



# KRITHOATHON 3.0

**CRAFTING TOMORROW'S WORLD**

Presented by  
KRITHOMEDH VNRVJIET

# **TEAM NAME**

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## Problem Statement :

Recruiters spend significant time manually reviewing job descriptions and CVs, making the process slow and error-prone. Identifying the right candidates efficiently remains a challenge,

- Time-consuming and error-prone.
- Limited by shallow keyword matching that misses qualified candidates.
- Vulnerable to keyword stuffing by unqualified applicants.
- Unable to recognize contextually equivalent skills.

## Key Features :

### Multi-Agent System Architecture:

- Job Description Analyzer: Semantically analyzes JDs and identifies core requirements.
- CV Assessment Agent: Extracts structured data and validates claimed skills.
- Matching Engine: Uses semantic algorithms to find true skill matches beyond keywords.
- Interview Scheduler: Automates communications with shortlisted candidates.

# Abstract

Our **multi-agent AI** recruitment system revolutionizes the hiring process by replacing manual CV screening with an intelligent, modular solution that understands the semantic context of both job requirements and candidate qualifications.

## Key Components :

- **Semantic Analysis:** Advanced NLP extracts meaning beyond keywords matching.
- **Specialized Agents:** Four coordinated AI agents handle distinct recruitment stages (JD analysis, CV assessment, qualification matching, interview scheduling)
- **Contextual Matching:** Recognizes skill equivalencies across industries and detects keyword stuffing.
- **Automation Pipeline:** Reduces recruiter workload by 70% while improving match quality
- **Scalable Architecture:** Python backend with LangChain/Ollama and MongoDB for handling thousands of applications.

Our approach transforms recruitment from keyword filtering to genuine qualification assessment, creating a more efficient and merit-based talent acquisition process.

# Implementation

Our recruitment solution is implemented through a sequential workflow where each stage is handled by a specialized agent:

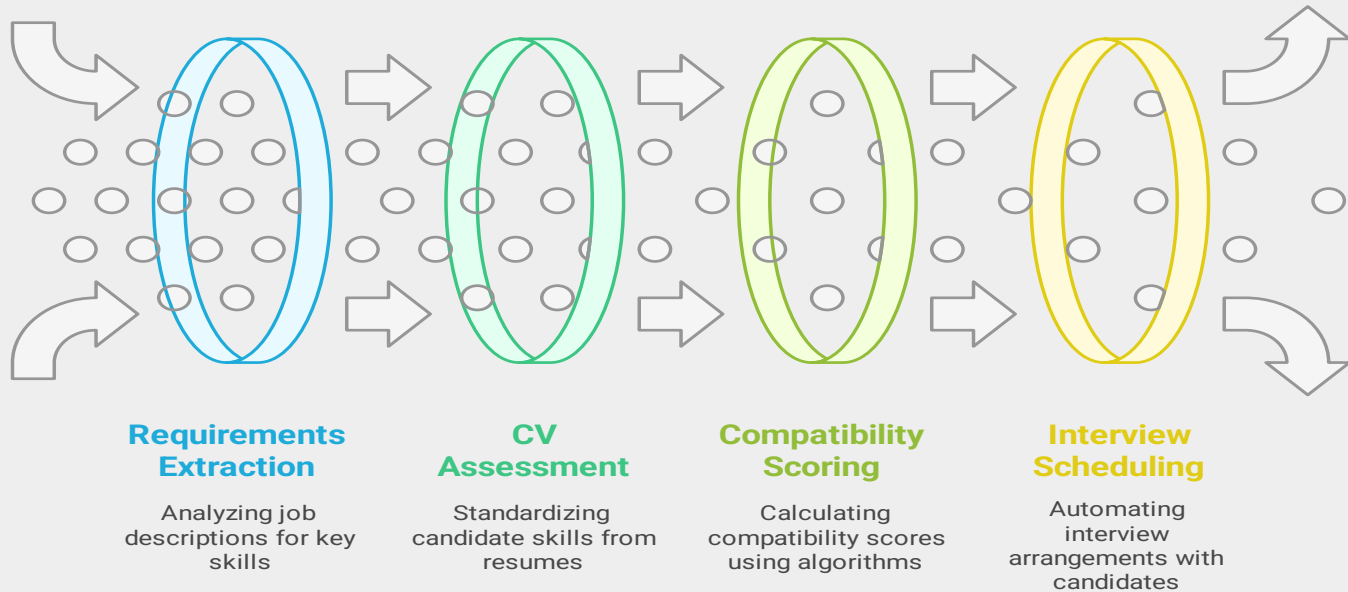
## Implementation Flow:

- JD Analyzer extracts and classifies requirements from job descriptions, creating a structured template with weighted skills and qualifications
- CV Assessment module processes candidate resumes, converting unstructured text into standardized skill representations and evidence validations
- Matching Engine applies semantic algorithms to calculate multi-dimensional compatibility scores beyond simple keyword matching
- Scheduling Agent automates communication with qualified candidates, handling interview arrangements

The system's modular design allows for independent optimization of each component while working together in an integrated pipeline that transforms the recruitment process from manual screening to intelligent candidate selection.

# Process Flowchart

## Candidate Selection Process



# Tech Stack

- **Programming Language (Python )** - Core development and scripting for system architecture, data processing and application logic
- **AI Framework (Lang-Chain/Crew-Ai)** - Multi-agent coordination and NLP capabilities to enable semantic analysis and intelligent processing of text
- **Database (MongoDB)** - Persistent storage of JDs and candidates with flexible document schema for unstructured recruitment data
- **Database Driver (Py-Mongo)** - MongoDB integration with Python providing efficient database operations and query capabilities
- **PDF Parsing (PyPDF2)** - Extract text from JDs and CVs regardless of formatting, enabling analysis of various document types
- **NLP Libraries (spa-Cy/NLTK)** - Process and extract structured data from text, identifying entities, skills, and relationships within documents
- **Email Automation (smtplib)** - Send interview requests to candidates and handle automated communication throughout the recruitment process

**Thank You**