

A Review of Enhanced Online Live Code Editors

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Abstract— This review paper provides a detailed review of online code editors. This project is based on web platforms and will allow programmers to write, compile and execute code in real time. It explores the different features of editors, including syntax highlighting, customizable user interface and code sharing. It improves the code's efficiency to improve the quality of code and performance. It gives freedom to run programming language without the need of any platform requirement to run programming language. There are also certain advantages and limitations that come while using live code editors for programming tasks including convenience, security issues. This paper provides information about various methods used in the development of editors, as well as their future work. It gives valuable resources for researchers interested in using live code editors. The main features available in our project are workspaces for writing, executing and building source code and a real-time result. This program supports Hyper Text Markup Language (HTML), Cascading Style Sheet (CSS) and JavaScript (JS) programming languages.

Index Terms- Web Platform, Code Editor, HTML, CSS, JS

I. INTRODUCTION

An online code editor is used to compile and run programming languages on a real-time basis. However, majority of programmers need to change the source code right away, and they might not be able to access these resources without first installing the necessary tools on their system. Using an online code editor,

developers can compile and run the source code using a web browser, and the code is generated. The result is then displayed in the client's browser. Because it offers a practical way to compile and run real-time programming languages without the need to install software on their computers, online code editors have grown in popularity among programmers in recent years. However, when developers use our online code editor, they can run the programming languages on the same platform, without installing any software to run code.

Online live code editors are designed to consume very few resources. These web-based applications can be accessed from a variety of gadgets, including computers, tablets, and smartphones, and allow developers to write, edit, and execute code using just a web browser. Our website is one such example of an online code editor. Some popular examples of such online compilers are Codechef and CodePad. The common way in which our website works is that users can

write or copy code in the code editor, which will compile the program in the backend on a real-time basis and display the result in the output window.

Our main goal is to provide a unique experience by altering the user interface and emphasizing the coding part. With its user-friendly interface and focus on identifying coding errors, it aims to offer developers a distinctive experience. Our website has a dark mode design that improves screen visibility while preserving battery life. Reviewing the features is crucial as the use of online development environments becomes more prevalent. In addition, live online code editors offer a collaborative setting for developers. Multiple users can work on the same codebase simultaneously in many online code editors, facilitating real-time collaboration and encouraging teamwork. The ability to easily share code with others is another important benefit of online live code editors. These editors frequently come with built-in sharing features that let programmers make their projects, code snippets, or entire development environments accessible to others via a straightforward URL.

Additionally, live online code editors provide a secure setting in which to test and experiment. This can be especially useful for developers who want to test new frameworks or techniques without affecting their local environment as well as for beginners learning to code. Online live code editors frequently include a wealth of features that improve productivity and the coding experience, such as syntax highlighting, auto-completion, error checking, and debugging tools. These tools can aid programmers in writing code more accurately and quickly, cutting down on errors and raising the code's overall quality.

Online live code editors do, however, have some drawbacks that are worth noting. In comparison to local development environments, they might not support all programming languages or have fewer features. The overall user experience may be impacted by the performance of online live code editors, which can be influenced by the reliability and speed of the internet connection. Security issues can arise, and developers must exercise caution when sharing information.

II. LITERATURE REVIEW

The primary focus of this literature review is to study the project based on online live code editors which relate to the creation of code editors for both web-based and programming languages. These are the following list of research articles that are available on the internet on online live code editors which includes a literature review that highlights the most important

conclusions from each publication and discusses relate to the project at hand.

"An Online Real-time Collaborative Code Editor for Learning Programming" by Lei Shi, Xiaohong Liu, and Yuhang Wang (2018) [1] - The creation of a real-time, collaborative online code editor for programming is covered in this paper. The code editor has functions like syntax highlighting and automated code completion and enables several users to work on the same code at once. The editor, according to the creators, enhanced students' coding skills and made studying more interesting. Relationship with our project: The creation of an online real-time collaborative code editor might be a useful complement to the ongoing project since it would enable numerous users to modify the same code at once, which could be very helpful for collaborative projects. The next paper which I reviewed is "A Web-Based Live Programming Environment for the R Language" by Timothy H. M. Chan (2017) [2] - The creation of a web-based live programming environment for the R language that enables users to create and run R code in real-time is described in this work. The author discovered that the live programming environment was user-friendly and offered people a practical approach to become familiar with and explore with R. Relationship to the current project: The current project's objective of enabling users to run both web-based and programming languages on a single platform may be relevant to the development of a web-based live programming environment for a particular programming language (in this case, R) as it demonstrates the potential advantages of providing an online platform for users to write and execute code in real time.

