

A literature review focused on current trends and practices in web application development

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Abstract

As time has progressed, web application development has experienced accelerated growth, becoming an essential component for companies seeking to provide high quality technology solutions. The proper use of technologies such as Angular, Node.js, JWT, Bcrypt and MySQL has proven to be fundamental for the creation of scalable, efficient, and secure systems. The main objective of this paper is to contextualize and substantiate the development of a prototype ecosystem for the effective integration of popular technologies in the development of web systems. This paper arises in response to the rapid evolution of web application development and the growing importance of specific technologies in this area. An empirical-analytical research methodology with a quantitative approach is used. The PRISMA data flow was used to select relevant studies. In the literature review process, predefined inclusion and exclusion criteria were applied to select the most relevant studies aligned with the research objectives. Twenty-seven relevant papers were obtained for the pertinent analysis to establish the relevant technological trends. It is discussed that web systems development is undergoing rapid evolution driven by emerging technology trends. The intersection of diverse programming languages, tools and platforms has resulted in a diversified technological landscape that optimizes speed and accuracy in web application development. The historical evolution of the Web has demonstrated the constant need to adapt to new technologies to meet the changing demands of the technological landscape. The work found demonstrates that effective integration of technologies in web development is essential to address specific challenges and improve efficiency in various contexts.

Introduction

As time has progressed, web application development has experienced accelerated growth, becoming an essential component for companies looking to provide high quality technology solutions. The proper use of technologies such as Angular, Node.js, JWT, Bcrypt and MySQL has proven to be essential for the creation of scalable, efficient and secure systems. This paper has relevance in the literature review that focuses on understanding how these technologies have been used in studies of relevant work, highlighting their advantages and challenges. Likewise, its rationale seeks to identify success stories and areas where current research can be expanded. This analysis will establish the necessary context for the design and implementation of the prototype, as well as for the subsequent evaluation of its effectiveness in terms of agility, standardization, security, and efficiency in the development of web projects. Finally, the main objective of this paper is to contextualize and substantiate the proposed research on the development of a prototype ecosystem for the effective integration of popular technologies in the development of web systems, including Angular, Node.js, JWT, Bcrypt and MySQL. This paper arises in response to the fast-paced evolution of web application development and the growing importance of specific technologies in this area.

Materials and Methods

An empirical-analytical research methodology with a quantitative approach is used. The definition of the research question is a clear and precise statement that addresses the fundamental PICO (Population, Intervention, Comparison, and Outcome) elements when inquiring about trends and best practices in web application development. The formulation of the research question towards a comprehensive assessment of current practices and trends in the mentioned field is set out in What are the current trends and best practices in web application development, considering aspects such as architecture, workflows, security, and the use of specific technologies such as Node.js, Angular, Bcrypt, JWT, MySQL and other frameworks?

Table 1.- Relevant technological trends

Trends	Relevance
Angular	Allows the creation of services, directives, and various essential elements for the development of web applications
Node.js	Service implementation follows a separate layered structure for more secure and understandable code
JSON Web Token	The tokens encode and verify their own assertions, allowing them to be self-contained for short durations and without the need for database access, simplifying design and eliminating database overhead.
Bcrypt	In a first step, an initial key is established using eksblowfish and then encrypted with OrpheanBeholderScryDoubt using a previously generated 192-bit key. This approach provides additional security by using a structure that makes potential attacks more difficult
MySQL	Its popularity among programmers is due to its cross-platform capability, ease of use and reliable security system
Scrum	Agile methodology for the development of applications that generates a climate of responsibility, progress and effective communication in the work team

Results

According to the 27 studies analyzed, the following results were obtained. According to the analysis of the limitations encountered, it was found that the works related to high resources for their implementation 22%, lack of experience in the use of the technologies 26% and comparison of efficiency in different scenarios 30%. According to the analysis of proposals and methodologies used, it was obtained that the works related to the comparative analysis of technologies 30%, review of literature on methodologies for software development 19%, recommendations for the correct use of technologies 37% and determination of resources obtained 15%, see Fig. 1. Finally, the relevant technological trends are presented according to the analysis of the works found see Table 1.

