



Intelligent CV Screening System

Ouail El Maadi

Supervised by Dr. Houda Chakiri

School of Science & Engineering
Fall 2025

TABLE OF CONTENTS

- 1. Introduction
- 2. Problem Statement
- 3. Project Specifications
- 4. Design & Methodology
- 5. Results
- 6. Conclusion & Future Work

250

average number of CVs received for one job posting

- Recruiters face increasing applicant volume.
- This makes it extremely difficult to evaluate every CV properly and consistently.

81%

of recruiters spend under 60 seconds reviewing each CV

- Under time pressure, many CVs receive only a quick skim, not a deep evaluation.
- Qualified candidates can be missed simply because their CV format or structure is different.

80%+

of CVs are rejected at the first screening stage

- Most CVs are eliminated early due to formatting issues or keyword mismatch, rather than lack of skills.
- Traditional systems (ATS) focus on keywords, not meaning.

==> Unfair, inefficient, and outdated.

PROBLEM STATEMENT

Recruitment today suffers from four major issues:

1. High Volume

- Hundreds of CVs per job.

2. Limited Time

- Seconds per CV → inconsistent decisions.

3. Keyword-Based Tools

- Can't understand synonyms or context.

4. Lack of Transparency

- Candidates don't know why they were rejected.

GOAL

Build an AI system that evaluates CVs based on context, skills, and meaning. Not just **keywords**.

==> fair, explainable, and fast.

PROBLEM OBJECTIVE

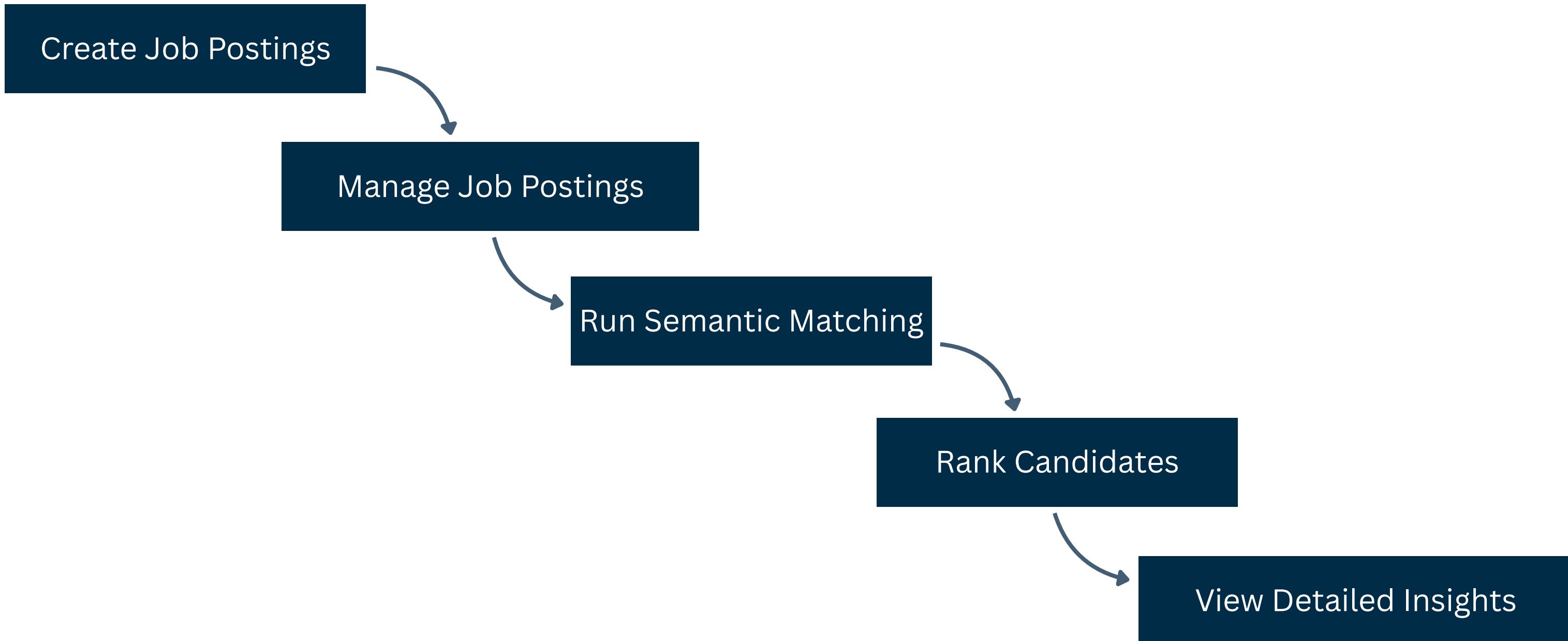
The objective of this system is to:

- **Understand CVs and Job Descriptions semantically**
- **Provide accurate match scores**
- **Give applicants skill-gap feedback**
- **Help HR rank candidates fairly**
- **Support both English and French CVs**
- **Support Multiple File Formats and reduce bias**

