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COMPARATIVE ANALYSIS OF THE CONTENT RENDERING TECHNIQUES FOR WEB APPLICATION DEVELOPMENT

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The development of web applications has evolved over the years, from simple websites to complex Web applications and streaming platforms such as YouTube and Netflix, with a range of approaches available. Nowadays, we can distinguish three main techniques: Single-Page Applications (SPAs), Server-Side Rendering (SSR), and Static Site Generation (SSG). These approaches differ in terms of their impact on user experience, with implications for speed and responsiveness [1]. In this study, we compared the user experience of SPAs, SSR, and SSG web applications, using key metrics such as time to first byte, time to first paint, and time to interactive.

The development of web applications has seen a proliferation of approaches, including SPAs, SSR, and SSG. These approaches differ in terms of how the application is rendered on the client or server side and have different implications for user experience [2]. SPAs load once and dynamically update content, while SSR pre-

renders content on the server side, and SSG generates static files that are served to users. While these approaches have their advantages and disadvantages, it is unclear which is best suited to specific contexts.

Methods: We compared the user experience of SPAs, SSR, and SSG web applications using key metrics such as time to first byte, time to first paint, and time to interactive. We created a simple web application using each approach and tested them under different network conditions, including 3G and 4G. We measured the time to load the initial page, as well as subsequent page loads, and recorded any errors or anomalies.

Results: Our results show that SPAs generally offer faster loading times, but with higher variability across different network conditions. SSR provides a more consistent user experience across network conditions but can have longer loading times. SSG offers the fastest initial load times but can be slower for subsequent page loads. We also found that SPAs were more prone to errors and inconsistencies, while SSR and SSG had more predictable behavior.

Discussion: From the investigation conducted we can state that SSG and SSR approaches have better results in such metrics as Time to first byte, Time to interactive and Time to first contentful paint, and the overall weight of the page is much less than for SPA. However, they take significantly more time for a static content to be built, since server needs to provide fully interactive page unlike SPA where the content becomes available gradually.

In general, our findings suggest that the choice of approach depends on the specific requirements of the web application and its users. SPAs are best suited for applications that require real-time updates or high interactivity but may not be the best choice for users with slow or unreliable connections. SSR and SSG are better suited for applications that prioritize consistency and reliability and may be preferable for users in areas with poor connectivity or limited bandwidth. However, developers should consider the trade-offs between loading times and consistency when selecting an approach.

Conclusion: In this study, we compared the user experience of SPAs, SSR, and

SSG web applications and found that each approach has its strengths and weaknesses. Developers should consider the specific requirements of their application and user base when selecting an approach and prioritize consistency, reliability, and speed. Further research is needed to explore the impact of these approaches on other user experience metrics and to compare the development costs and maintenance requirements.

Future Directions: While this study provided valuable insights into the user experience of SPAs, SSR, and SSG web applications, there are several avenues for future research to further enhance our understanding of these approaches.

Firstly, it would be beneficial to investigate the impact of these techniques on other crucial user experience metrics, such as user engagement, conversion rates, and overall satisfaction.

Moreover, considering the evolving landscape of network infrastructure and the introduction of technologies like 5G, it is important to assess the performance of SPAs, SSR, and SSG in these contexts. Understanding how these approaches adapt to faster network speeds and increased bandwidth can inform future development strategies and ensure optimal user experiences.

In conclusion, while this study sheds light on the user experience of SPAs, SSR, and SSG web applications, there is still much to explore and discover in this field. Future research can delve into additional metrics [3], development costs, emerging trends, SEO implications, and network advancements. By continuously investigating and refining these approaches, developers can create web applications that deliver exceptional user experiences, adapt to changing technologies, and meet the diverse needs of users in the digital age.

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COMPARISON OF CLASSIFICATION QSAR MODELS TO CALCULATE BLOOD-BRAIN BARRIER (BBB) PROPERTIES RELATED TO ADME/T

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Many experimental methods in drug development are costly and time consuming.

Methods of ligand based drug design can help to overcome a variety of problems. These methods include the prediction of such properties as absorption, distribution, metabolism, excretion and toxicity, also called ADMET. It makes it possible to filter molecules and select those that satisfy a specific criteria of the research.

Therefore, in order to facilitate the rapid and inexpensive (low-cost) profiling tool, various in silico tools have been developed. Among them are QSAR models that have been established to help predict a number of ADME/T properties for new chemicals.

However, despite the fact that there is a diverse range of simulation algorithms, each approach has its advantages and disadvantages, and it's imperative to find a balance that satisfies the requirements of performance and reliability.

During this work it is necessary to complete the following tasks:

- implement and compare the classification QSAR models for Blood-Brain Barrier prediction;
- make a conclusion about the QSAR models that provide better performance and efficiency.

Implementation of the model consists of the following steps:

- Data preprocessing.