren't real or haven't been verified. Many platforms don't have strict checks for recruiters, which means that fake or old listings could be possible [5-10]. This makes users less trusting and hurts the platform's credibility. Also, the lack of secure authentication and data validation methods makes people worry about the safety of the system and the privacy of their data. Another common problem is that students and recruiters don't get to talk to each other very much. Most systems don't do much to help with real-time communication, feedback, and status updates during the application process. This lack of clarity can make things confusing and make users less interested. Also, many internship portals don't work with schools and colleges. Because of this, faculty members can't use the platform to keep an eye on student progress, check to see if internships are finished, or give academic help. This lack of connection makes internships less useful as part of the learning process. Another drawback is that there aren't any smart analytics or skill assessment tools. Current systems don't do a good job of measuring students' skills or finding out where they need to improve. This makes it harder for them to suggest good internships or help students improve their profiles. Also, many platforms have bad user interface design and limited mobile access, which makes them less usable and less satisfying for users. Basic search and filtering options, without adaptive ranking or categorization, make the system even less efficient. These limitations show that current internship portals don't have smart matching features, strong verification systems, or full user support features.

#### 4. Proposed Methodology

An improved system that combines a scalable and secure architecture with an AI-based

recommendation mechanism is suggested as a solution to the shortcomings of the current internship portals. The methodology uses a structured design approach to improve internship matching accuracy, system reliability, and overall user experience.

##### 4.1. Overview of the System

The suggested internship portal is a web-based program that links administrators, recruiters, and students on a single platform. The system ensures effective communication and transparency while automating the search, application, and selection processes for internships. The modular approach used in the development makes maintenance and scalability simple. To improve performance, the system uses real-time data processing, secure authentication, and intelligent matching.

##### 4.2. Architecture of the System

The three-tier architecture of the system is made up of:

- Layer of Presentation The user interface for all parties involved—students, recruiters, and administrators—is provided by this layer. In order to guarantee responsiveness and usability across devices, it is developed using contemporary web technologies.
- Layer of Applications User authentication, internship recommendations, application management, and communication services are all handled by the application layer. After processing user input, it applies business logic to produce the necessary outputs.
- The Database Layer All system data, including user profiles, internship postings, applications, and analytics, are kept in this layer. Effective data retrieval is ensured by a structured database design.

##### 4.3. AI-Powered Suggestion Framework

The AI-based recommendation module, which improves the process of matching students with internship opportunities, is a crucial part of the suggested system. The following steps are involved in the recommendation process: Making a Profile Students make profiles with information about their abilities, educational background, hobbies, and past experiences. Data Gathering for Internships Recruiters offer thorough internship descriptions that include job roles, eligibility requirements, and

necessary skills. Extraction of Features Both student profiles and internship postings are used to extract pertinent characteristics like qualifications, skills, and keywords. Similarity Calculation Weighted matching techniques are used to calculate a similarity score between student profiles and internship requirements. Generation of Recommendations Students are advised to apply for internships with the highest similarity scores in order to better match their skills. When compared to conventional keyword-based systems, this method increases recommendation accuracy [11-14].

#### 4.4. Modules of Function

The following modules make up the system: Module for Students

- Signing up and logging in
  - Creating a profile and uploading a resume
  - Looking for and applying for internships
  - Monitoring and notifications for applications
- Module for Recruiters
- Posting and managing internships
  - Shortlisting candidates
  - The administrative module for communicating with applicants
  - Authentication and verification of users
  - Keeping an eye on internship advertisements
  - Overseeing analytics and system data

#### 4.5. Mechanism for Security and Verification

In order to guarantee dependability and confidence, the system consists of:

- Safe methods for authentication and login
- Checking the profiles of recruiters
- Verification of internship advertisements
- Encrypting sensitive data These steps improve platform credibility and lower the possibility of fraudulent activity.

