Alumni Tracer and Management System with Data Analytics: Enhancing Alumni Engagement and Data Management for South East Asian Institute of Technology, Inc

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ABSTRACT

Alumni Tracer Systems track graduates' career paths and determine whether they correspond with their undergraduate degrees. These systems help institutions understand employment trends and how well their programs prepare students for the workforce. South East Asian Institute of Technology, Inc. (SEAIT) lacks a system to monitor its alumni, making it difficult to determine whether graduates pursued careers related to their studies. To address this, the SEAIT Alumni Tracer and Management System with Data Analytics was developed as a practical solution by integrating multiple features to improve alumni tracking and engagement. It was designed to aid the institution in keeping track of and strengthening its connection with its graduates. The system was created using the Agile methodology, with iterative sprints ensuring continuous improvements based on survey feedback and data-driven decision-making through data analytics.

The System Usability Scale (SUS) evaluation yielded a high average score of 86.67, confirming the system's usability and effectiveness. The system proved to be practical and viable in assisting SEAIT in monitoring its graduates and enhancing its academic programs by evaluating career alignment with fields of study and supporting data-driven improvements in education. Therefore, the implementation of the system was strongly recommended.

Keywords: Alumni Tracer, SEAIT Alumni, Data Analytics, Career Alignment, Agile Methodology.

INTRODUCTION

Alumni tracking systems have become essential tools for educational institutions to monitor graduates' career trajectories and assess the relevance of academic programs to real-world employment. Effective alumni tracking enables institutions to refine curricula, strengthen industry partnerships, and provide better career support for future students. However, many institutions still struggle with outdated tracking methods, leading to inefficiencies in data management and limited alumni engagement. Without a structured system, schools face difficulties in gathering accurate employment data and maintaining strong connections with their graduates.

According to [1]Institutions with well-established alumni tracking systems benefit from improved communication with their graduates, enabling them to assess career alignment and refine academic offerings. However, many schools lack such systems, which results in missed opportunities for collaboration and engagement. Similarly, [2]Highlighted the growing need for web-based alumni platforms that integrate data analytics to streamline engagement and enhance institutional support. In response to these challenges, the South East Asian Institute of Technology, Inc. (SEAIT) developed the SEAIT Alumni Tracer and Management System with Data Analytics. This web-based platform aims to automate data collection, improve access to

career opportunities, and provide insights into alumni career paths. By leveraging data analytics, SEAIT seeks to enhance its programs, strengthen its alumni network, and improve institutional decision-making.

REVIEW OF RELATED LITERATURE

Alumni Tracer Systems

Alumni tracer systems have played a crucial role in enabling educational institutions to monitor and engage with their graduates effectively. Studies have shown that implementing a Tracer Study Information System improves graduate tracking and provides valuable feedback for curriculum enhancements. [3]. Similarly, some institutions have developed Alumni Tracer Systems that assess the employment status of graduates and determine the relevance of their job roles to their academic degrees, helping schools make necessary educational adjustments. [4].

Furthermore, web-based Online Alumni Tracer Systems have been introduced in universities to systematically track graduates' employment, job alignment, and current locations, improving institutional decision-making. [5].

Alumni Management System

Alumni management systems serve as vital platforms for strengthening relationships between educational institutions and their graduates. These systems allow for centralized data storage, automated communication, and event management to increase alumni participation. [6]. Research indicates that institutions using Alumni Management Platforms benefit from improved alumni networking, career support, and fundraising efforts. [7]. Additionally, some universities have adopted Alumni Engagement Software, which incorporates community-building tools, databases, and integrated communication channels to foster lifelong engagement between alumni and their alma mater. [8].

Data Analytics in Alumni Tracking

The application of data analytics in alumni tracking has provided institutions with valuable insights into alumni career trends and engagement patterns. A study found that integrating Data Analytics in Alumni Systems helps universities track alumni progress, optimize outreach strategies, and enhance institutional development. [9].

Another research highlights how Alumni Data Reporting Tools can generate reports on alumni interactions, event attendance, and employment rates to improve decision-making. Moreover, advanced analytics in alumni management software enables colleges to monitor engagement metrics and participation trends, allowing them to tailor outreach efforts effectively. [10].

