

# SkillPath Pro Project Proposal

## Group 9

Advitiya Sharda - 300395470

Jaspreet Baweja - 300393820

Dilpreet Sandhu - 300389106

Sitao Zheng - 300394733

Faculty of Commerce & Business Administration, Douglas College

CSIS 3275: Software Engineering - 001

David Chou

25th January 2025

# Project Description

Navigating today's job market often feels like solving a puzzle without all the pieces. Professionals know they need to improve their skills, but *what* to learn and *how* to prioritize those skills remains unclear. Existing platforms like LinkedIn Learning offer courses but lack actionable frameworks to connect learning to career outcomes. For example, a recent computer science graduate might master Python through online courses but still miss critical DevOps tools like Docker or Kubernetes—skills explicitly demanded by employers. This disconnects between learning and real-world requirements fuels frustration and underemployment.

**SkillPath Pro** addresses this gap as a streamlined web application designed to help users map career goals, identify skill gaps, and track progress. Built for simplicity and practicality, this project focuses on three core user groups:

- **Recent Graduates:** A computer science graduate targeting DevOps role often lacks proficiency in industry-critical tools like Docker (#2 DevOps tool in 2024) and Jenkins (#1 CI/CD tool), despite 80% of employers prioritizing these skills for automation pipelines.<sup>1</sup> SkillPath Pro provides a checklist of industry-specific requirements, turning academic knowledge into job-ready skills.
- **Mid-Career Changers:** Consider a retail manager transitioning to tech project management. They need to identify transferable skills (e.g., team coordination) while acquiring new ones (Agile methodologies, Jira). The project highlights these gaps and prioritizes affordable, time-efficient learning resources.
- **Upskilling Employees:** An IT professional seeking to specialize in cybersecurity may struggle to balance work with learning. SkillPath Pro creates a phased plan, breaking down certifications like CompTIA Security+ into manageable weekly goals.

These users represent a growing need. The global e-learning market is projected to grow at a CAGR of 8.56%, reaching \$185.2 billion in 2025<sup>2</sup>, reflects the demand for tools that bridge education and employment.

## How SkillPath Pro Works

The project's design prioritizes simplicity to align with a student team's capabilities:

1. **Goal-Setting Wizard:** Users select a target role (e.g., "Frontend Developer") to generate a checklist of required skills, tools, and certifications.
2. **Skill Gap Analysis:** A basic scoring system (not AI) compares user-inputted skills with role requirements. For instance, a user targeting data science roles might score 60/100 due to missing Python libraries like Pandas.
3. **Curated Learning Plans:** Resources are manually mapped to roles during development (e.g., freeCodeCamp's React course for frontend roles) to avoid complex AI recommendations.
4. **Progress Dashboard:** A visual timeline tracks completed courses, certifications, and projects. Users can export summaries to share with mentors or employers.

Unlike LinkedIn Learning's focus on course libraries, SkillPath Pro emphasizes *career alignment*—connecting learning to job requirements. For example, a user preparing for a UX design role isn't just told to "learn Figma" but guided through a sequence: Figma basics → portfolio project → internship opportunities.

The project's design directly addresses the struggles of its users:

---

<sup>1</sup> The 10 Best DevOps Tools For 2024 & Beyond, <https://qiita.com/babita/items/ae18fbdd5f07966a149>. Accessed 25<sup>th</sup> Jan 2025.

<sup>2</sup> eLearning Statistics 2025, <https://elearningstats.education/>. Accessed 25<sup>th</sup> Jan 2025.

- **Recent Graduates** waste time guessing which skills to highlight. SkillPath Pro’s DevOps checklist, for instance, prioritizes Jerkin, Docker, and AWS—tools critical for roles they target but often overlooked in academia.
- **Mid-Career Changers**, like the retail manager transitioning to tech project management, often misalign their learning with market needs. The app flags gaps in tools like Jira and Agile methodologies, ensuring they focus on high-impact skills.
- **Upskilling Employees**, such as the IT professional pursuing cybersecurity, need to demonstrate ROI on their learning. The dashboard generates shareable reports (e.g., “Completed 8/12 tasks in 15 days for preparing CompTIA Security+ certificate”), making it easier to justify promotions.

