

HR-Analytics Recruitment Tracker

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Abstract

The HR-Analytics Recruitment Tracker is a data-driven system designed to simplify and improve the management of the employee recruitment process. Recruitment involves handling a large amount of information related to job openings, candidates, applications, interviews, selections, and joining status. Managing this information manually can be time-consuming and may make it difficult for HR teams to track recruitment progress and evaluate hiring performance.

The proposed system collects and organizes recruitment data in a centralized platform and provides real-time tracking and analysis of hiring activities. Important parameters such as job position, department, candidate status, application source, interview stage, selection status, hiring time, and recruitment cost can be monitored. The system uses data analytics and visualization techniques to generate meaningful insights from recruitment data.

An interactive HR dashboard can display key performance indicators such as total applicants, shortlisted candidates, interviews conducted, selected candidates, rejected candidates, open positions, and hiring conversion rate. Charts and graphs can also be used to analyze recruitment trends by department, job role, recruitment source, and time period. This helps HR professionals identify successful recruitment channels and areas requiring improvement.

The system provides a centralized and systematic way to track candidates throughout the recruitment lifecycle, from application to final selection and joining. It reduces manual record keeping, improves data accessibility, and supports faster decision-making.

Overall, the HR-Analytics Recruitment Tracker provides an efficient and user-friendly solution for recruitment monitoring and workforce planning. It can be further enhanced with AI-based candidate screening, recruitment forecasting, automated interview scheduling, resume analysis, predictive hiring analytics, and automated notifications to make the recruitment process more intelligent and efficient.

I. Introduction

The HR-Analytics Recruitment Tracker is a data-driven system designed to simplify, monitor, and analyze the recruitment process within an organization. Recruitment is an important HR activity that involves managing job vacancies, receiving applications, screening candidates, conducting interviews, selecting suitable candidates, and completing the joining process. When these activities are managed manually, HR teams may face difficulties in tracking candidate information and evaluating recruitment performance.

The proposed system provides a centralized platform for managing recruitment-related information. It records details such as job position, department, candidate information, application date, recruitment source, interview status, selection status, and joining status. This allows HR professionals to track each candidate throughout the complete recruitment lifecycle.

The system also uses HR analytics and data visualization to convert recruitment data into useful insights. Important metrics such as total applicants, shortlisted candidates, interviewed candidates, selected candidates, rejected candidates, open positions, and hiring conversion rates can be displayed through interactive dashboards.

Recruitment data can be analyzed based on department, job role, recruitment source, time period, and candidate status. These analyses help HR teams identify which recruitment channels are producing better candidates and where delays or inefficiencies occur in the hiring process.

The system reduces manual record keeping and provides faster access to recruitment information. It also helps HR managers compare recruitment performance and make data-driven hiring decisions. Historical recruitment data can be used to identify trends and support future workforce planning.

II. Literature Survey

Research on HR Analytics and Recruitment Tracking Systems has grown rapidly with the adoption of data-driven decision-making in human resource management. HR analytics uses employee and recruitment data to support more objective and evidence-based decisions. Systematic reviews have identified HR analytics as a broad field covering descriptive, diagnostic, predictive, and prescriptive applications, with recruitment being one of its important areas.

Early recruitment management systems mainly focused on storing candidate information and tracking recruitment activities. These systems helped HR teams maintain records of job vacancies, applications, interviews, selections, and joining status. Recruitment and talent-management literature has emphasized that appropriate HR metrics can help organizations understand recruitment effectiveness and support workforce planning.

Researchers have increasingly explored recruitment analytics and key performance indicators (KPIs) to evaluate hiring processes. Metrics such as number of applicants, shortlisted candidates, interview-to-selection ratio, time-to-hire, cost-per-hire, recruitment source, and offer acceptance rate can help organizations identify efficient and inefficient recruitment channels. Analytical approaches can transform these records into useful information for HR decision-making.

The development of HR dashboards and data visualization has further improved recruitment monitoring. Interactive dashboards can present recruitment status through charts, graphs, tables, and KPI cards. Such visualization allows HR professionals to quickly understand open vacancies, candidate progress, department-wise recruitment, and hiring trends without manually analyzing large spreadsheets.

