

# Web Based IDE Implementation for C, C++,C#,VB, Java, Perl, Python, Ruby, HTML, CSS, java script.

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## ABSTRACT:

*web based interface is an application which provides facilities to programmer for software development such as code completing and fixing, source code editing and management, automated testing, etc. Software is rapidly moving from the desktop to the Web. The Web provides a generic user interface that allows ubiquitous access, instant collaboration, integration with other online services, and avoids installation and configuration on desktop computers. Moving IDEs to the Web is not just a matter of porting desktop IDEs, a fundamental reconsideration of the IDE architecture is necessary in order to realize the full potential that the combination of modern IDEs and the Web can offer. This paper discusses implementation of Web based interface environment for compilation and execution of codes written in different languages like C, C++, C#,VB, Java, Perl, Python , Ruby, HTML,CSS, Java Script languages. Users can edit, write, compile, debug and store their code on server. Users need not to spend their time for finding and installing an IDE for different languages. User can use IDE in any device like PC, tablet and mobile devices which has browser with internet connection. Web based interface can be used in low configuration systems also.*

**Keywords:** *web based Interface, web, compiler, programs, software, coding, IDE.*

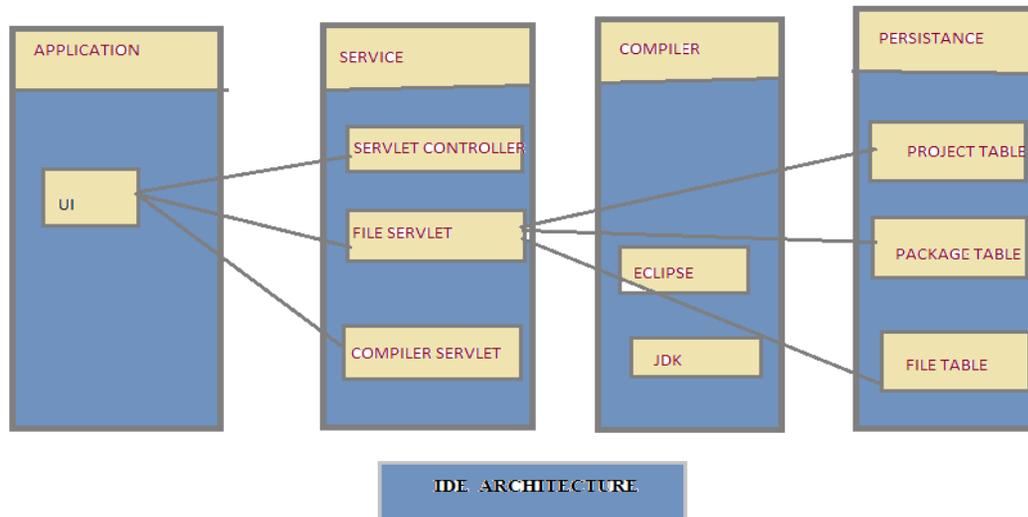
## 1. Introduction :

The goal of this project is to develop a web based Integrated Development Environment (IDE). The client only needs a web browser and an internet connection. By connecting to the server, an IDE looking page is downloaded by the browser that looks like and has the functionality of an IDE environment. The client is able to access previous code stored in the

database or create new projects, compile the code and run it. Also, the client is able to download the executable output of the compiler from the server to local disk .IDEs are designed to maximize programmers' productivity. They normally achieve this goal by consisting of a source code editor, a compiler and/or interpreter, built-in automation tools, and a debugger. Some modern IDEs even employ plug-in frameworks that support extension to the environment, hence meeting various needs of programmers. [21]. Software is moving from the desktop to the Web. Online services are rapidly replacing traditional downloadable software products. Based on the latest developments in Ajax technologies, vastly improved JavaScript engines, and the introduction of HTML5, there is now even a small but growing collection of browser-based code editors. Fully fledged integrated development environments (IDEs) are still lagging behind in this pull towards the Web. Modern, desktop-based IDEs integrate a wide range of software engineering tools, and provide a platform for writing, maintaining, testing, building, running, debugging, and deploying software. They increase developer productivity by incorporating many different kinds of editor services specific to the syntax and semantics of a language. These services assist developers in

understanding and navigating through the code, they direct developers to inconsistent or incomplete areas of code, and they even help with editing code by providing automatic indentation, bracket insertion, and content completion.

