Startup Team Finder: A Skill-Based Platform for Startup Team Formation and Co-Founder Discovery

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Abstract— **Startup Team Finder is a proposed web-based platform designed to simplify the process of forming startup teams by connecting individuals with complementary skills, shared interests, and similar entrepreneurial goals. Many aspiring entrepreneurs have innovative business ideas but face difficulties finding suitable co-founders, developers, designers, marketers, and other team members. Traditional networking methods often depend on personal connections and may not provide an efficient way to identify individuals with the required competencies. The proposed system addresses this problem through user profiles, skill-based search, project listings, and a recommendation mechanism that identifies potential team members according to their skills, interests, preferred roles, and project requirements. The platform aims to provide a centralized environment where users can discover startup opportunities, communicate with potential collaborators, and build multidisciplinary teams. A modular system architecture is proposed to support user management, profile handling, matching, project management, and communication. The system's effectiveness can be evaluated using matching relevance, response rate, usability, and the time required to identify suitable collaborators. The proposed platform seeks to make startup team formation more accessible, organized, and efficient. Its actual performance will depend on implementation, user participation, and empirical evaluation.**

Index Terms— **Co-founder discovery, entrepreneurial collaboration, recommendation system, skill matching, startup ecosystem, startup team formation.**

I. INTRODUCTION

Entrepreneurship plays an important role in innovation, employment generation, and economic development. Many individuals develop innovative business ideas and aspire to establish startups. However, transforming an idea into a successful venture requires more than an innovative concept. It also requires a team with suitable technical knowledge, business expertise, communication skills, and a shared vision.

Finding the right team members is a significant challenge for early-stage entrepreneurs. A founder with strong technical knowledge may require a business strategist, while a person with a business idea may need software developers, UI/UX designers, marketing professionals, or financial specialists. Existing personal networks may not always provide access to individuals with the required skills or interests.

Research on entrepreneurial team formation highlights the importance of understanding how founders select collaborators and how team composition influences new venture development [1]. These observations motivate the development of a digital platform that supports more structured discovery of potential startup collaborators.

Startup Team Finder is proposed as a web-based platform that enables users to create professional profiles, publish startup ideas, specify required roles, and discover potential teammates. Instead of relying exclusively on informal networking, the system can use structured profile information and matching criteria to recommend suitable candidates.

The primary objective of the project is to simplify startup team formation by bringing aspiring entrepreneurs and skilled individuals together in a single digital environment.

A. Problem Statement

Aspiring entrepreneurs frequently encounter difficulties when searching for people who can contribute to their startup ideas. These difficulties include limited professional networks, incomplete information about potential collaborators, difficulty

identifying complementary skills, and the absence of a centralized platform specifically designed for startup team formation.

The problem addressed by this project is the lack of an accessible and organized mechanism for discovering potential co-founders and team members according to startup requirements and individual capabilities.

B. Objectives

The major objectives of Startup Team Finder are as follows:

1. To provide a centralized platform for aspiring entrepreneurs and startup enthusiasts.
2. To enable users to create profiles containing their skills, interests, experience, and preferred roles.
3. To allow founders to publish startup ideas and specify the roles required for their projects.
4. To recommend potential teammates based on compatibility between user profiles and project requirements.
5. To support communication between founders and interested candidates.
6. To provide search and filtering facilities for discovering relevant projects and individuals.
7. To evaluate the platform's usability and matching effectiveness through systematic testing.

C. Scope of the Project

The proposed system focuses on early-stage startup team formation. Its intended users include students, developers, designers, aspiring entrepreneurs, business professionals, and individuals interested in collaborative innovation.

The core scope includes registration, authentication, profile management, startup project creation, skill-based matching, search, and collaboration requests. Additional features, such as notifications, profile verification, recommendation ranking, and administrative moderation, may be included depending on implementation resources.

The platform is intended to support team discovery rather than guarantee startup success, employment, funding, or the suitability of every recommended candidate.

II. LITERATURE REVIEW

Entrepreneurial team formation has been studied from several perspectives, including individual competencies, professional relationships, team composition, and the process through which founders establish working relationships.

Lazar et al. examined entrepreneurial team formation and presented an integrative framework describing the origins, strategies, and dynamics of founding teams [1]. Their work indicates that team formation is a multifaceted process rather than a simple selection of individuals.

Jin et al. conducted a meta-analysis of entrepreneurial team composition and new venture performance, examining characteristics such as team size and diversity [2]. This research provides a foundation for considering different competencies and backgrounds when forming teams.

Recent research by Battaglia et al. investigated how decision-making approaches influence the composition and reconfiguration of entrepreneurial teams [3]. Their findings emphasize the relevance of seeking resources and expertise when adjusting team composition.