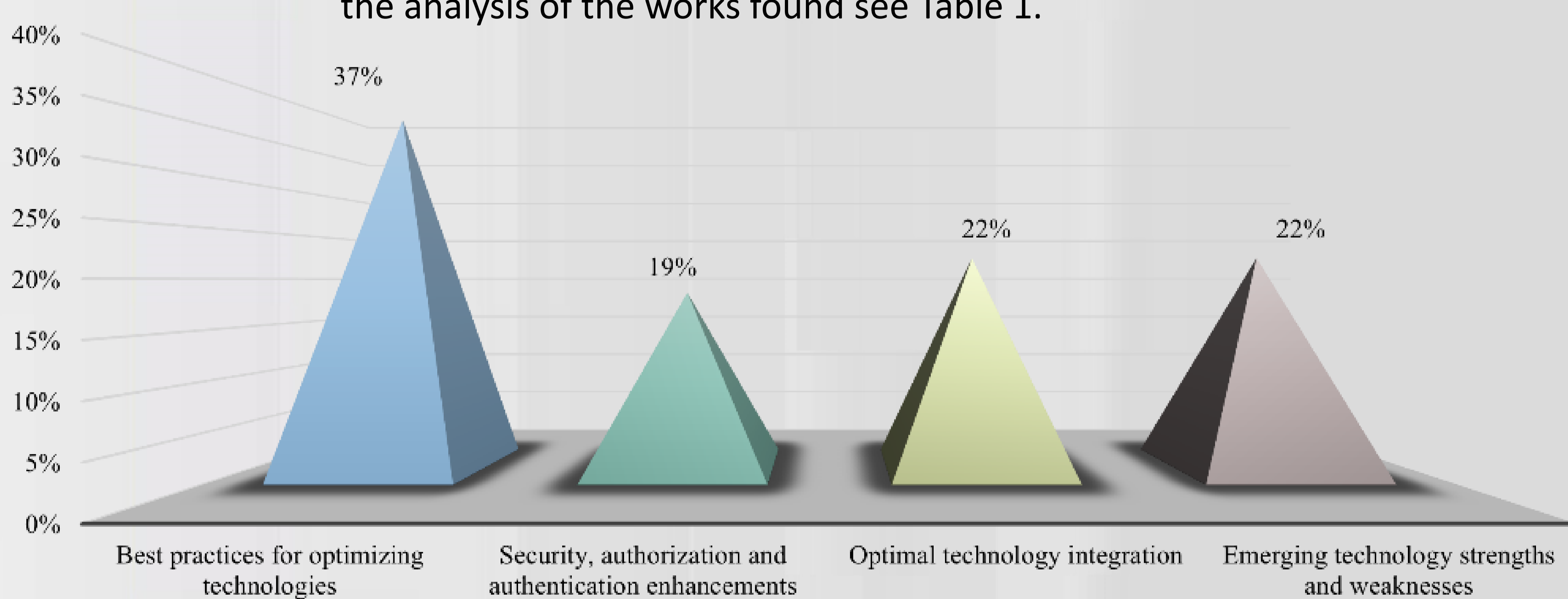


Figure 1.- Percentage of papers related to the results and challenges encountered.

Conclusions

This paper highlights the importance of integrating specific technologies, such as Angular, Node.js, JWT, Bcrypt and MySQL, for the effective development of web systems. The historical evolution from Web 1.0 to Web 4.0 has demonstrated the constant need to adapt to new technologies to meet the changing demands of the technological landscape. The review of methodologies, such as XP, Scrum and OOHDM, highlights how they have contributed to improving the quality and adaptability of web application development. In addition, current trends in web development, such as the predominant use of JavaScript, HTML5, JWT and Bcrypt, reflect the constant evolution and commitment to innovation and security. The projects reviewed demonstrate that effective integration of these technologies in web development is essential to address specific challenges and improve efficiency in a variety of contexts.

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