iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 11 **Issue:** XI **Month of publication:** November 2023

DOI: https://doi.org/10.22214/ijraset.2023.57011

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 11 Issue XI Nov 2023- Available at www.ijraset.com

Evolution of Web Development Frameworks

Ritesh[1], Ayush Yadav[2], Ashutosh Dubey[3], Deepak Prajapati[4], Akarsh Srivastava[5]
Department of Computer Science &Engineering Chandigarh University Mohali Punjab 140301, India

Abstract: ***Webapps have now become an important part of our industry. Be it small or big business house,they all depend upon webapps to attract more audience The field of web development has very rich history and it is ever evolving. The internet's ever-changing nature and users' and developers' evolving needshave led to a dramatic shift in the ever-changing and dynamic world of web development in the last few decades. This review paper presents an in-depth analysis of theevolutionary journey of web development frameworks, fromthe early days of static web pages to the complex, feature-rich web applications of today. An eye–catching and aproper design can only attract the users which can only bedone using a good design framework. Libraries and classes that offer a broad range of features called frameworks — frameworks layout a foundation of great architecture which is further used to build an application. Frameworks are the building blocks of a web application. They are the foundation upon which web applications are constructed. There are many frameworks for web development that support various programming languages. In this review paper, we will discuss some of the most important frameworks for web development. We will discuss the front-end framework, the back-end framework, and the databaseenvironment. Based on the information provided in thisreview, you can predict which framework will be mosteffective for increasing user engagement.***
Keywords: Web Development, Framework, Technologies,Organization, Web Design, Navigation.

I. INTRODUCTION

As the usage of Internet is on a boom in India and rest of the world, the public demand for online applications is increasing. According to a poll, there were 692.0 million internet users in India at the start of 2023, or 48.7% of the country's population, online. As of January2023, 32.8 percent of India's population, or 467.0 million people, were active on social media. Approximately 77.0percent of India's population, or 1.10 billion active mobile phone connections, existed in the beginning of 2023.

There were 5.3 billion internet users globally as of October 2023, or 65.7% of the world's population. Looking at this data, every company and business house be it small or big have got the idea that the world is now quickly shifting towards the online system. All companies want a large number of user engagements for which they want an excellent web application and to attract a large number of users on their web application they want a good eye-catching website which has an excellent design and an excellent design is made through a framework. A good website is that which is highly user friendly and user gets attracted towards websites which are effective, error free and visually aestheticSelecting wrong framework have numerous disadvantages which a developer can't afford at the working stage, so they have to be careful while selecting the framework. Better Webframework choices result in lower development costs, more efficient use of time and resources, better code, and the ability to construct interactive, user-friendly apps. This paper covers the many frameworks, languages, and solution stacks available for developing a microservices-based online application.

II. WEB v1.0 vs WEB v2.0 vs WEB v3.0

A. Web v1.0 (static web or read only web)

For the most part, this web covered the late 1990s and early 2000s.

1) This is the first stage of internet which is major dominated by static websites (read only web).
2) The purpose is information sharing in a simple and passiweb as a hyperlinked information system
3) The content is owned and focuses on connectiinformation (one way publishing medium) as a hu library of data sourced on a screen from computer syste in the network for users to browse.
4) User and server communication is minimal to non-existent. As Majority of users constituted of tho who had to consume the content. Slow internet speed

B. Web v2.0 (Interactive web)

It's a better version of the web 1.0. Personalized content, user profiles, and suggestions were introduced by Web 2.0 (read-write web) to make theonline more suited to individual interests.

©IJRASET: All Rights are Reserved

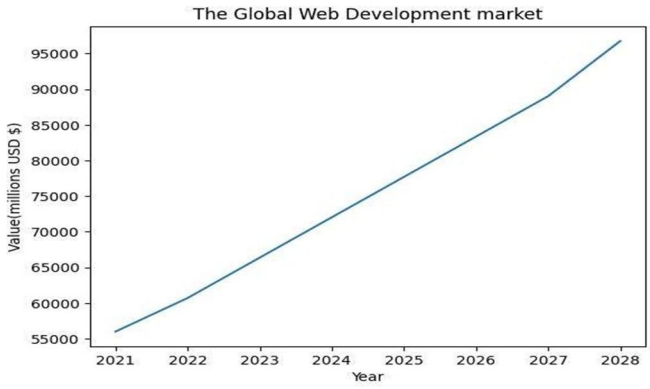
1) It focuses on modifying the way in which web pages are designed and the importance of responsive web design for mobile devices began to grow.
2) Web 2.0 unleashed in the era of social media blogs and content sharing platform where user could create, share, and collaborate on content and can interact with the web in the form of like, comment, sharing photos and videos. Websites like Wikipedia demonstrated the power of collaborative content creation, enabling users to contribute and edit information.
3) Rich user experiences became possible through technologies like AJAX, allowing for real-time updates and dynamic web applications.
4) Dynamic content that is user-friendly and highly sensitive to input from the user.
5) Tech giants like Facebook (Meta), Twitter, Google, Apple, Microsoft, and Amazon control the use of our personal data in web 2.0, or the current version of the internet.