Data Analytics in Alumni Tracking

Maintaining alumni engagement is essential for universities aiming to build long-term relationships with their graduates. Studies suggest that Alumni Digital Engagement Platforms help bridge the gap between institutions and their alumni by providing an online space for networking, mentorship, and career development. [11].

Furthermore, Alumni Tracer Studies have been widely used to collect career data from graduates, allowing schools to assess the effectiveness of their academic programs and improve industry alignment. [12]. Some researchers have also emphasized the importance of Data Analytics in Alumni Networks, which uses data-driven insights to personalize engagement strategies and strengthen the university-alumni connection. [13].
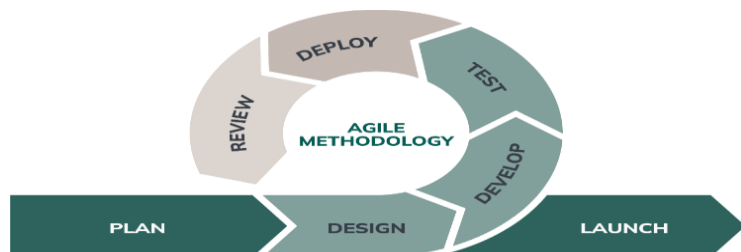
METHODOLOGY

Agile Model

Fig. 1. Agile Model

The development of the SEAIT Alumni Tracer and Management System with Data Analytics follows the Agile Methodology, ensuring an iterative and flexible approach to building its five core modules. The project begins with requirement gathering, where SEAIT administrators and alumni define key functionalities and a Product Backlog is created to guide development. The system is built in multiple sprints, each focusing on a specific module to ensure continuous improvement based on feedback. In early sprints, the Alumni Feedback Collection Module was developed to efficiently gather alumni insights and support SEAIT's program improvements. Subsequent sprints integrate the Engagement and Updates Module, providing alumni with timely notifications on yearbooks and events. To foster career growth, the Job and Networking Platform is implemented, enabling alumni to access job opportunities and professional connections. Another sprint introduces Data Analytics and Reporting, allowing SEAIT to track alum engagement and system performance for data-driven decision-making. Finally, the Document Request System is developed to streamline transcript and diploma requests, reducing wait times and improving user experience. Throughout the process, continuous testing, stakeholder feedback, and sprint reviews ensure that the system evolves to meet user needs efficiently.

Alumni Tracer Survey Form

Research Instrument

Fig. 2. System Usability Scale Evaluation Form

Figure 2 illustrates the System Usability Scale (SUS) Evaluation Form, which is used to assess the system's usability and functionality. This form consists of a 10-item questionnaire designed to collect user feedback on their experience, utilizing a 5-point Likert scale ranging from "Strongly Disagree" to "Strongly Agree."

CONCEPTUAL FRAMEWORK OF THE STUDY

Use Case Diagram Design
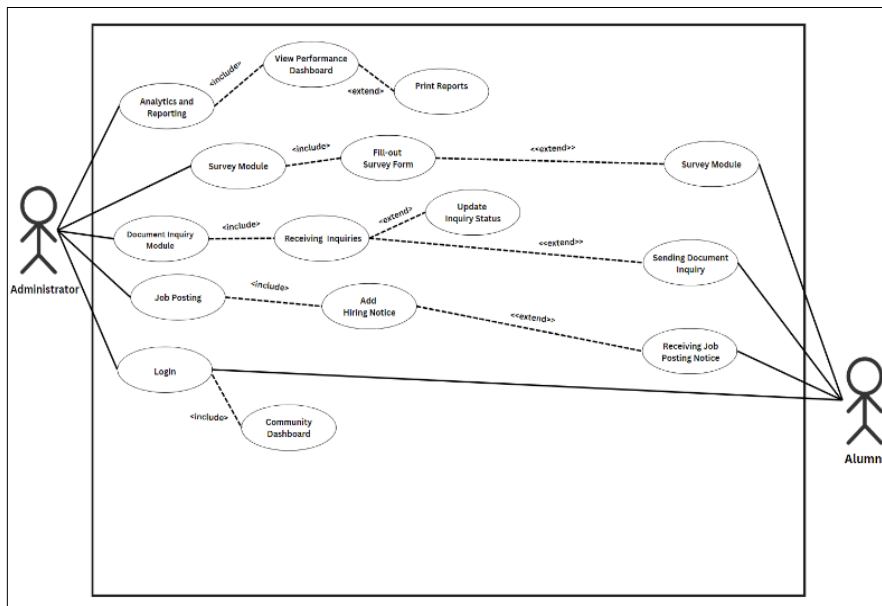
Fig. 3. Use case diagram of the Study.

