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**Chapter I**

**INTRODUCTION**

**Background of the Study**

Artificial Intelligence (AI) has brought about significant changes to various aspects of our lives, including the job market. The integration of AI algorithms in the development of the Alumni Tracker with Job Matching system has enabled job seekers to find personalized job recommendations based on their skills and qualifications. The objective of this research is to develop an AI-based Alumni Tracker with Job Matching system that will support alumni of the Northern Negros State College of Science and Technology (NONESCOST) in finding job opportunities that are a good fit for their skills and qualifications.

The Alumni Tracker with Job Matching system will collect and analyze data on alumni's education, work experience, skills, and preferences to provide personalized job recommendations. This system will help alumni stay informed about the latest trends in the job market by providing up-to-date information on job openings and the skills and qualifications required to succeed in those roles. Using AI algorithms, the system will match alumni with job openings that are a good fit, enabling employers to find qualified candidates for their job openings.

The development of the Alumni Tracker with Job Matching system using AI highlights the commitment of NONESCOST to support its alumni in achieving success in their chosen careers. This system's innovative approach sets it apart from other alumni tracker systems that may rely on manual processes or limited data analysis. The personalized job recommendations and up-to-date information on job openings provided by the system are crucial features that will help alumni navigate the competitive job market and find opportunities that match their profile.

**Objectives of the Study**

**General Objective**

This study aims to develop an Alumni Tracker with Job Matching using AI Integration.

**Specifically, it aims to**

1. Design a system that manage data of NONESCOST Alumni that includes their education, work experience, skills, and job preferences.
2. Design a system with an AI-based job matching algorithm that can analyze alumni data and provide personalized job recommendations that match their profile.
3. Generate the following reports
   1. Employment rate of Alumni
   2. Job Matching
4. Determine the quality of the developed system based on **ISO/IEC 25010:2011** Systems and Software Quality Requirements and Evaluation (SQuaRE) Quality Model

**Scope and Limitation**

The scope of this study is to develop an Alumni Tracker with Job Matching system using artificial intelligence (AI) to support the alumni of the Northern Negros State College of Science and Technology (NONESCOST) in finding job opportunities that match their skills and qualifications. The system will collect data on alumni's education, work experience, skills, and preferences to provide personalized job recommendations. The system will also integrate job postings to match alumni with job openings that are a good fit. The system's primary goal is to help alumni achieve success in their chosen careers by connecting them with job opportunities that meet their needs and qualifications.

The Alumni Tracker with Job Matching system has a few limitations that should be taken into account. Firstly, the system is dependent on the data provided by alumni, and if alumni do not provide accurate or up-to-date information, the system's effectiveness may be compromised. Secondly, the system's matching algorithms may not always provide perfect job matches, and it is the responsibility of the job seeker to evaluate the job opportunities presented by the system. Additionally, the system's effectiveness may be limited by the availability of job postings in the database, and it may not be able to capture all job opportunities in the job market. Finally, the system's effectiveness may be limited to the specific region or job market in which it is deployed, and its scalability to a wider range of job markets may require further research and development.

**Significance of the Study**

The NONESCOST Alumni Tracker with Job Matching using AI Integration system is designed to benefit several stakeholders, including NONESCOST alumni, employers, and the academic institution itself.

**NONESCOST Alumni**. The primary beneficiaries of the system are the alumni of the institution. The system will provide personalized job recommendations that match the alumni's education level, work experience, skills, and job preferences. The system will help alumni find job opportunities that align with their career goals, increasing their chances of finding employment that matches their interests and skillset.

**Employers.** The system will benefit employers by providing a pool of qualified job applicants who match their job requirements. Employers will benefit from a more efficient recruitment process, reducing the time and resources required to find suitable candidates. The system will help employers find qualified applicants who match their job requirements, increasing the likelihood of successful job placements.

**Academic Institution.** The system will benefit the academic institution by improving its alumni engagement and support services. By providing a job matching service for alumni, the institution can enhance its reputation and improve its relationships with alumni. The system will also provide valuable data on alumni employment trends, which can be used to improve the institution's academic programs and curriculum.

**Future Researchers.** The project may serve as a reference for future researchers.

**Definition of Terms**

**AI Integration**: Conceptually, AI integration refers to the use of artificial intelligence algorithms and techniques to enhance the performance and capabilities of a system. Operationally, AI integration in the NONESCOST Alumni Tracker system refers to the use of machine learning algorithms to analyze alumni data and provide personalized job recommendations.

