Recruit Right: Precision Hiring with AI Insight

Final Year Project Report

Submitted by

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In partial fulfilment of the requirements for the degree of
Bachelor of Science in Computer Science
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Hamdard Institute of Engineering and Technology

Hamdard University, Main Campus, Karachi, Pakistan

Certificate of Approval

Faculty of Engineering Sciences and Technology

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This project "**Recruit Right**" is presented by **Dr. Umer Farooq** under the supervision of their project advisor and approved by the project examination committee, and acknowledged by the Hamdard Institute of Engineering and Technology, in the fulfillment of the requirements for the Bachelor's degree in Computer Science.

Dr. Umer Farooq
(Project Supervisor)

In-charge FYP-Committee

Mr. XYZ
(Project Co-Supervisor)

Chairman
(Department of Computing)

(Dean, FEST)

Authors' Declaration

We declare that this project report was carried out in accordance with the rules and regulations of Hamdard University. The work is original except where indicated by special references in the text and no part of the report has been submitted for any other degree. The report has not been presented to any other University for examination.

Dated:

Authors Signatures:

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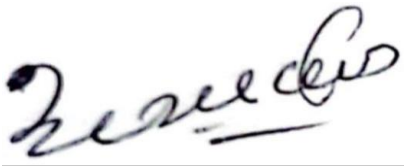
Muhammad Naeemuddin



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Muhammad Abdullah

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Muhammad Raza

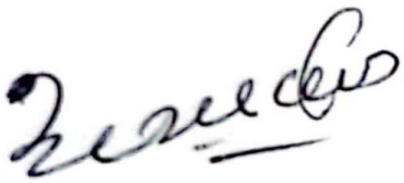
Plagiarism Undertaking

We, **Muhammad Naeemuddin, Muhammad Abdullah,** and **Muhammad Raza**, solemnly declare that the work presented in the Final Year Project Report **Recruit Right** has been carried out solely by ourselves with no significant help from any other person except few of those which are duly acknowledged. We confirm that no portion of our report has been plagiarized and any material used in the report from other sources is properly referenced.

Dated:

Authors Signatures:

Muhammad Naeemuddin



Muhammad Abdullah

Muhammad Raza

Acknowledgments

All praises to **Almighty" ALLAH",** The Most Merciful, The Most Gracious, the source of knowledge and wisdom owed to mankind. All respects for Holy Prophet "**Hazrat MUHAMMAD** ﷺ, whose personality will always be source of guidance for humanity.

Acknowledgment this due to **Hamdard Institute of Engineering and Technology** for support of this Project, a highly appreciated achievement for us in the undergraduate level.

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Many people, especially our classmates and team members themselves, have made valuable comment suggestions on this proposal which gave us inspiration to improve our project. Special thanks to our **Parents**, **Teachers**, and **Ms. Muntaha Mehboob (Ex. Supervisor)** & all the people for their help directly and indirectly to complete our project.

Document Information

Table 1: Document Information

Project Title	Recruit Right:
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Document Version	1.0
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Author(s)	Muhammad Naeemuddin, Muhammad Abdullah, Muhammad. Raza
Approver(s)	Dr. Umer Farooq
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Definition of Terms, Acronyms, and Abbreviations.

Table 2: Definition of Terms, Acronyms, and Abbreviations

NLP	Natural Language Processing
AI	Artificial Intelligence
HTML	Hyper Text Markup Language
CSS	Cascading Style Sheet
SSL	Secure Sockets Layers
TLS	Transport Layers Security
HTTP	Hyper Text Transfer Protocol
API	Application Programming Interface
RESTful	Representational State Transfer
SDK	Software Development Kit

Abstract

RecruitRight: Precision Hiring with AI Insight is an advanced recruitment platform designed to transform traditional hiring processes by addressing inefficiencies, biases, and time constraints. Leveraging the power of artificial intelligence, the platform incorporates Named Entity Recognition (NER) for automated resume analysis and asynchronous video interviews to deliver precise, unbiased candidate evaluations. These innovations streamline recruitment workflows, enabling organizations to focus on top-tier talent and make data-driven hiring decisions with confidence.

With its scalable microservices architecture, RecruitRight ensures robust performance even under high demand, making it suitable for businesses of all sizes. The platform's user-centric design prioritizes accessibility and ease of use, offering an intuitive experience for candidates, interviewers, and organizations alike. While its core features aim to enhance efficiency and reliability, future potential integrations, such as facial expression recognition (FER), highlight its commitment to innovation and continuous improvement.