PROJECT SPECIFICATIONS

HR Features

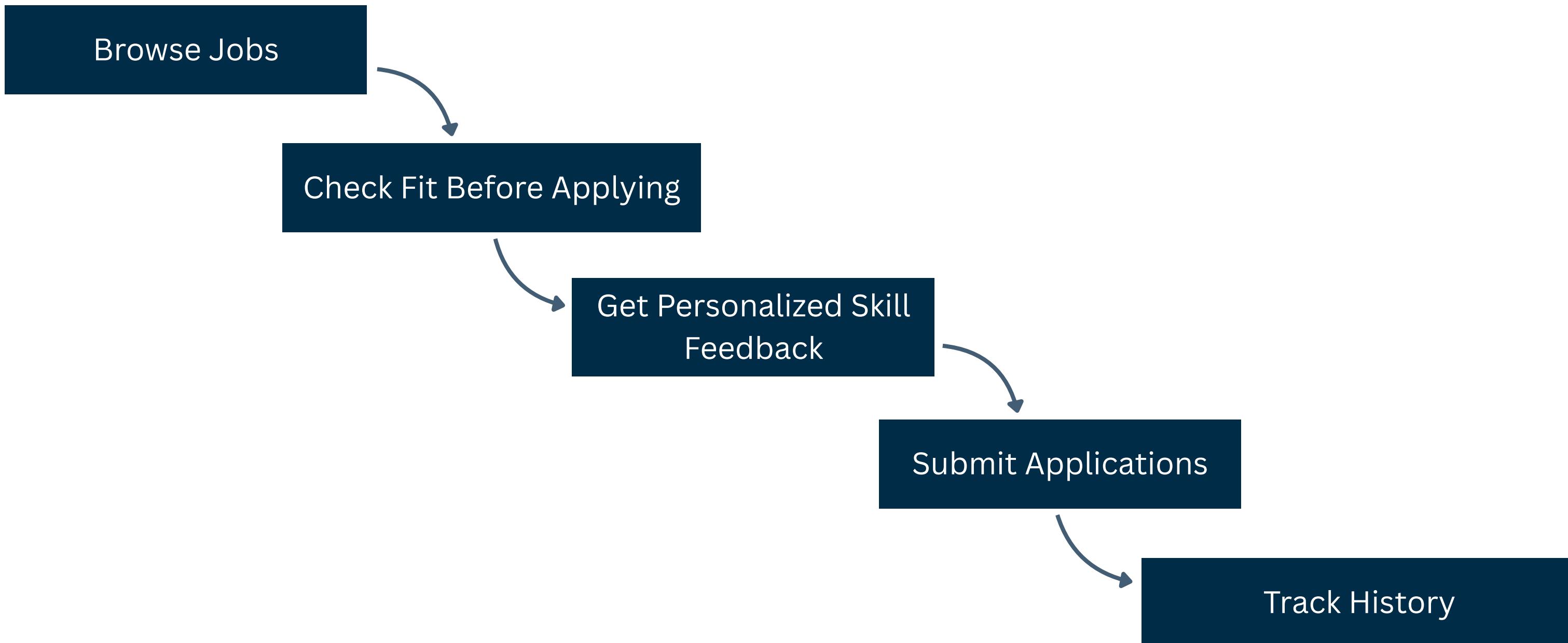
Functional Requirements



PROJECT SPECIFICATIONS

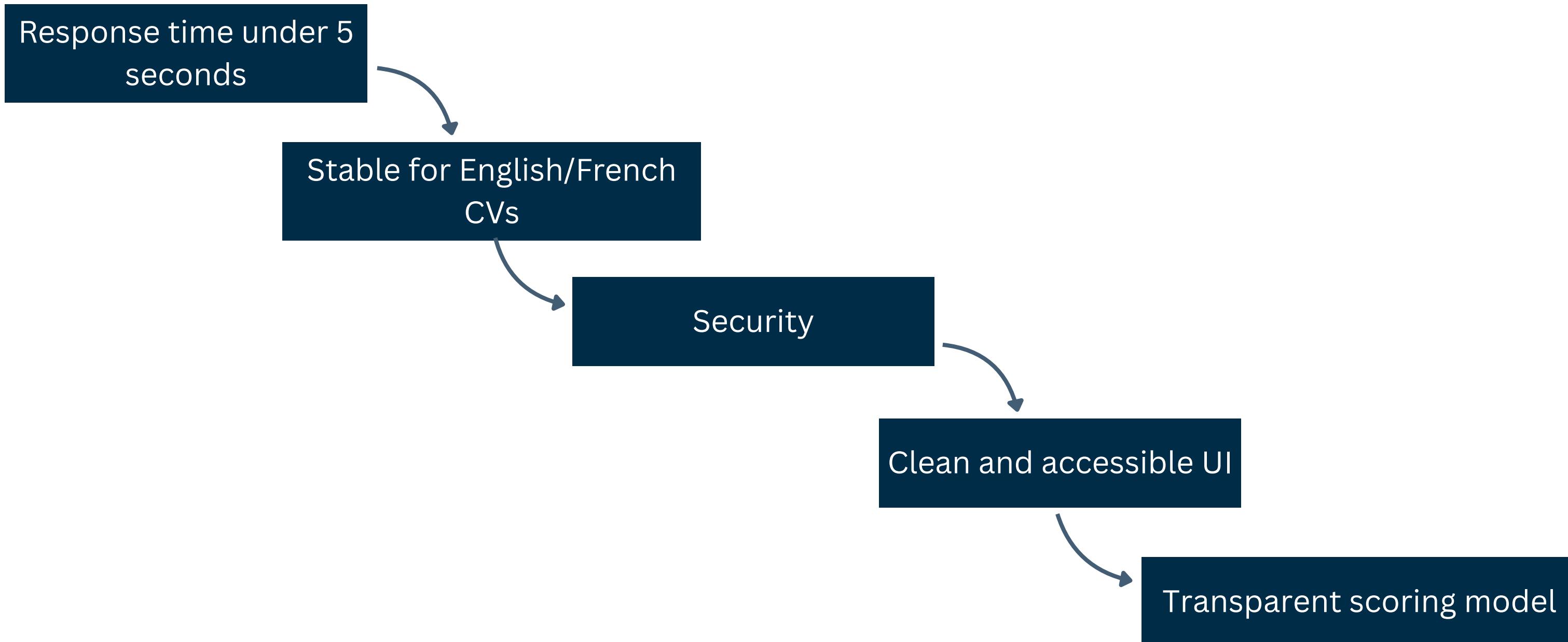
Applicant Features

Functional Requirements



PROJECT SPECIFICATIONS

Non-Functional Requirements

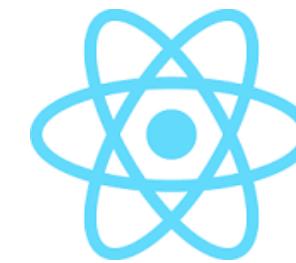


PROJECT SPECIFICATIONS

Technology Enablers



Flask



REACT



Vite



Tailwind CSS



MongoDB

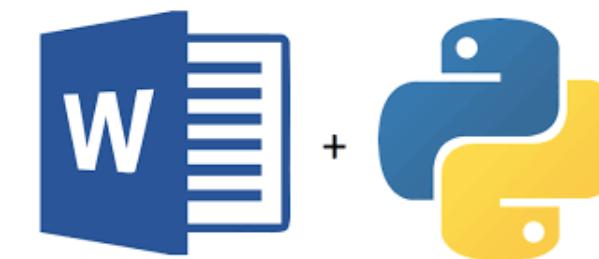


SBERT

PyPDF2



PYPDF2

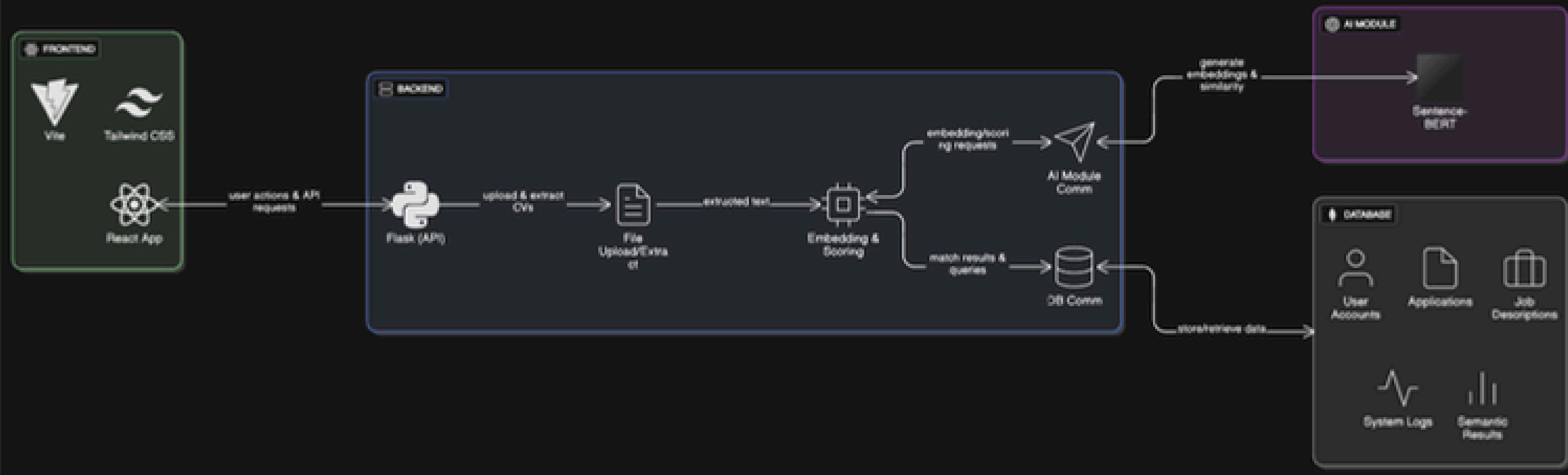


Docx2txt