C. Web v3.0(The Semantic Web)

Web v3.0 is still a concept under development, and its full realization remains a vision for the future. It aims to make the web smarter, more semantic, and better at understandingcontext.

1) It is the third generation of the internet that uses blockchain, cryptocurrencies, and metaverses. It focuses on taking back the control of the internet and our data from the giant tech companies.
2) Web 3.0 aims to create a "Semantic Web" where data is linked, organized, and understood by machines, enabling better data integration and intelligent decision-making. Revolves around connecting knowledge
3) In web 2.0, our data is under the control of centralized organizations but in web 3 content will be collectively owned and shared. With web3, the data will reside on blockchain networks. Therefore, users will be the owners of their own data. The owners get to decide the ways in which they want to share it.
4) It also emphasizes giving users greater security and privacy.
5) Although Web v3.0 is still evolving, technologies like the Internet of Things (IoT), blockchain, and advances in AI are paving the way for its development.
6) Enhanced natural language understanding, making itpossible for machines to comprehend and generate human language.

Parameters	Web 1.0	Web 2.0	Web 3.0
Stage	initial phase	Second phase	Thirdphase
Basic	Read-only	Read-write	Portable and Personal
User and Server Interaction	Little to no communicati on	Improved communicati onbetweenthe user and the server	created to offer consumers a personalized internet experience
Focus On	Company	Community	Individual
Focus of Content	Owningcontent	distributingcontent	Combining information
Interaction Based on	Directories	Tagging	User Behaviour
Monetizati on Strategy	Page view	Cost per click	User interaction
Technologies	HTML, Portals	Ajax, JavaScript, CSS, HTML 5	Blockchain , ArtificialIntelligenc e



III. FRONTEND FRAMEWORKS

A. ReactJS

React is a JavaScript based library which is developed by Jordan walke in 2011, who was a software engineer at Facebook. It enables the creation of reusable user interfaceelements by developers. It has the support of a robust development community. It has reusable components.

It has a market share of over 40 %. According to the State of JavaScript 2022 survey, 69% of developers have used React.js, and 54% said they would use it again. In the samesurvey, React.js was rated the most satisfactory JavaScriptlibrary among developers. Since ReactJs is an open source frontend javascript library thus the React.js GitHubrepository has over 190,000 stars and over 1,500 contributors. React is used to create websites that are responsive. While it's not a framework, React does have a dedicated framework.

React Version	Year Of Release	Description (focused on)
Initial Version	2013	solving specific challenges in building complex UI.
React 0.3	2013	unidirectional data flow pattern
React 0.4	2013	virtual DOM
React 0.5	2014	server-side rendering (SSR) capabilities
React 0.14	2015	React Native
React 15	2016	improving performance and stability
React 16	2017	Fixing problem without rendering
React 16.3	2018	Context API
React 16.8	2019	Hooks
React 17	2020	Upgrading React in existing projects
React 18	2022	concurrent rendering APIs

ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 11 Issue XI Nov 2023- Available at www.ijraset.com

B. Angular

It is based on typescript and was developed by Misko Hevery and Adam Abrons who were google engineers. It was released in 2010. The introduction of AngularJS was a revolution in the web development field as it provided an easy method for creating dynamic single-page applications(It is made up of a single HTML document that loads automatically in the browser whenever a user interacts withthe page). Angular 2.0, commonly referred to as Angular, was released in 2016 and is a comprehensive overhaul of AngularJS (Angular 1.0), which was first presented in2010. "AngularJS" refers to the 1.X versions and "Angular"without the "JS" refers to versions 2 and up. Angular has market share of 63.06% in front-end-framework market. According to the Stack Overflow Developer Survey 2023, Angular was used by 18.7% of developers, which is a decrease from 22.9% in 2022 and 30.7% in 2021. Angular ranked as the fourth most popular web framework, behind React (40.5%), Vue (23.4%), and jQuery (19.8%). The survey also showed that Angular had a lower satisfaction rate (58.6%) than React (74.5%) and Vue (66.9%). Developers those who had used it and would again were recorded as making up 20.8%. The number of developers not interested in Angular showed an increase, with 32.4% not interested in 2019 as compared to 40.5% in 2022.

