Title:CMS Using Jamstack

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ABSTRACT

Web development and technology have become increasingly important in our lives in recent years. Across all industries Web development is an inherently complicated process that involves a variety of steps. Stakeholders, tasks, and technology are all factors to consider. As a means to reduce the complexity of web development, so-called web stacks were established. Development, Web stacks may be described as a collection of technologies used in tandem to achieve a certain goal.All of the web infrastructure was designed and developed. New stacks emerge as technology and techniques advance are conceptualized and realized.

Jamstack is one such innovative stack that we examine in this thesis. We look at how Jamstack is seen by web development professionals, concentrating on its perceived merits and drawbacks, primary application domains, and supporting tools. We use vertical and orthogonal analysis to analyze the data we've gathered. According to the data gathered, Jamstack is regarded as a promising stack whose benefits outweigh its drawbacks. According to the statistics, Jamstack will undoubtedly play a role in present and future web development, however there is no compelling indication that it will supplant traditional stacks.

Keywords : Software Development, Web Development,Jamstack

I. INTRODUCTION

Web development and technology have become critical in nearly all industries, thanks to the growing use of fast and ultra fast connections and connected devices. Websites must be safe, easily accessible, user-friendly, and performative in today's world. According to Google study, 53% of users would quit a website if it takes longer than 3 seconds to load. According to the same study, online pages take about 22 seconds to load on average. Imperva conducted a study that supported Google's conclusions. Imperva's study looked into how website loading speed affects e-commerce engagement. Imperva conducted a study of 4500 consumers and discovered that 7% of them anticipated the website to load instantly, while 62 percent indicated they would wait up to 5 seconds before abandoning the page. As a result, one of the most essential phases in development is the exact selection of technologies that will be integrated to fulfill client needs in order to adhere to the standards. Web stacks are a collection of technologies that work together to produce a decent result. They are well-established and reliable. LAMP (Linux, Apache, MySQL, PHP) was one of the first web stacks created, followed by MEAN (MongoDB, Express, Angular, Node.js) and MERN (MongoDB, Express, Angular, Node.js) (MongoDB, Express, Angular, Node.js). These stacks are already well-established, and developers utilize them to build high-quality websites.

Matt Biilmann launched Jamstack (JavaScript, Application Programming Interface (API), and Markup) in 2015, a novel way to creating quick and scalable websites without the need for traditional infrastructure. The fundamental notion is that static websites don't have to be static any longer, thanks to the proliferation of new tools and services. Jamstack, like any other stack, is made up of many technologies that collaborate to create a suitable development workflow and solutions for building modern online applications. The Jamstack front-end is rebuilt into static pages and delivered straight from the CDN (CDN). Jamstack interfaces with APIs provided by third-party components known as Headless Content Management Systems utilizing JavaScript instead of a database and server-side code (CMSs). Jamstack has only been around for a few months and is still in its infancy. There is a scarcity of relevant research. Jamstack, on the other hand, has seen a significant increase in popularity among developers in the previous two years. Jamstack now has a slew of additional tools to assist it. Its

drawbacks are becoming less noticeable, while its advantages are becoming game-changing.

Tools & Technologies Used:
1.Github
2. Domain
3.JSON & AJAX
4.SSL
5. Node.js & NPM
6. File Storage (AWS S3)
7.Server less (AWS Lamda)
8. MongoDB Atlas (Database)

II. BACKGROUND:

Engineers can shape the ideal working environments for the product they're working on thanks to the constant arrival of new IT technologies. These environments are referred to as web stacks on the web domain. A web stack is a set of technologies used to create a website. For the same reason, they're related. MERN is one of the most used web stacks. LAMP (Linux, Apache, MySQL, PHP/Perl) and MEAN (MongoDB, Express, React, Node.js).Furthermore, new web stacks, such as Jamstack, have only recently been released. During the The rest of this section will go through some of these web stacks that are relevant to this thesis.

Haystack:MattBiilmann, a co-founder and CEO of Netlify, coined the term Jamstack in 2016. Jamstack was created as a solution to the time-consuming and unsafe conventional construction of dynamic web pages. Other factors contributing to Jamstack's popularity among web developers include the growing significance of elements like as performance and security, as well as the absence of restrictions on the programming languages that may be utilized. The article's info graphic picture depicts the diversity of Jamstack's ecology. Headless CMS, utility APIs, functions, and static site generators are just a few of the technologies accessible. Combining these tools at the developer's choice improves the developer's development experience by making it more rewarding, versatile, and distinctive. Unlike any other traditional stack, Jamstack's design is significantly simpler, consisting of only three components: JavaScript, API, and CDN-pre-rendered Markup. JavaScript is utilized for two purposes: creating interactive web pages and interacting with the backend through API. APIs are used instead of traditional databases to allow apps to connect to third-party services. Markup refers to static pages that are supplied through CDN and rendered as HTML files via Static Site Generators (SSG), rather than dynamic

sites that are served directly from the server. CDN ensures that loaded assets like as HTML, JavaScript, and pictures are sent quickly.