DESIGN & METHODOLOGY

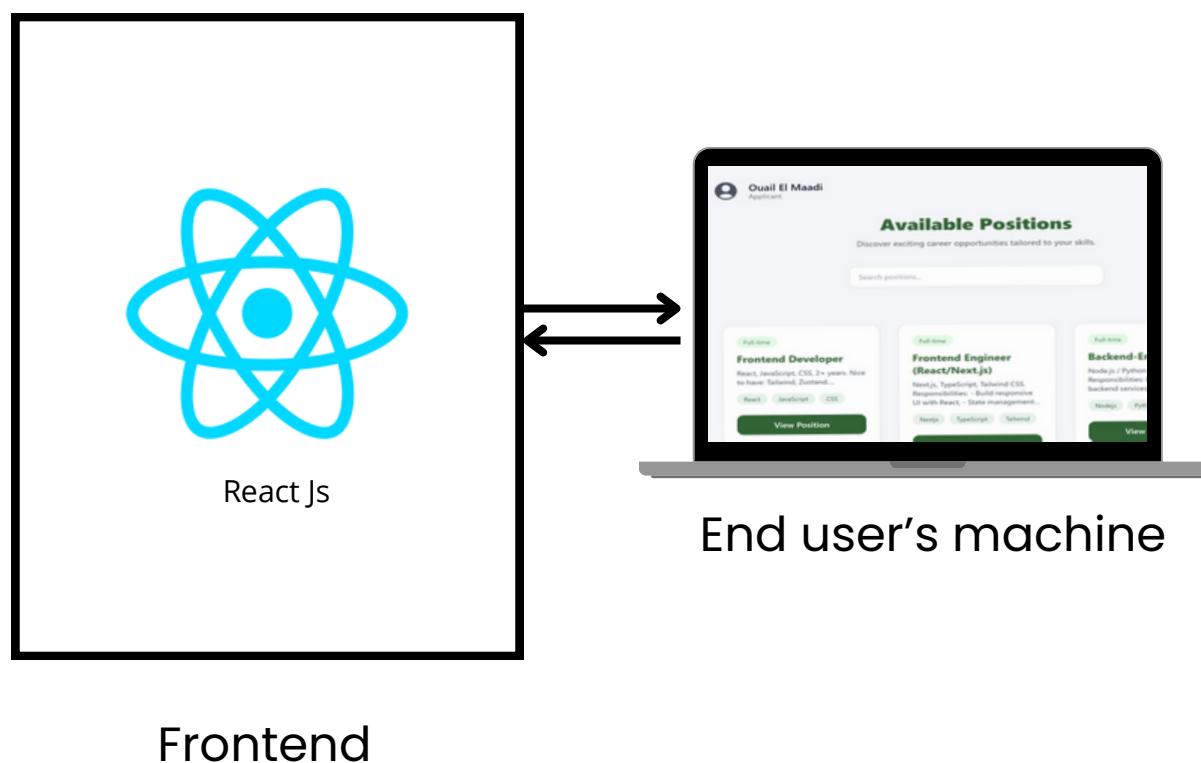
SYSTEM ARCHITECTURE

Job Application Platform Architecture



ARCHITECTURE

Zoom into the Frontend Components



Jobs List

Frontend Developer
React, JavaScript, CSS, 2+ years. Nice to have: Tailwind, Zustand....
[View Position](#)

Full-time

Data Analyst (2 Years)
SQL, PYTHON, R , Experience
Required: 2+ years Job Summary We are seeking a Data Analyst with at...
[View Position](#)

Frontend Engineer (React/Next.js)
Next.js, TypeScript, Tailwind CSS. Responsibilities: - Build responsive UI with React, - State management...