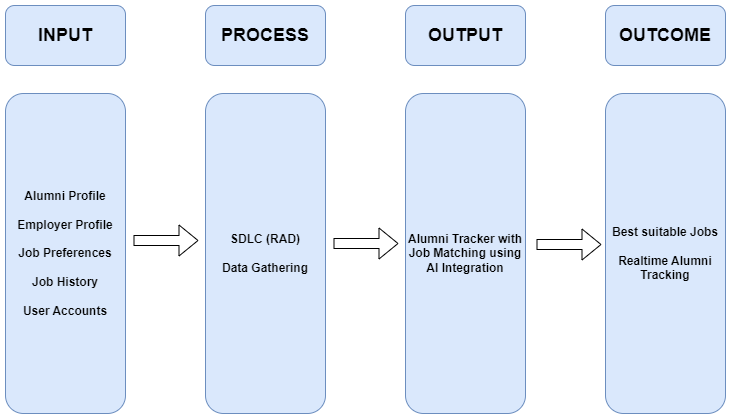
**Job Matching**: Conceptually, job matching refers to the process of matching job seekers with suitable job opportunities based on their skills, education, work experience, and job preferences. Operationally, job matching in the NONESCOST Alumni Tracker system refers to the algorithmic process of analyzing alumni data and employer job requirements to identify suitable job opportunities for alumni.

**Alumni Tracker:** Conceptually, an alumni tracker refers to a system that tracks the academic and employment progress of alumni. Operationally, the Alumni Tracker in the NONESCOST system refers to the database and user interface that enables alumni to input and update their personal and employment information, which is used by the job matching algorithm to provide personalized job recommendations.

**Data Analytics:** Conceptually, data analytics refers to the process of analyzing and interpreting data to derive insights and make informed decisions. Operationally, data analytics in the NONESCOST Alumni Tracker system refers to the use of machine learning algorithms to analyze alumni data and employer job requirements to provide personalized job recommendations.

**Personalized Job Recommendations:** Conceptually, personalized job recommendations refer to job opportunities that match the job seeker's skills, education, work experience, and job preferences. Operationally, personalized job recommendations in the NONESCOST Alumni Tracker system refer to the algorithmic process of analyzing alumni data and employer job requirements to identify suitable job opportunities for alumni.

**Conceptual Framework**



**Figure 1. Conceptual Framework of the Study**

Figure 1 shows the NONESCOST Alumni Tracker with Job Matching system that uses AI integration to match alumni with job openings. The system is based on the IPOO model and enables employers to find qualified candidates for their job openings while also providing real-time tracking of NONESCOST alumni. In summary, it is a tool that simplifies the job matching process and enhances the tracking of alumni.

**Chapter II**

**RELATED LITERATURE AND PRIOR ARTS SEARCH**

**Related Literatures**

**ALUMNI TRACKING SYSTEM**

The Alumni Tracking System is an online-based application that aims to enhance the current tracking process of college graduates. It is a web portal that provides a centralized platform for the management of alumni data and facilitates communication between alumni and the institution. The system allows alumni to update their information easily and provides a flexible and automated approach to managing alumni data. The proposed system offers great advantages to the alumni, such as eliminating the need for a group of alumni to manage the alumni forum and reducing maintenance effort. The system provides an all-in-one solution for collecting and managing alumni data, enabling effective communication between alumni and the institution, and offers great flexibility in keeping track of the data. In summary, the Alumni Tracking System is an innovative and useful application that can significantly improve the management of alumni data and benefit both the alumni and the institution.

**An Alumni Portal and Tracking System**

The system aims to integrate the existing unmanaged and outdated alumni data into a well-managed database and act as a portal where alumni can update their information and view online yearbooks. The paper provides insights from the collected alumni responses, including the job positions and employers of alumni, their current location, and the favored choice for further education. The system has been effective in collecting and managing alumni data and has been accessed by many alumni. Overall, the paper highlights the importance of an efficient alumni tracking system and how a web-based platform can make it easier for institutions to manage alumni data.

