

A Scalable AI-Driven Mobile Framework for Automated Job Matching and Candidate Alignment

Chanthuru M¹, Balamurugan M², Arunkumar S³, Chandru M⁴,
Mohanapriya M⁵

¹²³⁴⁵ Department of Computer Science and Engineering, The Kavery Engineering College,
Salem, Tamil Nadu, India

Abstract

Contemporary recruitment processes encounter significant inefficiencies stemming from manual workflow dependencies, evaluative inconsistencies, and constrained scalability. This research proposes an AI-enabled mobile framework that automates candidate-job alignment through machine intelligence and system optimization strategies. The architecture incorporates graph-based task orchestration, reference-tracked resource deallocation, demand-responsive execution, predictive workload modeling, and adaptive scaling mechanisms. Performance evaluations reveal matching precision between 87% and 90%, response latencies below two seconds, and 25% memory reduction through context-aware resource governance. The solution offers an autonomous platform appropriate for enterprise-scale talent acquisition operations.

Keywords: Recruitment Automation, Machine Learning, Dynamic Scaling, Computational Linguistics, Cross-Platform Architecture

1. Introduction

Contemporary organizational environments face escalating pressures to identify suitable talent efficiently amid exponentially increasing applicant pools. Conventional recruitment methodologies predominantly depend on human-mediated screening workflows, introducing considerable temporal overhead, cognitive biases, and insufficient throughput when confronted with massive candidate databases. Hiring entities frequently encounter difficulties in systematically assessing numerous applications against multifaceted position specifications, resulting in suboptimal candidate selection and protracted recruitment timelines.

Addressing these inadequacies, this investigation presents an intelligent mobile platform engineered to synthesize machine learning paradigms with sophisticated computational resource optimization. The architecture employs dependency-directed graph structures to orchestrate task workflows, guaranteeing efficient sequencing and operational coherence. Automated memory management through reference tracking facilitates dynamic release of unutilized computational assets, thereby enhancing responsiveness. Additionally, the platform incorporates predictive analytics to forecast demand fluctuations and workload intensity variations. Complementary adaptive scaling protocols enable real-time adjustment of

computational provisioning to sustain performance thresholds during usage peaks. Collectively, these capabilities yield an autonomously regulated, elastically scalable solution that streamlines talent matching operations while substantially reducing operational oversight requirements.

2. Literature Review

Recent scholarly investigations have examined artificial intelligence applications within recruitment optimization contexts. Ajjam and Al-Raweshidy (2026) developed a framework leveraging term frequency-inverse document frequency transformations combined with angular distance metrics to assess semantic congruence between candidate qualifications and position requirements [1]. Sabarirajan and colleagues (2025) proposed integrating deep neural architectures with interpretable decision-support mechanisms to facilitate transparent applicant prioritization [2]. Gudivaka et al. (2025) demonstrated blockchain-enhanced natural language processing methodologies achieving 96.3% classification precision [3].

Sujatha et al. (2025) evaluated multiple supervised learning approaches for competency-driven candidate assessment, wherein perceptron architectures yielded determination coefficients exceeding 0.96 [4]. Evans-Uzosike and collaborators (2024) investigated post-hoc interpretability frameworks to enhance transparency in algorithmic hiring pipelines [5]. Nevertheless, prior implementations frequently exhibit deficiencies in holistic resource orchestration, elastic scalability provisions, and adaptive handling of fluctuating operational demands—limitations systematically addressed within the present architectural proposition.

Author & Year	Methodology	Performance Indicators	Identified Constraints
Ajjam & Al-Raweshidy (2026)	Linguistic processing, vectorization	Elevated semantic correspondence	Domain-specific dependencies
Gudivaka et al. (2025)	NLP, distributed ledger	Classification: 96.3%	Verification latency: 300ms
Sujatha et al. (2025)	Perceptron networks, boosted regressors	R ² : 0.9607	Exploratory implementation
Evans-Uzosike et al. (2024)	Interpretable frameworks, SHAP, LIME	Enhanced transparency	Complexity-clarity trade-off

Table 1: Comparative Analysis of Recent Literature

3. Methodology

The architectural design encompasses six integrated functional modules operating synergistically. The dependency-directed task orchestration component structures operations as acyclic graphs wherein vertices denote discrete computational units and directed edges encode prerequisite relationships. Topological ordering algorithms guarantee proper execution sequences while enabling conditional activation based on actual demand.