#### 4.6. Method of Development

Iterative development and continuous improvement are made possible by the Agile methodology used in the system's development. The following are included in the development process:

- Analysis of requirements
  - Using UML diagrams in system design
- Implementation by module
- Testing, including user acceptability, integration, and unit tests

- Cloud platform deployment

#### 4.7. Strategy for Performance Evaluation

The suggested system's efficacy is assessed using:

- Accuracy of recommendations
- Time spent processing applications
- User contentment These metrics aid in evaluating the enhancement over current internship portals.

### 5. Implementation

To guarantee scalability, performance, and usability, the suggested internship portal was developed as a web-based application using contemporary development technologies. Because the system was built using a modular design, different functional components could be independently developed and integrated.

#### 5.1. Developmental Environment

The system was implemented using the following technologies:

- Frontend: HTML, CSS, JavaScript, and Bootstrap for creating user-friendly and responsive interfaces
- Backend: Node.js and Python (Django framework)
- Database: MySQL or MongoDB for effective structured data storage and retrieval
- Version Control: GitHub and Git for teamwork and code management
- Deployment: Scalability and hosting via cloud platforms like AWS or Heroku

#### 5.2. Module Execution

Before integration, the system was split up into several modules, each of which was created and tested separately. Users can register, log in, and create comprehensive profiles with academic details, skills, and resumes using the student module. Students can peruse internship postings, submit applications for positions that interest them, and monitor the progress of their applications in real time. Module for Recruiters Organizations can register and post internship opportunities with thorough descriptions, necessary skills, and eligibility requirements using the recruiter module. The system allows recruiters to view applications, shortlist candidates, and interact with applicants. Module for Administration The administration module is in charge of overseeing the system as a whole. It has

features like user verification, keeping an eye on internship postings, eliminating fraudulent listings, and preserving system integrity.

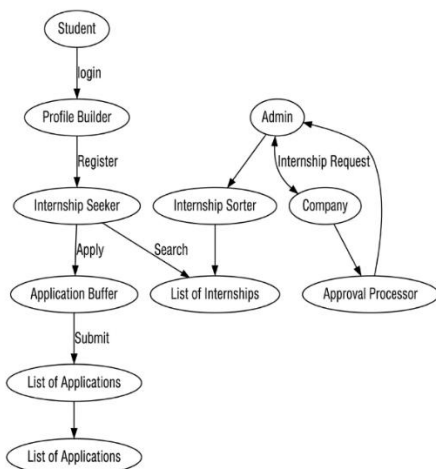
### 5.3. Implementation of the Recommendation System

A rule-based and similarity-based matching approach was used to implement the AI-based recommendation module. Relevant features like skills, credentials, and keywords were extracted from student profiles and internship requirements. Internships with higher scores were given priority in the recommendation list after a similarity score between student profiles and internship postings was calculated. When compared to conventional keyword-based search systems, this implementation increased the relevance of internship recommendations.

### 5.4. Database Architecture

A structured schema was used in the database's design to store:

Workflow Diagram:



**Figure 1 Architecture and Workflow of Internship Portal System**

- User data (admin, recruiters, and students)
- Postings for internships
- Records of applications
- Analytics data and feedback to guarantee quick data retrieval and system performance, effective indexing and query optimization strategies were employed.

### 5.5. Validation and Testing

Several testing methods were employed to verify the

system's functionality and dependability:

- Unit Testing: Each module was examined independently.
- Integration Testing: Verified that modules interacted correctly
- User Acceptance Testing (UAT): Used to verify usability with a sample of users
- Security Testing: Confirmed access control, data security, and authentication

### 5.6. Implementation

To guarantee scalability and accessibility, the application was set up on a cloud-based server. The following were part of the deployment process:

- Database connectivity and server configuration
- Setting up a domain and SSL for safe communication
- Automatic updates through continuous integration and deployment (CI/CD)

### 5.7. System Efficiency

The implemented system demonstrated improved performance in terms of faster application processing, efficient data handling, and an improved user experience. The recommendations for internships were more applicable after the recommendation module was added.