**Design and Development of Alumni Tracking Information System**

The study aimed to develop a web-based alumni tracking information system at SMKN 1 Garut, test it based on functional aspects, and evaluate user responses. The system was developed using a waterfall model and was tested using blackbox testing and expert validation. The feature completeness matrix was used to calculate the results, and user responses were collected using a Likert scale questionnaire from ten alumni of SMKN 1 Garut. The study found that the web-based alumni tracking information system at SMKN 1 Garut is feasible in terms of functional aspects and received a "very positive" response from users. The study highlights the importance of an efficient alumni tracking system and how a web-based platform can make it easier for institutions to manage alumni data.

**Prior Arts**

**A career counseling system based on intelligent matching algorithms.**

This paper describes a career counseling system that uses intelligent matching algorithms to help individuals find suitable job opportunities based on their skills and interests.

**A job matching system based on ontology and machine learning.**

This article presents a job matching system that uses ontology and machine learning to match job seekers with suitable job opportunities based on their skills and qualifications.

**A job recommendation system based on multi-criteria decision making**

This paper proposes a job recommendation system that uses multi-criteria decision making to recommend job opportunities based on the preferences and qualifications of job seekers.

**A method for using natural language processing to match job seekers with suitable job postings.**

This article describes a method for using natural language processing to match job seekers with suitable job postings based on their skills and qualifications.

**An intelligent job matching system based on deep learning.**

This paper proposes an intelligent job matching system that uses deep learning algorithms to match job seekers with suitable job opportunities based on their skills and qualifications.

**A hybrid approach for job recommendation using collaborative filtering and content-based filtering.**

This article presents a hybrid approach for job recommendation that combines collaborative filtering and content-based filtering to recommend job opportunities based on the preferences and qualifications of job seekers.

**A job matching model based on artificial neural network.**

This paper proposes a job matching model that uses artificial neural networks to match job seekers with suitable job opportunities based on their skills and qualifications.

**Job matching based on ontology and semantic matching.**

This article presents a job matching approach that uses ontology and semantic matching to match job seekers with suitable job opportunities based on their skills and qualifications.

**Job matching system based on personality traits and skills.**

This paper proposes a job matching system that uses personality traits and skills to match job seekers with suitable job opportunities.

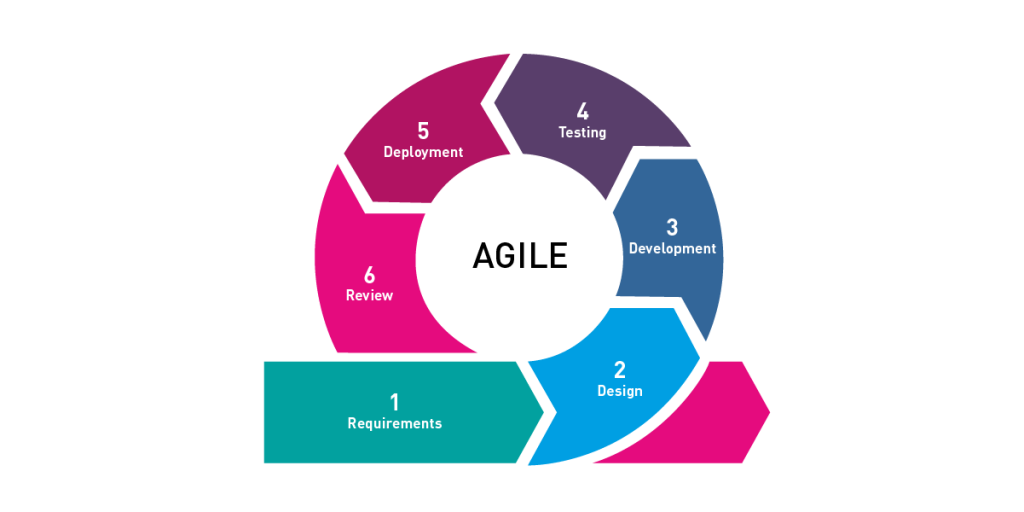
**Synthesis**

Based on the related literature and prior arts, it is evident that there is a growing need for job matching systems that can help alumni find suitable job opportunities based on their skills, qualifications, and preferences. These systems often use intelligent algorithms, such as machine learning and natural language processing, to match job seekers with job postings that meet their criteria.

**Chapter III**

**METHODOLOGY**

**System Design**



**Figure 2. Agile Software Development**

The **Agile** methodology is a software development approach that emphasizes collaboration, flexibility, and continuous improvement. It focuses on delivering value to end-users through rapid iteration and incremental development. The Agile methodology is based on the Agile Manifesto, a set of values and principles for software development that prioritize individuals and interactions, working software, customer collaboration, and responding to change.