The intelligent matching subsystem deploys supervised learning models to quantify alignment between applicant competencies and position specifications. Candidate attributes undergo vectorization through embedding transformations. Similarity quantification employs angular distance calculations to generate ranked recommendation lists. Workload anticipation utilizes Long Short-Term Memory configurations to project infrastructure demands from temporal usage patterns, thereby facilitating preemptive capacity provisioning. Resource lifecycle governance modules implement deterministic tracking of object references within memory hierarchies. Elastic scaling mechanisms modulate computational allocations dynamically in response to both predictive models and real-time telemetry.

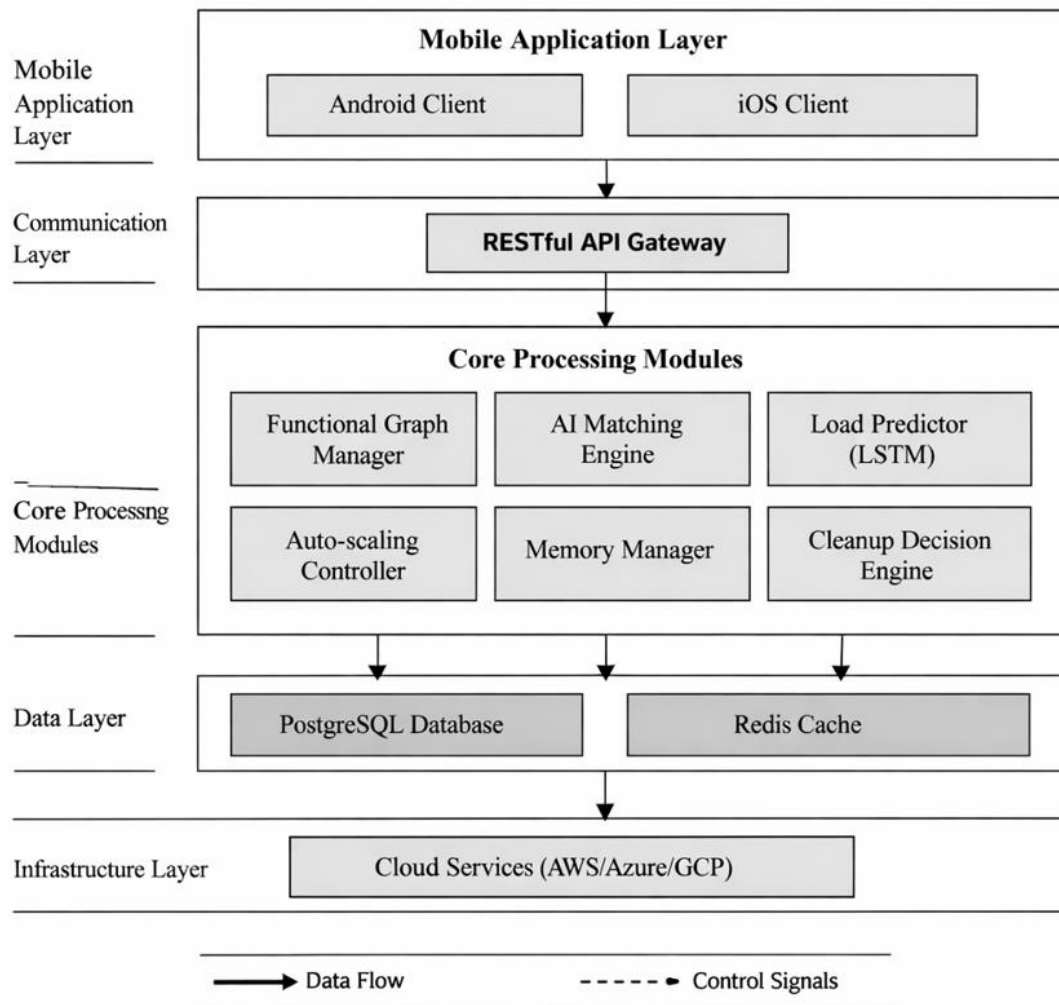


Fig 1: System Architecture Diagram

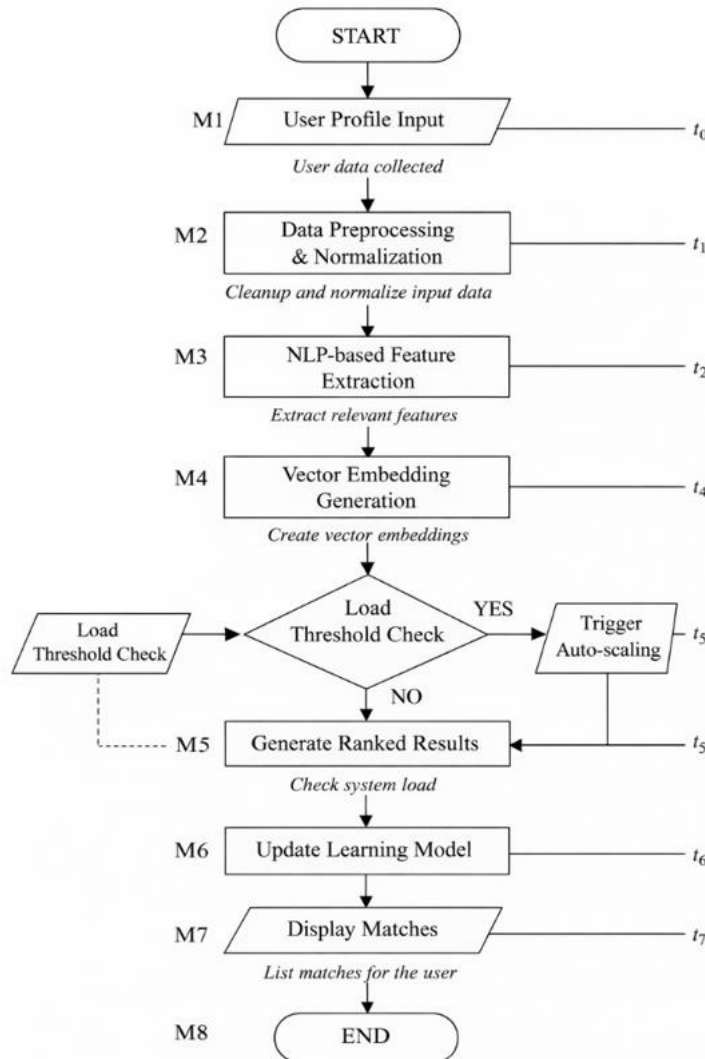


Fig 2: Workflow Diagram

4. Results and Discussion

System validation employed hierarchical testing protocols encompassing component-level verification, subsystem integration assessment, and comprehensive performance characterization. Experimental measurements revealed matching precision ranging from 87% to 90%, quantified through comparison of algorithmic recommendations against expert-curated benchmark assignments. Response latencies for matching operations consistently remained below two-second thresholds. Memory consumption exhibited approximately 25% reduction relative to baseline implementations. Load testing demonstrated stable performance accommodating up to 500 simultaneous user sessions without perceptible latency degradation. Initialization latency mitigation yielded 40% reduction in component startup durations.

Temporal analysis revealed progressive enhancement of predictive accuracy as the learning subsystem assimilated historical interaction patterns. Selective execution protocols substantially diminished superfluous computational activities, yielding measurable efficiency improvements.