## Technical Approach for a Student Team

Given a 10-week timeline and a team of four with basic Java/Web skills, the project will leverage:

- **Frontend:** React.js for a responsive interface (priority: goal-setting wizard and dashboard).
- **Backend:** Java Spring Boot for RESTful APIs handling user profiles and skill checklists.
- **Database:** MySQL for storing user data and predefined role requirements (e.g., “Data Analyst” = SQL + Python + Tableau).
- **Third-Party Data:** Static job market insights (e.g., common skills from Indeed job postings) preloaded into the database.

## Feasible 10-Week Roadmap

Timeline	Phase	Key Milestones
Weeks 1-2	Prototype Setup	Basic React app with login; Spring Boot API skeleton + MySQL.
Weeks 3-6	Core Features	Role selection; Skill checklist generator + scoring; Progress dashboard visualization.
Weeks 7	Courses Data Integration	Mapped freeCodeCamp, Coursera courses.
Weeks 8-9	Testing and Polish	Usability feedback from classmates; simplified UI navigation.
Week 10	Final Demo	Working prototype

By focusing on a minimal viable product (MVP) with manually curated role requirements and resources, the team avoids overcomplicating the project while delivering tangible value. The project’s modular design also allows future teams to expand features (e.g., job board APIs) without rebuilding core components.

In summary, SkillPath Pro tackles a real-world problem with a student-friendly approach. By streamlining career planning into actionable checklists and progress tracking, it empowers users to focus on learning what matters. While the project has limitations (e.g., mock data instead of live job feeds), it establishes a foundation that future teams could expand with AI or API integrations. For now, it delivers a practical, scalable tool that aligns with both user needs and course constraints—proving that even small projects can make a meaningful impact.

# User Stories

## Epic 1: User Registration and Profile Management

### 1. User Account Registration

As a new user, I want to sign up using my email and password so that I can securely access the platform.

Acceptance Criteria:

- **Given** a new user navigates to the signup page,  
**When** they enter a valid email (e.g., "[user@domain.com](mailto:user@domain.com)") and a password meeting strength requirements (8+ characters, 1 uppercase, 1 number),  
**Then** the system sends a confirmation email to the provided address.
- **Given** a new user submits an invalid email (e.g., "user@domain"),  
**When** they click "Sign Up,"  
**Then** the system displays an error: "Invalid email format."
- **Given** a new user submits a weak password (e.g., "pass123"),  
**When** they click "Sign Up,"  
**Then** the system displays an error: "Password must contain at least 8 characters, including one uppercase letter and one number."
- **Given** a user has received a confirmation email,  
**When** they click the confirmation link within 24 hours,  
**Then** their account is activated, and they are redirected to the profile setup page.
- **Given** a user tries to sign up with an email already registered,  
**When** they click "Sign Up,"  
**Then** the system displays an error: "Email already in use. Please log in or reset your password."

### 2. User Login

As a returning user, I want to log in with my credentials so that I can view my personalized dashboard.

Acceptance Criteria:

- **Given** a registered user enters their correct email and password,  
**When** they click "Log In,"  
**Then** the system authenticates them and redirects to their personalized dashboard.
- **Given** a user enters an incorrect password,  
**When** they click "Log In,"  
**Then** the system displays an error: "Invalid email or password."
- **Given** a user enters an unregistered email,  
**When** they click "Log In,"  
**Then** the system displays an error: "Account not found. Please sign up."
- **Given** the user has not verified their email,  
**When** they attempt to log in,  
**Then** the system displays an error: "Please verify your email first."
- **Given** a user has exceeded 3 failed login attempts,  
**When** they try again,  
**Then** the system temporarily locks the account and displays: "Account locked. Reset your password or try again in 15 minutes."

### 3. Profile Customization

As a user, I want to edit my profile to include my career stage (e.g., recent graduate), current skills, and work experience so that SkillPath Pro can tailor my gap analysis.

