

PROJECT PROPOSAL

ACCA6020

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Independent Project

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Introduction and Background

The process of job searching for students and recent graduates has become increasingly complex in the digital era. Modern recruitment practices require applicants to engage with multiple online platforms, including company career portals, recruitment agencies, and professional networking sites such as LinkedIn. [1] As a result, individuals often submit a high volume of applications within a short period, particularly during graduate recruitment cycles. While these platforms have streamlined the application process, they have simultaneously introduced challenges in terms of tracking, organisation, and information management from the applicant's perspective.

A key issue faced by students is the lack of an effective system for managing application-related information. After submitting applications, candidates typically receive numerous follow-up emails containing acknowledgements, status updates, interview invitations, rejections, and offers. These communications are stored within email inboxes, which are not designed to function as structured tracking systems. Consequently, students frequently experience difficulty recalling where they have applied, what stage each application has reached, and which organisations have responded. This leads to inefficiencies such as missed deadlines, duplicated applications, and increased cognitive load during the job search process.

Research in personal information management highlights that individuals often struggle to organise and retrieve information when it is distributed across multiple digital sources. Email, while a central communication medium, contributes significantly to this challenge due to its unstructured nature and the high volume of messages users must process. In the context of recruitment, this problem is particularly pronounced, as job-related emails contain valuable but dispersed information that is not easily consolidated into a single overview. [2] [3]

Existing technological solutions do not adequately address this issue from the perspective of the applicant. Applicant Tracking Systems (ATS) are widely used by employers to manage recruitment processes; however, these systems are not accessible to candidates and are designed primarily for organisational use. [4] On the other hand, personal job tracking tools that are available to individuals typically rely on manual data entry, requiring users to input details such as company name, job title, and application status themselves. While functional, these tools do not leverage the information already available in recruitment emails and therefore do not significantly reduce the effort required from the user. [5]

This project seeks to address this gap by proposing a semi-automated job application tracking system that combines manual data management with rule-based analysis of email content. The system will enable users to maintain a structured dashboard of their

applications while introducing an automated feature that extracts and classifies information from email text. Rather than implementing full email integration, which involves complex security and technical challenges, the project adopts a semi-automatic approach in which users paste the subject and body of job-related emails into the system. The application then analyses the text using predefined keyword rules to determine the likely application status. [6]

This approach is grounded in established information extraction techniques, particularly rule-based text classification, which is suitable for environments with clearly defined patterns and limited data variability . [7] Although more advanced methods such as machine learning and natural language processing can offer higher accuracy, they also introduce significant complexity and are not always necessary for constrained problem domains. [8] [9] By using a rule-based system, the project maintains a balance between functionality, interpretability, and feasibility within the scope of an undergraduate-level implementation.

The relevance of this project lies in its strong connection to real-world user needs. Students and graduates represent a large group of users who actively engage in job applications and face challenges in managing their application data. By providing a system that centralises application information and reduces manual input through semi-automation, the proposed solution has the potential to improve organisation, reduce stress, and enhance the overall efficiency of the job search process.

Furthermore, the project contributes to the broader field of web-based application development and user-centred system design. It demonstrates how relatively simple automation techniques can be integrated into everyday tools to enhance usability and functionality. [10] [11] The system also provides a foundation for future development, such as full email integration, advanced text analysis, and data visualisation features, which could further improve the user experience.

In summary, this research addresses a clear gap in existing solutions by developing a semi-automated job application tracking system tailored to the needs of students. It combines practical software development with an innovative feature that leverages email data, offering both immediate usability and potential for future expansion. The project is therefore both technically relevant and socially valuable, aligning with current trends in digital employability support and personal information management

Aim

The aim of this project is to design, develop, and critically evaluate a semi-automated web-based job application tracking system that supports students in organising, monitoring, and managing multiple job applications through the integration of manual data entry and rule-based email content analysis.

More specifically, the project seeks to address the limitations of existing manual tracking methods by introducing a system that reduces user effort, improves data organisation, and enhances visibility of application progress. By incorporating a semi-automated email processing feature, the system aims to transform unstructured recruitment-related email data into structured and actionable information within a centralised dashboard.

The overall goal is not only to develop a functional prototype but also to demonstrate how lightweight automation techniques can improve personal information management in a real-world context, particularly within the domain of graduate employability.

Objectives

1. To investigate and analyse the challenges associated with manual job application tracking

This objective focuses on understanding the difficulties faced by students when managing multiple job applications across different platforms. It will involve reviewing existing literature on personal information management, email overload, and employability tools, as well as identifying key limitations in current tracking approaches. The purpose of this objective is to establish a clear problem context and justify the need for a more efficient and integrated solution.