**System Structure:** In order to develop a flexible structure for the IDE, we referred to the architecture of Eclipse. There are four layers in our design: Application layer, service layer, compiler layer, persistence layer



This paper discusses the implementation of Web Based Integrated Development Environment (IDE) for the different languages to code, compile and run the code. The Web based interface will allow easy development and testing of applications. The users have the privilege to register on to the system write, save and manage programs online. After the language is chosen by the user the request is forwarded to the respective compiler.

## 2. What Is The Importance Of The Web Based Interface:

Software development is an important activity in today's world. In old days, programmers used to write codes into the text files and then by using compiler and similar tools which are command line based, these written codes were turned into software programs. As the computers evolve, size and the complexity of software production increased. With this increasing complexity, accomplishing tasks such as code editing, build automation and debugging started getting more and more difficult. Solution for this problem of programmers is found to be Integrated Development Environments which are commonly referred as IDE's. Although IDE's are life saver for programmers, these software applications have couple of drawbacks.

Local systems IDE's are installed on a system and one need to use that computer to use features of IDE and develop the software. Stand alone IDE high computer resources, as IDE's supported more facilities to the

Multiple users can write programs in different programming languages and also can compile and run the program. a source code editor, a compiler and/or interpreter, built-in automation tools, and a debugger Some modern IDEs even employ plug-in frameworks that support extension to the environment hence meeting various needs of programmers[21].

programmer they require much more computer resources, especially memory and CPU, which may not be available all the time. Most of the desktop based IDE's require the development environment to be set up on their machines.

This development environment requires language specific integrated development environment like eclipse or visual studio to be downloaded and configured within the user's machine. If the user decides to work on a different machine the entire development kit and IDE has to be installed in the new system which makes the process tedious and extremely inconvenient. Web based interface thus provides a solution to the given problem and gives user the flexibility to start a web browser and open his/her project.

The basic requirement here is that the user must have access to an internet connection to be able to connect to

the Web IDE. We will install all programming development environment on a server.

Important questions developers might have such as: Which of my team mates worked on this piece of code before? What other parts has this person changed in the past? How many of the co-developers are working on the project code at this moment? Who is modifying what part of the system? Can I get real-time feedback on the changes they are making to the code? While answers to these developer questions may be available in the minds of certain team members, the underlying knowledge is often left implicit and unavailable to other team members [23]. Most of the reasoning leading to a particular piece of code gets lost, leaving only the new code itself as result of a complex program comprehension process.

#### **Following points justifies the importance of Web based interface System:**

- i. Available 24×7 days on anywhere.
- ii. Access from anywhere or any computer (with Internet access).
- iii. Minimal configuration needed (or only needed once).
- iv. Centralized workspace.
- v. No need to install a lot of software locally.
- vi. Allows for development from inexpensive machines, such as mobile phones.

### **3. Related Work:**

Many efforts have been made to implement online compiler and runtime environments in past few years. In this section we briefly discuss recent developments. Codeine [24]. It seems exciting in the beginning. However, when writing something more complicated in its editor, it fails miserably. For example, it only supports simple statements in C++ no other than “print”, but not the core concepts of Object-oriented programming. Python Fiddle [7] is a code editor and code execution environment that allows programmers to run snippets and debug scripts on the go. It supports a plethora of third-party packages, boasts superb documentation, comes with a wide array of built-in hot keys and is also open source to boot. Code run Studio [2] offers users a cross-platform tool for writing ASP.NET, JavaScript, C#, HTML and CSS. Its default Visual Studio compatibility is a nice touch and should have Microsoft-focused coders feeling right at home. It comes equipped with the usual bells and whistles like code completion and syntax highlighting. Remote Application Platform [1] Project is an open-source software project under the Eclipse Technology Project which aims to enable software developers to build Ajax-enabled rich Internet applications by using the Eclipse development model, plugging and a Java-only application programming interface (API). It can be considered a counterpart for web development to the Rich Client Platform (RCP). Source kit is a lightweight, browser-based alternative to bloated desktop development suites.

Supported languages include all the majors you’d expect, such as C/C++/C#, PHP, Python, Java script, Java and Ruby. Odin [3] allows developers to code in PHP, Python, Perl and Java script while working with popular frameworks like Jingo, Ruby on Rails and Node.js. We

This leads to a number of research hypotheses. The first is making the knowledge leading to code modifications explicit, and sharing it among all team members, will lead to a significant increase in productivity and software quality. Web-based IDE encourages live collaboration between team members, because its structure requires all documents and codes to be modified and saved on the servers, which will release the problems of the implicit code knowledge. The most exciting advantage of web-based IDE is that, with the new generation of smart phones and PDAs that support AJAX and Java programming jobs can be done movably anywhere anytime.

