

# SE-VAULT: A one-stop resource for all Software Engineers

– made with passion by developers for next-gen developers

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## ABSTRACT

COVID-19 has wreaked havoc on the majority of the world's industries of which the software industry is one of them. It showed companies the importance of having better tools for knowledge management and establishing a digital presence. As a result, many organizations have to revamp their development and training programs. Apart from this, COVID-19 has also impacted the mental health of employees resulting in poor productivity. Our product SE-VAULT aims to make learning easy and effective. The only constraint in the software industry is the rapidly changing technologies which keep emerging day-by-day. This application will help new and existing software engineers learn and make the transition to new technologies easier and enjoyable. The application also focuses on the mental well-being of the users which is just as important as technical skills. It also helps beginners in the software industry interact with their mentors by streamlining virtual knowledge transfer sessions. Lastly, this application acts as a one-stop resource for all software engineers that also makes learning efficient serving for both personal and professional development.

## KEYWORDS

*Software Development during COVID-19, Productivity, Mental Well-being, Digital Collaboration, Training & Development, Structural Design Pattern.*

## 1 INTRODUCTION

During these difficult times of the COVID-19 pandemic, the software industry had to undergo tremendous changes in terms of the usual working environment [1]. Companies had to quickly adapt to the 'new normal' working

conditions i.e., working and collaborating from home. Additionally, workplaces offer Training and Development programs which are essential to new graduates as well as existing employees who are looking to expand their skill sets. This program also plays an important role for the onboarding employees who recently joined the company. Due to this digital-shift, the career development program, which was mostly offered in-person, is being shifted to the virtual platforms. Furthermore, apart from just technical training, there is a growing need for organizations to provide moral and mental support to its employees in the ongoing pandemic period.

We tried to analyze the changes that took place in the software industry during the COVID-19 pandemic. One study [2] shows that companies failed to adapt to these new-normal conditions. As per this study, mental well-being of employees was not handled well. It was also found that the stress level increased among the employees. Another key takeaway from the paper was that mentoring activity has significantly decreased. These findings highlight the important underlying issues which need to be resolved as they can affect the overall development process in the long run [3].

SE-VAULT is our joint effort aimed towards solving these issues. It is a web application which sets a strong, all-round foundational stage for beginners and enables them to excel in the industry training programs and fulfill the expected job requirements. Some of the key features of this web application include:

- 1) Video Streaming across different categories.
- 2) Recreational Sessions.
- 3) Links to useful literature.
- 4) Focus on mental well-being.

SE-VAULT will follow Model-View-Template architecture. It will use Python-Django for back-end along with MySQL database. The front-end of the application will be designed

using HTML5, CSS3 and JavaScript. The detailed illustration is explained through the architecture diagram.

## 2 RELATED WORK

### 2.1 Training and Professional Development Programs

Training and development programs play a crucial role in employee growth. One popular study [4] on this states that an effective training program enhances employee performance which in turn helps organizations hold a good place in the market. Another article [5] proclaims that there is a need for companies to re-engineer their training and professional development programs. Here, the author suggests an idea to integrate self-paced and on-demand digital learning. We adopt this idea of learning in our implementation.

### 2.2 Mental well-being of Employees

[unmind.com](http://unmind.com) is a mental well-being platform for employees. It has a massive library of unique subjects like fitness, lifestyle, and events. We incorporate this idea of using different recreational events in our webapp.

### 2.3 Knowledge Transfer Sessions

A study on mentoring programs for knowledge transfer has been conducted in a small-scale software company [6]. This study suggests that effective monitoring always contributes to a positive attitude towards work and career. Another study [7] proposes the implementation of an interactive web-based platform to improve the interaction between senior employees and beginners in the software industry. Future work of this research recommends combining interactive approaches with video-based learning which will add depth to the current material and also help employees learn at their own pace. Finally, we explore the idea of combining these two approaches to help software engineers have a better understanding of SE processes and workflows.

## 3 ARCHITECTURAL DESIGN

SE-VAULT follows a mix of event-based and layered architectural design patterns. Since Python and Django are used for the back-end of the application, the architecture that we'll use will largely be the *Model-View-Template* (MVT). Main functionality will be written in the *View* part. Database schema will be designed in the *Model* part and front-end of the application will be in the *Template* files. Basically, whenever the user tries to access the website, the view will fire the required template allowing the user to see

the appropriate template on the screen. For instance, when a user is not authenticated and is visiting the website for the very first time, the user will see the login page on the screen. This is because, in MVT design, every part of the architecture is a different entity which will provide us the required modularity for concurrent collaboration.

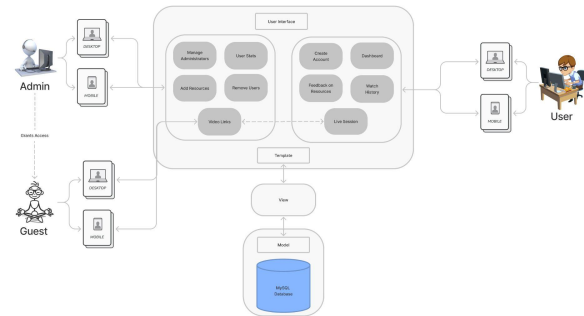


Fig1: Architecture Design for SE-VAULT

## 4 CONSTRAINTS

This web application has server constraints for streaming videos. If at one instance more than 10K+ users try to stream videos, then we will have to move to some higher end server capable of handling such traffic. Additionally, we are only permitting uploads in a limited number of formats.

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