"Cloud Code: Collaborative Web-Based Development for Mobile Devices" by Michael D. Ekstrand, John C. Springer, and Diane J. Cook (2013) - The creation of Cloud Code, a web-based platform for mobile device programming that includes a code editor, a file management, and a compiler, is discussed in this article. The platform, according to the creators, offered customers a simple method for creating and testing code for mobile devices. Relationship to the ongoing project: The creation of Cloud Code illustrates the potential advantages of offering a web-based development platform with a code editor and other tools, which may be pertinent to the objective of the current project, which is to allow users to create and run code on a single platform. [3] "A Blocks-Based Editor for HTML Code" published in 2015 - The author of the paper introduces a block programming HTML code editor that shows HTML syntax as blocks. The editor was developed as an addition to droplet, a framework for dual-mode JavaScript and Coffee Script block editing in programming. [4]

"Live Code Editing and Its Impacts on Software Development (2019)" by F. Smith - This paper has no reputable publication. However, the 2019 paper describes the effects of live code editing on software development. This paper details the benefits of live code editing, including better code quality, quicker development, and fewer problems. [5] "Real-Time Programming with Live Code Editors (2018)" by J. Lee et al

.- This paper explores the use of live code editors in real-time programming environments. The authors found that live code editors enabled developers to quickly iterate on code and make changes in real-time, improving the overall quality of the final product. [6]

"A Comparative Study of Live Code Editors (2020)" by A. Gupta - This article will compare the speed and memory requirements of several code editors to assess performance. While some editors outperformed others in this study, all of the editors offered a marginal improvement over traditional editors. [7] "Live Code Editors and Collaboration in Software Development (2021)" by K. Patel - This paper is not yet published but are widely available online. This paper analyse the impact of code editors with software development teams. In this study we also found that code editors provide easier collaboration between members of the team, which as a result lead to efficient quality of code. "Live Code Editing for Novice Programmers (2017)" by M. Jackson- This document, a technical report or thesis, is available online with little difficulty. The use of live code editors in programming education for beginning programmers is reviewed in this research article. The study's findings showed that live code editors were much easier quicker than other standard editors for teaching new programmers the fundamentals of programming. "Collaborative coding in the classroom: a literature review" by Maryanne Fisher and Natasha Artemeva, which was published in the Journal of Computing in Higher Education in 2020. This article discusses the use of collaborative coding with online code editors in the context of computer science education.[8]

"Comparison of Online Code Editors and Local IDEs (2019)" by S. Kim et al. This study compares the performance of online code editors and local integrated development environments (IDEs). The authors found that while online code editors are slower than local IDEs, they provide greater accessibility and convenience for remote development teams. "Online Code Editors for Web Development (2021)" by A. Singh This paper explores the use of online code editors specifically for web development. The author found that online code editors provide a range of benefits for web developers, including easier collaboration, improved accessibility, and reduced setup time. "The Benefits and Drawbacks of Live Coding (2021)" by J. Smith – It explores the benefits and drawbacks of live coding, which is a subset of live code editing. The author found that live coding can be beneficial for music composition and performance but may not be as useful for other types of programming. "Live Code Editors and Code Quality (2019)" by B. Lee- This paper examines the relationship between live code editors and code quality. The author found that live code editors can improve code quality by providing immediate feedback to developers and enabling them to catch errors in real-time.