Evolution of AngularJS (Angular 1):

Version	Year of release	Description (focused on)
AngularJS 1.0	2010	two-way data binding,dependency injection, and custom HTML directives.
AngularJS 1.1-1.2	2011-2013	enhancing features and performance.
AngularJS 1.3	2014	ngAria, a module for accessibility support.
AngularJS 1.4	2015	Improved animation support,ng Messages modulefor form validation.
AngularJS 1.5	2016	the. component () method for creating components, aligning with the component-based architecture.
AngularJS 1.6	2016	component router anduse support for common cases.
AngularJS 1.7	2018	Marked the end of active development for AngularJS

Evolution of Angular (Angular 2+):

Versions	Year of release	Description (focused on)
Angular 2	2016	rewrite of AngularJS,
Angular 4,5,6	2017	performance improvements, code size reduction, and tooling enhancements.
Angular 7,8,9	2018	Payload size, re-build time
Angular 10,11,12,13	2020	Improvements, features and performance.

©IJRASET: All Rights are Reserved

Angular 14, 15	2022	Supports NodeJS and typescript latest versions
Angular 16	2023	improving server-side rendering avoiding issues like screen flickering

C. VueJS

Evan You developed the open-source, progressive JavaScript framework Vue JS, sometimes known as Vue, in 2014 as a substitute for more complex frameworks like AngularJS and React.VueJs is a progressive JavaScript framework that focuses on creating user interfaces and single-page apps. It is well-known for being simple to integrate into existing projects. Even though Vue.jsis small—only 18–21 KB in size—it delivers fast performance..

Vue.Js has a market share of around 2.78%. The number ofsurveyed developers who were not interested in Vue increased from 19% in 2019 to 26.4% in 2023. Compared to 2019, in 2022, willingness to use Vue again dropped from40.5% to 35.5%.

Version	Release Year	Description (focused on)
Initial release	2014	simplicity and ease of use.
Version 1.0	2014	flexibility and ease of integration with existing projects
Version 2.0	2016	Single File Component format
Version 3.0	2020	performance and maintainability
Version 3.1	2021	Compatibility
Version 3.2	2021	Improved Performance
Version 3.3	2023	enhancing development experience.

D. Ember.JS

It is an opensource JavaScript framework developed by Yehuda Katz. The developer's team was called "Ember coreteam ". It has a market share of less than 0.1%.

Versions	YearOf release	Description (focused on)
Ember1.x Series	2013	improvements and bug fixes.
Ember2.x Series	2015	removing deprecated features
Ember 3.x Series	2018	stability and incremental improvements.
Ember Octane	2019	new programming model and conventions
Ember4.x Series	2023	incremental, compatible, performance, deprecations.
Ember5.x Series	2023	bug fixes, removal of deprecatedpublic API

E. Backbonen.JS:

It is developed by Jeremy Ashkenas in 2010. Backbone is used by 1.1% of all the websites whose JavaScript library is known. This is 0.9% of all websites.

Versions	Year of release	Description (focused on)
Backbone 0.1 -0.5	2010	framework's core concepts
Backbone 0.9	2011	separation of concerns and an improved event system.
Backbone 1.0	2013	stable API
Backbone 1.1-1.3	2013	bug fixes, feature enhancements
Backbone 1.4	2016	enhancements, bug fixes, and updates.

F. Meteor:

A full-stack platform that makes web development easier. 2012saw its release. The usage of meteor is less than 0.1%.

Versions	Year of release	Description (focused on)
Meteor 0.x Series	2012	built-in database (MongoDB)
Meteor 1.0 series	2014	Modular code
Meteor 2.0 series	2021	NPM integration, modern JavaScript features
Meteor 2.13	2023	NodeJS security update

G. Svelte:

A relatively new JavaScript framework that compiles components into highly efficient vanilla JavaScript at build time. It was developed by Rich Harris. Svelte is used by less than 0.1%.

Versions	Year of release	Description (focused on)
Svelte 1	2016	web applications with modern approach
Svelte 2	2018	user feedback and further refined Svelte' s capabilities
Svelte 3	2019	rewritten compiler that made it even more efficient.
Svelte 4	2023	compatibility

CSS Frameworks

H. Bootstrap

A popular CSS framework developed by Twitter that provides a setof predesigned, responsive components and styles. Foundation: Another responsive CSS framework that includes a wide range of customizable design elements. Bootstrap, originally named Twitter Blueprint, was developed by Mark Otto and Jacob Thornton at Twitter as a framework to encourage consistency across internal tools.