The use case diagram for the SEAIT Alumni Tracer and Management System with Data Analytics illustrates the interaction between Administrators and Alumni, showcasing key system functionalities. The Administrator manages the system, including survey collection, job postings, document inquiries, analytics, and reporting. Alumni engage by filling out surveys, submitting document requests, and receiving job postings and updates. The Survey Module allows alumni to provide feedback, while administrators analyze responses, view performance dashboards, and print reports. The Document Inquiry Module enables alumni to request documents, which administrators process and update accordingly. The Job Posting Module allows administrators to add hiring notices, which alumni receive for career opportunities.

Additionally, both actors access the Community Dashboard for updates. The diagram uses "include" relationships to indicate required actions, such as survey completion and login access, and "extend" relationships for optional features like report printing and inquiry status updates. This framework ensures efficient alumni engagement, career development, and streamlined document processing, supporting SEAIT's data-driven decision-making.

User Story

1. Alumni Feedback Collection Module *"As an alumnus, I want to provide feedback through an online survey so SEAIT can improve its programs by analyzing alumni experiences and making data-driven enhancements."*
2. Alumni Engagement and Updates Module *"As an alumnus, I want to receive timely updates on yearbooks and events to stay connected and engaged with the SEAIT community."*
3. Job and Networking Platform *"As an alumnus, I want access to job opportunities and professional networking within the SEAIT community so I can advance my career."*

4. Data Analytics and Reporting Module

"As a SEAIT administrator, I want to analyze alumni progress and engagement so I can make data-driven decisions to improve services and track system performance."

5. Document Request System

"As an alumnus, I want to request important documents like transcripts and diplomas online so I can receive them faster without long wait times."
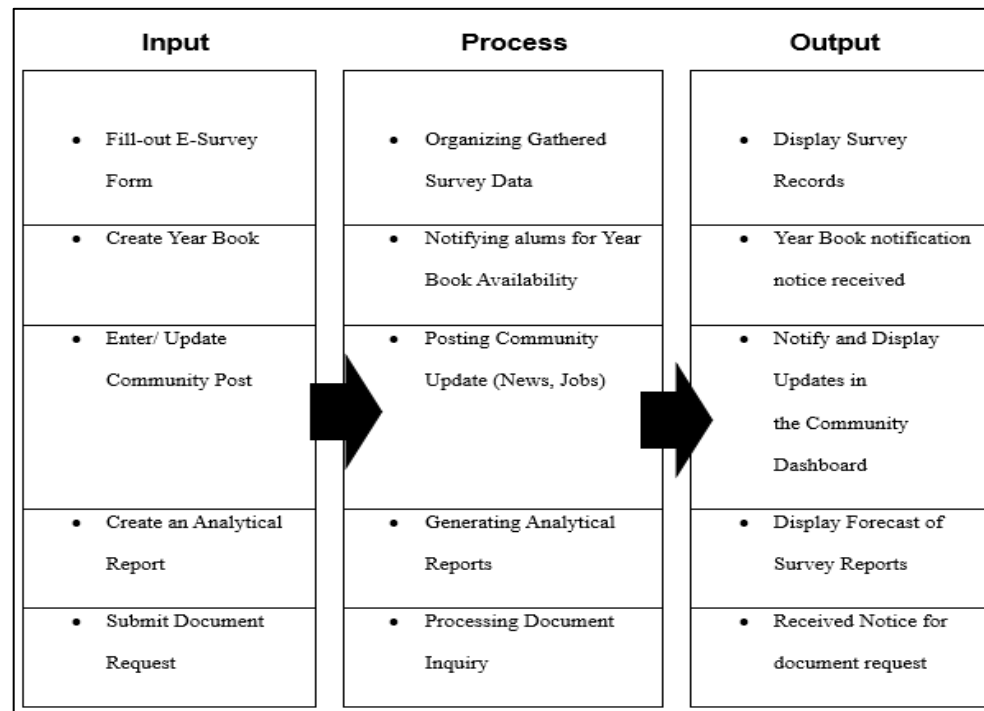
Conceptual Framework