This report presents the motivations, methodologies, and technical foundations of RecruitRight, showcasing its potential to revolutionize the hiring landscape through cutting-edge technology and forward-thinking design.

Keywords:

- Recruitment Automation
- Artificial Intelligence (AI)
- Named Entity Recognition (NER)
- Scalable Microservices Architecture
- Candidate Evaluation
- Data-Driven Decision Making
- Resume Analysis
- User-Centric Design

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CHAPTER 1

INTRODUCTION

1.1 Motivation

The traditional hiring process is often plagued by time-consuming manual tasks, subjective evaluations, and inefficiencies, making it difficult for organizations to identify top talent. With the rapid advancements in technology and an increasing demand for skilled professionals, there is a critical need for a faster, objective, and automated recruitment solution.

The **RecruitRight: Precision Hiring with AI Insight** project aims to revolutionize hiring by leveraging artificial intelligence and natural language processing. This platform will automate key stages of recruitment, including personality assessments, real-time coding interviews, and asynchronous video evaluations. By providing data-driven insights, it ensures fair, efficient, and reliable hiring decisions, reducing time-to-hire, minimizing bias, and improving overall recruitment outcomes.

1.2 Problem Statement

Cause:

1. Traditional technical hiring processes are slow and inefficient due to manual resume screening and candidate selection.
2. Inconsistent candidate evaluations occur due to subjective assessments by different interviewers.
3. Organizations face increased operational costs and delays in filling critical roles, impacting growth and productivity.

Construct:

We are building an **automated recruitment and interview platform** to:

1. Streamline resume screening using NER (Named Entity Recognition) tools to match candidate profiles with job descriptions.
2. Facilitate seamless scheduling and conducting of interviews via integrated tools (e.g., Google Meet/Zoom).
3. Provide structured evaluation through pre-defined interview rubrics and automated reporting.

Effect:

1. **Optimized Hiring Efficiency**: Reduced time-to-hire by automating repetitive processes and expediting candidate assessments.
2. **Consistent Candidate Evaluation**: Enhanced fairness and objectivity through standardized interview tools and reporting mechanisms.
3. **Cost Savings and Productivity Boost**: Minimized operational overhead, enabling organizations to focus on strategic growth initiatives.

1.3 Goals and Objectives

Goals

To automate and streamline the technical hiring process, enhancing efficiency, reducing time-to-hire, and improving candidate and organizational experiences.

Objectives

1. **Study and Analyze the Problem**:
    - Conduct a comprehensive literature review to identify inefficiencies and challenges in traditional technical hiring.
    - Understand current practices, technologies, and their limitations in addressing recruitment bottlenecks.
2. **Proposed Solution**:
    - Develop an automated recruitment platform featuring collaboration with pre-vetted expert interviewers.
    - Enable tailored interviews based on specific job requirements for consistent and objective evaluations.
    - Offer scalable and flexible solutions to meet the needs of businesses of all sizes.
3. **System Design**:
    - Design a seamless platform that integrates resume screening (using NER tools), interview scheduling, and performance evaluation.
    - Provide detailed, data-driven post-interview reports highlighting candidate strengths, weaknesses, and overall suitability.
    - Enhance the candidate experience with a transparent and smooth interview process.

1.4 Project Scope

This project focuses on addressing inefficiencies in traditional technical hiring processes, such as prolonged timelines, inconsistent candidate evaluations, and high operational costs. By leveraging automation and expert collaboration, the proposed platform aims to:

1. **Analyze Hiring Challenges**: Conduct an in-depth study of current hiring practices to identify pain points and inefficiencies in resume screening, interview processes, and candidate evaluations.
2. **Offer an Automated Solution**: Develop a scalable platform that integrates resume screening using NER tools, facilitates seamless interview scheduling, and ensures objective candidate assessments through collaboration with pre-vetted expert interviewers.
3. **Design a Comprehensive System**: Create a system that generates detailed, data-driven post-interview reports, enhancing decision-making for hiring teams while providing a smooth and transparent experience for candidates.

The platform will cater to businesses of all sizes, helping them reduce time-to-hire, improve recruitment efficiency, and support organizational growth through streamlined technical hiring.

CHAPTER 2

RELEVANT BACKGROUND & DEFINITIONS

The **RecruitRight: Precision Hiring with AI Insight** project draws inspiration from existing innovative platforms that aim to revolutionize the hiring process through technology. Two notable websites relevant to this work are **Intervue** and **Karat**, which have pioneered the integration of advanced tools to streamline and enhance recruitment practices.

Intervue is a collaborative interview platform designed to simplify the technical hiring process by providing tools for live interviews. It emphasizes seamless interaction between interviewers and candidates while enabling quick assessments of technical skills.