Scheme [6] is an educational programming environment, embedding Code Mirror [4] for syntax highlighting and bracket matching. However, these can useful tools for coding small program; they do not provide a comprehensive environment with all the facilities that are especially important for productivity in larger projects. They also do not offer any support for collaboration. Another IDE, specialized to Iron Python, is provided by Void Space, and uses Silver Light for its implementation [8]. There is currently one open source initiative for creating an extensible IDE for the Web, allowing developers to add new components using JavaScript. The Cloud9 project [9] integrates the Mozilla Sky Writer [10] and ACE editors, and provides a plugging based IDE architecture in HTML5 and JavaScript. Compile online [17] provides more than 50 language compilers online but does not provide facility for store the program. Using compiler [18] we can learn programming languages and execute programs online. An Online Programming Tutors named Problems by Kumar [11] is designed as a tutoring system for students to learn Java, C++, and C# OO programming.

It mainly covers Java programming and basic programming constructs. In Cloud9 IDE [9] front end is all Java script, while the back end relies on the popular Node JS framework. It has syntax highlighting for C#, C++, Python, Perl, Ruby, Scale and a few others as well. Code anywhere [20] is a code editor in a browser with an integrated ftp client, and all popular web formats are supported (HTML, PHP, JavaScript, CSS, and XML). Cloud IDE [5] is a solid Web IDE which supports the

usual languages like Java script, Ruby, Groovy, Java and Html.

Erbil [26] if you think JavaScript is not so popular among the developers; you might be unaware about the current scenario. Today, JavaScript has gained immense popularity and respect from developers across the globe. Erbil is all about JavaScript — it provides tools to create JavaScript applications for online business productivity. Orion [27] — Orion brings Eclipse’s considerable

#### 4. Architecture

Users are required to register through the web interface. Whenever a new user registered, all the required data will be created in the database and a predefined workspace will be assigned for the user. Later, user will be able to login and logout the system anytime. Of the existing (JSON is often used instead), and the requests do not need to be asynchronous.

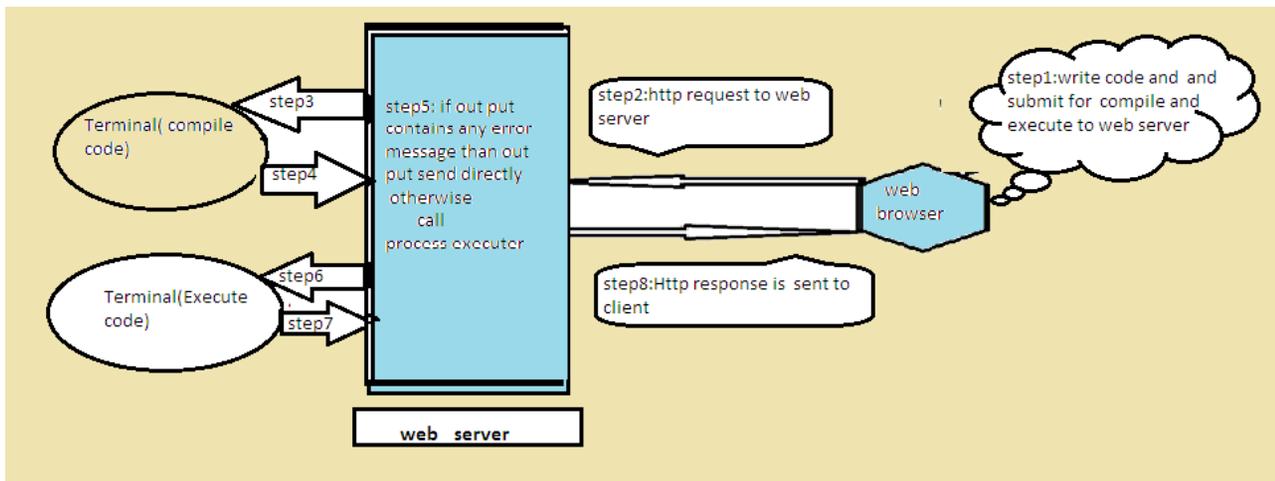
**Steps for web based interface are as follows. Step 1, 2:** Types the program code on the text area provided on the web page and submits the code to server. **Step 3:** Web

experience to the Web IDE. It is extensively used these days for front-end development, which restricts it to the HTML and JavaScript. , its team is trying hard to improve it and you can expect a lot more features in the near future. Ideate [28] this is on online compiler and debugging tool that allows you to compile source code and execute it online in more 60 different programming languages. Choose a programming language of your choice, enter the source code.

server will call appropriate script to compile the program (E.g. java, tic, and cask)

. **Step 4, 5:** After the compilation of the program if there are any errors present in the program then those error messages are transferred back to the client side.