Acceptance Criteria:

- **Given** the user is on their profile page,  
**When** they select a career stage (e.g., "Recent Graduate") from the dropdown,  
**Then** the selection is saved and displayed on their profile.

- **Given** the user selects skills (e.g., "Python," "Git") from a predefined list,  
**When** they click "Save Changes,"  
**Then** the skills are stored and reflected in their skill gap analysis.
- **Given** the user edits their work experience (e.g., selects "1-3 years" from a dropdown),  
**When** they save the changes,  
**Then** the experience level is used to prioritize learning resources.
- **Given** the user leaves the career stage field blank,  
**When** they attempt to save their profile,  
**Then** the system displays an error: "Career stage is required."

#### 4. Password Recovery

As a user, I want to reset my password via email verification so that I can regain access if I forget my credentials.

Acceptance Criteria:

- **Given** a user clicks "Forgot Password" and enters their registered email,  
**When** they submit the form,  
**Then** the system sends a password reset link to their email.
- **Given** a user clicks an expired password reset link (older than 24 hours),  
**When** they attempt to reset their password,  
**Then** the system displays an error: "Link expired. Request a new reset link."
- **Given** a user clicks a valid reset link,  
**When** they enter a new password meeting strength requirements,  
**Then** the system updates their password and sends a confirmation email.
- **Given** a user enters a new password identical to their current password,  
**When** they click "Reset Password,"  
**Then** the system displays an error: "New password must differ from your current one."

## Epic 2: Goal-Setting Wizard

#### 5. Role Selection

As a user, I want to select a target role (e.g., DevOps Engineer) from a predefined list so that the platform generates a skill checklist.

Acceptance Criteria:

- **Given** a logged-in user navigates to the Goal-Setting Wizard,  
**When** the page loads,  
**Then** the system displays a dropdown list of predefined roles (e.g., "Frontend Developer") pulled from the database.
- **Given** a user selects "DevOps Engineer" from the dropdown,  
**When** they click "Next,"  
**Then** the system displays a checklist of required skills (e.g., Docker, AWS).
- **Given** a user tries to proceed without selecting a role,  
**When** they click "Next,"  
**Then** the system displays an error: "Please select a target role."

#### 6. Role Requirements Overview

As a user, I want to view the required skills, tools (e.g., Docker), and certifications for my selected role so that I can prioritize learning.

Acceptance Criteria:

- **Given** a user has selected "Cybersecurity Specialist" as their target role,  
**When** they view the role requirements page,

- Then** the system displays categorized skills (e.g., "Certifications: CompTIA Security+", "Tools: Wireshark").
- **Given** a role has both required and optional skills,
  - When** the user views the checklist,
  - Then** required skills are marked with an asterisk (\*), and optional skills are labeled "Recommended."
- **Given** the user has not selected a role,
  - When** they attempt to view requirements,
  - Then** the system redirects them to the role selection page.
- 7. Goal Persistence
 

As a user, I want to save my selected role to my profile so that my dashboard reflects my current career goals.

Acceptance Criteria:

  - **Given** the user selects a role and clicks "Save Goal",
    - When** they visit their dashboard,
    - Then** the selected role is displayed under "Current Career Goal."
  - **Given** the user has not saved a role,
    - When** they visit their dashboard,
    - Then** the system displays a prompt: "Set your career goal to get started."
  - **Given** the user's selected role is saved,
    - When** the admin updates the role's requirements,
    - Then** the user's saved role remains unchanged unless they reselect it.
- 8. Goal Flexibility
 

As a user, I want to update my target role if my career focus shifts so that my skill gap analysis stays relevant.

Acceptance Criteria:

  - **Given** the user edits their profile and selects a new role (e.g., "Cybersecurity Specialist"),
    - When** they save the change,
    - Then** the system recalculates their skill gaps based on the new role.
  - **Given** the user updates their role,
    - When** they view their dashboard,
    - Then** the new role and updated progress metrics are displayed.
  - **Given** the user changes their role,
    - When** they revisit their learning plan,
    - Then** the system shows recommendations aligned with the new role.