Version	Year of release	Description (focused on)
Bootstrap	2011	open-source project
Bootstrap 2	2012	responsive grids, typography, buttons, forms, and navigation bars.
Bootstrap 3	2013	flat design style, responsiveweb development.
Bootstrap 4	2018	grid system with better customization options.
Bootstrap 5	2020	Removing jQuery, a JavaScript library

I. Bulma

Jeremy Thomas created the open-source CSS framework Bulma. A lightweight and modern CSS framework based on Flexbox, designed for quick and easy website development. In the Frontend Framework market, Bulma has a 1.93% market share. Bulma is ranked sixth in the Frontend Framework category of 6sense's Market Share Ranking Index.

Version	Year of release	Description (focused on)
Bulma 0.1	2016	building responsive websites.
Bulma 0.3.0	2017	modifiers for columns
Bulma 0.7.0	2018	new components like cards
Bulma 0.9.0	2019	official Bulma website
Bulma 0.10.0	2020	utility classes, new features like Navbar dropdowns.

J. Material UI:

Version	Year of release	Description (focused on)
Material-UI 0.x	2018	foundation for the library
Material-UI 1.x	2018	JavaScript Style Sheets

Material-UI 2.x	2018	core Material Design aesthetic
Material-UI3.x	2018	Customization and integrating into existing React applications.
Material-UI 4.x	2029	accessibility, usability, and documentation.
Material-UI5.x	2021	Material Design principles, developer ergonomics and theming capabilities.

A popular CSS framework that implements Google's Material Design guidelines, particularly for use with React. Material-UI has market share of 1.82% in front-end- framework market.

IV. BACKEND FRAMEWORKS

The evolution of backend frameworks has been a dynamic journeyclosely intertwined with the ever-changing landscape of web development. In the early days, web development lacked structured frameworks, requiring developers to craft custom server-side solutions using languages like Perl and early PHP. The emergenceof server-side scripting in the late 1990s brought some order to thechaos, with PHP and ASP leading the way. However, it was in 2005that Ruby on Rails (RoR) and Django ushered in a new era, introducing the MVC pattern and promoting convention over configuration, setting the stage for more organized backend frameworks. Subsequently, the rise of JavaScript on the server-sidewith Node.js opened up new possibilities, with frameworks like Express.js leading the way. As web applications became more complex, microservices architecture, performance, and concurrency became paramount, leading to the development of specialized backend frameworks like Spring Boot, FastAPI, and Actix. Today, a diverse ecosystem of backend frameworks caters to different languages, paradigms, and use cases, with an ongoing focus on improving developer productivity and meeting the evolving demands of modern web development.

A. Ruby on Rails (2005)

Ruby, a dynamic and object-oriented programming language, has undergone a fascinating evolution since its inception in the mid-1990s. Initially created by Yukihiro Matsumoto, it aimed to combine the best features of Perl and Python. Over the years, Rubyhas seen significant advancements and adaptations. The release of Ruby 1.8 in 2003 brought substantial performance improvements, making it more competitive in the web development world. Ruby on Rails, introduced in 2005, revolutionized web application development with its elegant and productive framework. Subsequent releases, including Ruby 1.9 and the more recent Ruby 2.0 and 2.7, continued to enhance the language's capabilities, improving performance and introducing new features. Additionally, Ruby's community has grown, fostering the development of various gems and libraries that extend its functionality.

Versions	Release Date	Description (focused on)
0.1	December 2005	Initial release with basic features
1.0	December 2005	Stable release with a strong framework

ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 11 Issue XI Nov 2023- Available at www.ijraset.com

2.0	December 2007	Built-in support for REST and ActionMailer
3.0	August 2010	Introduction of Rails 3, major changes and modularity
4.0	June 2013	Strong parameters, live streaming, and Turkish support
5.0	June 2016	API mode, Action Cable, and Turbolinks 5
6.0	August 2019	Action Mailbox, Parallel Testing, and Webpacker
7.0	December 2021	Introduced in the future with new features and improvements
7.1	October 5, 2023	Generate Dockerfiles for new Rails applications

