

A Skill Based Peer Discovery System: A Review

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- Abstract** - Development of a skill-Based peer discovery system in academic environments, students are encouraged to work on innovative projects, ranging from mobile applications to hardware prototypes. Currently, there is no centralized system for students to discover and connect with peers based on specific technical expertise. This leads to several critical issues: Students with great ideas often abandon them because they lack the specific technical knowledge to execute certain parts of the project. **Discovery Barriers:** Highly skilled students often remain "hidden" within the campus because there is no public directory of their capabilities. Students often work on creative projects that call for interdisciplinary expertise in contemporary academic settings. Finding compatible collaborators with the necessary technical know-how is still very difficult, though. The design and implementation of a skill-based peer discovery system, a web-based platform that allows students to find, connect, and work together with peers based on their interests, skills, and project requirements, is presented in this research study. The suggested approach makes it easier to organise teams for projects, hackathons, and academic activities by utilising student profiles, skill classification, search filters, and collaboration tools. HTML, CSS, JavaScript, Node.js, Express.js, and MySQL are used in the system's development. The platform fosters student creativity lowers obstacles to collaboration and increases peer visibility. AI-based suggestions, cross-campus cooperation, and gamification elements are some of the upcoming improvements.

Keywords—Skill Matching, Student Collaboration, Peer Discovery, Web Application, Team Formation, Educational Technology.

INTRODUCTION

Students at colleges and universities frequently come up with creative ideas for projects, research initiatives, and hackathons. Because students are unable to locate teammates with the necessary technical competence, many of these concepts fall short. Conventional approaches to locating partners, such social media groups or personal relationships, are unreliable and ineffective.

This problem can be resolved by a centralised platform that

enables students to find peers based on technical expertise. Students can build profiles, describe their technical talents, look for peers, and work together on projects in the digital environment offered by the proposed Skill-Based Peer Discovery System.

The system's main goals are to foster multidisciplinary cooperation within academic institutions, enhance communication, and raise student visibility.

I. OBJECTIVES OF PROPOSED WORK

- to establish a centralised platform for student collaboration.
- to make skill-based peer discovery possible.
- to make the creation of a project team easier.
- to enhance student communication.
- to promote creativity and transdisciplinary learning.
- to make it easier to discover peers by offering search and filtering capabilities.

II. LITERATURE REVIEW

[1] Many digital platforms today try to connect people with work and services. Some focus on freelancing, some on local services, and a few try to support people with special needs. But when we look closely, most of these systems solve only one part of the problem.

[2] They do not bring everything together in one place. This section looks at different types of platforms and what they do well, and where they fall short.

[3] Freelancing platforms have grown a lot in recent years. Websites like Upwork and Fiverr allow people to work online and earn money based on their skills. These platforms connect freelancers with clients from different parts of the world. Users can create profiles, list their skills, and apply for jobs. This has helped many people find remote work, especially in areas like writing, design, and programming.

[4] However, these platforms are mostly global and competitive. Beginners often find it hard to get their first job because there are many experienced users already. Also, these platforms are not designed in a very simple way for everyone. For disabled individuals, the interface and process can sometimes feel complex. There is also less focus on accessibility features like voice support or simplified navigation. So even though opportunities exist, not everyone can use them easily.

[5] On the other side, there are platforms that focus on local services. Apps like Urban Company help users find workers such as electricians, cleaners, and repair technicians. These platforms provide location-based services and allow users to book workers easily. They also include ratings and reviews, which help build trust between users and workers.

[6] Even though such platforms solve the problem of finding local services, they are limited in scope. Only registered professionals who meet certain standards can join. Many small-scale or independent workers are not part of these platforms. Because of this, many skilled workers remain unknown. Also, these platforms

mainly focus on services and do not provide job opportunities for people who want to work remotely.

[7] There are also job portals like Naukri.com that help users find employment. These platforms are useful for full-time jobs and internships. Users can upload resumes and apply for positions in different companies. While they are helpful for general employment, they do not support flexible or skill-based short work in a simple way. They also do not focus much on accessibility for disabled users.

[8] In recent years, there has been some research and development in assistive technology. These systems aim to help disabled individuals use digital platforms more easily. Features like screen readers, voice commands, and adaptive interfaces have been introduced. Some applications are built specially for accessibility, but they are often limited to specific tasks like communication or education. They do not fully support employment or income generation in a practical way.

[9] Another important area is innovation platforms. Websites like AngelList and LinkedIn allow people to

connect with professionals and companies. These platforms help users share ideas, find jobs, or build networks. Students and startups can use them to reach a larger audience.

[10] Some research papers also discuss smart platforms that combine multiple services. These systems try to integrate job search, service booking, and user interaction into one application. While this idea is useful, most of these systems are still at a basic level or are not fully implemented in real-world scenarios. They often lack proper scalability, user friendly design, or real-time features.