### Epic 3: Skill Gap Analysis

- 9. Skill Inventory Input
 

As a user, I want to input my current proficiency in skills (e.g., Python, Agile) so that the system identifies gaps against my target role.

Acceptance Criteria:

  - **Given** the user has selected a target role (e.g., "DevOps Engineer"),
    - When** they rate their proficiency in a required skill (e.g., "Docker" as Intermediate),
    - Then** the skill and rating are saved to their profile.
  - **Given** the user tries to submit the skill form without selecting a proficiency level,
    - When** they click "Save Skills,"
    - Then** the system displays an error: "Please rate all selected skills."
  - **Given** the user adds a skill not required for their target role (e.g., "Photoshop"),
    - When** they save their profile,
    - Then** the skill is stored but does not affect their gap score.

- **Given** the user updates an existing skill's proficiency (e.g., changes "Git" from Beginner to Advanced),  
**When** they save the changes,  
**Then** the system recalculates their gap score and updates the dashboard.

#### 10. Skill Comparison Interface

As a user, I want to see a side-by-side view of my current skills vs. role requirements, with color-coded gaps (e.g., red for missing skills), so that I can focus on missing competencies.

Acceptance Criteria:

- **Given** the user has a saved target role and inputted skills,  
**When** they view the skill comparison page,  
**Then** they see two columns: "Your Skills" (green for met, yellow for partial) and "Required Skills" (red for missing).
- **Given** a required skill (e.g., "Jenkins") is missing from the user's profile,  
**When** they hover over the red "Missing" label,  
**Then** a tooltip appears: "Learn Jenkins to automate CI/CD pipelines."
- **Given** the user has not selected a target role,  
**When** they navigate to the skill comparison page,  
**Then** the system redirects them to the role selection page.

#### 11. Proficiency Scoring

As a user, I want to see a numerical score (e.g., 65/100) and progress bar reflecting my readiness for the target role so that I can measure improvement over time.

Acceptance Criteria:

- **Given** the user has met 6 out of 10 required skills for their role,  
**When** they view their dashboard,  
**Then** they see a score of "60/100" and a progress bar at 60%.
- **Given** the user completes a skill (e.g., marks "AWS" as Advanced),  
**When** they refresh the dashboard,  
**Then** their score increases proportionally (e.g., from 60 to 70).
- **Given** the user changes their target role,  
**When** they view the score,  
**Then** it reflects gaps against the new role's requirements.
- **Given** the user has no skills input,  
**When** they view their score,  
**Then** it displays "0/100" with an empty progress bar.

#### 12. Skill Updates

As a user, I want to edit my skill inventory over time to reflect new certifications or experience so that my gap analysis stays accurate.

Acceptance Criteria:

- **Given** the user edits their "Python" proficiency from "Intermediate" to "Advanced,"  
**When** they save the change,  
**Then** the gap analysis removes "Python" from the missing skills list.
- **Given** the user adds a new skill (e.g., "AWS") from the predefined list,  
**When** they rate it as "Intermediate,"  
**Then** the system includes it in their profile and updates their score.
- **Given** the user removes a skill (e.g., "Agile") from their profile,  
**When** they save the change,  
**Then** the system recalculates their score and updates the gap analysis.

## Epic 4: Learning Plan Curation and Course Integration

### 13. Curated Learning Resources

As a user, I want the system to recommend free/paid courses (e.g., freeCodeCamp's React tutorial) and certifications mapped to my skill gaps so that I know where to focus.

Acceptance Criteria:

- **Given** the user has a gap in "Docker,"  
**When** they view recommendations,  
**Then** they see "Docker Essentials" course from freeCodeCamp prioritized at the top.
- **Given** a skill (e.g., "Jira") has no mapped resources in the database,  
**When** the user views recommendations,  
**Then** the system displays: "No resources found for this skill. Check back later."
- **Given** the user has no skill gaps,  
**When** they view recommendations,  
**Then** the system displays: "Great job! You've met all required skills."

