Table of Contents

[Title 2](#_Toc194239082)

[1.0 Background and Problem Description 3](#_Toc194239083)

[1.1 Research Objectives 4](#_Toc194239084)

[2.0 Research Methodology 5](#_Toc194239085)

[Bibliography 6](#_Toc194239086)

# Title

A Consolidated Tool for Automating Candidate Recruitment Searches Using the Coresignal API and Recommendation Engines.

# Background and Problem Description

To find candidates to headhunt for job positions, recruitment agencies defined as partners that assist an organization in recruiting suitable candidates for available job positions (Eichhorst, et al., 2013), often have to manually search for candidates from various job portals. The agencies individually visit multiple job portals such as LinkedIn, Pnet, Indeed and provide certain search criteria, such as job title, location, education, and other parameters. They then sift through the search results and manually save the candidates matching the provided search parameters to an Excel file for each job portal. This process is tedious and delays the process of finding suitable candidates for the role (Pavithr & Gulomkodirova, 2024). An example is Search Partners International (SPI), an executive recruitment agency that headhunts candidates for executive roles on behalf of organizations (Search Partners International, 2025). SPI recruiters perform manual candidate search across various job portals such as LinkedIn, Indeed and Pnet (Search Partners International, 2025). The challenges at SPI served as a motivation for this research to develop an automated solution, which, although it is illustrated using SPI as a real world case study, can be widely used by other recruitment agencies.

This highlights the need for an automated solution such as a unified search interface tool that allows recruitment agencies to input search parameters such as job title, location, education and skills in one place. The unified search interface tool would not only improve the manual search process of finding candidates but also provide an opportunity to incorporate machine learning recommendation systems that rank candidates by relevance to job descriptions.

# 1.1 Research Objectives

The primary aim of this research is to automate the manual candidate search process by adhering to the following proposed objectives:

* Build a web application that leverages the Coresignal Application Programming Interface (API) to consolidate the search for candidate information from various job portals such as LinkedIn, Pnet, and Indeed. This automates the manual process by consolidating the candidate search into a centralized search system. Coresignal API is an official API that provides publicly accessible data about employees such as their experience history, skills, education, country and more from various job portals and adheres to data governance and ethical data collection laws worldwide (Coresignal, 2025).
* Create a user-friendly user interface (UI) that enables recruitment agencies to enter search criteria such as job title, education and skills in one place. The interface will pull data from the Coresignal API and display consolidated candidate data matching the search criteria.
* Build a machine learning recommendation model that ranks the candidate profiles from the search results against the job descriptions. This evaluates the candidate profiles according to how well they align with particular job descriptions. This added layer of analysis seeks to improve the precision of candidate-job matching and facilitate recruitment agencies in swiftly identifying the most relevant candidates for the role.

# 2.0 Research Methodology

To achieve the objectives of this research, the following methodology will be adhered to. The proposed methodology is intended to be adaptable across other recruitment agencies, even though SPI serves as the primary real world case study:

* This research will partner with SPI for a real world case study to analyse their manual candidate search process.
* The candidates data will be collected from the Coresignal API matching SPI’s job search criteria. This API provides access to consolidated publicly available candidate data from multiple online job portals that recruitment agencies would otherwise collect manually. The data that will be collected from the Coresignal API is information such as job titles, degree, skills, country and city. Data that personally identifies candidates such as first name, email address and phone number will be omitted or anonymized.
* Develop a web-based user interface that consolidates the candidate search process. This user interface will allow recruitment agencies to input search parameters of the job positions they want to find candidates for in a single, unified platform by querying the Coresignal API.
* Develop a machine learning recommendation model that computes cosine similarity scores between candidate information and job descriptions. The model will be trained and evaluated on SPI’s job descriptions and candidate data. The trained model will return candidates ranked by similarity scores. Higher ranking candidates will be the ones most recommended for headhunting because they better fit the job description.

# Bibliography

Eichhorst, W., Gerard, M., Braga, M. & Huemer, U., 2013. *The Role and Activities of Employment Agencies,* Bonn: IZA Institute of Labor Economics.

Pavithr, M. & Gulomkodirova, M. S. Q., 2024. A Study on Various E-Recruitment Tools and Its Effectiveness for Recruitment. *Kokand University Herald,* Issue 10, p. 33.

Search Partners International, 2025. *WHO WE ARE: Leading Executive Consultancy Services.* [Online]   
Available at: https://searchpartners.co.za/who-we-are/  
[Accessed 27 March 2025].

Coresignal, 2025. *Employee API: Unlock millions of professional profiles.* [Online]   
Available at: https://coresignal.com/solutions/employee-data-api/  
[Accessed 27 March 2025].