[11] From all these studies and existing platforms, one clear observation can be made. Each system focuses on solving a single problem. Freelancing platforms focus on remote work. Local service apps focus on nearby workers. Job portals focus on employment. Networking platforms focus on connections. But there is no single system that connects all these aspects together in a simple and accessible way.

[12] Another major gap is inclusivity. Many platforms do not fully consider the needs of disabled individuals. Accessibility is often added as an extra feature, not as a core design element. This makes it harder for such users to fully benefit from the platform.

[13] Also, small-scale workers and beginners are often left behind. Platforms either focus on highly skilled professionals or verified service providers. This creates a gap where many capable individuals do not get enough opportunities.

[14] Based on this understanding, there is a need for a unified platform that brings together local services, remote job opportunities, and innovation support. The system should be simple, easy to use, and accessible for everyone. It should not only connect users but also create equal opportunities for workers, disabled individuals, and innovators.

[15] Skill Connect is designed with this idea in mind. It tries to combine the strengths of existing systems while reducing their limitations. By integrating multiple features into one platform, it aims to provide a more complete and practical solution for real-world problems.

Sr. No	Paper Title	Author	Results	Limitations	Year	Method Used
1	“Peer-to-Peer Learning Platforms”	Kumar et al.	Improved collaborative study groups	limited to academic learning only	2020	Web-based learning portal
2	“Campus Freelance Network”	Sharma & Patel	Enabled service exchange among students	Lack of security and verification	2021	Role-based web application
3	“Smart Collaboration System”	Das et al.	Increased matching accuracy by 30%	computational cost	2022	AI-based recommendation system
4	“SkillLink: Student Skill Marketplace”	Roy & Singh	Improved student visibility	No academic integration	2023	Social + Freelance hybrid platform

III. METHODOLOGY

A. Proposed Architecture

The Skill Connect system is designed as a simple and modular architecture so that it can handle different types of users and services without confusion. The main idea is to bring three major parts into one system: local services, remote jobs, and innovation sharing. Instead of building separate apps for each, everything is connected in a single platform.

The system is divided into different layers such as user interface, backend services, database, and external integrations. Each layer has its own role, but all of them work together smoothly. The mobile or web app acts as the front layer where users interact. The backend manages logic, user data, and communication. The database stores all important details like user profiles, job listings, and service requests.

The architecture is designed in a way that new features can be added later without affecting the existing system. This makes the platform scalable and easy to maintain

This module helps small-scale workers become more visible and increases their chances of getting work.

B. Registration and Role Management

The first step in the system is user registration. Every user creates an account using basic details such as name, email, phone number, and password. After registration, the user selects a role based on their purpose.

There are mainly five roles in the system:

- i. Customer (looking for workers)
- ii. Service Provider (offering services)
- iii. Disabled User (looking for remote jobs)
- iv. Innovator or Student (sharing ideas)
- v. Industry or Company (posting jobs and reviewing ideas)

Once the role is selected, the system provides a dashboard based on that role. This makes the app simple because users only see what they need.

B. Local Service Matching Module

This module is used to connect users with nearby workers. When a customer searches for a service, the system uses location-based filtering to display relevant workers. Service providers can create profiles where they list their skills, experience, and type of services. They can also update availability and pricing. When a user enters a request, the system

matches it with nearby providers.

The working process is as follows:

1. User selects the required service
2. System identifies user location
3. Nearby workers are displayed
4. User selects and contacts the worker Ratings.

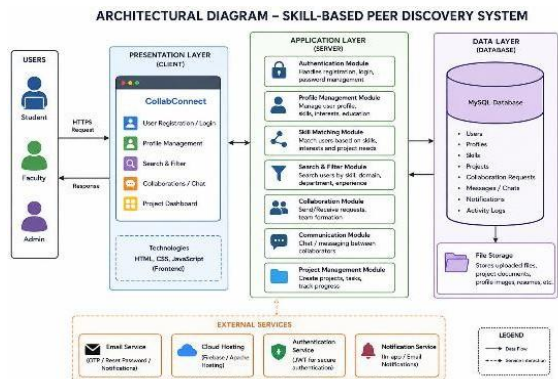
- System Workflow

The overall workflow of the system is simple and user friendly:

1. User registers and selects role
2. User accesses dashboard
3. User performs actions based on role
4. System processes request
5. Matching or response is generated
6. Communication and transaction take place
7. Feedback is collected

The Suggested System The suggested method is a web-based platform called Collab Connect that facilitates connections between students based on their project interests and technical proficiency.

Principal Elements Creating a Student Profile and Registering and Logging in Matching Based on Skills Features for Search and Filtering Requests for Collaboration Formation of the Communication Module Project Team.