### 14. Learning Plan Saving

As a user, I want to add resources to a "My Learning Plan" section so that I can track enrolled courses and planned certifications in one place.

Acceptance Criteria:

- **Given** the user clicks "Add to Plan" on the "React Basics" course,  
**When** they navigate to "My Learning Plan,"  
**Then** the course appears in their list with a "Not Started" status.
- **Given** the user tries to add the same resource twice,  
**When** they click "Add to Plan,"  
**Then** the system displays: "This resource is already in your plan."
- **Given** the user logs out and logs back in,  
**When** they view "My Learning Plan,"  
**Then** all saved resources are retained.

### 15. Progress Marking

As a user, I want to mark resources as completed (e.g., "Finished Udemy Python Course") so that my progress is visible.

Acceptance Criteria:

- **Given** the user toggles "Complete" on the "Python for Beginners" course,  
**When** they view their plan,  
**Then** the course moves to the "Completed" section, and their dashboard progress increases.
- **Given** the user unchecks a completed resource,  
**When** they save the change,  
**Then** the course moves back to "In Progress," and their progress decreases.

### 16. Course Details

As a user, I want to view course descriptions, durations, difficulty levels, and providers (e.g., Coursera vs. Udemy) before enrolling so that I can choose the best fit for me.

Acceptance Criteria:

- **Given** the user clicks on the "AWS Certification Guide" resource,  
**When** the modal opens,  
**Then** they see metadata: "Type: Certification; Duration: 20 hours; Provider: AWS Training."
- **Given** a resource has no duration defined,  
**When** the user views its details,  
**Then** the duration field displays: "Not specified."

### 17. Resource Filtering



As a user, I want to filter learning resources by type (course, article), duration (<10 hours), and cost (free only) so that I can narrow down options.

Acceptance Criteria:

- **Given** the user selects "Free" and "Certification" filters,  
**When** they apply the filters,  
**Then** only free certifications (e.g., "CompTIA Security+ Prep") are displayed.
- **Given** the user selects "Duration < 10 hours,"  
**When** they apply the filter,  
**Then** only resources under 10 hours (e.g., "Git Crash Course: 2 hours") appear.

#### 18. Skill-Specific Resources

As a user, I want to see resources linked to specific skills (e.g., Jira → Atlassian's Jira guide) so that I can address specific gaps.

Acceptance Criteria:

- **Given** the user clicks on the "Jira" skill in their gap analysis,  
**When** the modal opens,  
**Then** they see "Atlassian's Jira Guide" and "Jira for Beginners" courses.
- **Given** a skill (e.g., "Kubernetes") has no linked resources,  
**When** the user clicks on it,  
**Then** the modal displays: "No resources available. Contact us to suggest one."

### Epic 5: Progress Tracking and Dashboard

#### 19. Progress Dashboard

As a user, I want a dashboard showing my overall completion percentage, skill category progress bars, and recent achievements so that I can track growth at a glance.

Acceptance Criteria:

- **Given** a user has selected a target role (e.g., "Frontend Developer")  
**And** completed 2/5 courses in their learning plan,  
**When** they view their dashboard,  
**Then** the system displays a progress bar showing "40% Overall Completion."
- **Given** a user has updated their skill inventory (e.g., marked "Git" as Intermediate),  
**When** they refresh the dashboard,  
**Then** the skill progress bars reflect the updated proficiency levels.
- **Given** a user has no completed courses or updated skills,  
**When** they view the dashboard,  
**Then** the system displays a message: "Start your first course to track progress!"

#### 20. Learning Timeline

As a user, I want to see a timeline of completed courses and upcoming deadlines so that I can plan my schedule.

Acceptance Criteria:

- **Given** a user adds a deadline for "Complete Docker Basics by Jan 20,"  
**When** they navigate to the timeline,  
**Then** the deadline appears under "Upcoming Activities" with a yellow "Pending" tag.
- **Given** a user marks "Python Course" as completed on Jan 5,  
**When** they view the timeline,  
**Then** the activity appears under "Completed" with a green checkmark and date.
- **Given** a user has overlapping deadlines (e.g., two courses due on the same date),  
**When** they view the timeline,  
**Then** the system stacks activities vertically for clarity.