**Software Life Cycle Model**

**Planning**: In this phase, the development team works with stakeholders to define the project scope, establish goals and objectives, identify risks and challenges, and determine the initial requirements for the system. The team creates a roadmap that outlines the development process, timelines, and milestones.

**Design**: In this phase, the development team creates a high-level design for the system, which includes the system architecture, technology stack, database design, and user interface. The team also defines the functionality of the system and how it will be implemented.

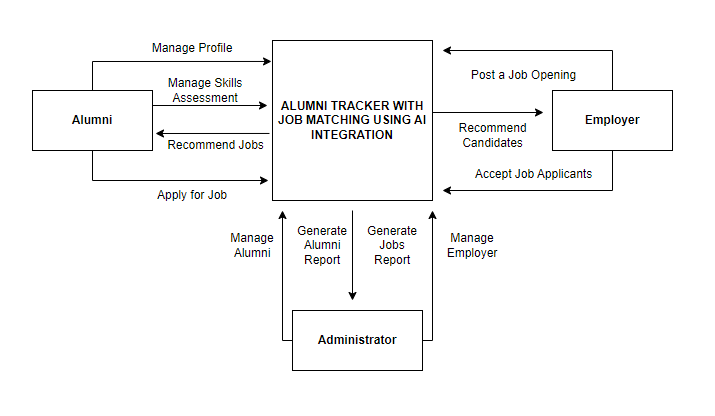
**Development**: In this phase, the development team begins building the system by creating software components, integrating them, and testing them. The team works in short iterations, which typically last 2-4 weeks, to deliver a working system incrementally.

**Testing**: In this phase, the development team tests the system to ensure that it meets the requirements and is functioning as expected. Testing is done throughout the development process, with each iteration being tested thoroughly before moving to the next one.

**Deployment**: In this phase, the development team deploys the system to a test environment or a staging server for further testing and feedback. Once the system is fully tested, it is deployed to the production environment.

**Maintenance**: In this phase, the development team continues to maintain and improve the system, fixing any bugs or issues that arise, adding new features, and updating the system to keep up with changing requirements or technologies.

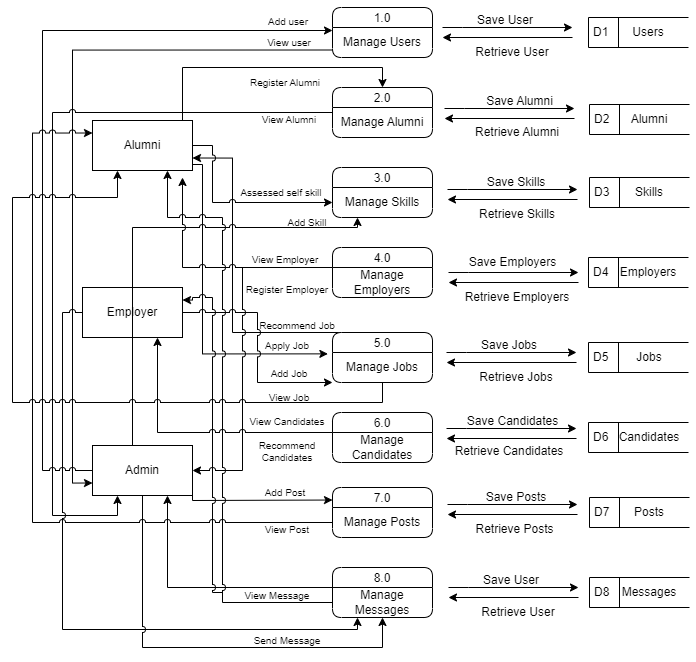
**Context Flow Diagram**



**Figure 3. Context Flow Diagram**

Figure 3 shows how the researcher maps out on how the entire features and components of the system will work together according to its purpose.