The general structure and workflow of the platform intended to assist students in finding and working with peers based on their technical skills and project interests are depicted in the architectural diagram of the Skill-Based Peer Discovery System (Collab Connect). To provide easy communication between users, application modules, and the database, the system employs a layered architecture. The Users Layer, Presentation Layer, Application Layer, Data Layer, and External Services make up most of the architecture.

1. Users Layer

The system is accessed by three types of users:

- **Students** – Create profiles, search peers, and collaborate on projects.
- **Faculty** – Monitor student collaboration and guide project teams.
- **Admin** – Manage users, verify profiles, and maintain the platform.

Users interact with the system through a web browser using secure HTTP/HTTPS requests.

2. Presentation Layer (Client Side)

The users of the system include students, faculty members, and administrators. Students use the platform to create profiles, add technical skills, search for peers, and collaborate on projects. Faculty members can guide students and monitor collaborative activities, while administrators manage the overall system, maintain security, and verify user information. These users access the platform through a web browser using secure HTTP/HTTPS communication.

The Presentation Layer, which is created with HTML, CSS, and JavaScript, serves as the system's front-end interface. All user interaction features, including registration, login, profile management, search and filtering, project dashboard, and collaboration requests, are provided by this layer. It ensures a responsive and user-friendly experience by acting as a communication link between users and the backend server.

The presentation layer acts as the user interface of the system. It is developed using:

- HTML
 - CSS
 - JavaScript
- This layer provides functionalities such as:
- User Registration and Login
 - Profile Management
 - Skill Search and Filtering
 - Collaboration Requests
 - Chat and Project Dashboard

3. Application Layer

Node.js and Express.js are used to implement the Application Layer, which serves as the system's central processing unit. Several crucial modules at this tier oversee managing system functions. Password security, login, and user registration are all handled by the Authentication Module. User information,

including skills, hobbies, education, and project experience, is stored and updated via the Profile Management Module. In order to suggest appropriate collaborators, the Skill Matching Module evaluates user capabilities and project needs. Users can search peers according to departments, technical domains, or areas of competence using the Search and Filter Module. While the Communication Module facilitates communication and engagement between collaborators, the Collaboration Module assists users in sending requests and forming teams. The Project Management Module also enables users to effectively create projects, allocate tasks, and track project progress.

Helps users:

- Create projects
- Assign tasks
- Track progress

4. Data Layer (Database)

The database layer uses **MySQL** for storing and managing system data. All system-related data is securely stored and managed by the Data Layer using a MySQL database. Users, profiles, abilities, project information, requests for collaboration, chat messages, alerts, and activity logs are all kept on file. The database guarantees effective information retrieval and storage, facilitating the platform's seamless operation.

Additionally, the system has a File Storage component that keeps uploaded items including project documents, resumes, and profile pictures. Students' cooperation and document sharing are improved as a result. In addition, the design incorporates a few external services, such as email services for password resets and OTP verification, cloud hosting services like Firebase or Apache, JWT token authentication services, and notification services for alerts and updates.

The database stores:

- User information
- Student profiles
- Skills data
- Project details
- Collaboration requests
- Chat messages
- Notifications
- Activity logs

This layer ensures secure and efficient data management.