In the area of recommendation systems, similarity measures can be used to compare structured representations of users and their interests. For example, cosine similarity measures the normalized similarity between two vectors and is commonly used in information retrieval and text-based matching [4].

These studies provide a conceptual foundation for Startup Team Finder. However, a practical team-matching platform must also consider user preferences, role requirements, availability, communication, and the fact that profile similarity alone does not guarantee successful collaboration.

III. PROPOSED SYSTEM

The proposed Startup Team Finder platform provides a structured environment for discovering startup collaborators.

The system consists of user registration, profile management, startup project management, candidate discovery, matching, and communication modules. Each module performs a specific function while interacting with the central application and database.

A. User Registration and Authentication

Users create accounts using the registration interface and provide the required account information. The authentication module verifies login credentials and controls access to authorized features.

Passwords should be stored using an appropriate secure hashing mechanism rather than as plain text. Access to profile editing, project management, and administrative functions should be restricted according to user permissions.

B. User Profile Management

Each user maintains a profile containing relevant professional and entrepreneurial information.

The profile may include:

- Name and professional introduction.
- Technical and non-technical skills.
- Areas of interest.
- Preferred startup roles.
- Experience and project portfolio.
- Availability and preferred collaboration mode.
- Entrepreneurial interests and long-term goals.

Structured profile data enables the platform to compare user capabilities with the requirements of startup projects.

C. Startup Project Management

Registered users can create startup project listings by entering the project title, description, problem statement, proposed solution, required skills, preferred roles, and collaboration expectations.

Project owners can update their listings, review interested candidates, and manage collaboration requests. Depending on the implemented functionality, a project may be marked as open, active, or closed.

D. Skill-Based Matching

The matching module identifies potential collaborators by comparing the requirements of a startup project with the skills and preferences listed in user profiles.

For example, a startup requiring web development, UI/UX design, and digital marketing can discover candidates whose profiles contain those skills.

A basic matching system may use weighted skill overlap. An extended version may include interest compatibility, experience, availability, preferred role, and collaboration preferences.

E. Search and Filtering

The search module allows users to explore startup projects and potential teammates using relevant criteria, such as skills, project category, role, experience, and collaboration preference.

Search and filtering complement automated recommendations by allowing users to investigate candidates and projects independently.

F. Collaboration and Communication

The platform may allow users to express interest in a project, send collaboration requests, and communicate with project owners.

A request-management module can track pending, accepted, and rejected requests. Messaging and notifications may be implemented to improve communication between interested participants.

IV. SYSTEM ARCHITECTURE

The proposed architecture follows a modular web application design. The presentation layer handles user interaction, the application layer processes business logic, the matching engine generates candidate rankings, and the database layer stores user and project information.

A. Architectural Components

1. Presentation Layer: Provides registration, login, profiles, project listings, search results, and recommendation interfaces.
2. Application Layer: Processes authentication, profile updates, project creation, and collaboration requests.
3. Matching Layer: Compares project requirements with user skills and preferences to rank potential collaborators.
4. Database Layer: Stores user profiles, skills, project information, and collaboration-request records.
5. Communication Layer: Supports messaging or notifications if these features are included in the implementation.

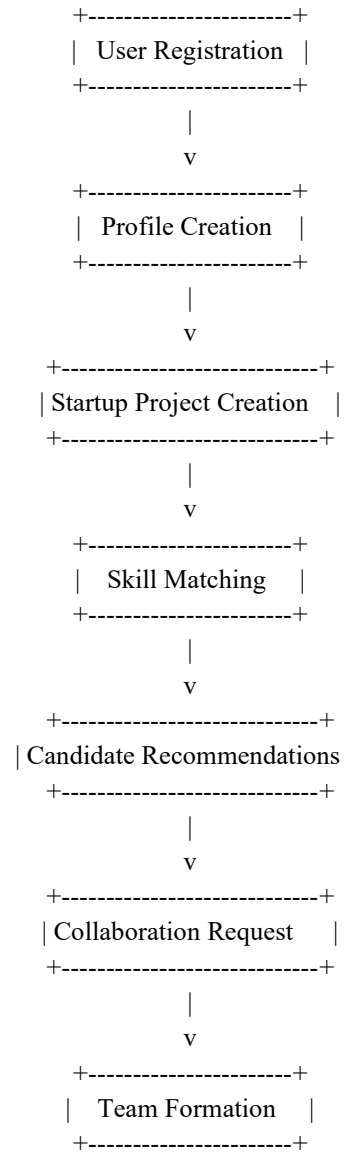
B. System Workflow

The general workflow of the proposed system is:

1. A user registers and logs in.
2. The user creates a profile containing skills, interests, and preferred roles.
3. A founder creates a startup project and defines the required competencies.
4. The matching module retrieves eligible user profiles.
5. The system calculates compatibility scores and ranks candidates.