Fig. 4. Conceptual Framework of the Study

The conceptual framework of the SEAIT Alumni Tracer and Management System with Data Analytics follows an Input-Process-Output (IPO) Model, illustrating how data flows through the system to improve alumni engagement and institutional decision-making. The Input stage consists of data collection and user interactions, where alumni and administrators provide information through various activities such as filling out e-survey forms, creating yearbook entries, posting community updates, generating analytical reports, and submitting document requests. These inputs serve as the foundation for the system's operations. In the Process stage, the system organizes and processes the collected data to generate meaningful insights and responses. Survey responses are structured and stored for analysis, while alumni receive timely notifications regarding yearbook availability. Community updates, including job postings and news, are published to keep alumni informed. Additionally, the system generates analytical reports to track alumni progress and trends, supporting data-driven decision-making. Document requests are processed efficiently, ensuring that alumni receive necessary documents without long wait times. The Output stage provides actionable results and enhances user engagement. Alumni feedback is displayed in survey records for institutional analysis, while notifications ensure they stay updated on yearbook availability and community announcements. The system also delivers real-time updates on the community dashboard, allowing users to stay connected. Forecasted survey reports help SEAIT administrators identify trends and improve alumni-related services, while document request confirmations ensure a streamlined and transparent process. Overall, the framework enhances alumni relations by automating feedback collection, career updates, reporting, and document processing, ultimately leading to a more efficient and data-driven alumni management system.

System Design

Fig. 5. Manage Alumni Module

Figure 5 illustrates the Manage Alumni module, which allows administrators to add an alumni record.

