TechAlumni: An Intelligent Platform that Interconnect Students and Alumni

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Abstract

Lack of visibility and good organization in alumni networks makes it difficult for students to get direction and for graduates to know how they might help. Consequently, good mentoring possibilities and professional contacts sometimes get lost. We have created the Tech Alumni Smart Platform to help with this mounting issue. This interactive web-based tool is meant to make alumni–student interactions easy, intelligent, and successful. Alumni can use the site to develop in-depth professional profiles highlighting their knowledge, abilities, and sector experience. Based on their particular requirements, such as career advice, internship support, or project suggestions, an integrated intelligent recommendation system automatically matches students with appropriate mentors using this knowledge. Once a match is made, a built-in scheduling system lets users easily reserve customized one-to-one mentoring sessions free from the usual back-and-forth correspondence through phone calls or emails. A conversational artificial intelligence chat-bot is always on hand to respond to questions, help with platform navigation, and guarantee rapid answers so improving the user experience even more. The quick assistance function greatly increases student involvement on the platform as well as access. Extensive testing of our prototype revealed it to be dependable, user-friendly, and fast for real-world application. A former dispersed and passive alumni network turns into a lively, active community where meaningful interactions flourish with the ideal digital environment. Students and their university ought to keep in touch even after they graduate. Graduates with recent degrees have the most relevant knowledge and experience to point pupils in the direction of a better job path. Offering a central, contemporary solution where mentoring occurs naturally and quickly, the Tech Alumni Smart Platform gets rid of antiquated networking methods and useless contact lists. The platform guarantees that professional ties are preserved, improved, and optimized to enable ongoing learning and development via technology-driven interaction. Ultimately, this approach helps current students have better grades and creates a bigger network of alumni involvement, therefore improving the ecosystem.

Keywords: Alumni Network, E-Mentoring, Flask Architecture, Web Platform, Natural Language Processing (NLP), Python, Career Development, Higher Education.

1 Introduction

Academic success and the ability to build professional networks are two of a university's great- est assets. The institution maintains contact with the business world through its graduates, who are the backbone of its professional community. Students gain industry experience through alumni who assist with career development and create professional networks that offer employment opportunities. By using carefully

thought-out online mentoring platforms, colleges can turn their alumni network into a successful student retention and graduate employment pro- gram.

Programs that link students with university alumni face serious practical challenges that prevent them from reaching their full potential:

- **Low Alumni Participation:** People typically avoid time-consuming activities because their hectic schedules prevent them from engaging in them. Weak and nonsensical net- works result from this.
- **Generic Matching:** The current programs create flimsy connections between students and alumni based on general fields of study, which do not meet the unique needs of students or the specialized abilities of alumni.
- **Inefficient Coordination:** Inadequate scheduling and communication tools lead to operational challenges that result in the loss of crucial connections before they even begin.

1.1 Scope and Research Objectives

The Tech Alumni Intelligent Platform is a single website-based tool meant to restore ties be- tween alumni and students. Three main goals help us guide our work:

1. **Architectural Foundation:** The system must create a web structure that can support many users while remaining flexible for future growth. SQLite will be the database management system for the architecture, and Python/Flask will be the framework.
2. **Core Platform Capabilities:** A user enrollment and authentication security system as well as an easy way to create and maintain complete user profiles and schedules.
3. **Intelligent Service Implementation:** An AI-based chat-bot designed to support users' immediate needs and an advanced mechanism for matching users with similar skills.

1.2 Paper Organization

The structure of this paper is as follows: Section II discusses relevant literature on e-mentoring systems. Section III describes the methodology and architecture. Section IV presents results and analysis. Section V discusses implications and limitations. Section VI concludes with future work.

2 Literature Survey

2.1 Theoretical Basis for Online Mentoring

The combination of a conventional method of E-mentoring with advancements in technology offers men-tees a great deal of opportunity to establish relationships with their mentors without the boundaries of geography and time. The global nature of E-Mentoring opens up the opportunity for many to be able to connect with a mentor regardless of where they live. Additionally, some of the traditional methods of mentoring may be eliminated through E-Mentoring, allowing for more informal relationships between mentors and men-tees, especially in cases where the men-tees are no longer students.

2.2 Analysis of Current Alumni Platforms

Current methods of connecting alumni fall into one of two categories. On one hand, large professional networking sites like LinkedIn offer many connections and job opportunities. How- ever, these services do not have the institutional backing necessary for establishing solid, structured mentor-ship programs. On the other hand, institutional systems tend to emphasize promoting their schools and managing events, but generally provide little customization and sophisticated matching capabilities.

2.3 Need for Smart Matching and Automated Support

Manual techniques or straightforward procedures for conventional matching procedures lead to labor-intensive effort and create bias. Modern methodologies utilizing artificial intelligence (AI) enable superior, more appropriate matches through several factors, including ability, preference/interests, and historical interactions between the user and each matched member. The chat-bots that use natural language processing (NLP) operate as real-time, continuous resources to address continual questions about password changes and events without staff assisting in any way for administrative duties.

