Project Requirement Mapping Module

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1. Module Overview

The Project Requirement Mapping Module is a core component of the Explainable Skill-Based Internship and Project Matching Platform. It converts unstructured project descriptions into structured, weighted, and machine-readable competency requirements.

2. Objectives

- Enable structured skill definition. - Support weighted competency scoring. - Improve transparency and explainability. - Reduce bias in requirement design. - Enhance fairness-aware candidate matching.

3. Required Skills Definition

Allows project creators to define mandatory skills such as programming languages, tools, frameworks, domain knowledge, research skills, and soft skills. Skills can be tagged as technical, behavioral, or domain-specific.

4. Skill Weight Assignment

Each required skill is assigned a percentage weight contributing to the total match score. Total required skill weight equals 100%. Example: Python (30%), ML (40%), Communication (15%).

5. Optional Skills Configuration

Optional skills enhance ranking but are not mandatory. They provide bonus points with a capped contribution (e.g., maximum 15%).

6. Experience Level Mapping

Experience levels are defined as Beginner, Intermediate, Advanced, or Expert. These levels are mapped to numerical scoring ranges for algorithmic evaluation.

7. Domain Specification

Defines the project domain such as AI, Cybersecurity, Data Science, Web Development, etc., ensuring contextual alignment between candidate expertise and project needs.

8. Timeline & Availability Criteria

Includes start/end dates, weekly time commitment, and work mode (remote/on-site). Matching logic validates candidate availability overlap and required hours.

9. Team Collaboration Requirements

Defines if the project is individual or team-based. Can include role-based requirements such as Team Lead, Developer, Researcher, and communication skill weighting.

10. Skill Priority Settings

Skills can be categorized as Critical, High, Medium, or Low priority. Critical skills may have higher multipliers and minimum thresholds.

11. Fairness & Bias Prevention

- Prevents over-weighting prestige factors. - Normalizes domain imbalance. - Encourages balanced soft and technical skill inclusion. - Supports fairness-aware scoring calibration.

12. Explainability Features

Generates detailed score breakdown including skill contribution, optional bonus, experience match, availability alignment, and domain compatibility.

13. System Workflow

1. Define skills and weights. 2. Set experience levels. 3. Configure domain and timeline. 4. Apply priority multipliers. 5. Generate structured requirement blueprint. 6. Pass data to matching engine.

14. Advantages

- Eliminates vague job descriptions. - Improves ranking transparency. - Enables explainable AI-based selection. - Reduces manual screening bias. - Promotes competency-driven opportunity allocation.