Recent research has focused on predictive analytics and artificial intelligence in recruitment. Machine-learning techniques can be used for candidate screening, resume classification, job-fit prediction, interview analysis, and recruitment forecasting. A recent systematic review found that AI applications are increasingly being used for candidate pre-selection, résumé classification, interview analysis, job suitability prediction, and automation of recruitment-related tasks.

Researchers have also investigated automated hiring systems that use machine learning and other intelligent techniques. A 2025 systematic review reported that machine-learning models remain prominent in automated hiring research, while more advanced approaches such as large language models and hybrid systems are emerging. However, practical implementation can be limited by data availability, deployment cost, ethical accountability, and the need for reliable evaluation.

Another important research area is fairness, transparency, and ethical use of recruitment analytics. AI-based recruitment systems can introduce algorithmic bias if historical training data contains unfair patterns. Recent research therefore emphasizes the importance of fairness, transparency, explainability, privacy, and human oversight when applying analytics or AI to recruitment decisions.

Studies on people analytics also show that organizations are increasingly using data and analytics to improve HR decision-making. Recent systematic research identifies AI and machine learning integration, organizational value, analytical capability, and data ethics as major themes in people analytics. However, challenges such as data quality, organizational readiness, analytical skills, and ethical concerns can affect successful implementation.

Overall, the literature indicates a transition from basic recruitment record management toward integrated HR analytics and intelligent recruitment systems. Based on these developments, the proposed HR-Analytics Recruitment Tracker can combine candidate tracking, recruitment KPIs, data analysis, visualization, and reporting in a centralized system. Future enhancements can include AI-based resume screening, candidate ranking, recruitment forecasting, automated interview scheduling, predictive hiring analytics, and bias monitoring to make recruitment more efficient, transparent, and data-driven.

III. System Analysis

System analysis is an important stage in developing the HR-Analytics Recruitment Tracker. The system is designed to manage, monitor, and analyze the recruitment process in an organized manner. It maintains information about job vacancies, candidates, applications, interviews, selections, and joining status. The system collects recruitment data from HR records and stores it in a centralized database. Important parameters such as department, job role, candidate status, application source, and recruitment dates are maintained. Data analysis is performed to identify recruitment trends and evaluate hiring performance. The system calculates useful HR metrics such as total applicants, shortlisted candidates, selected candidates, and hiring conversion rate. It also helps HR professionals monitor the progress of candidates through different recruitment stages. Dashboard visualizations are used to present recruitment information in a clear and understandable format. The system reduces manual

tracking and improves the accessibility of recruitment information. It can also help identify delays and inefficient recruitment sources. Overall, the system provides an organized and data-driven approach to recruitment management.

Existing System

In the existing system, recruitment activities are commonly managed using manual records, spreadsheets, emails, and separate HR applications. Candidate information may be stored in different files, making it difficult to maintain a centralized recruitment database. HR professionals often manually update candidate status after screening, interviews, and selection. Tracking a large number of applicants through multiple recruitment stages can be time-consuming. Recruitment performance is generally analyzed using manually prepared reports and spreadsheets. Identifying the most effective recruitment sources may require significant manual effort. Existing systems may provide limited visualization of recruitment trends and performance indicators. Data from different departments may not always be consistent or easily accessible. Manual data entry can also result in duplicate, missing, or outdated information. HR managers may experience delays when generating recruitment reports and analyzing hiring performance. Traditional systems may not provide sufficient predictive or analytical capabilities. Therefore, an integrated recruitment tracking and analytics system is required to improve efficiency and support better HR decision-making.

Disadvantages of Existing System

- Heavy dependence on manual data entry.
- Time-consuming recruitment tracking.
- Candidate information may be scattered across multiple files.
- Difficult to manage large numbers of applicants.
- Limited real-time recruitment monitoring.
- Manual preparation of recruitment reports.
- Higher possibility of data-entry errors.
- Difficult to identify recruitment bottlenecks.
- Limited visualization and analytics.
- Difficult to compare recruitment sources.
- Limited predictive recruitment capabilities.
- Delayed decision-making.