[View Position](#)

Full-time

Senior Back-End Engineer
Python, Java, Go, Overview We are looking for a Senior Back-End Engineer to design, build, and...
[View Position](#)

Backend-Engineer
Node.js / Python / Java
Responsibilities: Build and maintain backend services and APIs Work...
[View Position](#)

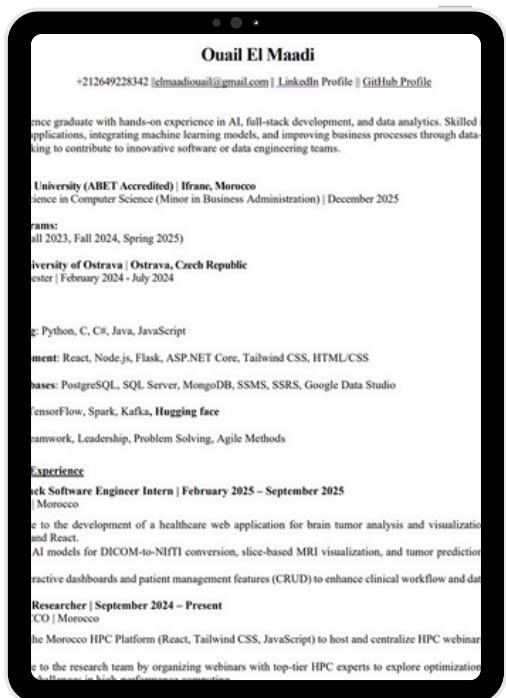
Full-time

Senior Data Analyst
SQL, API, EXCEL, Experience
Required: 5+ years Job Summary We are seeking a Data Analyst with at...
[View Position](#)