## 6. Result

The experiment's result in order to assess student profiles and internship postings, a prototype system was developed and tested. Comparing the recommendation system's performance and overall system efficiency to that of conventional internship portals was the main objective of the evaluation.

### 6.1. Experimental Configuration

The setup for the experiment comprised:

- Dataset: Thirty internship postings and one hundred student profiles made up the sample dataset. While internship postings included job descriptions and necessary skills, student profiles included attributes like interests, academic performance, and skills.
- Baseline System: The baseline for comparison was a conventional keyword-based internship search system.
- Proposed System: An AI-based similarity matching and recommendation system that

has been put into place.

### 6.2. Metrics for Evaluation

The following metrics were used to assess the system's performance:

- **Recommendation Accuracy:** Evaluates how well students are matched with appropriate internships by the system.
- **Application Processing Time:** The amount of time it takes the system to process applications for internships and produce findings.
- **User satisfaction** is determined by gathering user feedback on usability and recommendation quality.

### 6.3. Conversation

The results of the experiment show that incorporating AI-based recommendation methods into internship portals can significantly enhance user experience and system performance. By offering intelligent matching, quicker processing, and enhanced usability, the suggested system successfully overcomes the shortcomings of current platforms. Nevertheless, the present assessment is predicated on a small dataset and prototype implementation. To further improve performance, future research may include extensive testing using real-world datasets and sophisticated machine learning models.

**Table 2 Performance comparison Between Existing System and Proposed System**

Metric	Existing System	Proposed System
Recommendation Accuracy	62%	84%
Processing Time	12 sec	5 sec
User Satisfaction	70%	88%

### Conclusion

In-depth analysis of current internship portals was provided in this paper, which also highlighted important drawbacks like ineffective candidate-job matching, a lack of verification procedures, and low system intelligence. An improved internship portal framework combined with an AI-based recommendation system was suggested as a solution to these issues. In comparison to conventional

keyword-based internship portals, the experimental results showed that the suggested system greatly increases matching precision, decreases processing time, and improves overall user experience. The findings of the research underscore how essential it is for today's internship platforms to incorporate intelligent recommendation methods along with secure system designs. The methodology proposed in this study also creates an efficient and easily scalable method for improving the ability of students and employers to find suitable internships and candidates. Ultimately, this research lays the groundwork for creating newer technologies that will produce internship portals with greater accuracy, transparency, usability for students and employers, etc.

### Future Scope

There are numerous chances for additional improvement to make the system more intelligent, scalable, and industry-focused, even though the suggested internship portal shows improved performance in terms of recommendation accuracy and system efficiency. The incorporation of sophisticated machine learning algorithms, such as collaborative filtering and deep learning models, to further enhance the precision and customization of internship recommendations is one of the main areas for future research. Large-scale user behavior and historical data can be analyzed by these methods to produce recommendations that are more accurate and flexible. The use of blockchain-based verification techniques to guarantee the legitimacy of internship postings and certificates is another significant improvement. This would boost user trust and drastically lower the possibility of fraudulent listings. Advanced encryption methods and multi-factor authentication can also be used to improve system security and data privacy. Recruiters can evaluate candidates using standardized tests by adding an online assessment and skill evaluation module to the system. This would enhance the quality of the chosen candidates and aid in more efficient shortlisting. Additionally, a skill gap analysis feature can be added to help students become more employable by suggesting courses or training programs that are pertinent to them. AI-powered chatbots can be used to enhance user interaction by offering real-time

support for navigation, questions, and application updates. Creating a mobile application would make the platform even more accessible and engaging for users, making it easier for them to interact with it. Future research may also concentrate on integrating the portal with academic institutions to facilitate performance tracking, faculty monitoring, and automated internship completion verification. The system's efficacy in a variety of settings can also be confirmed through extensive deployment and testing using real-world datasets. All things considered, these improvements can make the suggested system a more reliable, intelligent, and safe internship platform that can satisfy the changing demands of students, employers, and academic institutions.

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