Fig. 6. Job Posting Module

Figure 6 illustrates the Job Posting Module, which allows the administrator to post job vacancies which also enabling alumni to view job updates posted by the administrator.
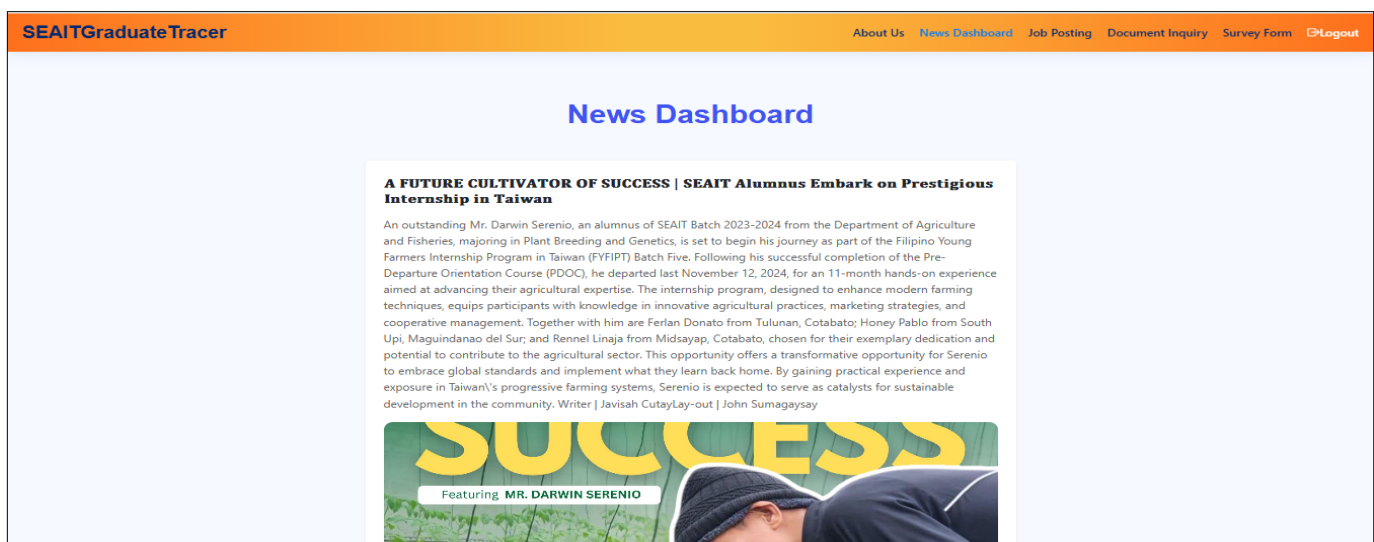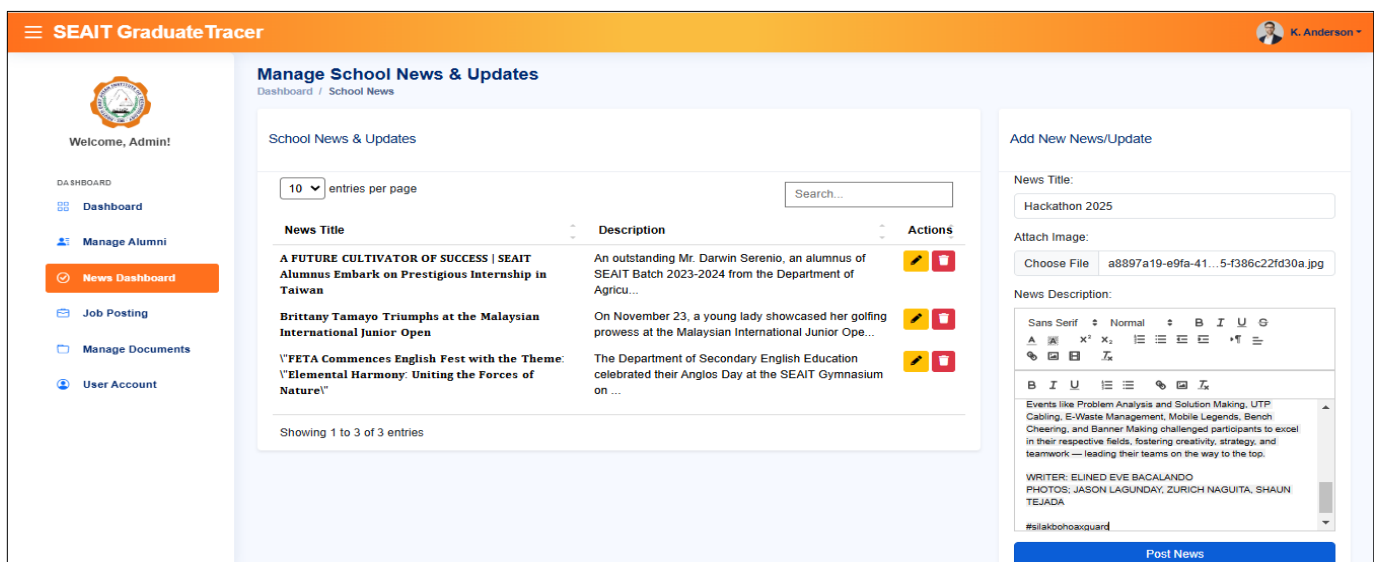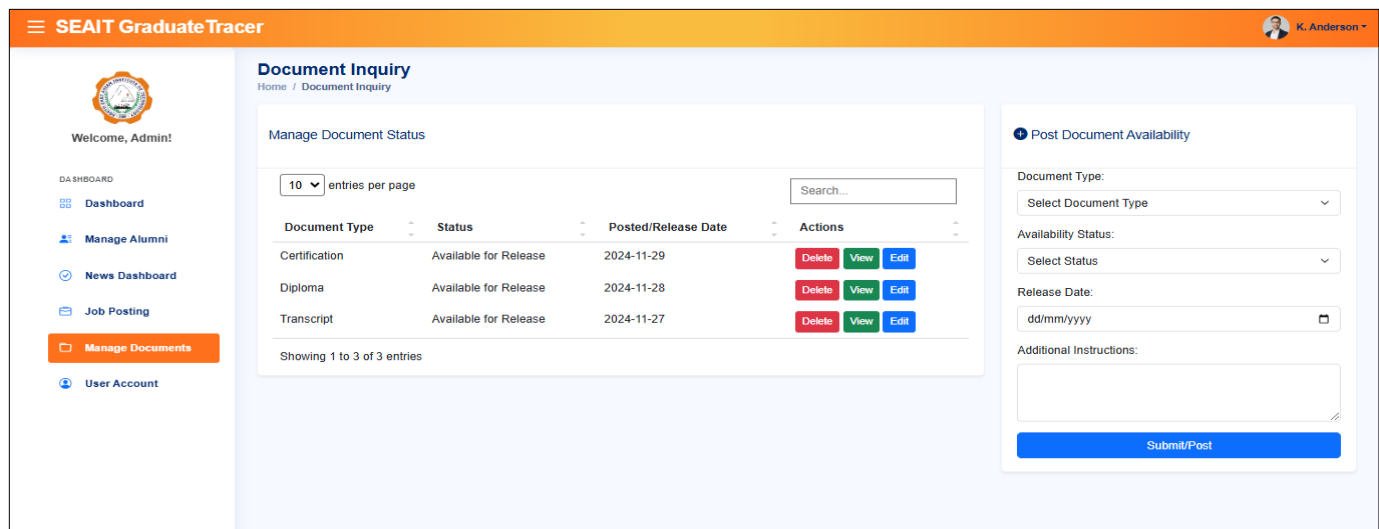
Fig. 7. News Portal Module

