

Candidate Profile Module Documentation

1. Module Overview

The Candidate Profile Module is the foundational component of the Explainable Skill-Based Internship and Project Matching Platform.

It captures, validates, structures, and evaluates candidate competencies in a transparent, skill-first, and fairness-aware manner.

It eliminates dependency on traditional resumes and keyword-based screening mechanisms.

2. Objectives

- Replace resume-based filtering with structured competency representation
- Enable measurable and validated skill profiling
- Provide explainable ranking and match scores
- Prevent demographic and institutional bias
- Offer real-time feedback and skill gap analysis
- Support continuous candidate skill evolution

3. Core Architecture

The module consists of structured layers:

- Basic Information Layer (Anonymized during ranking)
- Competency Profile Layer
- Skill Validation Layer
- Project & Experience Mapping
- Assessment Records
- Certification Records
- Availability & Preferences
- Fairness Metadata Layer
- Explainability Engine

4. Candidate Dashboard Components

- Profile Completion Indicator with improvement suggestions
- Competency Radar Chart for skill visualization
- Weighted Overall Competency Score

- Project-wise Match Score with reasoning
- Skill Gap Analysis and improvement recommendations
- Historical performance tracking

5. Candidate Profile Fields

Basic Information:

- Full Name (hidden during evaluation)
- Email and Phone
- University and Degree
- Graduation Year

Skill Matrix:

- Skill Name
- Category (Technical, Soft, Domain)
- Proficiency Level
- Self Rating (1–5)
- Validation Status
- Evidence Link

Projects:

- Title, Description, Role
- Skills Used (tag-based)
- Duration
- Outcome Metrics
- Repository/Portfolio Links

Assessments:

- Test Name
- Score and Percentile
- Attempt Date
- Expiry Date

Certifications:

- Certificate Name
- Issuer
- Verification ID
- Skill Mapping

Soft Skills:

- Communication
- Teamwork
- Problem Solving
- Leadership (if applicable)

Availability:

- Internship Type
- Duration
- Weekly Commitment
- Domain Preferences

6. Scoring System

Final Weighted Competency Score Formula:

Final Score =
(Technical Skills × 40%) +
(Projects × 25%) +
(Assessments × 20%) +
(Certifications × 10%) +
(Soft Skills × 5%)

All scores are normalized to a 0–100 scale.
Confidence score is calculated based on validation strength.

7. Fairness & Bias Prevention

- Blind evaluation (no name, gender, photo visibility)
- No college-tier bias influence
- Equalized opportunity constraints
- Disparate impact monitoring
- Bias audit logs and fairness reports

8. Explainability Engine

For every ranking decision, the system provides:

- Positive contributing factors
- Missing competencies
- Weighted contribution breakdown
- Improvement suggestions

Example:

- + Strong Python proficiency (+12)
- + High ML assessment score (+8)
- Missing SQL validation (-6)

9. Evaluator Dashboard

- Blind ranked candidate list
- Skill-wise breakdown

- Project relevance mapping
- Confidence indicators
- Fairness metrics visualization

10. Data Security & Compliance

- Encrypted data storage
- Role-based access control
- Secure authentication
- Audit logs for profile edits
- Consent-based data usage compliance

11. Advanced Features

- Dynamic Skill Ontology
- AI-powered skill extraction
- Skill similarity graph mapping
- Real-time ranking updates
- Career growth prediction
- Peer benchmarking system
- Portfolio strength score

12. Technical Stack (Suggested)

Frontend: React.js with visualization libraries

Backend: FastAPI or Django

Database: PostgreSQL + Graph database (Neo4j optional)

AI Layer: Scikit-learn / TensorFlow

Security: JWT Authentication, Role-based access