2. To design a secure and user-centred system architecture for job application management

This objective involves the conceptual design of the system, including database structure, user interface layout, and overall workflow. It will ensure that the system is intuitive, accessible, and aligned with user needs. Key considerations will include usability principles, data organisation, and secure user authentication. The outcome of this objective will be a structured design that supports both manual input and automated features.

3. To develop a fully functional web-based application implementing CRUD operations

This objective focuses on the implementation of the core system functionality. The application will allow users to create, read, update, and delete job application records within a personalised dashboard. This ensures that users maintain full control over their data and can manage their application history effectively. The system will be developed

using appropriate web technologies and will incorporate secure database interactions and session management.

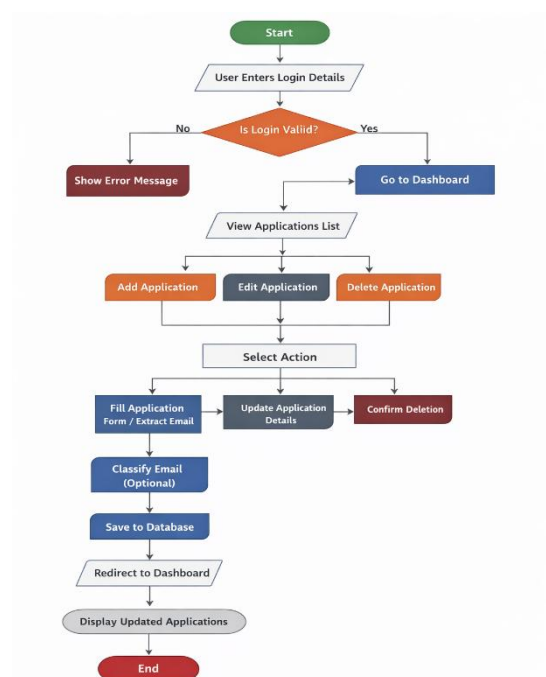
4. To implement a semi-automated email processing feature using rule-based text classification

This objective represents the innovative component of the project. It involves developing a mechanism that allows users to input email content, which is then analysed using predefined keyword rules to determine the application status. The system will categorise applications into stages such as Applied, In Progress, Interview, Accepted, or Rejected. This objective aims to reduce manual data entry while demonstrating the practical application of information extraction techniques.

5. To evaluate the system in terms of functionality, usability, and effectiveness

This objective focuses on assessing the performance and practical value of the developed system. Evaluation will include functional testing to verify that all features operate correctly, as well as an assessment of usability to determine whether the system is intuitive and beneficial for users. Additionally, the accuracy and reliability of the rule-based classification feature will be analysed using test cases. The findings will be used to identify strengths, limitations, and areas for future improvement

FlowChart



Methodology

1. Research Approach

This project adopts a design and development research approach, focusing on the creation and evaluation of a functional software artefact. Rather than relying on purely theoretical analysis, the study aims to produce a working prototype that addresses a real-world problem faced by students managing multiple job applications.

The chosen approach is appropriate because the primary objective of the research is not only to understand a problem but also to design and implement a practical solution. This aligns with applied computing methodologies, where system development, testing, and evaluation form the core of the research process. The project therefore combines elements of software engineering, user-centred design, and information extraction techniques. [12]

2. Development Methodology

An iterative and incremental development methodology will be employed throughout the project. This approach allows the system to be developed in manageable stages, enabling continuous testing, refinement, and improvement. It also reduces risk by ensuring that core functionalities are completed before more advanced features are introduced.

Requirements Analysis

In this phase, the key problem is defined, focusing on the challenges students face in tracking job applications. Functional requirements are identified, including user registration, authentication, application management (CRUD operations), and email-based data input. Non-functional requirements such as usability, security, and reliability are also considered.

System Design

The system architecture is designed to support both manual and semi-automated features. This includes:

- **Database Design:** A relational database structure is developed using MySQL. The main table (applications) stores key attributes such as company name, job title, location, status, application date, and user ID.
- **User Interface Design:** The interface is designed to be simple, intuitive, and accessible, following usability principles such as clarity, consistency, and minimal user effort.
- **Workflow Design:** The system flow includes user authentication, dashboard access, application management, and email import functionality.