Figure 7 illustrates the academe news management page under the Manage School News and Updates page, where the admin can post announcements to inform alumni of updates and news.

Fig. 8. Document Inquiry Module

Figure 8 displays the Document Inquiry Transaction on the Document Inquiry page, where the admin can acknowledge alumni document requests and update the availability of the document requested.

Fig. 9. Alumni Survey Module

Figure 9 shows the Alumni Survey page, which allows the alumni to take a survey. All survey data were collected as a form of alumni tracing.
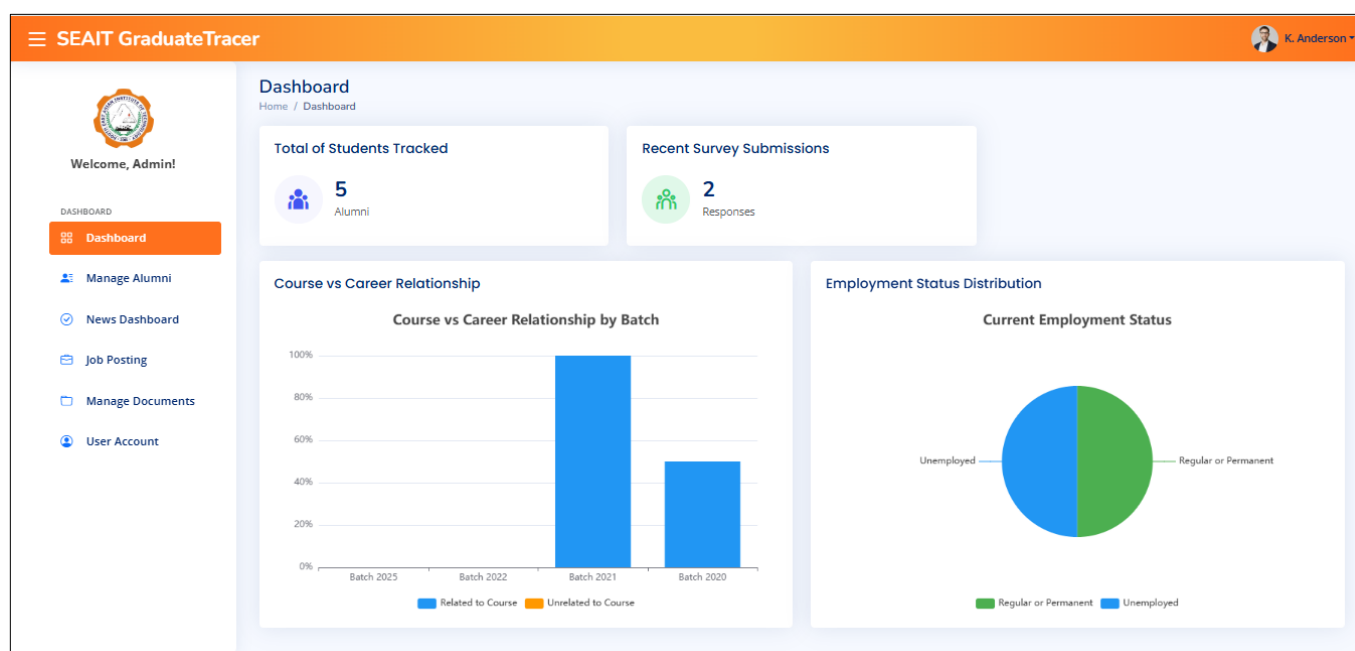
Fig. 10. Analytical Dashboard

Figure 10 shows the analytical dashboard of the system, which shows the statistical data collected from the alumni surveys.