B. Django (2005)

Django, the high-level Python web framework, hasundergone a remarkable evolution since its inception in 2005. Developed by Adrian Holovaty and Simon Willison,Django aimed to simplify web application development byproviding a robust and pragmatic foundation. The early versions, such as Django 0.90, focused on essentials like theORM, templating system, and administrative interface. With Django 1.0's release in 2008, the framework gained stability and broader adoption, cementing its position in the Python web development ecosystem. Subsequent versions,including Django 1.5, 1.8, and 2.0, brought significantimprovements, such as better support for Python 3, enhanced security, and more powerful features like DjangoREST framework for building APIs. The Django community has also grown, leading to an extensive ecosystem of reusable apps, ensuring that developers can build sophisticated web applications efficiently. As it continues to evolve, Django remains a leading choice for web developers, prized for its clarity, versatility, and commitment to best practices.

Versions	Release Date	Description (focusedon)
0.90	July 2005	Initial release
1.0	September2008	Stable release with improved ORM

©IJRASET: All Rights are Reserved

2.0	December 2017	Removed old features, support for Python 3.4+
3.0	December 2019	Custom lookups and responsive admin improvements
4.0	December 2021	Support for Python3.10, and various enhancements
4.2	03 Apr 2023	better support for asynchronous programming, allowing for more efficient handling oflong-running I/O operations

C. SpringBoot (2013)

Since its inception in 2013, Spring Boot has undergone a remarkable evolution in the realm of Java application development. Initially introduced by Pivotal Software (now VMware), Spring Boot aimed to simplify and streamline the process of building Java applications. The framework's core principle of convention over configuration, coupled with pre-configured templates, swiftly resonated with developers, resulting in rapid adoption.

Over the years, Spring Boot has seen substantial growth and development. It has embraced the microservices architecture, providing seamless integration with Spring Cloud, which is instrumental in building distributed systems. Moreover, SpringBoot has integrated with Spring Data, making it easier to work withdata sources, databases, and persistence layers. Its robust security module, Spring Security, has further extended its capabilities, enhancing authentication and authorization mechanisms for applications.

One of Spring Boot's standout features is its auto-configuration, which simplifies project setup and configuration by eliminating the need for manual adjustments. The inclusion of embedded containers for web applications ensures that developers can quicklydeploy and test their applications without the hassle of external server setups. Continuous improvements in developer experience, like live reloading and enhanced tooling support, have made SpringBoot even more appealing to developers.

Spring Boot's ecosystem has grown significantly, encompassing a wide array of third-party libraries and extensions, offering solutions for various use cases. This diverse ecosystem provides developers with the flexibility to choose the components that best fit their project requirements.

An essential aspect of Spring Boot's evolution is its commitment to staying current. It actively embraces the latest Java versions, allowing developers to take advantageof the newest language features and improvements. This approach ensures that Spring Boot remains relevant and competitive in the ever-changing landscape of software development.

Versions	Release Date	Description (focused on)
1.0	April 2014	Initial release with embedded Tomcat and auto-configuration
2.0	March 2018	JDK 8 baseline, reactive programming, and Spring Framework5

3.0	August 2010	Introduction of Rails 3, major changes and modularity
3.1	2023	bug fixes, documentation improvements, and dependency upgrades

D. Laravel (2011)

Laravel, an open-source PHP web application framework, has undergone a significant evolution since its initial release in 2011. Developed by Taylor Otwell, Laravel started as an elegant and intuitive framework for building web applications, with a focus on developer productivity. Over the years, it has evolved to become one of the most popular PHP frameworks globally. Laravel introduced features like Eloquent ORM, a powerful query builder, and Blade templating for efficient and expressive coding. With each new version, the framework has incorporated enhancements, such as artisan commands for automation, robust authentication, and API support. Laravel's ecosystem has grown, offering a wide range of packages, tools, and community-driven resources. Its commitment to modern

Versions	Release Date	Description (focused on)
1.0	June 2011	Initial release, basic features, and elegant syntax
2.0	September 2011	Enhanced features, Eloquent ORM, and more
3.0	February 2012	Bundles, improved routing, and Laravel 3 introduced
4.0	May 2013	Composer integration, Eloquent relationships, and more
5.0	February 2014	Laravel 5 introduced, Laravel Homestead, and Blade updates
6.0	September 2019	Laravel 6 introduced, semantic versioning, and more
7.0	March 2020 Laravel 7 introduced, Blade component tags, and more	Laravel 7 introduced, Blade component tags, and more

8.0	March 2020	Laravel 8 introduced, Laravel Jetstream, and more
9.0	February 2022	Anonymous Stub Migration, Minimum PHP Requirement
10.0	February 2023	enhance the performance, security, and functionality of web apps.