Implementation of Core Functionality

The core system is developed using:

- **PHP** for server-side logic
- **MySQL** for database management
- **HTML/CSS** for front-end interface

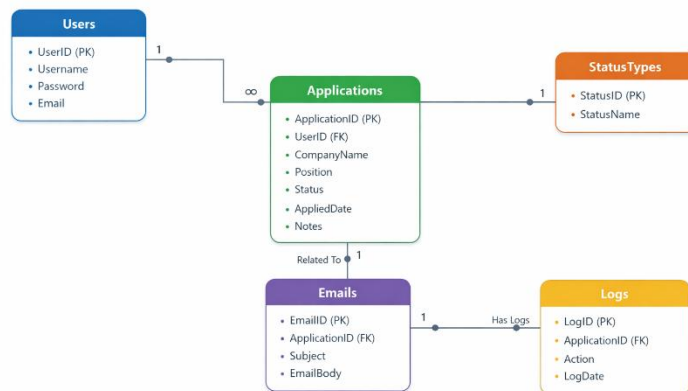
Key features implemented include:

- User registration and login system
- Session management for secure access
- CRUD operations (Create, Read, Update, Delete) for job applications
- Dashboard displaying user-specific application data

Prepared SQL statements are used to prevent SQL injection and improve security.

ERD

Job Application Tracking System - ERD



Development of Semi-Automated Email Processing Feature

This phase introduces the innovative component of the project. A semi-automatic email import feature is developed, allowing users to paste email subject lines and message content into the system.

The system applies rule-based keyword classification to analyse the text and determine the application status. This approach is chosen due to its simplicity, transparency, and suitability for structured problem domains.

For example:

- Keywords such as *“thank you for applying”* → classified as **Applied**
- *“under review”* → classified as **In Progress**
- *“invite to interview”* → classified as **Interview**
- *“unsuccessful”* → classified as **Rejected**
- *“offer”* → classified as **Accepted**

The classification follows a priority hierarchy to resolve conflicts between multiple detected keywords. The extracted data is then stored in the database and displayed in the dashboard.

Testing and Debugging

Testing is conducted throughout development to ensure system reliability and correctness. This includes:

- **Unit Testing:** Testing individual components such as form handling and database queries
- **Integration Testing:** Ensuring different parts of the system work together correctly
- **User Interface Testing:** Verifying usability and layout consistency
- **Classification Testing:** Evaluating the accuracy of keyword-based email classification using sample email inputs

Errors identified during testing are corrected through iterative debugging.

Evaluation

The final system is evaluated based on:

- **Functionality:** Whether all features operate as intended
- **Usability:** Ease of use, clarity of interface, and user experience
- **Effectiveness:** Ability to reduce manual effort and improve organisation
- **Accuracy:** Correct classification of application status based on email content

Data Collection and Analysis

The project utilises both secondary and primary data. [13]

Secondary Data

Secondary data is collected from academic literature, books, and journal articles related to:

- Personal information management
- Email overload
- Information extraction techniques
- Usability and system design [14]

This supports the theoretical foundation of the project.

Primary Data

Primary data is generated through:

- Sample recruitment emails used for testing classification logic
- System-generated data from user interactions
- Functional testing results

Data Analysis

Data analysis is primarily qualitative and functional, focusing on:

- Whether the system performs as expected
- Whether classification rules produce correct outputs
- Identification of misclassifications and their causes

Limitations

The proposed system has several limitations:

- The semi-automatic feature relies on keyword-based classification, which may not capture all variations of email language
- The system does not include full email integration, limiting automation
- Accuracy may vary depending on email structure and wording

These limitations will be acknowledged and discussed in the evaluation.

Reliability, Validity and Generalisability

- **Reliability:** The rule-based system ensures consistent outputs for identical inputs
- **Validity:** The classification accuracy depends on the relevance of chosen keywords
- **Generalisability:** The system may not fully generalise across all recruitment contexts due to variability in communication styles

Gantt Chart

Task / Week	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12
Proposal Planning & Topic Selection												
Literature Review												
Requirements Analysis												
System Design (ERD, Flowcharts, UI)												
Database Development												
Core System Development (Login, CRUD)												
Email Import Feature (Semi-Automatic)												
Testing & Debugging												
System Evaluation &												

Improvements												
Report Writing (All Sections)									■	■	■	
Final Editing & Proofreading										■	■	■
Submission Preparation											■	■

The project is planned over a twelve-week period, beginning with proposal development and literature review, followed by system design and implementation. The core system is developed before integrating the semi-automated email feature. The final stages focus on testing, evaluation, and report writing to ensure a complete and well-documented system.

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