#### 21. Progress Export

As a user, I want to export my progress report as a PDF with my profile picture, skill scores, and completed courses so that I can share it with mentors or employers.

Acceptance Criteria:

- **Given** a user clicks "Export PDF" from their dashboard,  
**When** the PDF generates,  
**Then** it includes their profile picture, readiness score (e.g., 65/100), and list of completed courses.
- **Given** a user selects "Highlight Certifications" in the export settings,  
**When** they generate the PDF,  
**Then** certifications appear in a dedicated section at the top of the document.
- **Given** a user tries to export a report with no completed courses,  
**When** they click "Export PDF,"  
**Then** the system displays a warning: "No progress to export. Complete a course first."

## 22. Skill Progress Visualization

As a user, I want color-coded progress bars (e.g., green for "Completed," yellow for "In Progress") for each skill category (e.g., "DevOps Tools") so that I can quickly assess my development.

Acceptance Criteria:

- **Given** a user completes all resources linked to the "DevOps Tools" skill category,  
**When** they view the dashboard,  
**Then** the progress bar for that category turns green with "100% Complete."
- **Given** a user clicks the "In Progress" (yellow) bar for "Certifications,"  
**When** the drill-down modal opens,  
**Then** it lists specific incomplete certifications (e.g., "AWS Certified Solutions Architect").

## 23. External Achievement Logging

As a user, I want to manually add external achievements (e.g., "Completed Hackathon") with dates and descriptions so that I can track all my activities in one place.

Acceptance Criteria:

- **Given** a user navigates to "Add Achievement,"  
**When** they enter "Won Programming Hackathon" with a date and description,  
**Then** the achievement appears on their timeline with a custom trophy icon.
- **Given** a user submits an achievement without a title,  
**When** they click "Save,"  
**Then** the system displays an error: "Title is required."

## 24. Deadline Reminders

As a user, I want email notifications for upcoming deadlines (e.g., "3 days left to complete Jira Basics") so that I stay on track with my goals.

Acceptance Criteria:

- **Given** a deadline for "Jira Basics" is set to Jan 25,  
**When** the system detects the date is 7 days away,  
**Then** the user receives an email: "Complete Jira Basics in 7 days."
- **Given** a user disables reminders in their notification settings,  
**When** a deadline approaches,  
**Then** no email is sent.

# Epic 6: Basic Administrative Backend (MVP Stretch)

## 25. Role Management

As an admin, I want to add/edit/delete roles (e.g., "Cybersecurity Analyst") and their associated skills via a secure dashboard so that the platform stays relevant.

Acceptance Criteria:

- **Given** an admin adds a new role "Cloud Architect" with skills "AWS, Terraform,"  
**When** they save the role,  
**Then** it appears in the user's role selection dropdown within 5 minutes.
- **Given** an admin tries to delete a role assigned to 10+ users,  
**When** they confirm deletion,  
**Then** the system displays a warning: "This role is in use. Reassign users first."

## 26. Resource Linking

As an admin, I want to associate learning resources (e.g., Coursera's "Agile 101") with specific skills (e.g., "Agile Methodologies") skills so that users receive accurate recommendations.

Acceptance Criteria:

- **Given** an admin maps "Coursera's Agile 101" to the "Agile Methodologies" skill,  
**When** a user with that skill gap views their learning plan,  
**Then** the course appears under "Recommended Resources."
- **Given** an admin tries to link a resource to a non-existent skill,  
**When** they click "Save,"  
**Then** the system displays an error: "Skill not found. Update the skill list first."

## Peer Evaluation Matrix

Evaluator \ Evaluate	Sitao Zheng	Dilpreet Sandhu	Jaspreet Baweja	Advitiya Sharda
Sitao Zheng		4	4	4
Dilpreet Sandhu	5		4	4
Jaspreet Baweja	4	4		4
Advitiya Sharda	4	4	4	