IV. SYSTEM DATA FLOW

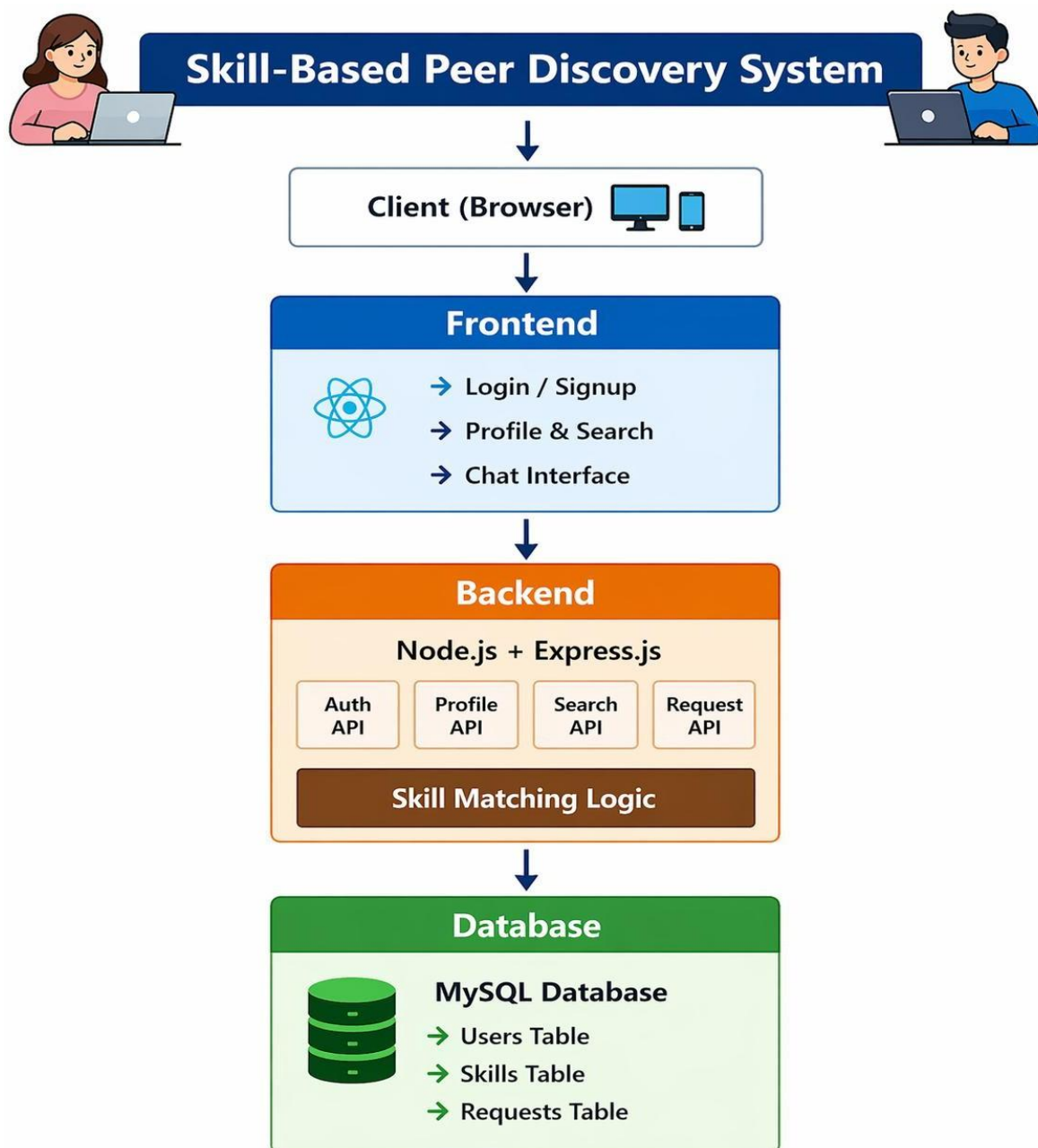


Figure. Overview of a skill-Based peer discovery system

V. COMPONENT USED

Component	Requirement / Purpose
Operating System	Windows 10/11, or any OS supporting web browsers
Programming Language	Frontend: HTML/CSS/JavaScript, Backend: Node.js + Express.js
Database	MySQL (to store Student data,)
Web Server / Hosting	Apache / Firebase Hosting (for web portal)
IDE / Tools	VS Code (for web/backend development)

CONCLUSION

The proposed Skill Connect system presents a simple and practical solution to solve multiple real-world problems related to services, employment, and innovation. The platform brings together local service discovery, remote job opportunities for disabled individuals, and an idea-sharing system into a single application. This combined approach helps reduce the gap between people, skills, and opportunities. The system allows users to easily find nearby workers, while also giving small-scale service providers better visibility. At the same time, it supports disabled

individuals by providing access to skill-based online jobs, helping them work without facing physical challenges. In addition, the innovation module creates a useful space where students can share their ideas and connect with industries for support and collaboration. The results show that the system works effectively under normal conditions and provides a smooth user experience. The role-based design makes the platform easy to understand and use. Compared to existing platforms that focus on only one area, this system provides a more complete and useful solution. Although the current system is developed as a prototype, there are still areas for improvement. Future work can include adding AI-based recommendations, improving security, supporting multiple languages, and integrating real-time features such as maps and advanced payment systems.

In conclusion, Skill Connect is a step towards building a more inclusive and connected digital environment. It not only helps people find work and services but also supports innovation and equal opportunity, making it a valuable solution for real world applications.

Discussion From the results, it is clear that the Skill Connect platform successfully solves the problems identified earlier. First, it reduces the difficulty of finding local workers. Users can directly view available workers instead of depending on personal contacts. Second, it provides a working solution for disabled individuals by giving them access to remote job opportunities. This improves inclusivity. Third, it creates a new space for students and innovators to share ideas and connect with industries. This helps in turning ideas into real opportunities. Unlike

existing platforms, this system combines all these features into one application, making it more practical and useful.

E. Limitations

Somelimitations were observed during testing:

The system currently supports a limited number of users In conclusion, Skill Connect is a step towards building a more inclusive and connected digital environment. It not only helps people find work and services but also supports innovation and equal opportunity, making it a valuable solution for real world applications.

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