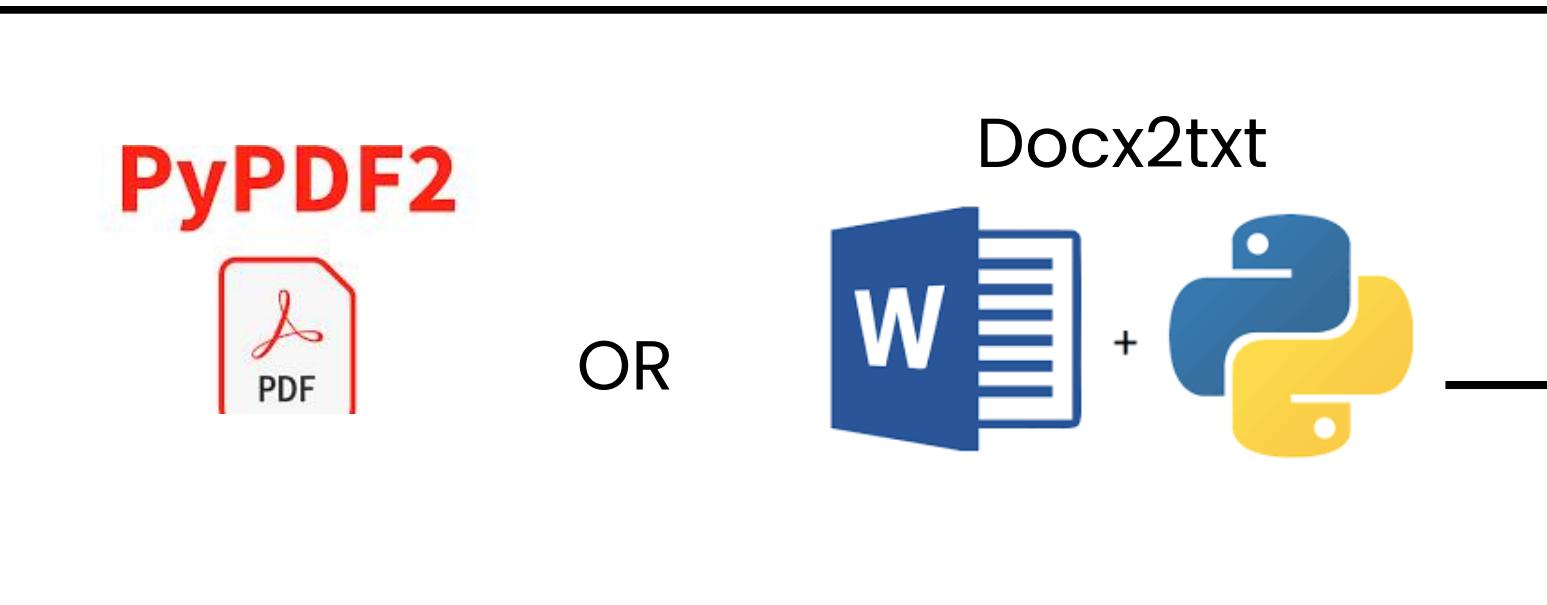
ARCHITECTURE

Data Extraction

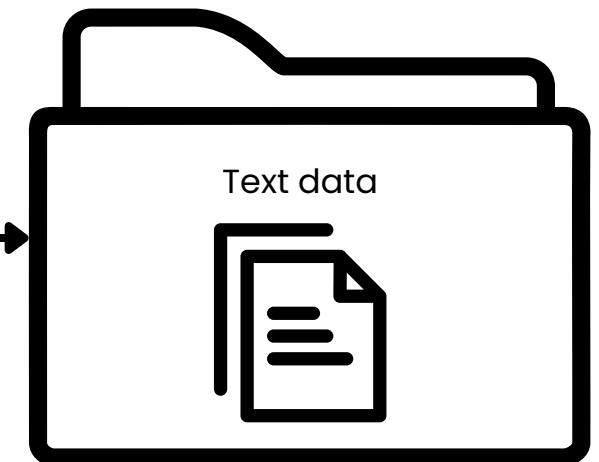
Parsing Engines



Extract CV Text



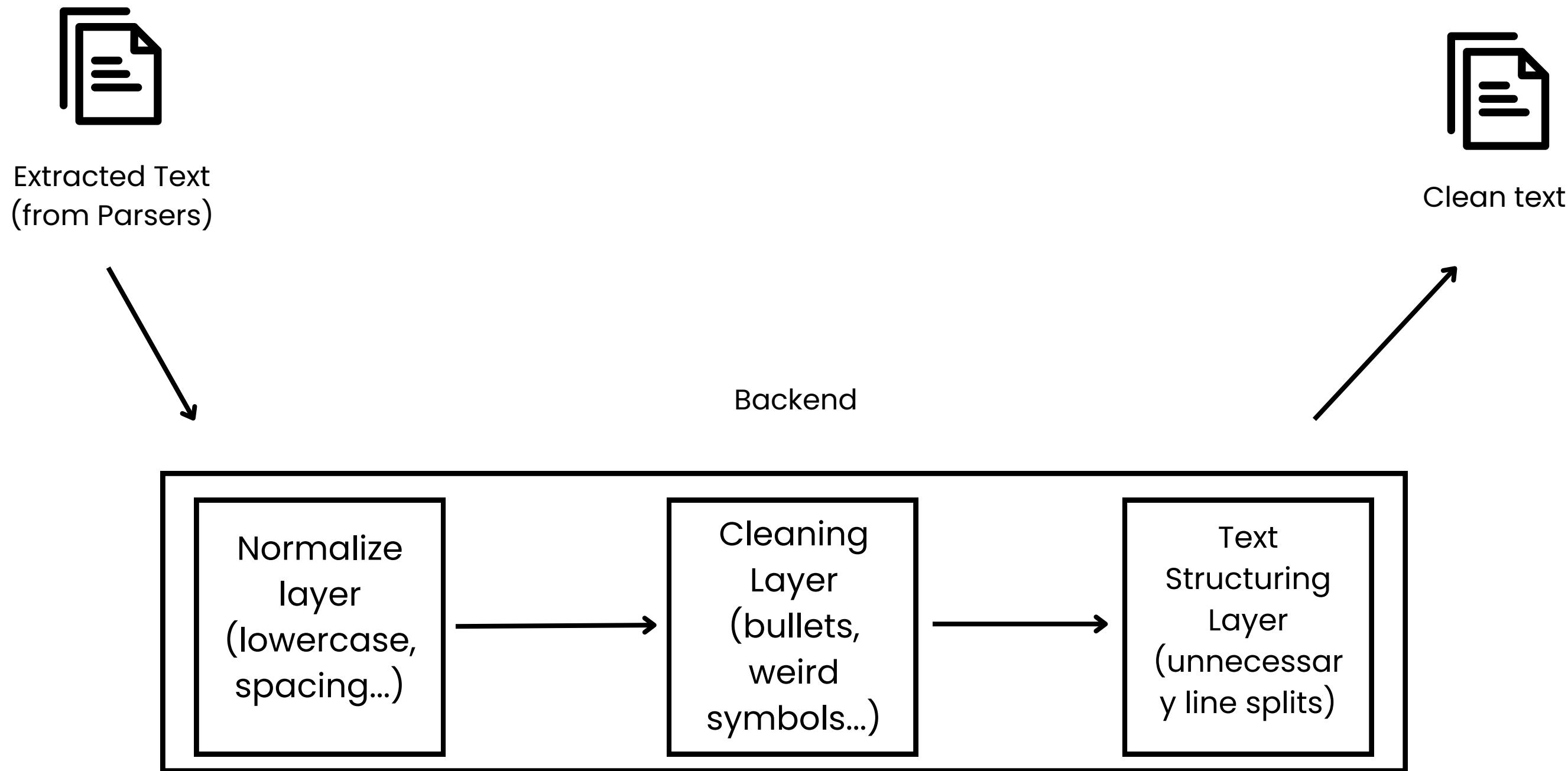
Text Output



Applicant's
CV

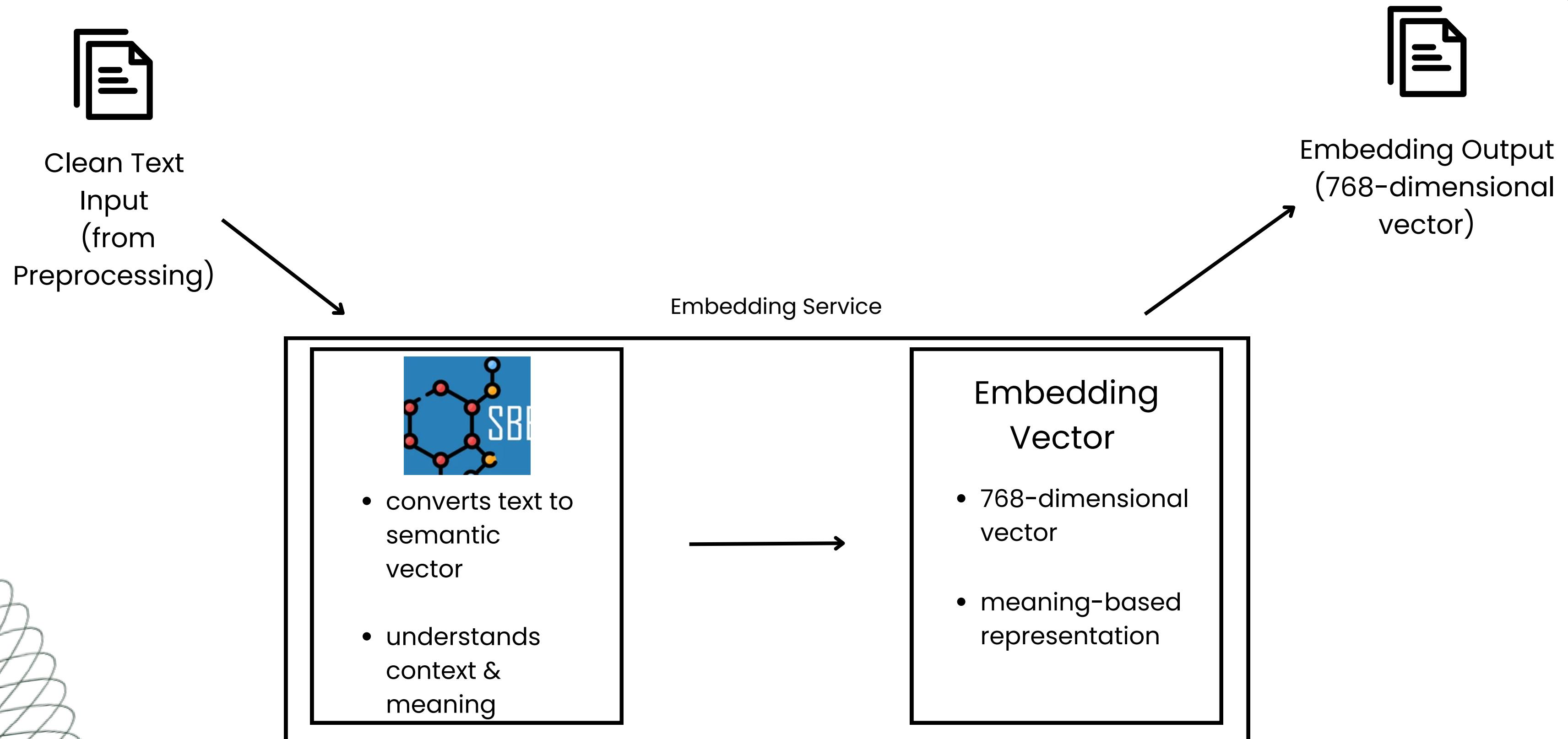
ARCHITECTURE

