

A Comprehensive Survey on Scalability and Performance in Full Stack Web Applications

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Abstract: *A key component of creating and maintaining websites and web applications is web development, a dynamic and expanding subject. A web developer who is proficient in both front-end and back-end technologies can ensure that a website or application runs smoothly. This article provides a comprehensive introduction to full-stack web application development, which focuses on combining front-end and back-end technologies to build user-friendly, efficient, and scalable web solutions. It examines the fundamental components of web development, including the architectural layers of full-stack applications, such as client interfaces, application logic, database management, and system administration. In order to find out how well, scalable, and fast different technology stacks work in modern web apps, the study looks at MERN (MongoDB, Express, React, Node) and MEAN (MongoDB, Express, Angular, Node). The testing of Full Stack Web Applications with AngularJS and Java Spring Boot also shows the benefits of containerization, API optimization, microservices design, and strategies for improving speed such as caching and lazy loading. The article goes on to talk about how full-stack development is beneficial, highlighting how developers can handle both server-side and client-side tasks. Additionally, it identifies key challenges such as debugging complexities, premature optimization, and maintaining abstraction levels, offering potential solutions through AI-driven debugging, structured learning, modular coding practices, and automation tools. The survey concludes by outlining future research directions that can enhance web application development, ensuring more robust, scalable, and efficient digital solutions*

Keywords: Web development, full stack web applications, Scalability, performance, MERN, MEAN, Databases.