RESULTS AND DISCUSSIONS

Development and Testing

The SEAIT Alumni Tracer and Management System with Data Analytics was developed to enhance alumni engagement and streamline key institutional processes at the South East Asian Institute of Technology, Inc. The system's core features included automated alumni feedback collection, real-time notifications for yearbook availability and events, job posting and career networking, data analytics for alumni tracking, and an efficient document request system. These functionalities were designed to strengthen SEAIT's connection with its alumni while providing valuable insights for institutional decision-making.

To evaluate the system's usability and efficiency, 15 college alumni who had already graduated participated in testing. The participants were selected from three graduating batches: 2022, 2023, and 2024, with five (5) alumni from each batch. Since the system was built in 2025, all participants had completed their degrees before its implementation, ensuring that their feedback reflected the real needs of SEAIT graduates.

The alumni evaluated various system modules, including feedback submission, job postings, document requests, and engagement features. To measure the system's usability, efficiency, and overall effectiveness in addressing alumni-related concerns, a 5-point Likert scale evaluation tool based on the System Usability Scale (SUS) was used.

System Evaluation

Fifteen alumni participants evaluated the SEAIT Alumni Tracer and Management System with Data Analytics using the System Usability Scale (SUS) to assess its usability, effectiveness, and efficiency. The final SUS scores were as follows: the 2022 batch achieved an average score of 94.00, the 2023 batch received 95.5, and the 2024 batch obtained 70.5.

The overall mean SUS score of 86.67 indicated that the SEAIT Alumni Tracer and Management System was an effective and well-accepted platform, providing essential services to graduates and supporting SEAIT's alumni engagement efforts.

Table 1. Raw Results of Respondents' Answers In 5-Point Likert Scale

A1 – Alumni 1 (5)   **A2** – Alumni 2 (5)   **A3** – Alumni 3(5)

Respondent No.	R1	R2	R3	R4	R5	R6
			Respondents			
Question	A1.1	A1.2	A1.3	A1.4	A1.5	A2.1
1	5	5	5	5	5	5
2	1	1	1	1	1	1
3	5	5	5	5	5	5
4	1	2	4	1	1	1
5	3	5	5	5	5	5
6	1	1	2	1	1	1
7	4	5	5	5	5	5
8	1	1	1	1	1	1
9	4	5	5	5	5	5
10	2	1	3	1	1	1

Respondent No.	R13	R14	R15
	Respondents		
Question	A3.3	A3.4	A3.5
1	5	3	4
2	4	5	3
3	5	4	4
4	4	3	4
5	5	5	5
6	1	4	2
7	3	5	5
8	2	1	2
9	3	3	4
10	3	3	3

Respondent No.	R7	R8	R9	R10	R11	R12
			Respondents			
Question	A2.2	A2.3	A2.4	A2.5	A3.1	A3.2
1	5	5	4	5	3	4
2	1	1	1	1	1	3
3	5	5	5	5	5	5
4	1	1	2	1	3	2
5	5	5	4	5	5	5
6	1	1	2	1	1	2
7	5	5	4	5	5	4
8	1	1	1	1	1	1
9	5	5	4	5	3	4
10	1	1	4	1	5	2

Table 1 presents all the calculated odd and even scores, which were derived from the raw scores. The SUS equation used was as follows: Calculated Odd Score = $((q1 + q3 + q5 + q7 + q9) - 5)$ and Calculated Even Score = $(25 - (q2 + q4 + q6 + q8 + q10))$.

Table Ii. Calculated Results of Respondents

QUESTION	A1.1	A1.2	A1.3	A1.4	A1.5	A2.1
Odd Score	16	20	20	20	20	20
Even Score	19	19	14	20	20	20

QUESTION	A2.2	A2.3	A2.4	A2.5	A3.1	A3.2
Odd Score	20	20	16	20	16	17
Even Score	20	20	15	20	14	15

QUESTION	A3.3	A3.4	A3.5
Odd Score	16	15	17
Even Score	11	9	11

Table 2 presents each respondent's calculated score using the SUS equation for the total SUS score. The equation applied was: **SUS Score = (Calculated Odd Score + Calculated Even Score) × 2.5** [14].