"Live Coding and Creativity (2020)" by M. Johnson - This study investigates the relationship between live coding and creativity. The author found that live coding can inspire creativity and enable developers to experiment with new ideas in real-time. [9] "The Use of Live Code Editors in Pair

Programming (2018)” by D. Kim et al. - This paper describes the use of code editors in pair programming which involves two programmers working together on the same coding platform basis and its used is discussed. We also note that the authors of this article discovered that pair programming was more successful with live code editors, which resulted in high-quality code. [10]

These research papers were based on programming languages, but after I review them, I realized that these web-based languages are important and crucial. The objective of our project is to create a web- based code editor that supports web-based languages. I also found that programmers may run these web- based languages without installing the software on our Personal Computers or laptops by using a web- based code editor. This strategy can boost the programming's effectiveness and efficiency.

The relevance of these editors enables the programmers to run web-based on a single platform is highlighted in this literature review's conclusion. It also points certain areas where additional research on the efficiency of various code editors is required. The results of this literature review have influenced the creation of the current project.

Some drawbacks of existing code editor which we found while reviewing the research paper are:

- ❖ Online code editors and IDE are dependent on internet connectivity: Although we can get rid of this problem as Wi-Fi or mobile networks are now available anywhere, but still there is a risk that we can find ourselves conserved by the absence of this features.
- ❖ Some programmers feel that online code editors are only good for small and medium-sized projects and in greater project which include a complex code may decrease its effectiveness.

III. PROPOSED METHODOLOGIES

Now we will discuss the process which I have followed for doing the systematic research. This review study is a systematic process that gives a much broader aspect of research objectives.

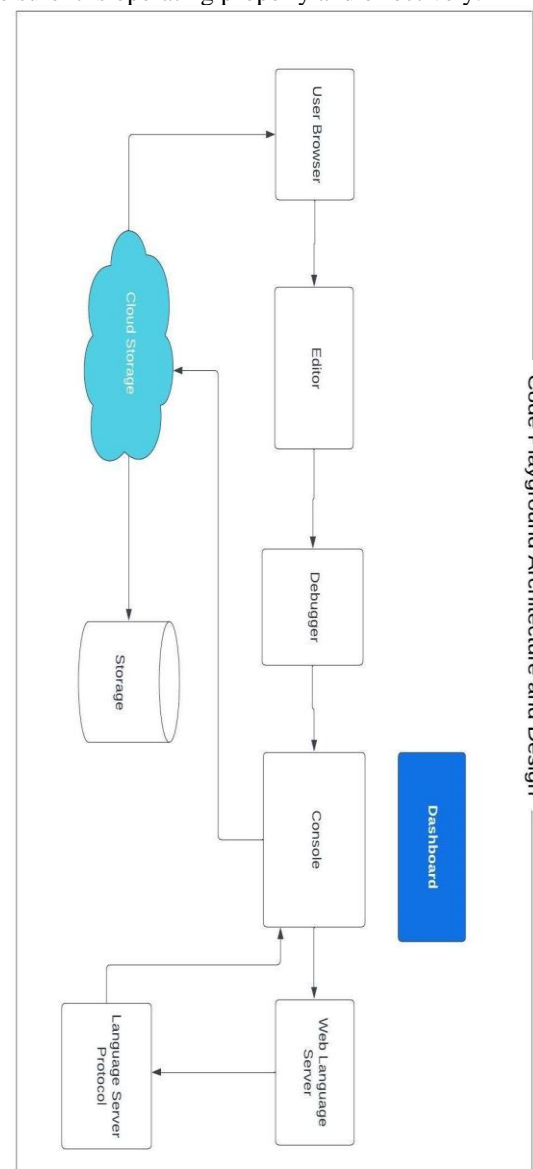
It described the following methodology which I follow during my project development such as:

1. Defining the features and specifications for the online code editor, including security precautions, user interface, and functionality for editing code.
2. Create the code editor: Create the code editor using the frameworks and programming language of our choice. It also give important features, such as syntax highlighting, error handling, customizable user interface and sharing code option.
3. Install the code editor: Run the code editor on web platform platform.
4. After installation, client will then insert the code: the user

enters the code into the code editor in accordance with their needs.