Karat focuses on conducting professional technical interviews at scale. The platform employs trained interview engineers to evaluate candidates and provide comprehensive reports, helping organizations make informed hiring decisions. Karat's emphasis on scalability and accuracy in candidate evaluations serves as a benchmark for modern recruitment systems.

Building upon these approaches, RecruitRight aims to offer an all-in-one platform that incorporates AI-driven personality analysis, asynchronous video interviews, and detailed expert evaluations. This project aspires to push the boundaries of existing technologies by introducing advanced automation, performance evaluation, and scalable solutions tailored to the needs of organizations in a competitive hiring landscape.

CHAPTER 3

LITERATURE REVIEW & RELATED WORK

Literature Review

Intervue. (n.d.). *Intervue: Simplifying Remote Hiring*. Retrieved Jan 21, 2025, from https://www.intervue.io

Karat. (n.d.). *Karat: Interviewing Cloud for Hiring Engineers*. Retrieved Jan 21, 2025, from https://karat.com

Mehboob, M., Ali, S., ul Islam, S., & Ali, S. (2022). Evaluating Automatic CV Shortlisting Tool for Job Recruitment Based on Machine Learning Techniques. *2022 Mohammad Ali Jinnah University International Conference on Computing (MAJICC)*.

Narendra, G., & Hashwanth, S. (2022). Named Entity Recognition based Resume Parser. *International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)*.

Related Work

Several platforms and studies have laid the foundation for enhancing technical recruitment through innovative technologies. Two prominent platforms, **Intervue** and **Karat**, have significantly influenced modern hiring practices.

Intervue provides a collaborative interview environment tailored for technical interviews. It enables organizations to conduct live assessments, evaluate candidates' problem-solving abilities, and foster seamless interaction between interviewers and candidates. The platform's focus on efficient evaluation has proven to reduce time-to-hire and enhance the accuracy of technical skill assessments.

Karat specializes in scaling technical interviews by leveraging a network of trained interview engineers. It ensures consistency and accuracy in candidate evaluations through standardized interview formats and detailed reporting. Karat's emphasis on data-driven insights and scalability has demonstrated its effectiveness for large organizations requiring efficient technical hiring solutions.

In addition to these platforms, research on automated recruitment systems has highlighted the importance of incorporating AI and machine learning for unbiased candidate evaluations. Studies on natural language processing for resume screening and facial gesture analysis for confidence assessment have further showcased the potential of advanced technologies in recruitment.

The **RecruitRight: Precision Hiring with AI Insight** project builds upon these existing works by integrating features such as AI-powered personality assessments, asynchronous video interviews, and scalable microservices architecture. Unlike its predecessors, RecruitRight emphasizes a holistic approach, combining multiple automated tools into a single platform to streamline hiring processes and deliver precise insights for improved decision-making.

Gap Analysis

The current technical hiring landscape lacks a unified platform that leverages advanced natural language processing (NLP) techniques, particularly Named Entity Recognition (NER), for automating resume analysis. Recruiters and hiring managers often face inefficiencies in manually analyzing resumes, leading to inconsistencies, potential biases, and missed insights during candidate evaluation.

RecruitRight introduces NER as a core feature, enabling the platform to automatically extract key candidate attributes such as skills, experience, certifications, and qualifications. By automating resume analysis, RecruitRight significantly reduces manual effort, improves the accuracy of candidate evaluations, and ensures fairness and consistency throughout the hiring process. This automation also streamlines the recruitment workflow, enabling faster and more reliable decision-making.

Existing platforms like Intervue and Karat aim to standardize interviews and evaluations but lack features for automating the extraction of critical candidate information. These solutions rely heavily on manual resume screening, which is time-consuming, prone to inconsistencies, and susceptible to biases. While they provide standardized interview processes, they fail to address the inefficiencies and limitations in the earlier stages of recruitment, such as resume analysis and candidate shortlisting.

