International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 07 Issue: 06 | June - 2023 SJIF Rating: 8.176 ISSN: 2582-3930

A Detail Analysis of Web Development

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Abstract:

Web is a field which is enhancing continuously, with web 2.0 and web 3.0 coming, new innovations are continuously being made. There are many frameworks and services that are now available like firebase, node JS and Express, etc. In this research paper we talk about (RDF) Frame work, MERN stack chrome developer tools, MERN stack uses and its application, how mobile application become more popular than web application, various technology used in Web development, various reasons why non-relational databases like MongoDB are widely used compared to relational MYSQL databases, Agile Web Development AWDWF Framework. Around 6 papers were studied and reviewed from various publications. Apart from the above topics, the paper also presents features of HTML5, Node .JS and its application, challenges and potential. A web application is made for the "Brahma Kumaris" organisation using HTML, CSS, JS and firebase as a backend service. It has many features like appointment booking, image gallery, downloading meditation songs and music, and getting daily murli. It will have many advantages like 24 x 7 access to murli and songs, help in booking slots for classes being held and with features of web development and integrations with new technologies coming, it would enhance the experience of the user.

Keywords: Web development, MERN stack, Agile model, MongoDB, HTML5, Node.js, MySQL

Introduction:

With a dynamically fast-moving world, the need for connectivity gave rise to the internet and various applications that are built on it today. various technologies have been coming via continuous research and development to enhance the systems and as per requirements. The history began around 1990. It evolved such that it has four generations till now. First generation focussed on static web pages. Second generation focussed on things like blogs, social networks, creating web page contents, user experience and many other advanced things. Third generation focussed on personalising the content, semantic web, searching techniques, and content creation and also used technologies like Ontologies, Resource Description Framework (RDF), Web Ontology Language (OWL), and many others, search engines functionality, and how internet 4.0 will have features that are direct in comparison to that in previous versions. The various technologies, components and implementation techniques have also been discussed like MERN (MongoDB, ExpressJs, ReactJs, NodeJs) stack, chrome developer tools, redux for simulation and many more for making an e-commerce project for providing a critical review of relevant literature in the ebusiness field are there about which detailed information is mentioned and information about how it got implemented is also there. Web applications have been used more than any mobile app and have extensive use in association with other applications. There's continuous innovation that is happening and various technology stacks have been developed with the knowledge about which is given [1].

The world is shifting to mobile era but still web application is more efficient than any mobile Apps, so in long run web-based application always ahead and used for making highly scalable Technology, there are different technology used for web Development.

Various reasons why non-relational databases like MongoDB are widely used compared to relational MYSQL databases are also discussed like being more user friendly, having a more versatile framework for customization as per user needs, scalable, flexible and security wise also it is better than MYSQL. It's also more beneficial for data intensive applications.

It gives review regarding why non-relational databases are preferred as compared to relational databases as they have a more versatile framework as per the user needs.

A review of various technologies mentioned in about 10 papers have been discussed in [2].

Due to very large web systems, complex problems may be seen. Quality assurance techniques are applied and several technologies related to agile web development are mentioned. It also discusses how internet expansion may lead to problems that not even software developers face. The ISO9001 constituted for improving software quality standards have been mentioned. Web development becomes more flexible by short development life cycle, integrating software solutions, small team size, high demand, quick feedback of users and less to develop. The need for implementing a QA system fitting the traditional software needs and agile web framework rules is in demand. For business this agile web development very, important it helps in reacting to user needs fastly and getting their feedback

Agile development has AWDWF rapid and high-quality web development methods. Only the core business module is built. Timely feedback is taken and software quality gets improved. Iterative and incremental development is the main part of the agile AWDWF web development framework. Good communication is the key in as agile framework and this area is one which needs to be focused on. Agile AWDWF framework follows the ANSI Standards of web development. The main crux is that the whole process should be according to the requirements of the user. We should also focus on user retention. The paper also mentions about importance of reliability [3].

HTML5 introduced a new way to build interactive and rich websites. We can build stuff like animations, graphics, music, movies, complicated web apps. It helps in cross platform real-time collaborations in web browsers, easing the work for software developers, improving interoperability, precise handling of elements, saving time and resources. The various features introduced by HTML5 have also been discussed by the author in [6].

HTML5 provides new features like:

- Audio, Video, Canvas – 2D/3D Graphics
- Location based Services
- Offline work
- Drag & Drop, New Input Types
- New Elements like <applet>, <dir>, <font>, <frame>
- Form Elements like new input types for input elements

The discussion regarding NPM modules useful to nodejs has been mentioned in the Importance of the module system is mentioned and various types of modules which are there like core modules, local modules, etc. It also mentioned how the event loop is the heart of the processing model. The points regarding the event loop of nodejs are also written by the author.

Potential application areas of Node.js

- Media
- Ecommerce
- Social media
- Payment gateways
- Enterprise web apps
- Backend/API for mobile apps

Features of Node.Js

- By using Node.js the Full Stack Developers are able to manage server and client side on their own.
- Node.js is fast and reliable for heavy files and heavy network load applications.
- Developers can also maintain complete projects in single pages (SPA).
- Can build highly load bearable and faster applications.
- Event-Driven Programming, Non-Blocking I/O, and asynchronous features.
- Some organisations might not adopt node.js over previous Technologies like PHP [4].