**Step 6, 7, 8:** If there are no errors then process executor is called and the output of the process is transferred back to client side so that the user can view the output of the program.



**Web based interface Architecture:**

### 5. Technology:

#### 1) Visual Studio 2010

Microsoft Visual Studio is an integrated development environment (IDE) from Microsoft. It is used to develop console and graphical user interface applications along with Windows Forms or WPF applications, web sites, web applications, and web services in both native code

together with managed code for all platforms supported by Microsoft Windows, Windows Mobile, Windows CE, .NET Framework, .NET Compact Framework and Microsoft Silver light

#### 2) MS SQL Server

Microsoft SQL Server is a relational database management system developed by Microsoft Inc. As a database, it is a software product whose primary function

is to store and retrieve data as requested by other software applications, be it those on the same computer or those running on another computer across a network.

In our model implementation, instead of going into a novel distributed data management system, we used a common database management system – My SQL. We understand that even the distributed database systems will fail to manage the huge amount of data web based

### 3)JavaScript:

JavaScript is a dynamic language that executes within a browser. JavaScript code is embedded within an HTML

4) **Query** :Query is a fast and concise JavaScript Library that simplifies HTML document traversing, event handling, animating, and Ajax interactions for rapid web development.

5) **Ajax** :Ajax (also AJAX an acronym for Asynchronous JavaScript and XML) is a group of interrelated web

## 6.Implementation

We have implemented Web based interface in ASP.NET using C# as frontend and SQL Server as a backend. User first creates a login ID to access the compilers. After creating login ID user must login in the system. After login user select the compiler for which he wants to use. After selecting the compiler user type his code in the editor and use the button or shortcut keys to compile and execute the code. The output is displayed on the output tab. Although the frontend is designed to be as simple as possible with only a few commonly used options, it is

applications have to deal with. To respect this fact, in our implementation we decoupled the database manager from the other parts of the code to present the obvious fact that we could use some distributed data management system too.

page using the JavaScript tag. The <script> tag is used to embed JavaScript code.

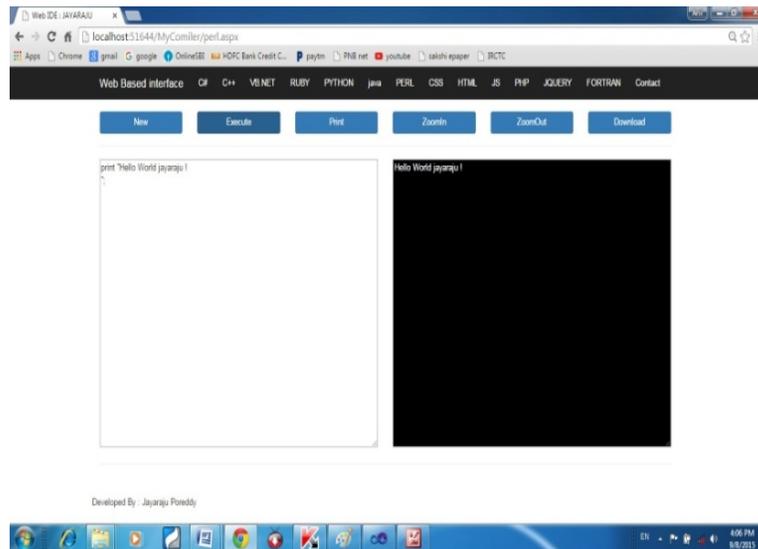
development techniques used on the client-side to create asynchronous web applications. With Ajax, web applications can send data to, and retrieve data from, a server asynchronously (in the background) without interfering with the display and behaviour.

sufficiently functional and can be used quickly. Proper validations are used. User code is submitted to server. Server side code compiles the code and displays warning message or show the results on the client window, Compiler Helper class to represent a compiler error or warning. After successful compilation compiler generate execute file (exe). This exe file produce the desired output for the given source code. Following figures show the Web Based Interface design and working.

