PES UNIVERSITY, BANGALORE

Department of Computer Science and Engineering

B. Tech (CSE) – 5th Semester – Aug-Dec 2024
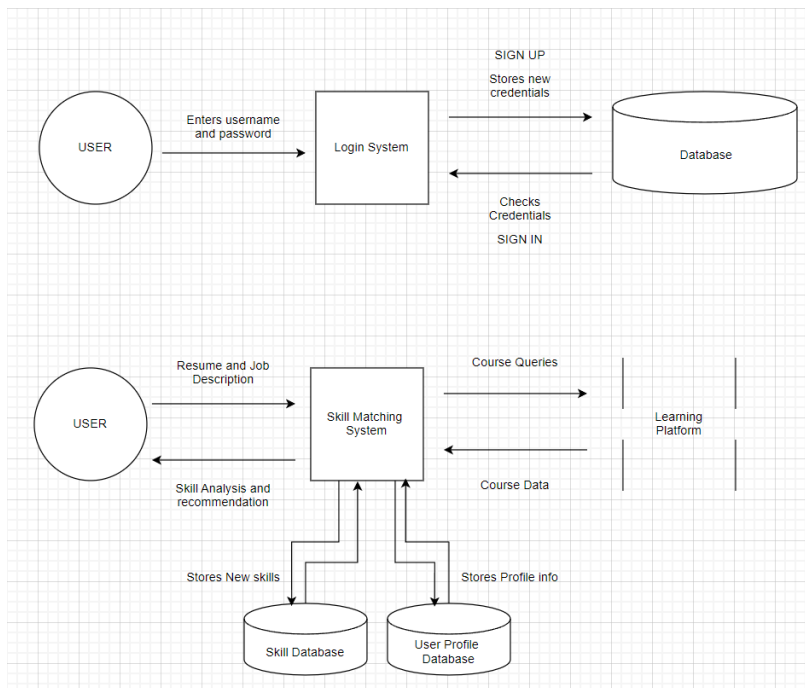
**UE22CS303 - Software Engineering**

**DESIGN DOCUMENT**

*Automated Skill Matching and Gap Analysis Tool*

Team #: 33

| PES2UG22CS591 | Suhit Hegde |
|---------------|-------------|
| PES2UG22CS618 | Tanistha Hota |

*Design Diagrams*

Diagrams of Levels of DFD

## *Architectural Design*

The architecture is organized into four main layers:

1. **Presentation Layer**
   - Web Interface for user interactions
   - Interactive Dashboard for data visualization
2. **Application Layer**
   - Document Parser Service: Handles resume and job description processing
   - Skill Matcher Service: Performs skill comparison
   - Gap Analyzer Service: Identifies skill gaps
   - Recommendation Engine: Generates personalized learning paths
3. **Data Layer**
   - User Database: Stores user profiles, preferences, and history
   - Skill Database: Contains skill taxonomies and relationships
   - Course Database: Stores learning resource metadata
4. **External Services**
   - Learning Management Systems: Integration with external learning platforms
   - NLP Services: For advanced text processing and analysis

## Modularity

- Each component (Parser, Matcher, Analyzer, Recommendation Engine) is independent

- Services can be developed, tested, and deployed separately

- Easier to assign different teams to different modules

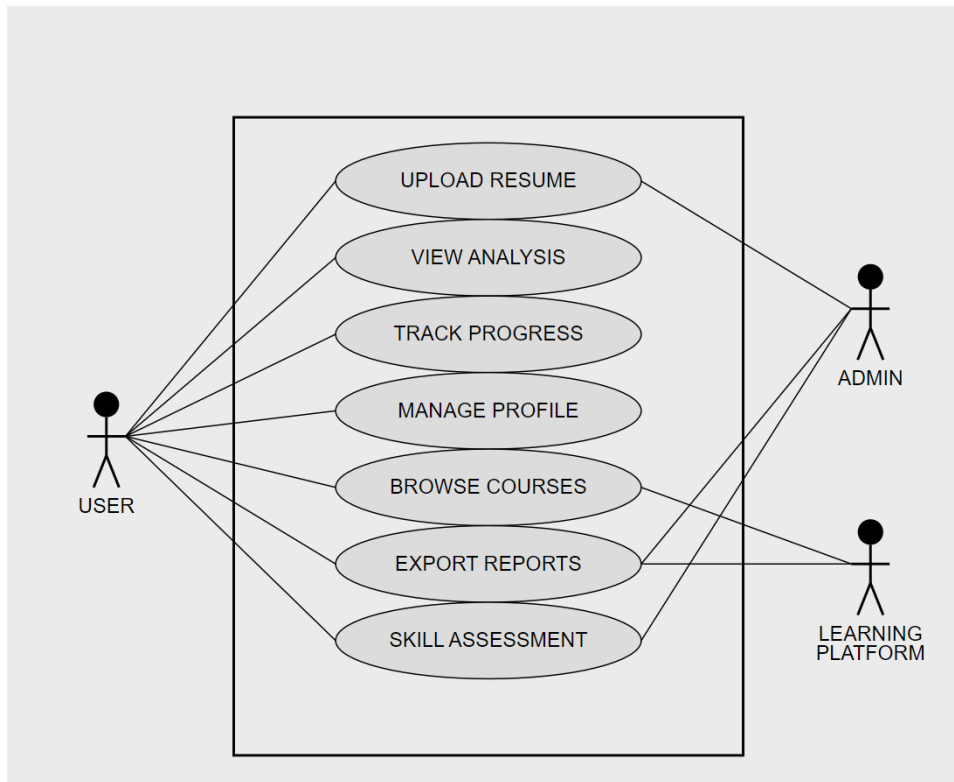- Components can be replaced or upgraded without affecting others

## Scalability

- Layered architecture allows horizontal scaling of individual components

- Separation of concerns enables adding more processing nodes as needed

- Database layer can be scaled independently based on data growth

- External services integration via APIs allows for easy expansion

## Maintainability

- Clear separation between presentation, business logic, and data layers

- Standardized interfaces between components

- Easy to identify and fix issues in specific modules

- Independent deployment reduces system-wide downtime

## Security

- Clear boundaries between system layers

- Authentication and authorization can be implemented at multiple levels

- Sensitive data can be isolated in secure databases

- API gateway can control access to different services

## Use Case Diagram

## Class Diagram