

## **DEVELOPMENT AND RESEARCH OF SOFTWARE SOLUTIONS USING MODERN TOOLS, FRAMEWORKS, AND METHODS BASED ON THE EXAMPLE OF AN ONLINE STORE**

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In today's fast-paced digital environment, e-commerce solutions must provide optimal performance, scalability, and maintainability to meet the growing demands of online consumers. The shift toward online shopping has become more pronounced in recent years, driven by advancements in technology, increased internet accessibility, and changing consumer behaviors. As more consumers turn to digital platforms for their shopping needs, businesses are compelled to adapt and innovate their online offerings. This dynamic landscape requires e-commerce applications to be responsive, user-friendly, and capable of handling a large volume of transactions seamlessly.

Furthermore, the increasing reliance on digital commerce has intensified competition among businesses. Companies are not only competing on product offerings but also on the quality of the user experience. A well-optimized e-commerce platform can significantly impact customer satisfaction, retention rates, and ultimately, revenue generation. As a result, developers and businesses must prioritize the implementation of robust frameworks and tools that can deliver exceptional performance while ensuring a smooth and engaging shopping experience for users.

This research focuses on comparing three different software solutions to provide valuable insights into the effectiveness of various technological approaches and their impact on the overall efficiency of e-commerce platforms.

The primary goal is to conduct a detailed performance and efficiency comparison of these applications, which aims to highlight best practices that can guide developers in creating high-performing, scalable, and maintainable e-commerce solutions:

- Custom-Developed E-Commerce Application: Built using RESTful APIs, OData, a three-layer architecture, .NET 8, Blazor WASM, EF Core, and SQL Server Management Studio (SSMS).
- Second Application: A .NET6 REST API-based solution developed using ASP.NET MVC.
- Third Application: The open-source eShop project from GitHub.

The applications will be evaluated based on the following criteria:

- Performance: Load and response times will be measured under various conditions, including high traffic volumes, to determine which framework offers superior performance.
- Scalability: The ability of each application to handle increased user loads will be assessed, focusing on the efficiency of backend services and database interactions.
- Maintainability and Flexibility: The frameworks will be analyzed for ease of maintenance, flexibility for future development, and integration capabilities with other services and libraries.