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4.6 Test Cases

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A2. Requirement Specifications
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UI/UX Details
Coding Standards
Project Policy
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Copy of Evaluation Comments by Jury for Project – I End Semester Evaluation
Copy of Evaluation Comments by Supervisor for Project – II Mid Semester Evaluation
Copy of Evaluation Comments by Jury for Project – II Mid Semester Evaluation
Copy of Evaluation Comments by Jury for Project – II End Semester Evaluation
A7. Meetings' Minutes
A8. Research Paper
A10. Any other

A0. COPY OF PROJECT REGISTRATION FORM

A Photostat or scanned copy should be placed when submitting a document to Project Coordinator. (**Note**: Please remove this line when attach copy that is required)

A1A. PROJECT PROPOSAL AND VISION DOCUMENT

Any standard template may be used, as per project need approved by Project Coordinator & Supervisor. Following is a suggestive outline. **Also, the same outline should be used for Project Proposal Presentation.**

1 Introduction
1.1 Problem Statement
1.2 Project Motivation
1.3 Objectives
1.4 Literature Review
2 Project Vision
2.1 Business Case and SWOT Analysis
2.2 Background, Business Opportunity, and Customer Needs
2.3 Business Objectives and Success Criteria
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4.2 Team Role & responsibilities
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8 Project Deliverables
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8.3 Phase III - Release Candidate
8.4 Phase IV - Final Product
9 Proposed GUI (Disposable Prototype)
10 Meetings held with supervisor and/or client.
11 Reference

A1B. COPY OF PROPOSAL EVALUATION COMMENTS BY JURY

A Photostat or scanned copy should be placed when submitting a document to Project Coordinator. (**Note**: Please remove this line when attach copy that is required)

A2. REQUIREMENT SPECIFICATIONS

Any standard template may be used, as per project need approved by Project Coordinator & Supervisor. Following is a suggestive outline.

1. Introduction
1.1. Purpose of Document
1.2. Intended Audience
1.3 Abbreviations
2. Overall System Description
2.1. Project Background
2.2. Project Scope
2.3. Not In Scope
2.4. Project Objectives
2.5. Stakeholders
2.6. Operating Environment
2.7. System Constraints
2.8. Assumptions & Dependencies
3. External Interface Requirements
3.1. Hardware Interfaces
3.2. Software Interfaces
3.3. Communications Interfaces
4. Functional Requirements
4.1. Functional Hierarchy
4.2. Use Cases
4.2.1. [use case 1]
4.2.2. [use case 2]
4.2.n. [use case n]
5. Non-functional Requirements
5.1. Performance Requirements
5.2. Safety Requirements
5.3. Security Requirements
5.4. User Documentation
6. References

A3. DESIGN SPECIFICATIONS

Any standard template may be used, as per project need approved by Project Coordinator & Supervisor. Following is a suggestive outline.

1 Introduction
1.1 Purpose of Document
1.2 Intended Audience
1.3 Project Overview
1.4 Scope
2 Design Considerations
2.1 Assumptions and Dependencies
2.2 Risks and Volatile Areas
3 System Architecture
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5.1 Database Design
5.1.1 ER Diagram
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5.2.1 Sequence Diagram
5.2.1.1 <Sequence Diagram 1>
5.2.1.2 <Sequence Diagram 2>
5.2.1.3 <Sequence Diagram n>
5.2.2 State Diagram
5.2.2.1 <State Diagram 1>
5.2.2.2 <State Diagram 2>
5.2.2.n <State Diagram n>
6 References

A4. OTHER TECHNICAL DETAIL DOCUMENTS

Test Cases Document

UI/UX Detail Document

Coding Standards Document

Project Policy Document

User Manual Document

A5. FLYER & POSTER DESIGN

A6. COPY OF EVALUATION COMMENTS

COPY OF EVALUATION COMMENTS BY SUPERVISOR FOR PROJECT – I MID SEMESTER EVALUATION

A Photostat or scanned copy should be placed when submitting document to Project Coordinator. (**Note**: Please remove this line when attach copy that is required)

COPY OF EVALUATION COMMENTS BY JURY FOR PROJECT – I END SEMESTER EVALUATION

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COPY OF EVALUATION COMMENTS BY SUPERVISOR FOR PROJECT – II MID SEMESTER EVALUATION

A Photostat or scanned copy should be placed when submitting document to Project Coordinator. (**Note**: Please remove this line when attach copy that is required)

A7. MEETINGS' MINUTES & Sign-Off Sheet

Original Documents should be placed when submitting document to Project Coordinator. Document should be signed by the supervisor and all other members present in the meeting (wherever possible). (**Note**: Please remove this line when attach copy that is required) Weekly meetings' minutes are required (held with Supervisor and/or with client). Important group discussions can also be included here.

A8. DOCUMENT CHANGE RECORD

Date	Version	Author	Change Details
17/01/2025	1.0	Muhammad Naeemuddin	First Draft ochap # 1,2,3

A9. PROJECT PROGRESS

Photostat of Incremental versions of Requirement Signoff sheet submitted to Project Coordinator. (**Note**: Please remove this line when attach copy that is required)

A10. RESEARCH PAPER