6. The founder reviews the recommendations and sends collaboration requests.
7. Interested candidates respond, and accepted requests establish a potential collaboration.

Fig. 1. Proposed system workflow



The workflow represents the intended system design. The final architecture diagram should be prepared using the modules and technologies actually implemented in the project.

V. METHODOLOGY

The proposed development methodology consists of requirement analysis, system design, implementation, matching logic development, and testing.

A. Requirement Analysis

The initial stage identifies the needs of founders and potential team members. Functional requirements include account management, profile creation, project listings, search, recommendations, and collaboration requests.

Non-functional requirements include usability, security, response time, maintainability, data privacy, and reliability.

B. System Design

The system is divided into independent modules to simplify implementation and maintenance. Database entities can include User, Skill, UserSkill, StartupProject, RequiredSkill, CollaborationRequest, and Message.

Relationships between these entities allow the platform to associate users with their skills, projects with their requirements, and collaboration requests with the relevant participants.

The final database design should be adapted to the actual database technology used.

C. Matching Algorithm

A baseline matching algorithm can be developed using weighted skill overlap. Let U represent a candidate's skill set and R represent the required skill set of a startup project.

The skill-match score is defined as:

$$S_{skill} = (|U \cap R| / |R|) \times 100 \quad (1)$$

where:

- U is the set of skills possessed by the candidate.
- R is the set of skills required by the project.
- $|U \cap R|$ represents the number of required skills present in the candidate's profile.
- $|R|$ represents the total number of required skills.

For example, if a project requires five skills and a candidate possesses three of those skills, the skill-match score is 60%.

This score indicates skill coverage only. It does not measure personality compatibility, reliability, commitment, or the probability of startup success.

An extended matching model can combine several compatibility dimensions:

$$M = \alpha S + \beta I + \gamma E + \delta A \quad (2)$$

where:
- M is the overall matching score.
- S is the normalized skill-match score.
- I is the interest-compatibility score.
- E is the experience-relevance score.
- A is the availability-compatibility score.
- α, β, γ, δ are configurable weights.

The weights should be non-negative and satisfy:

$$\alpha + \beta + \gamma + \delta = 1 \quad (3)$$

All component scores must be normalized to a common scale before they are combined. The values of the weights should be selected and evaluated using project requirements and user feedback rather than assumed to be universally optimal.

The resulting score can be used to rank eligible candidates. Additional constraints, such as project status, user preferences, and role requirements, may be applied before ranking.

D. Implementation

The platform can be implemented using a suitable web development stack. The frontend provides the user interface, the backend manages application logic and API requests, and the database stores persistent information.

The precise technologies should reflect the actual project implementation. For example, a JavaScript-based implementation may use React for the frontend, Node.js and Express for the backend, and MongoDB for data storage. These are illustrative options, not a statement that the project already uses them.

The matching algorithm can initially be implemented as a backend service. This approach allows recommendations to be generated from stored profile and project data while keeping the matching logic separate from the user interface.

E. Testing Methodology

Testing should verify the correctness, usability, security, and performance of the implemented platform.

1. Unit Testing: Verify individual functions, including score calculation, profile validation, and project creation.
2. Integration Testing: Verify interactions among authentication, profile management, project management, and matching modules.
3. Functional Testing: Confirm that users can perform the intended operations successfully.
4. Usability Testing: Ask representative users to complete common tasks and provide feedback.
5. Performance Testing: Measure response time and behavior under different numbers of users and project records.
6. Security Testing: Check access control, input validation, password handling, and protection against common web application vulnerabilities.

Actual test results should be recorded before conclusions are drawn about system performance.

VI. IMPLEMENTATION AND FUNCTIONAL MODULES

The implementation can be organized into the following modules.

A. Authentication Module

This module handles account creation, login, logout, and authorization. It ensures that protected operations are available only to authenticated users with appropriate permissions.

B. Profile Module

The profile module allows users to add, edit, and view their skills, interests, experience, and preferred roles. These details serve as inputs to the matching algorithm.

C. Startup Listing Module

This module allows founders to publish startup ideas and specify the skills required for each project. It also supports updating project information and managing the project's availability.

D. Recommendation Module

The recommendation module retrieves eligible candidates and calculates their compatibility scores. Candidates can then be displayed in descending order of their matching scores, subject to the system's eligibility rules.

E. Collaboration Request Module

This module records requests between founders and potential team members. It manages request status and prevents unauthorized users from changing requests that do not belong to them.