JavaScript:
Brendan Eich introduced JavaScript, a web browser scripting language, in 1995. It is now mostly used to create interactive web pages and is regarded as one of the most widely used programming languages. Web browser languages that are strong and well-known. It may give everything a developer needs to create any sort of web application on its own. React, Angular, Vue.js, Node.js, and Express are just a few of the prominent front-end and back-end frameworks that use JavaScript. In response to the rising popularity of SSGs, JavaScript has released its own SSGs. Gatsby, which was launched in 2015 and is used to construct performative websites, and Next.js, which allows server-side rendering, are two examples. Section 2.1.3 contains further information about SSGs for those who are interested. The build API, which is the second part of the Jamstack, sits on top of the JavaScript.

API:
The API is used to facilitate interaction between the front-end and back-end, as well as content distribution to any device. APIs are the primary means through which static websites may become dynamic and functioning. Jamstack employs headless CMS, a back-end-only content management system, to add and change content. Unlike traditional CMS, such as WordPress, headless CMS separates the backend and frontend. API-driven and Git-based headless CMS are the two kinds. API-driven CMS stores material in a database, whereas Git-based CMS saves content in Git files. Strapi, Craft CMS, Directus, and other open source API-driven CMSs are among the most popular. There are other API-driven CMS that are solely utilized as a cloud service, storing all content data on their servers. Contentful, DatoCMS, and other CMSs are the most popular. Sanity and Ghost, for example, are headless CMS that support both open source and cloud services. There are far fewer alternatives for Git-based CMS. Netlify CMS, Forestry, and Site leaf are some of the best Git-based CMS. A comprehensive list of all headless CMS can be found at, and a comparison list of some headless CMS can be found in. GraphQL is one of the most powerful API query languages, and it's used by several of the above-mentioned headless CMS. The way GraphQL allows developers to acquire data is its main benefit. There is no need to contact numerous

endpoints to retrieve data using GraphQL; instead, a developer can submit a single query and the server will answer with a JSON (JavaScript Object Notation) object containing all the data requested.

MARKUP:

SSG, which is delivered straight to the browser from the CDN, is used to produce the Jamstack website pages. Templates and content are combined into website pages using SSGs like Gatsby. Developers may create viable dynamic websites that serve as static pages by decoupling SSG and headless CMS. Websites developed with this technology will be quicker and more secure than those established with existing methods. Hugo SSG, for example, might be used by a developer to construct a small static website due to its speed. If a developer has to build a more complicated website, he or she will use an SSG with more capabilities, such as Gatsby or Next.js

React. They're both built on React, a JavaScript framework for designing user interfaces with reusable components that make application development faster and easier.

TRADITIONAL STACKS:

In the late 1990s, traditional stacks became popular. The dependability of the composing technologies was one of the main causes for its success. For example, the Apache web server (used in LAMP) was first introduced in 1995 and remains the most used online internet server to this day. Apache is most commonly used in conjunction with Linux. LAMP has been utilized for constructing various successful apps since the mid-2000s, mainly to the popularity of the PHP programming language and MySQL. The WordPress content management system is one of these, with 33.5 percent of all websites on the internet using it.
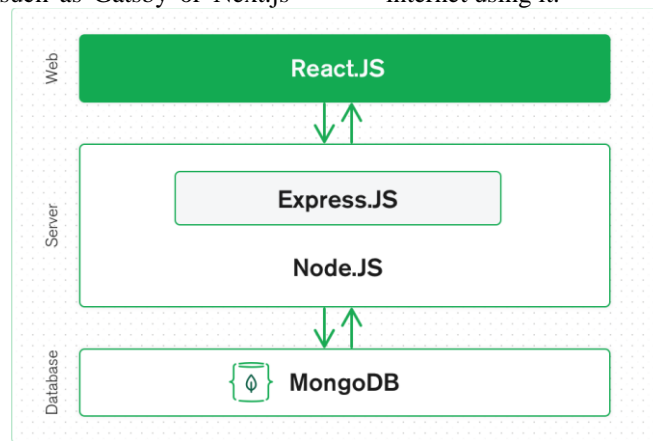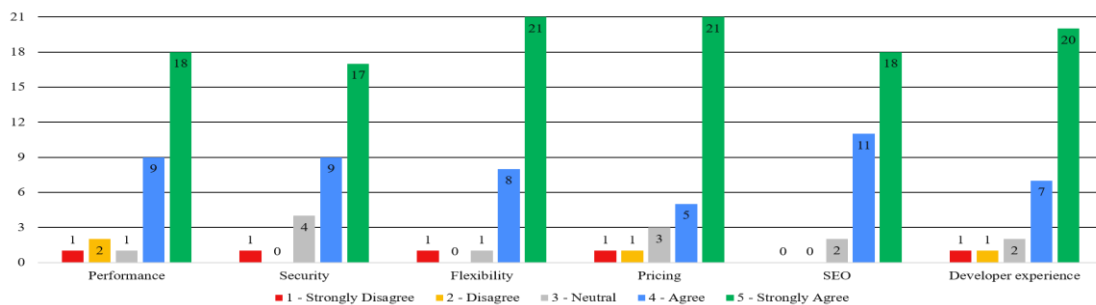

MongoDB's MERN stack architecture

Jamstack benefits:

During our literature analysis, we discovered six major advantages. We constructed

one closed-ended question for each of these benefits, with respondents choosing a score from 1 to 5 (Strongly Disagree to Strongly Agree).