Respondents	SUS Score
A1.1	87.5
A1.2	97.5
A1.3	85
A1.4	100
A1.5	100
A2.1	100
A2.2	100
A2.3	100
A2.4	75.5
A2.5	100
A3.1	75
A3.2	80
A3.3	67.5
A3.4	60
A3.5	70
Average:	**86.67**

Table Iii. System Usability Scale Calculated Score And Acceptability Score

Table 3 shows the overall mean SUS score across all participants, reflecting that SEAIT Alumni Tracer with Data Analytics is an acceptable system with high usability. With an "Excellent" average of 86.67, the system is a valuable tool for the South East Asian Institute of Technology, Inc., supporting improved tracing of SEAIT graduates.
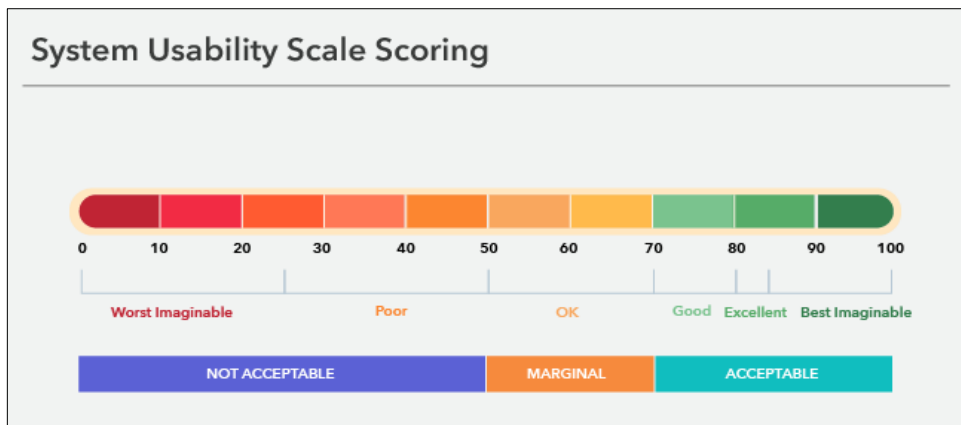
Fig. 11. System Usability Scale

Figure 11 presents the system's usability assessment based on the System Usability Scale (SUS). A SUS score above 68 is considered average, while scores below this threshold are classified as marginal or unacceptable. Scores ranging from 51 to 70 fall into the marginal category, whereas scores below 50 are deemed "Not Acceptable." In contrast, scores above 71 are categorized as "Acceptable," indicating a satisfactory user experience.

CONCLUSIONS

The SEAIT Alumni Tracer and Management System with Data Analytics received an overall mean SUS score of 86.67, indicating a high level of usability and acceptability among alumni users. The system effectively streamlined key alumni-related processes, including feedback collection, job postings, document requests, and data analytics, making it a valuable tool for enhancing alumni engagement and institutional decision-making. All system features were tested and confirmed to be fully functional, working seamlessly across survey management, career networking, notification services, and administrative reporting. Alumni participants found the system highly beneficial in simplifying processes, improving accessibility, and maintaining strong connections with SEAIT after graduation. Overall, the system successfully provided a user-friendly and efficient platform that met the needs of SEAIT graduates.

RECOMMENDATIONS

Enhancements to the SEAIT Alumni Tracer and Management System with Data Analytics are suggested to improve accessibility, security, and data accuracy. Developing a mobile application version would enable alumni to conveniently access the system via their mobile devices, enhancing usability and engagement. To strengthen account security and protect user data, the implementation of a two-factor authentication mechanism is advised. Additionally, integrating data analytics for survey responses, including data cleansing of alumni career paths, professions, and work alignment, is recommended to support SEAIT's academic performance evaluation and decision-making.

These enhancements are designed to strengthen the system's existing functionalities, ensuring it remains secure, efficient, and accessible to all SEAIT alumni while further improving alumni engagement and institutional services.

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