Challenges on using nodejs:

- Developers can create backdoors softwares for misusing data in the target computer and their network even if the computer is password locked [5].

UML activity diagram notation has been used for modelling the composition process from the activity diagrams by mapping them into basic BPEL4WS constructs and then inputted to an execution engine. The idea of having activity diagrams, workflow services and modelling composition is discussed in [7]. The author also discussed a tool which is used to model UML activity diagrams into web services composition using a parser made on the web.

Literature Review

S.No	Authors	Date	Source	Purpose	Subjects/findings
1.	Mr.Patel Tirthkumar Mr. Vaghela Surajsinh P.	2019	Online Appointment Booking System (https://ijream.org/papers/IJREAMV04I1147134.pdf)	Appointment and slot booking feature	A mutual preference model for appointment scheduling is proposed by schedule defragmentation leading to higher appointment acceptance rate, time utilisation rate at a given appointment demand matched. Accurate service time distribution estimation improves appointment scheduling efficiency by decreasing unit time slot size.
2.	Tayibia Bazaz	2016	A Review on Single Sign on Enabling Technologies and Protocols (https://www.researchgate.net/publication/309225903_A_Review_on_Single_Sign_on_Enabling_Technologies_and_Protocols)	SSO authentication for security	For gaining access to countless services every day, SSO saves users from maintaining many usernames and passwords for every new service and helps to sign in firstly, securely and with a single click.

3.	Vikalp Kaushik	2021	Ultimate guide for designing UI cards (https://uxplanet.org/ultimate-guide-for-designing-ui-cards-59488a91b44f)	Making cards in website	Cards are UI components that help us to organize a single topic's elements (content and actions) at a single place, thus eliminating long textual sentences, enhance readability and user experience. They suppress content, are modular, minify content, breaks down contents making it easy to take by the user. Card UI design is intuitive, easy to digest, user friendly, responsive compatibility, shareable. It is used during searching, browsing, task management, grouping related items and for efficiently analysing things. The anatomy and best practices one should follow while using cards is also mentioned along with the aesthetics and modern UI trends. It has applications in making blog/posts, e-commerce, profile, dashboards, kanban activities, and many more.

4.	QP Software	2019	QPS (https://qpsoftware.net/blog/website-audio-video)	Including audio/video in website	Including audio and video is necessary somewhere for: 1)Make good user experience e.g., click sound while capturing image, message etc. 2)A sound can convey a feeling of accomplishment. How to decide when to use Audio on your website? 1) Is the Audio Necessary? 2)Where Will the User Most Likely Use the Application? 3)Who is Your User? 4)Thinking about performance Including audio/video in the website helps create a positive user interaction, enhance mood of user, giving users a feeling of accomplishment, improving accessibility, helps in improving productivity, etc.
5.	Free visitor counters	2022	https://freevisitorcounters.com/	Visitor count feature	This help in telling the user that how popular the site, how many user visit that site.

This literature review has been made by analysing around 2 papers taken from IEEE, Science direct, frontier, google scholar and discusses about the various ways in which website has been implemented, its innovations, advantages, disadvantages, using cloud technology database Website is for enhanced workflows and cost-effective methods of data collection, sharing and analysing. The paper ends by giving advantages and disadvantages along with the future scope website systems have in our lives.

Website systems are an important asset one can have in their organisation for smooth workflows, efficiency and better IT facilities. Unfortunately, such facilities are not widely implemented in many organisations but the research and innovation continue to get the website to adopt the framework. the website provides us an opportunity and an environment where we could easily inculcate this concept into everyday lives of people. It would save us from making and maintaining the paperwork done to write detail and double entering the data. The error of data entry that could be there due to writing can also be avoided via this.

Methodology:

Website provide 24*7 information bridge between any organisation and the user who is in need of it so that they can remain connected whenever they want to. User can utilise the content 24*7. In today's time a website is needed for most organisations because every organisation wants a website for its existence on the internet. Through this website any

organisation can provide various services to users easily by some clicks.

Website also provides an interface by which we can access our various document stores on the internet using cloud technology. On the website we can add a registration link for booking various types of services. It would save us from making and maintaining the paperwork done to write details about a person who registered through our website.

Conclusion:

This paper is a review of basic web technologies that are used for website development. The various features are discussed along with advantages, features and challenges for technologies like HTML5, Nodejs, etc. The paper discusses various MERN stack technologies that are there, current technologies that are being used and agile web development methods to facilitate fast workflow, efficiency and focussing on user requirements and fast development in phases. Then various features of HTML5 are discussed. It has very exciting new features which developers can utilise in order to make games like ping pong, applications, etc. The various features, advantages and challenges are also discussed about Nodejs. The paper end with a methodology on how the website for the organisation “Brahma Kumari’s” is built, its structure and what technologies are being used.
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