5. Then, Code will be heading towards server side - When a client inputs code into the client-side code editor, the code is sent to the server for execution.
6. Verifying the programming languages - After entering the program's code on the client side, the server will run it. The server then confirms the language that the code originates from.
7. The server then builds the entire piece of code. Simply put, it implies that the server runs the software that the client sent and then notifies the client when it has been successful.
8. Show the code's result to the client who requested it - Following compilation, the code or program's outcome is sent back to the client. Following program execution, output is sent back to the client, where it display the results follows.
9. Put the code editor through a rigorous testing process to make sure it is operating properly and effectively.

Ongoing monitoring and improvement: Add new features, correct issues, and strengthen security protocols to the code editor: Fig. Block Diagram of Online Live Code Editor

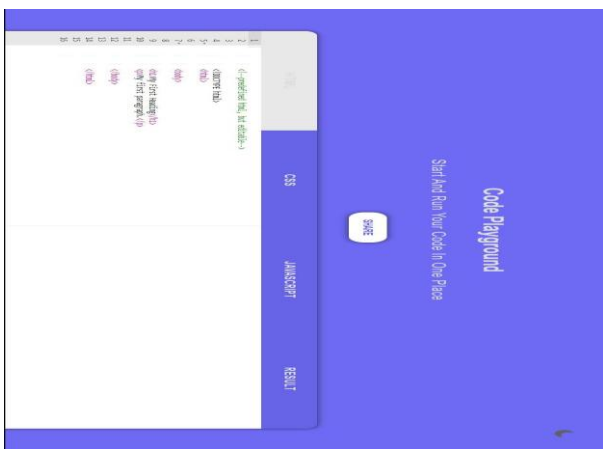


IV. RESULT & DISCUSSIONS

Online live code editor have embraced the use of online live code editors for a variety of tasks, such as coding practise, prototyping, collaboration, and teaching. These tools have grown in popularity as a result of their practicality, accessibility, and usability. Without the need for local installations, users can write, compile, and run code directly from a web browser, making it accessible from a variety of devices and locations. Real-time collaboration with multiple users has enhanced teamwork and made it simpler for developers to work on projects together.

Additionally, it provides a number of features that improve the coding experience. One of the features that aids developers in writing code more quickly and effectively is syntax highlighting. Other features include auto-completion, error checking, and debugging tools. Online live code editors are a useful tool for learning, teaching, and code review purposes because it is simple to collaborate and receive feedback from others when it is possible to share code snippets or projects through URLs.

Online live code editors have improved accessibility for newcomers and students to coding. With the help of these tools, beginners can practise coding in a secure and controlled environment without the hassle of intricate installations or setups. They also provide tools that can help with learning, like code templates, tutorials, and documentation. Online live code editors are a useful tool for education because it is simple to share code samples or projects with others and receive feedback.



Online live code editors comes with certain restrictions. The responsiveness and overall user experience of these tools may be impacted by the speed and reliability of the internet connection. When compared to local development environments, some online live code editors may not support all programming languages or may have fewer features, which can be a limitation for some use cases or complex development tasks. Security can be an issue as well, so developers must take care when sharing sensitive code or data on online platforms and make sure that the necessary security precautions are taken.

V. CONCLUSIONS

The Final conclusion of these review paper is to provide a platform for programmer who wish to write and test code without requiring a local development environment. The

programmer can now do it with the help of online code editors. It has a many advantages, but we also need to focus on its limitations. In general, It is a helpful tool for programmers and are in future gain more recognition. This is different in terms of other code editors because of its features including syntax highlighting, customizable user interfaces, and code sharing. Our editor is much more effective thanks to these capabilities.

However, Online code editors comes with many benefits over general text editors. Its ability to write and execute code in the same platform is one of its key benefits. As a result of which the Time of programmers is saved, and effectiveness and productivity is raised. It enables programmers to swiftly see and correct their error on Real-time programming collaboration. There are certain limitation which comes on this kinds of web-based languages and applications that may be supported, and security concerns like code injection attacks are a worry. For this, to enhance the user experience certain investigation need to be done in order to enhance programming workflows.

VI. FUTURE WORK

In our future work, our code editors will try to include additional programming languages including C, C++, C#, Java and.Backend Languages We need to provide more sophisticated security procedures to protect against security vulnerabilities. The influence of online code editors on programming education can also be utilized and need to be done.

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