Preprocessing Service



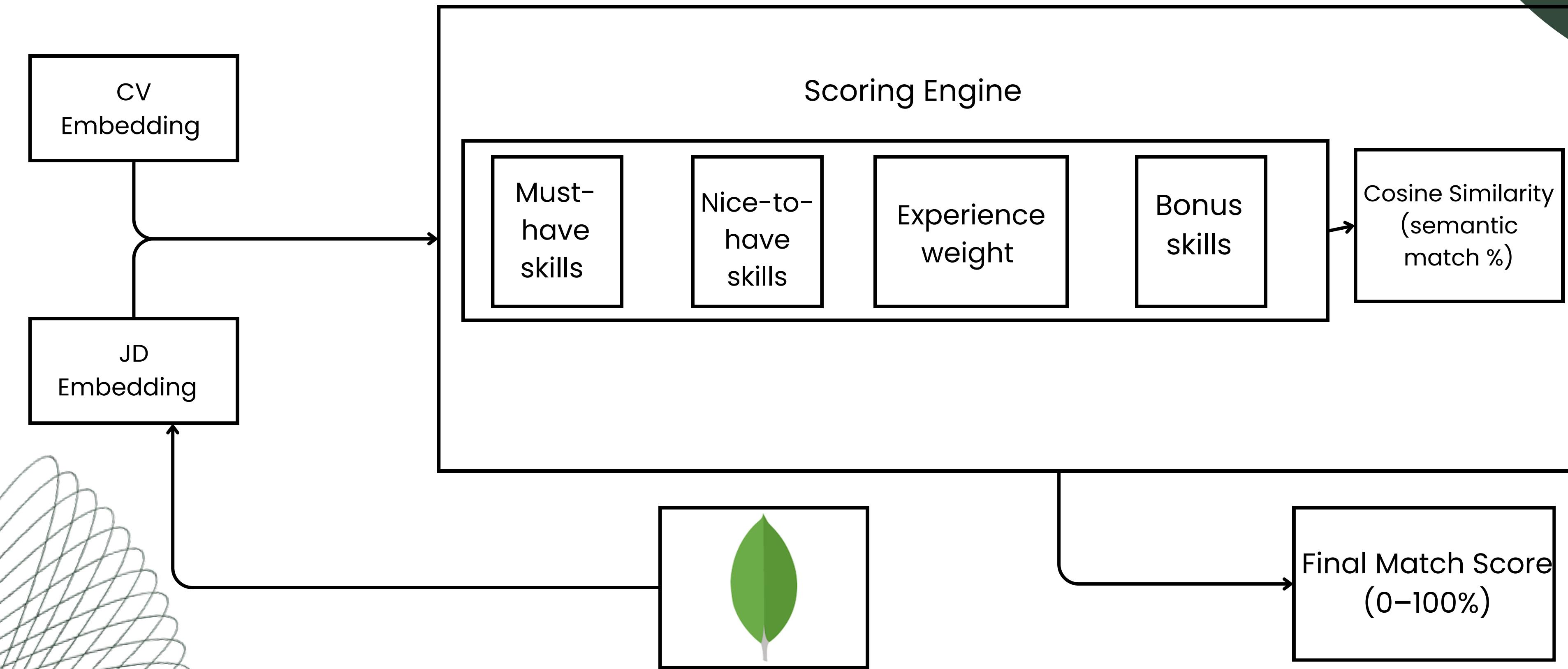
ARCHITECTURE

Semantic Embedding Generation



ARCHITECTURE

Matching & Scoring Pipeline



ARCHITECTURE

Cosine Similarity

CV
Embedding

Vector A
[$a_1, a_2, a_3, \dots, a_{768}$]

Vector B
[$b_1, b_2, b_3, \dots, b_{768}$]