E. ASP.NET (2011)

ASP.NET has evolved significantly since its inception. Starting with ASP.NET 1.0 in 2002, subsequent versions introduced key advancements.

ASP.NET version 2.0 (2005) brought master pages,membership, and enhanced data controls. ASP.NET version 3.5 PHP practices and continuous improvements in performance and security have made it the framework of choice for developers building everything from small websites to complex enterprise applications, showcasing Laravel's enduring relevance in the PHP web development landscape.

(2008) integrated ASP.NET AJAX for improved client-side interactions. The release of ASP.NET 4.0 (2010) focused on web development productivity and introduced the Entity Framework. ASP.NET 4.5 (2012) emphasized responsive design with enhancements like the asynchronous programming model. The modular ASP.NET Core emerged in 2016, supporting cross-platform development, improved performance, and a lightweight, flexible architecture. ASP.NET Core 2.0 (2017) expandedits capabilities, and subsequent versions continued to refine features, including Razor Pages and SignalR for real-time communication.ASP.NET-version5, later-renamed ASP.NET Core 3.0, marked a milestone in unifying theplatform. The latest versions, like ASP.NET Core 6 (2021),continue to prioritize performance, cross-platform compatibility, and modern development paradigms.

Versions	Release Date	Description (focused on)
ASP.NET 1.0	January 2002	Initial release,Web-Forms, Web Services
ASP.NET-v2.0	November2005	Master pages, themes, membership, and more
ASP.NET 3.0	November2006	Windows Communication Foundation (WCF), Windows Presentation Foundation (WPF), Windows Workflow Foundation (WWF) added to the platform

ASP.NET 4.0	April 2010	Dynamic data, model binding, and more
ASP.NET Core 1.0	June 2016	entire rewrite with cross-platform support as ASP.NET Core
ASP.NET Core 2.0	August 2017	Improved performance, .NET Core 2.0, and more
ASP.NET Core 3.0	September2019	gRPC support, Blazor, and more
ASP.NET 5 (Core 5)	November2020	Renaming to ASP.NET 5, support for .NET 5, Blazor updates, and more
ASP.NET CORE (6.0)	November2021	integrates and MVC Web API capabilities.
ASP.NET CORE(7.0)	November2022	Filters in Minimal API

F. Express.js framework (2011)

Express.js, a minimalist Node.js web application framework, has evolved significantly since its inception. Introduced in 2010, it gained rapid adoption due to its simplicity and flexibility. The release of Express 4.0 in 2014 brought modular routing and improved middleware support. The subsequent versions focused onenhancing performance, security, and developer experience. With Express 5, the framework aimed at modernizing its codebase and aligning with ECMAScript modules. The community-driven nature of Express.js ensures ongoing updates, fostering a vibrant ecosystem of middleware and extensions. Its evolution reflects a commitment to simplicity, scalability, and adaptability in building web applications with Node.js.

Versions	Release Date	Features (focused on)
Express 2.5.8	December 2011	Early version withbasic routing and middleware capabilities.
Express 3.0.0	July 2012	Introduced middleware layer and the concept of app-routing.
Express 4.0.0	April 2014	Improved performance, modular routing, and new features.
Express 5.x	ongoing	Early stages of development, focusing on performance improvements and modernization.

ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 11 Issue XI Nov 2023- Available at www.ijraset.com

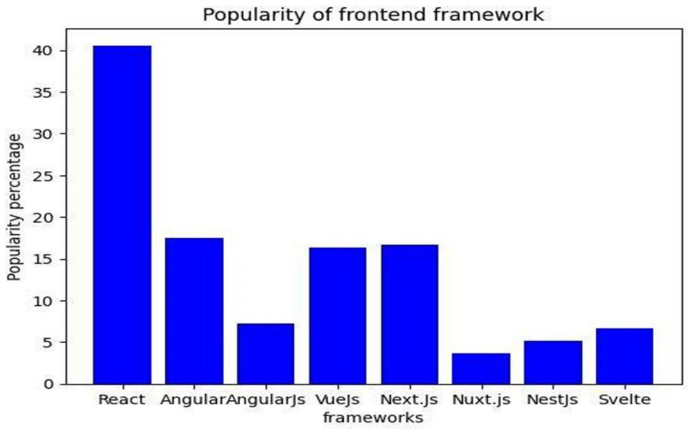
V. RESULT

The worldwide web development market was estimated to be worth USD 56000.0 million in 2021, USD 60709.6 million in 2022, and USD 96748.41 million in 2028, with a compound annual growth rate (CAGR) of 8.08% between 2022 and 2028, according to The Web Development Market Report.