Jamstack benefits

The res ponders agreed with all the benefits mentioned in the literature. Flexibility and SEO are the most widely recognised benefits, with 93 percent of respondents strongly agreeing or agreeing. This demonstrates that the res ponders value the fact that the sites are static, that the material is reusable, and that it can be viewed on any device via the API. With 87 percent of respondents, developer experience and performance are the third most popular perks.

Jamstack limitations:

We discovered three major limitations throughout our literature study. We developed one closed-ended question for each of the elicited constraints, similar to the benefits, in which respondents may pick a score from 1 ("Strongly Disagree") to 5 ("Strongly Agree").
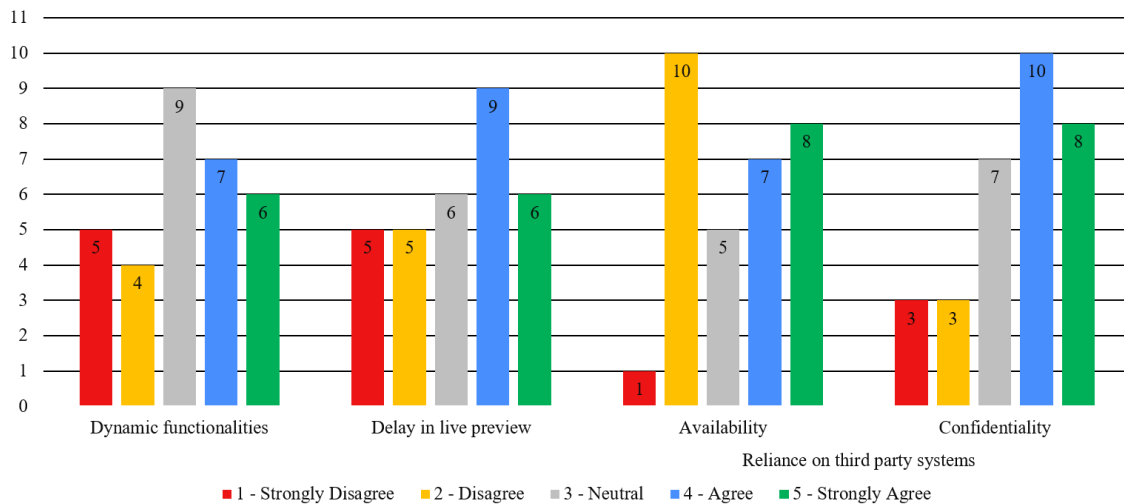
Confidentiality is the most commonly stated constraint, with 58 percent of respondents agreeing that the danger of revealing sensitive information is a concern. This conclusion appears to be consistent with security being one of the least valued benefits. With 48 percent of votes, availability and latency in live preview are two more major drawbacks. This validates that the website's availability may be impacted by the failure of third-party plugins. In addition, we discovered that when changing material, a delay in the live view happens frequently. With 42 percent of votes, the respondents' least accepted restriction is dynamic functions.

III. CONCLUSION & AMP; FUTURE WORK :

Web developers built online stacks, a collection of technologies that may provide ideal solutions for any type of web application, in order to generate high-quality websites. Jamstack is one of the stacks that this thesis looks into. The purpose of this thesis was to determine which kind of web applications Jamstack might be used for and why. An online survey was created based on the results of a literature review. The poll was sent out to 31 web development professionals. The findings show that practitioners have encountered all the benefits and limitations of Jamstack as described in the literature. We observed, however, that some of the restrictions are less evident now, and that they may be addressed with the proper use of supporting technologies. The most widely recognised benefits were flexibility and SEO, while the most often accepted drawbacks were secrecy and live preview latency. Jamstack is mostly used for static websites like blogs, portfolios, news, and magazines, according to statistics. Despite the fact that the present study had a limited sample size, the findings imply that Jamstack will undoubtedly play a role in future web development, even if there is no indication that it will become the de facto norm. Confidentiality, availability, and dynamic features have hindered the adoption of Jamstack for more dynamic websites such as social media, media streaming, and e-commerce. One path of future work may be creating dynamic websites with Jamstack in order to identify the specific difficulties linked to those restrictions, as well as potential solutions. Another possible future path would be to do the study again with a bigger sample size. A larger research would not only have a higher statistical value, but it would also assist to

find more intriguing connections, such as those between benefits, limits, and the sorts of websites that might be investigated further.

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