F. Administration Module

If implemented, the administration module supports platform moderation, management of reported content, and handling of inappropriate or fraudulent profiles.

The final implementation report should include screenshots of the actual registration page, profile page, startup listing page, recommendation interface, and collaboration-request workflow.

VII. RESULTS AND DISCUSSION

The expected outcome of Startup Team Finder is a functional platform that organizes startup opportunities and supports the discovery of potential collaborators based on structured information.

The system is expected to reduce the manual effort involved in searching for candidates by allowing founders to filter profiles and receive ranked recommendations. Candidates may also benefit from discovering projects that align with their skills and interests.

However, these benefits are expectations that require empirical verification. The quality of the recommendations will depend on profile completeness, the accuracy of user-provided information, the suitability of the matching criteria, and the number of active users.

A. Evaluation Metrics

The platform should be evaluated using measurable criteria.

1. Matching Precision: Measures the proportion of recommended candidates judged relevant among the candidates recommended.

Precision@k = Relevant candidates in top k / k (4)

2. Matching Coverage: Measures the proportion of required skills covered by a candidate's profile. Equation (1) provides a simple form of this metric when each skill is treated equally.

3. Response Rate: Measures the proportion of collaboration requests that receive a response within a defined evaluation period.

Response Rate = (Requests receiving a response / Total request sent) × 100 (5)

4. Task Completion Time: Measures the time users require to complete tasks such as publishing a startup project or locating suitable candidates.

5. User Satisfaction: Can be measured through a structured questionnaire after participants use the system.

Table I. Proposed evaluation report

Evaluation metric	Actual result
Functional test pass rate	To be measured
Matching precision at k	To be measured
Average recommendation response time	To be measured
Collaboration request response rate	To be measured
Average task completion time	To be measured
User satisfaction score	To be measured

No numerical performance results are claimed in this draft because measured project data has not been provided.

C. Discussion

A skill-based matching approach offers a transparent baseline for comparing project requirements with candidate capabilities. It can help users understand why a particular profile appears in the recommendation list.

Nevertheless, a candidate with a high matching score is not necessarily the best collaborator. Team formation also involves communication, trust, motivation, complementary expertise, and agreement on responsibilities. Therefore, the recommendation mechanism should assist human decision-making rather than automatically determine team membership.

The platform may also face a cold-start problem when few users have registered. Incomplete profiles and outdated availability information may reduce recommendation relevance. These limitations can be addressed progressively through profile-completion prompts, user feedback, improved ranking methods, and continued evaluation.

VIII. LIMITATIONS AND FUTURE SCOPE

The proposed system has several limitations that should be considered during development and evaluation.

First, the accuracy of the matching process depends on the completeness and reliability of user profiles. Second, the platform cannot independently verify every claim made by users. Third, the initial matching model may not capture nuanced preferences, working styles, or interpersonal compatibility. Fourth, the usefulness of the platform depends on attracting a

sufficiently active community of founders and potential collaborators.

Future development may include the following enhancements:

1. Natural language processing to extract skills and requirements from project descriptions.
2. Semantic matching to recognize related skills expressed using different terminology.
3. Recommendation models that incorporate user feedback and previous interactions.
4. Availability-aware team composition that considers complementary roles and time commitments.
5. Portfolio integration to help users demonstrate relevant work.
6. Secure messaging and notification services.
7. Profile verification and reporting mechanisms.
8. Multilingual support for broader accessibility.
9. Analytics for measuring recommendation quality and collaboration outcomes.
10. Privacy controls that allow users to manage which profile details are visible to other participants.

Any advanced recommendation model should be evaluated against a simpler baseline to determine whether the additional complexity provides a meaningful improvement.

IX. CONCLUSION

Startup Team Finder is proposed as a web-based platform for improving the discovery of startup collaborators and supporting the formation of entrepreneurial teams. The system brings together user profiles, startup project listings, skill-based search, candidate recommendations, and collaboration requests within a centralized environment.

The proposed matching approach compares the skills required by a project with the competencies listed in candidate profiles. An extended model can incorporate interests, experience, and availability to generate more comprehensive recommendations. The platform is intended to make the discovery process more structured while allowing founders and candidates to make their own decisions about collaboration.

The effectiveness of the system must be established through implementation, functional testing, usability evaluation, and measurement of recommendation relevance. Further improvements may include semantic search, feedback-driven recommendations, and stronger profile verification.

Overall, Startup Team Finder provides a practical foundation for a digital startup collaboration platform. Its potential value lies in reducing discovery barriers and helping individuals explore opportunities to build teams with complementary skills. Its real-world impact will depend on recommendation quality, user trust, platform adoption, and the results of systematic evaluation.

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