Proposed System

The proposed HR-Analytics Recruitment Tracker provides a centralized platform for managing and analyzing the complete recruitment process. The system stores job vacancies, candidate profiles, applications, interview details, selection results, and joining information in a structured database. HR professionals can track candidates from the initial application stage through screening, interview, selection, and final joining. The system automatically updates candidate status and provides an organized view of recruitment progress. Recruitment data is analyzed to calculate important performance indicators such as application volume, selection rate, hiring conversion rate, and time-to-hire. Interactive dashboards and charts provide a visual representation of recruitment activities and trends. The system can analyze

recruitment performance based on department, job role, recruitment source, and time period. HR managers can identify which recruitment channels are producing better results and where delays are occurring. Centralized data storage improves accessibility and reduces duplicate records. The system also provides reports that support workforce planning and recruitment decisions

Advantages of Proposed System

- Centralized recruitment data management.
- Easy candidate tracking.
- Reduces manual data entry.
- Provides recruitment status in an organized manner.
- Supports real-time monitoring.
- Generates recruitment analytics and reports.
- Provides interactive dashboards.
- Helps identify recruitment bottlenecks.
- Can be enhanced with AI-based recruitment features.

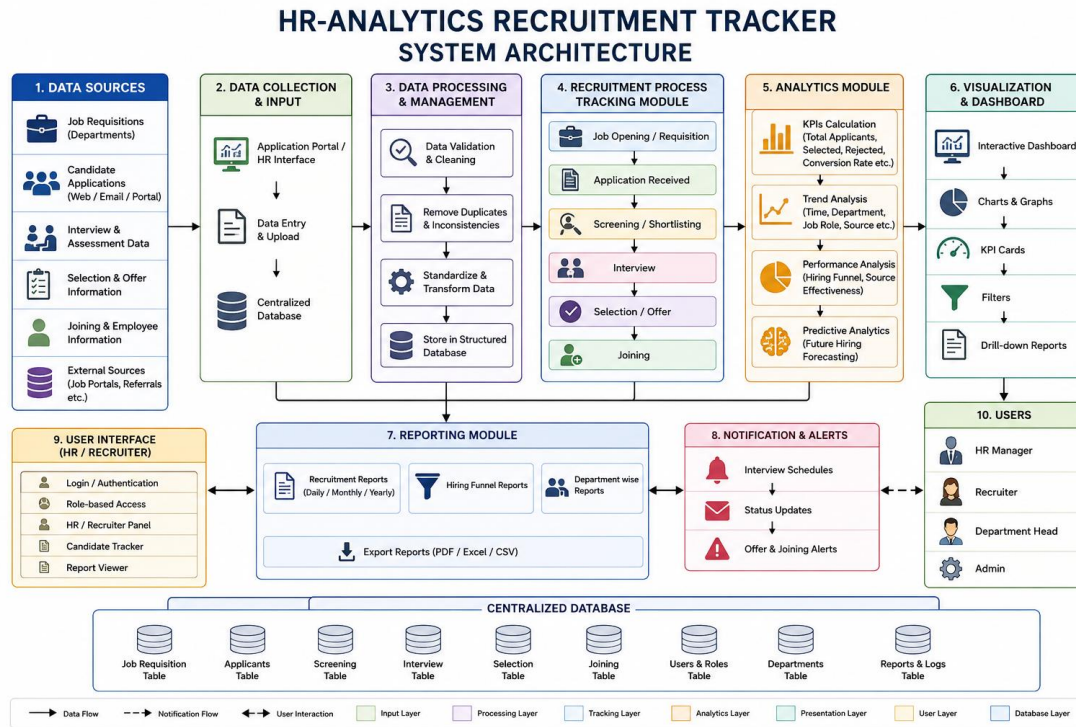
IV. Methodology

The methodology begins with identifying the recruitment requirements and collecting relevant information about job vacancies and candidates. Candidate details, job information, application records, interview results, and selection status are stored in a centralized database. The collected data is cleaned to remove duplicate records, incorrect entries, and unnecessary information. Important recruitment attributes such as department, job role, candidate status, recruitment source, and application date are organized into suitable data fields. The system tracks candidates through different stages, including application, screening, interview, selection, and joining. Analytical techniques are then applied to calculate recruitment KPIs and identify important trends. Metrics such as total applications, shortlisted candidates, selected candidates, rejection rate, hiring conversion rate, and time-to-hire are calculated. Data visualization techniques are used to display recruitment performance through charts, graphs, tables, and KPI cards. HR users can filter the dashboard based on departments, job roles, recruitment sources, and time periods. The system generates reports that can assist HR managers in evaluating recruitment performance. The results can be used to identify inefficient recruitment channels and improve hiring strategies