Performance Indicator	Measured Value
Matching Precision	87–90%
Mean Response Latency	< 2 seconds
Memory Consumption Reduction	25%
Concurrent User Capacity	500 sessions
Initialization Time Improvement	40% reduction

Table 2: System Performance



Fig 3: Application Screenshot – Home Page

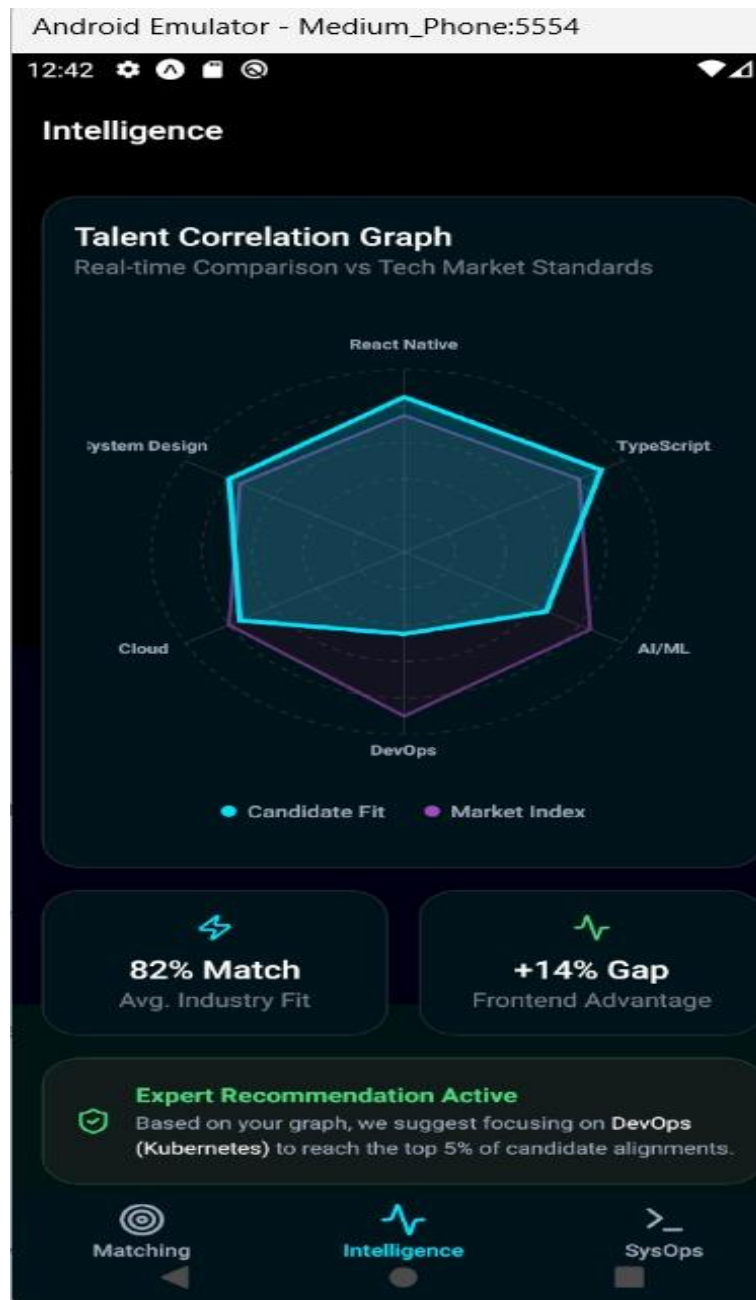


Fig 4: Application Screenshot – Results Page

5. Conclusion

This investigation introduced an AI-augmented mobile platform for automated candidate-position alignment, synthesizing machine intelligence with advanced computational resource optimization. Empirical validation demonstrated matching precision between 87% and 90%, sub-two-second response latencies, and 25% memory footprint reduction. The system sustained stable operation supporting 500 concurrent sessions while minimizing manual infrastructure oversight. Future research directions include incorporation of advanced recommendation architectures employing attention mechanisms and integration of real-time recruiter feedback loops to further enhance alignment precision.

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