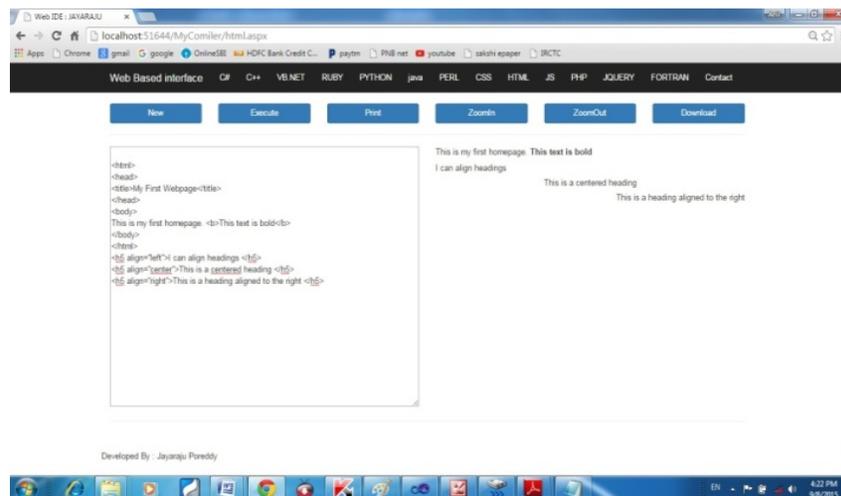
**Snapshot: figure1: web based interface login page**



**Figur2: Web based interface layout: Perl program with standard input & output:**



**Fig3: Web based interface layout: html program with standard input & output:**



## 7. Operations:

- 1) **Registration:** - This module accepts the details of a new user and stores it in the database. This action is logged in the Logs database. This module ensures that the user is registered before the first login.
- 2) **Login:** - A registered user should login with his username and password to use the Interface.
- 3) **Create new Project/ File:-** This module permits valid users to create new Project.
- 4) **Open Project/ File:-**This module permits valid users to open existing projects. The user's access rights to the projects and files are checked from the database.
- 5) **Delete Project/ File:-** This module permits the valid users to delete a project.
- 6) **Save:** - This module allows the valid users to save their projects. These projects are stored in database.

- 7) **Compile & Run:** - This module allows the users to compile and run their code. The result of compilation is displayed to the user.
- 8) **Zoom in:** - This module allows users to do Decrease of the program code.
- 9) **Zoom out:** - This module allows users to do increase of the program code...
- 10) **Font Size:** - This module allows users to change the font size.
- 11) **Download:** - This module allows users to download the code.
- 12) **Print:** This module allows users to print the out of the code.

## 8. Advantages And Disadvantages

**A. Advantages** 1) Development can happen on any Web-enabled machine, and execution resources can be shared among developers. 2) Development can be done by low configuration devices.

3) User can use any device with internet connection for execution of code.

4) Collaboration becomes easier, and might amount to as little as sharing the URL to the same IDE “workspace”

5) Scaling from one machine too many becomes a matter of configuration – acquiring, setting up and maintaining the hardware is handled by the cloud provider.

6) For web applications, there is very little difference between testing, debugging and deployment: the mechanism for deploying in the edit-compile-run cycle is the same as for testing and as for production.

**B. Disadvantages** 1) Developer gives up (some) control of the execution environment and might be unable to diagnose problems which require access to logs and process inspection tools.

2) Network bandwidth and latency make some applications, especially graphically intensive ones, infeasible to develop remotely.

3) Duplication of most of the essential tools and concepts already provided by the operating system on the user’s machine, though this can be mitigated by exposing the deployment/ testing/debugging host through a remote shell, i.e. by breaking out of the traditional Web interface.

4) Integration with existing deployment and debugging tools is likely to be difficult, if not impossible.

## 9. Conclusion

In this paper we have discussed Web based interface from the stand alone desktop to the Web. The proposed research questions arose from placing ourselves in the seat of the software developer who already develops for the Web, but now wants to transition his daily development activities to the Web, and take advantage of the hallmarks of the Web, pervasive collaboration, zero deployment, instant-access from anywhere, and vast computational resources. We discussed how we can move the software development environment from one paradigm (the desktop) to another (the Web). This can be used for E-learning platform that lets students write,

execute and test programs entirely in their browser. With Web based interface allows the user to write and manage their programs on the server. The programs stored on server, the compilation of the programs will be managed by the server by forwarding the request to the required processor. Based on the programming language in which program/code is written and sends that program/code to the respected compiler. The proposed system showed how Web based interface can be used to eliminate the problem of storage. Many more applications are possible when taking into account.

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#### Author[s] brief Introduction:



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