Illuminate: The One-Stop E-learning Platform for Working Professionals

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ABSTRACT

Software engineering is a dynamic and rapidly growing field with numerous opportunities for professional development. However, S.E. professionals face various obstacles that hinder their growth and development. Lack of skills while joining or starting a new position, lack of mentors in the workspace, difficulty in implementing knowledge, limited knowledge of expectations in real-life working scenarios, and difficulty while collaborating on projects all fueled our motivation for this project. With the ed-tech solutions currently available on the market, there has to be a platform that handles all the problems; users have to use several platforms to overcome these barriers. We introduce Illuminate, a new platform that serves as a one-stop shop for all the challenges that a software engineer or aspiring engineer might encounter. Our services include free courses and resources according to the current industry demands. A place catered to one-on-one mentoring: We will assign industry professionals as mentors to help users connect and outline the pathway to achieving their goals. A platform for project collaboration: where members of our community can work together on open-source projects that will strengthen their resumes. Ultimately, the tool aims to provide valuable insights for software engineers seeking to advance their careers and overcome the challenges of working in the industry.

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1 INTRODUCTION

Although the software engineering industry is a hotspot in the job sector, professionals in this field face a variety of problems on a day-to-day basis. These issues range from a lack of required skills when joining a new position to the gap in skill level experienced by working professionals who are trying to get a start in a new role. Additionally, newly graduated students often find that the coursework taught in school does not prepare them for the industry's current requirements.

Even when professionals are familiar with the various technologies and skills, there can be barriers to implementing the knowledge to arrive at a tangible solution. This could be due to a lack of experience, which can lead to confusion regarding expectations while working in real-life scenarios and difficulty collaborating on projects. More specifically, in Radermacher, Walia, and Knudson noted in a study regarding the skill gap between graduating students and industry requirements that students' lack of preparation encompassed "communication ability, familiarity and proficiency with software tools, and an understanding of software engineering concepts such as software development processes" [1]. Although proper support and mentoring can help navigate these issues, finding mentors who are keen and committed can be challenging.

Illuminate offers solutions to these problems through an e-learning platform that acts as a one-stop-shop, guiding working professionals from the beginning to the end. The platform offers a wide variety of features such as free course recommendations and reading materials, suggestions for project topics and problem statements to work on, and the option to collaborate with others who are either learning similar skills or working on similar projects. Users can also get in touch with mentors and experts in the field to get relevant advice and suggestions. As a result, the users also get an opportunity to network and build their profile within the industry.

The platform categorizes users based on several attributes, such as the number of years of working experience, the field in which they have experience, and the skills they are aiming to learn, and curates relevant suggestions. It helps software engineering professionals be more confident in their skills, allowing them to present their views and solutions. Collaborating on projects enables professionals to get hands-on experience while working in a team. Professionals can share the guidance they received from their mentors and help peers improve their work. Overall, Illuminate helps software engineering professionals be industry-ready.

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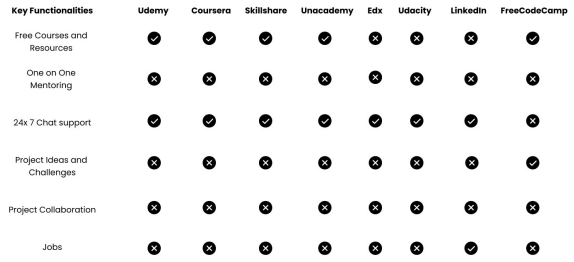

Key Functionalities	Udemy	Coursera	Skillshare	Unacademy	Edx	Udacity	LinkedIn	FreeCodeCamp
Free Courses and Resources	✓	✓	✓	✓	✗	✗	✗	✓
One on One Mentoring	✗	✗	✗	✗	✗	✗	✗	✗
24x 7 Chat support	✓	✓	✓	✓	✓	✓	✓	✗
Project Ideas and Challenges	✗	✗	✗	✗	✗	✗	✗	✓
Project Collaboration	✗	✗	✗	✗	✗	✗	✗	✗
Jobs	✗	✗	✗	✗	✗	✗	✓	✗

Figure 1: Competitive Analysis of Related E-learning Apps

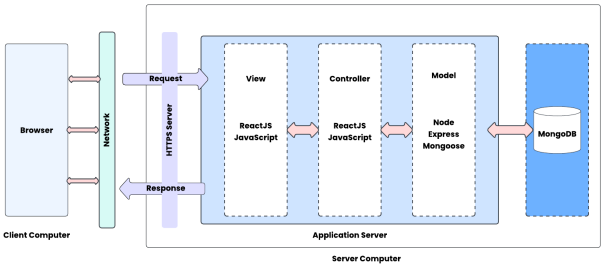

Figure 2: Tiered Architecture Design

2 COMPETITIVE ANALYSIS

Based on the concept of Illuminate we listed out eight applications that share a similar core idea with our product, i.e, a learning platform for a target audience. We compared these websites based on six key functionalities designed for Illuminate. The features are as follows: free courses and resources, one on one mentoring, 24 x7 chat support, project ideas and challenges, project collaboration, and jobs.

We aim to have links to free courses and resources as well as courses uploaded directly to our platform as a later functionality. Furthermore, we want to give the user access to one-on-one mentoring where they can connect to a mentor through different means (message, email, chat, calendar appointment, etc), and 24x7 chat support. In addition, we aim to provide the user with a means to collaborate on projects with others and pitch their own ideas or projects they're working on. Lastly, we also aim to show job listings related to the skills or positions the user shows interest in.

In our analysis, we noted that none of the e-learning platforms have a means to show job listings in addition to courses.In addition, none of these e-learning platforms provide a specific platform dedicated to project collaboration. While LinkedIn Learning provides courses along with job listings, it does not give free access to everyone. Moreover, while it does provide a way for users to collaborate, the process is not as streamlined as we aim to make ours. As a general observation from our own experience as well as competitive analysis in the tech industry, we have noticed that there are many tools available for different aspects of personal and professional growth, but keeping track of a growing set of tools can stretch one thin. We noticed that not only does no platform encompasses all features that we plan to implement, but also none implement any more than two of the features we have listed. Because we see a lack of a congregation of these features, a "one-stop shop" for software professionals as well as amateurs, we believe pursuing this project will be a useful venture.

3 HIGH-LEVEL ARCHITECTURE DESIGN

We will be utilizing a layered or tiered architecture as this will be a web application More specifically, we will be using the MERN (MongoDB, ExpressJS, ReactJS, NodeJS) stack with a Model-View-Controller design pattern. The View layer is what the user's browser will directly interact with over the network, and the Controller layer will serve as the abstraction between the Model and View layers. We will be using MongoDB which is a NoSQL database, which will be used to store the data. We are using NoSQL Database because it has flexible data models which are easier to scale. We will use NodeJS and ExpressJS to interact with the database and perform CRUD (Create, Read, Update, Delete) operations, and implement the business logic Using NodeJS and ExpressJS. We would implement the front-end of the application using ReactJS which will interact with the APIs.

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[1] Alex Radermacher, Gursimran Walia, and Dean Knudson. 2014. Investigating the Skill Gap between Graduating Students and Industry Expectations. In *Companion Proceedings of the 36th International Conference on Software Engineering* (Hyderabad, India) *(ICSE Companion 2014)*. Association for Computing Machinery, New York, NY, USA, 291–300. https://doi.org/10.1145/2591062.2591159