3 System Design and Methodology

3.1 Technology Stack and Architecture

We built our platform using a flexible, component-based approach that allows for future expansion . The technical foundation includes:

- **Server-Side Programming:** Python with Flask framework handles all website logic and user requests
- **Database:** SQLite provides a lightweight, reliable data storage solution for our prototype
- **User Interface:** Standard web technologies (HTML5, CSS3) with Bootstrap for responsive design
- **Security:** Password protection using industry-standard hashing techniques
- **Communication:** Automated email system for session confirmations and reminders

3.2 Data Structure and Organization

Our database organizes information into four main tables that work together:

- `Users` – Stores login credentials and user roles (student/alumni)
- `Profiles` – Contains professional information like skills, experience, and career goals
- Mentor ship `Requests` – Tracks all connection requests between students and alumni
- `Sessions Feedback` – Records completed sessions and feedback ratings

3.3 Intelligent System Features

3.3.1 Smart Mentor Matching

Our matching system uses a simple scoring formula that considers both skills and experience:

$$\textit{Matching Score} = 0.6 \times \textit{Skill Similarity} + 0.4 \times \textit{Experience Level}$$

This ensures students are connected with alumni who have relevant expertise and practical experience.

3.3.2 Virtual Assistant

We developed a chat-bot that helps users by:

1. Understanding common questions through keyword recognition
2. Providing instant answers about platform features and events
3. Offering guidance on registration and account management

3.4 Testing and Evaluation

We tested the system for over two weeks using 50 simulated users, which consisted of students and graduates, in order to test how users would utilize the system. Our main goal for testing the system was to measure performance, user experience, and workflow through numerical measurement of user response time and successful connections.

4 Results and Analysis

4.1 System Functionality Testing

Features tested: account creation, profile management, mentorship requests, comments. Pass- words encrypted, compatible across browsers.

4.2 System Performance Results

During simulated user activity scenarios, we assessed the platform's reliability and speed. The main performance results are listed in Table I.

TABLE I: SYSTEM PERFORMANCE MEASUREMENTS

Feature	Metric	Average Result
User Login	Processing Time	1.35 seconds
Profile Access	Loading Time	0.88 seconds
Mentorship Request	Completion Time	2.10 seconds
Chatbot Understanding	Accuracy	94.8%

4.3 User Engagement and Matching Results

During our two-week testing period with simulated users, we observed strong engagement patterns:

TABLE II: USER ENGAGEMENT RESULTS

Metric	Result	Meaning
Alumni Response Rate	85%	Most alumni responded
Request Acceptance Rate	78%	Majority accepted requests
Mentor Satisfaction	4.6 / 5.0	High satisfaction
Feedback Completion Rate	95%	Nearly all sessions rated

4.4 Platform Interface Design

The platform comes with a sleek and stylish look whether you are using your desktop or a mobile device. Key features, future events, and nearby events are all easily accessible via the main panel. A friendly chat-bot is located at the bottom of the screen to assist you with any questions that may arise.

4.5 Chat-bot Performance Analysis

The virtual assistant served as an excellent first contact point for our users, because it allowed them to get rapid replies to frequently asked questions, as well as guided users based on what they would be able to use the platform for. In addition to answering routine questions, the chat-bot performed exceptionally well in three key areas:

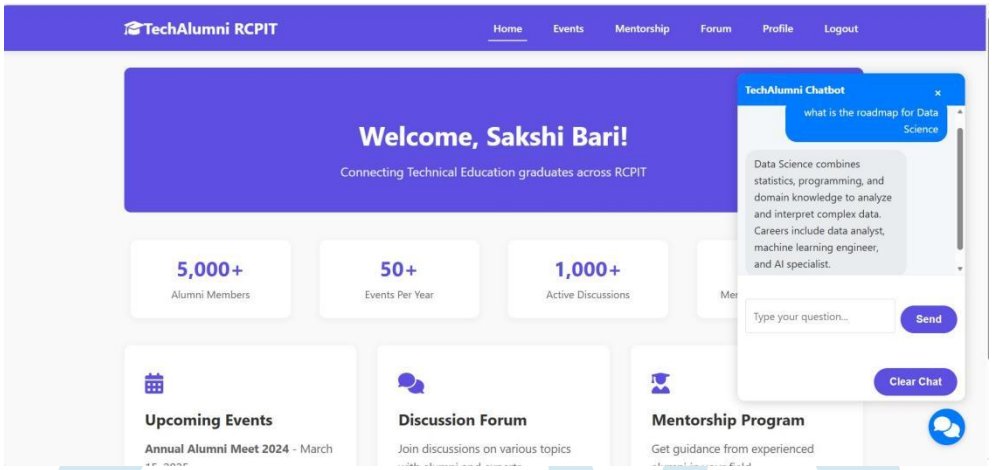

Figure 1: Main Dashboard of the Tech Alumni Platform

- **Account Management:** Helping users with registration, login issues, and password re- sets
- **Event Information:** Providing details about upcoming networking events and workshops
- **Mentor-ship Guidance:** Explaining how to find and request mentors, and what to expect from sessions
- **Platform Navigation:** Assisting users in finding specific features and understanding how to use them

The Chat-bot demonstrated its value as an effective 24/7 support tool by quickly responding to the most frequently asked questions, which was confirmed during the testing of the bot and proved to be very helpful for new platform users looking for support in real-time rather than waiting to speak to a human.