JD
Embedding

Dot Product

$$(A \cdot B)$$

$$a_1 \cdot b_1 + a_2 \cdot b_2 + \dots + a_{768} \cdot b_{768}$$

Magnitudes

$$|A| \text{ and } |B|$$

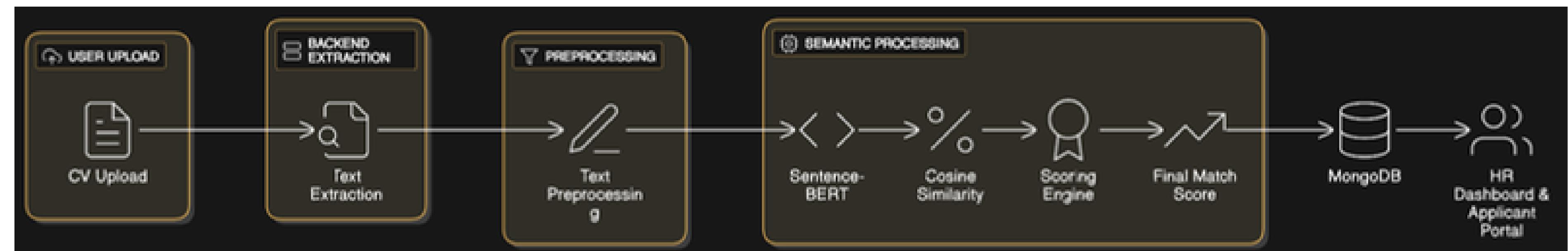
$$\sqrt{a_1^2 + \dots + a_{768}^2}$$
$$\sqrt{b_1^2 + \dots + b_{768}^2}$$