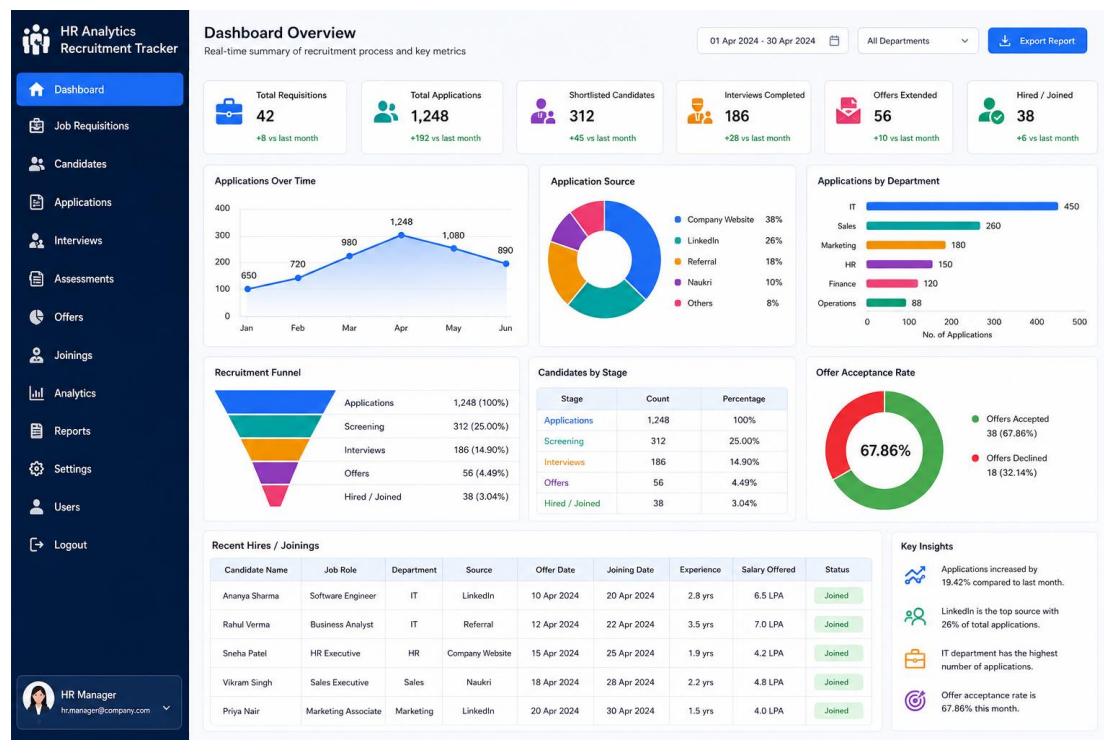
System Architecture

The system architecture represents the complete workflow of the HR-Analytics Recruitment Tracker from data collection to HR decision-making. The process begins with HR and recruitment data sources, including job vacancies, candidate applications, interview records, and selection information. The collected information is entered into the recruitment management system and stored in a centralized database. A data-processing module validates and organizes the information before analysis. The candidate tracking module manages the recruitment stages from application and screening to interview, selection, and joining. The analytics module processes recruitment data and calculates important KPIs and performance indicators. A visualization module converts the analyzed information into charts, graphs, tables, and dashboard components. HR users can view recruitment status, candidate progress,

hiring trends, and recruitment-source performance through the dashboard. The reporting module generates summarized recruitment reports for management review. The system can also provide notifications or status updates for important recruitment activities. In future implementations, an AI module can be connected for resume screening, candidate ranking, and predictive recruitment analytics.



V. Result and Output



VI. Conclusion

The HR-Analytics Recruitment Tracker successfully provides an organized and data-driven solution for managing and analyzing the recruitment process. The system centralizes important recruitment information such as job requisitions, candidate applications, screening, interviews, offers, and joining details.