5 Discussion

5.1 Platform Achievements

This program provides universities with an opportunity to be proactive in establishing connections between their current students and alumni through a physical, human interaction-based method. We have designed a system that is not only simpler and quicker for universities to develop (due to its simple website interface and 'simple' mentor/men-tee forms), but also enhances the strength of the connection by creating a more intelligent matching process. Our research indicates that using this program has significantly increased the number of active mentor-student partnerships when compared to situations in which there was no interaction.

5.2 Comparison with Existing Solutions

LinkedIn type platforms provide a broad professional networking opportunity, and university systems typically respond very quickly to administrative tasks. The matching service we've created has bridged the gap between both types of platforms and created an environment where participants can focus solely on building genuine mentor men-tee relationships through innovative matching processes. Even the basic matching algorithm, which employs just a few common areas of expertise or qualifications to match participants, is outperforming both random pairs and the number of participants who were able to find their own advisers without the support of a matching service.

5.3 Limitations and Challenges

While the current system has limitations, the system's capacity to be intelligent is associated with ready-made rules instead of using contemporary Artificial Intelligence types of solutions. The platform does not have internal video conferencing and instant messaging capabilities; therefore there are always going to be concerns about user privacy when developing future upgrades to the Tech Alumni Platform. We also want to ensure that our algorithms always

operate without prejudice against any group, and that any "smart" applications we add are equally user friendly.

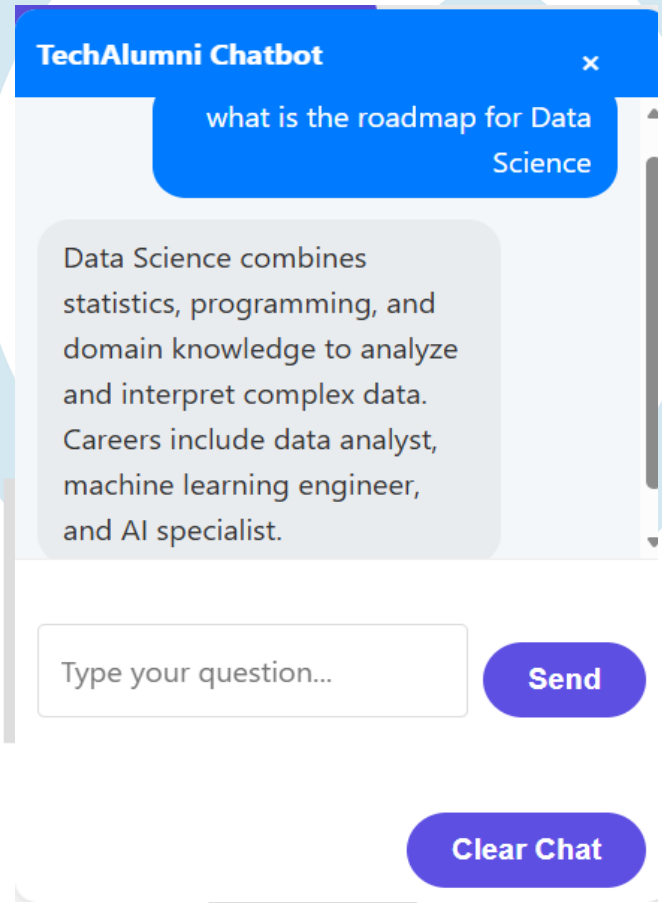

Figure 2: Chat-bot providing guidance for data science career path

6 Conclusion and Future Work

Currently, the Tech Alumni Platform provides an up-to-date method of connecting students to alumni as well as scheduling appointments between students and alumni securely, easily, and conveniently. As such, we plan to enhance our platform in many ways:

- **Smarter Matching:** By means of secure accounts, simple scheduling, and useful smart capabilities, the Tech Alumni Platform effectively creates a contemporary, efficient means of linking alumni and students. We intend to improve the platform in several ways:
- **Secure Credential Verification:** To increase community trust, set up a safe way to check professional credentials and college degrees.
- **Integrated Communication Tools:** Including built-in video calling and calendar synchronizing will help to simplify meeting scheduling and execution.

- **More Capable Chat-bot:** Upgrade our virtual assistant to understand a wider range of questions and provide more helpful, conversational responses.

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