A. Frontend-Frameworks in Web Development

The side of a website which user interact with is called frontend. It is also called as client side of an application. This side of a website is for user interaction so thus it is made beautiful to attract more user engagement. This side of the application is made to provide user friendly environment by providing more images, text, videos and animation. Everything a user interact with on an application is developed by a frontend developers. The major objectives of the developers include responsiveness and performance. Developers want their website to be responsive on all the different types of devices.

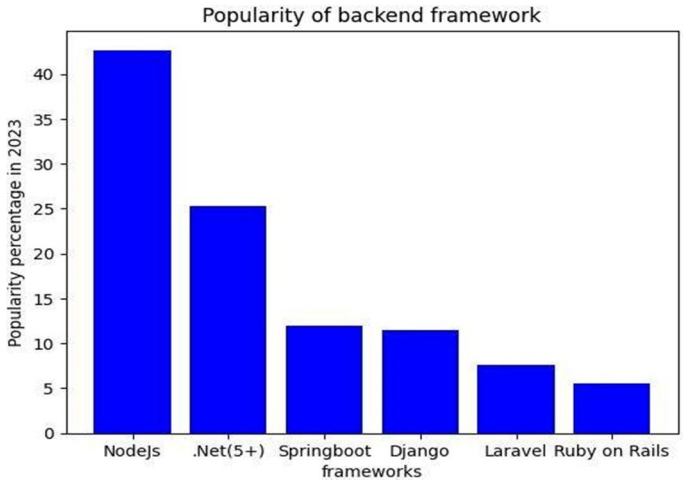
98.7% of websites (around 49,501,698 websites) on the Internet use JavaScript as a client-side programming language. There are around 6072115 users (45.41%) in the US, 993194 users (7.43%) in Germany, and 9491887 users (7.10%) in the United Kingdom that use JavaScript.



B. Backend-Frameworks in Web Development

Working on server-side software, which focuses on anything that isn't visible on a website, is known as back- end development. With an emphasis on databases, back-end logic, application programming interfaces (APIs), architecture, and servers, back-end developers make sure the website operates as intended. The most popular languages for developing enterprise-level applications that can run constantly in the background are Java,.NET, and Node.js. For small-to-medium app development, Python and PHP work well (though they can still work well on large-scale projects; they're simply not the first pick in most cases).

Node.js is one of the most popular web frameworks in 2023, according to Statista, with 47.12% of respondents using it. On the other hand, React.js comes in second place with 42.62%, followed by jQuery in third place on the podium with 28.57%. Express and Angular come next, both with numbers above 20 percent, followed by Vue and ASP.Net 15-20%.