The proposed system helps HR professionals track candidates throughout the recruitment lifecycle and reduces the need for manual record keeping. The analytics module provides useful KPIs, recruitment funnel analysis, application trends, source effectiveness, and department-wise recruitment insights.

The dashboard makes recruitment information easier to understand through charts, graphs, tables, and visual reports. By analyzing recruitment data, HR managers can identify successful recruitment sources, monitor hiring performance, detect delays, and make better workforce decisions.

Overall, the HR-Analytics Recruitment Tracker improves recruitment efficiency, data accessibility, monitoring, and decision-making. It can be further enhanced with AI-based resume screening, candidate ranking, predictive hiring, automated interview scheduling, chatbot assistance, and recruitment forecasting to create a more intelligent and efficient recruitment management system.

References

- [1] Kumar, R. D., Prudhviraaj, G., Vijay, K., Kumar, P. S., & Plugmann, P. (2024). Exploring COVID-19 through intensive investigation with supervised machine learning algorithm. In *Handbook of Artificial Intelligence and Wearables* (pp. 145-158). CRC Press.
- [2] Swathi, B., Vijay, K., Sushanth Babu, M., & Dinesh Kumar, R. (2024, November). Machine Learning Techniques in Cloud Based Intrusion Detection. In *The International Conference on Artificial Intelligence and Smart Environment* (pp. 557-564). Cham: Springer Nature Switzerland.
- [3] Sv satyakrishna, shirisha rangu ,bhargavi nalacheruve.(2024) Prospective investigation on colorectal cancer with SMOTE on machine learning Algorithm
- [4] Dr.G.Vishnu Murthy, BhargaviNalacheruve 1Professor, Department of computer Science & engineering, Anurag University, TS, India. 2Student, Department of computer Science & engineering, Anurag University, TS, India.
- [5] V. N. S. Manaswini, K. K, C. Nigam, S. S. Ali, R. Niranjana, and Suman, "Real-Time Object Detection in Drone Surveillance Using YOLOv5," in *Proc. 2025 3rd Int. Conf. IoT, Communication and Automation Technology (ICICAT)*, Gorakhpur, India, 2025, pp. 1–6, doi: 10.1109/ICICAT68430.2025.11414670.
- [6] B. Soundarya, V. N. S. Manaswini, M. Ayyakrishnan, R. D. Kumar, "Contextual Analysis of Big Data Analytics in Intelligent Transportation Frameworks," in *Intersection of Artificial Intelligence, Data Science, and Cutting-Edge Technologies: From Concepts to Applications in Smart Environment*, Lecture Notes in Networks and Systems, vol. 1353, Cham: Springer, 2025, doi: 10.1007/978-3-031-88304-0_79.
- [7] R. D. Kumar, V. N. S. Manaswini, "Applications of blockchain in smart cities: detecting fake documents from land records using blockchain technology," in

Blockchain for Smart Cities, Elsevier, 2021, pp. 105–117, doi: 10.1016/B978-0-12-824446-3.00017-X.

[8] Tejavath Veeramma, Badarla Anil, Guguloth Ravinder, “An advanced movie recommender using collaborative filtering and sentiment analysis,” *International Research Journal of Modernization in Engineering Technology and Science*, vol. 7, no. 7, July 2025, doi: 10.56726/IRJMETS81618.

[9] Ravi Kumar Banoth, Ramana Murthy B V, “Automatic crop recommendation system using LightGBM and decision tree machine learning models,” *Journal of Machine and Computing*, vol. 5, no. 1, pp. 343, Jan. 2025, doi: 10.53759/7669/jmc202505026.

[10] Ravi Kumar Banoth, Dr. B.V. Ramana Murthy, “Smart agriculture through IoT and machine learning for analyzing carbon footprints,” in *Proc. Int. Conf. Computer Science and Communication Engineering (ICCSCE)*, Apr. 2025.

[11] Ravi Kumar Banoth, B. V. Ramana Murthy, “Soil image classification using transfer learning approach: MobileNetV2 with CNN,” *SN Computer Science*, vol. 5, art. no. 199, 2024, doi: 10.1007/s42979-023-02500-x.