$$\text{cosine} = \frac{(A \cdot B)}{(|A| \times |B|)}$$

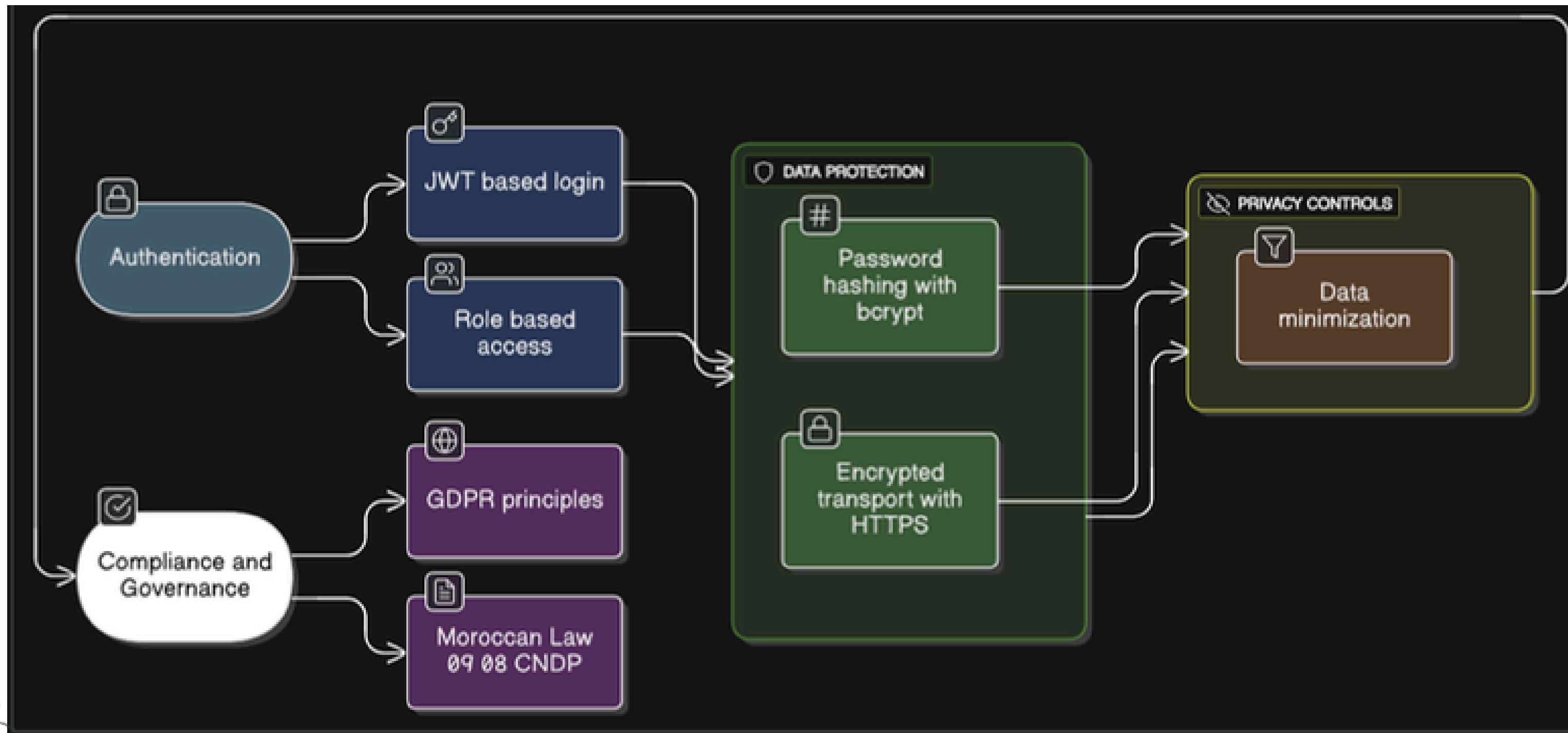
Final Match
Score (0–100%)

ARCHITECTURE

End-to-End System Pipeline



SECURITY & PRIVACY





DATA PRESENTATION & RESULTS

CONCLUSION

Transforms the recruitment workflow by evaluating CVs based on context, meaning, and real skills not keywords.

Combines modern AI techniques (semantic embeddings, cosine similarity, and scoring logic) into a clear and explainable matching pipeline.

Delivers a faster, more consistent, and intelligent screening experience for applicants and HR teams, with a strong foundation ready for future optimization and deployment.

FUTURE WORKS

Migrate CV file storage to Amazon S3 with encrypted buckets and private access policies to strengthen data protection for production deployment.

Expand the system beyond matching: introduce automated shortlisting, interview scheduling, and full hiring-pipeline management.

The background features abstract geometric elements. On the left, there's a large, dark green, semi-transparent circle. Above it, two sets of thin, light gray lines fan out from the top corners towards the center; the left set curves upwards and to the right, while the right set curves downwards and to the left. The text is centered against this minimalist backdrop.

SPECIAL NOTE...



THANK YOU !