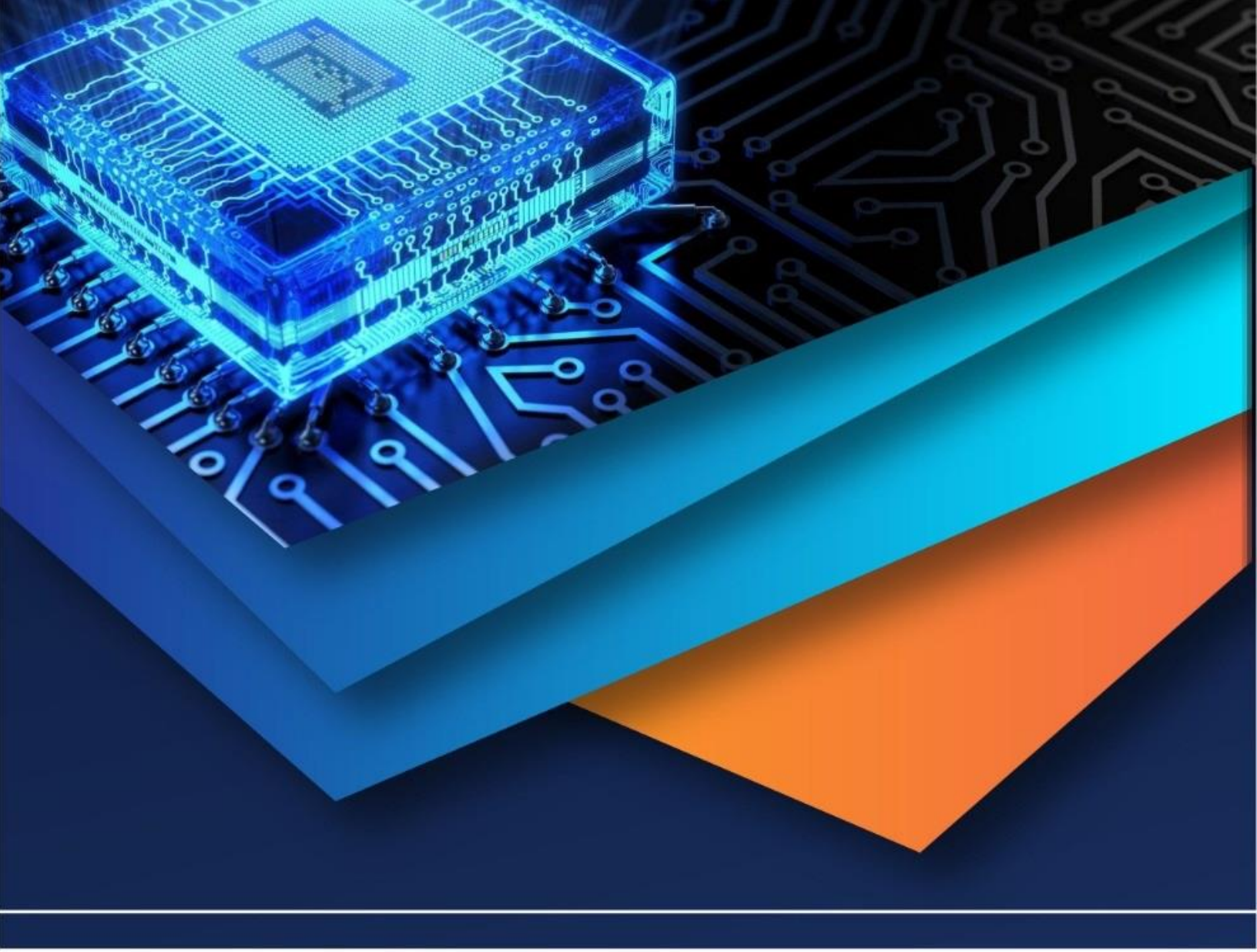
©IJRASET: All Rights are Reserved

VI. CONCLUSION

This review paper presents a front-end and back-end best practices comparison of Web frameworks. The creation of better and more effective Web applications is made possible by the implementation of best practices. Each web framework comes with pros and cons of its own. A developer's familiarity with the technologies, simplicity of programming, scalability and maintenance, time required to bring the product to market, and support from the developer community are all taken into consideration while selecting web development frameworks. The authors of this article believe that analyzing new best practices, including CSS selectors, caching, and performance for the various Web frameworks provided in this study, is appropriate as a future direction.

REFERENCES

[1] Angular.io. 2023. Angular. Accessed on 29 October 2023[online] Available at: https://angular.io/docs
[2] Statista statistics of web development framework. [online] Available at: https://www.statista.com/statistics/1124699/worldwide-developer- survey-most-used-frameworks-web/
[3] P. Di Francesco, "Architecting Microservices," 2017 IEEEInternational Conference on Software Architecture Workshops (ICSAW), Gothenburg, 2017, pp. 224-229.
[4] Frontend development frameworks comparison. [online] Available at: https://www.linkedin.com/pulse/front-end- frameworks-comparison-guide-compare-popular-daljit-singh/
[5] Backend development framework comparisons. [online]Available at: https://radixweb.com/blog/best-backend- frameworks
[6] Curie Dasari & Jaison, Joyce & Yadav, Jyoti & Fiona, J. (2019).Analysis on Web Frameworks. Journal of Physics: Conference Series. 1362. 012114. 10.1088/1742-6596/1362/1/012114
[7] Jovanovic, Zeljko Jagodic, Dijana ujicic, Dejanan ic , Sinis a, Java Spring Boot est EB Service Integration with Java Artificial Intelligence Weka Framework 2017 INTE NATIONAL SCIENTIFICCONFERENCE, GABROVO
[8] Kaluža, Marin & Vukelic, Bernard. (2018). "Comparison of front-end frameworks for web applications development" Zbornik Veleučilišta u Rijeci. 6. 261-282. 10.31784/zvr.6.1.19.
[9] Gackenheimer C., 2015. "Introducing Flux: An Application Architecture for React. In: Introduction toReact". Apress, Berkeley, CA
[10] MN BORHAN,"Design Of The High Speed AndReliable Source Coupled Logic Multiplexer",Journal of VLSI Circuits And Systems 1(01), 18-22,2019



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)