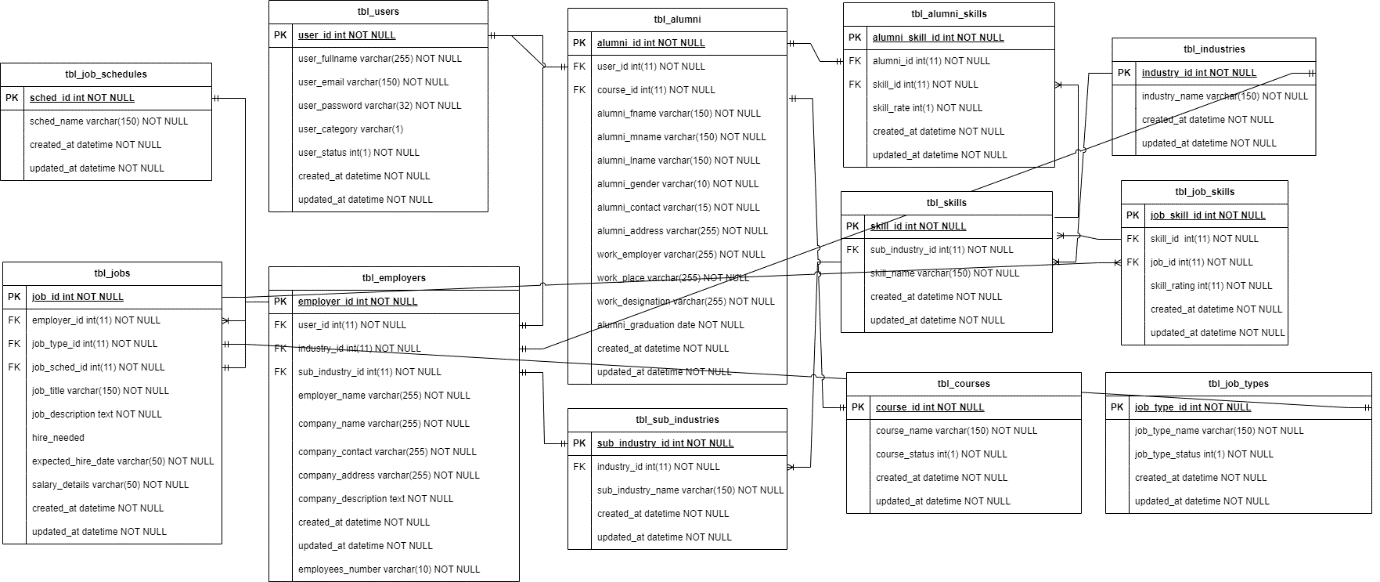
**Data Flow Diagram**



**Figure 3. Data Flow Diagram**

Figure 4 illustrates how information is processed within the system, including where it comes from, how it is transformed, and where it is stored. The purpose of the Data Flow Diagram is to depict the system's scope and boundaries, and it can be used as a tool for communication between the systems analyst and stakeholders involved in the system's redesign.

**Entity-Relationship Diagram**



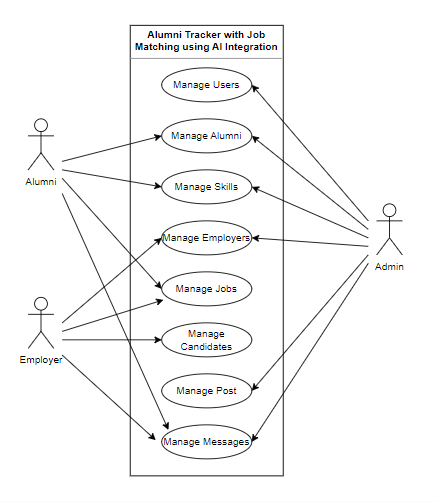
**Figure 9. Use Case Diagram**

An entity relationship diagram gives a snapshot of how these entities relate to each other. You could call it the blueprint that underpins your system architecture, offering a visual representation of the relationships between different sets of data (entities).

**Application Architecture**

Figure 6 shows how the web app will work when used by the registered users.

**Use-Case Diagram**



**Figure 9. Use Case Diagram**

A Use Case diagram is a representation of a user's interaction with the system that shows the relationship between the user and the different use cases in which the user is involved as shown in figure 9.

**Software Requirements**

Admin side:

Operating System (Windows 7,8 or 10)

PHP

Web Hosting/Server

MySQL

Python

Client side:

Operating System (Windows 7, 8, or 10)

Web browser

**Hardware and Other Required Devices**

Processor: Intel Core i3 or higher

RAM: 2GB or higher

Hard Disk Drive: 500GB or higher

Printer

Internet Plan at least 5 Mbps

**Cost-Benefit Analysis**

**Chapter IV. PRESENTATION, ANALYSIS, AND INTERPRETATION OF DATA**

**Chapter V. SUMMARY, CONCLUSION, AND RECOMMENDATION**

Summary of Findings

Conclusion

Recommendation

Appendices

References

Curriculum Vitae