

ABSTRACT

In the era of the Industrial Revolution 4.0, the need for technical skills in web application development has become increasingly important. The Web Application Development practicum in the Information Systems Study Program at Telkom University aims to meet this need. However, the processes of installation, programming environment configuration, and practicum result assessment pose various technical and administrative challenges. Students often face issues such as operating system incompatibility, device specification limitations, and technical errors that hinder learning. Additionally, assessment methods based on screenshots and manual source code review are considered inefficient. This research adopts a case study method with the stages of foundation, prefield, field, and reporting to identify problems, develop solutions, and analyze the effectiveness of those solutions. The researcher implemented and compared Cloud Development Environment (CDE) and Platform-as-a-Service (PaaS) solutions in the practicum context. Testing was conducted by comparing four (4) CDE services—GitHub Codespaces, CodeSandbox, Jetify Devspace, and DevZero—and four (4) PaaS platforms—Koyeb, Render, Northflank, and Lade—based on parameters such as performance, network latency, booting time, features, security, UI/UX, and portability. The results of the study indicate that GitHub Codespaces is the most suitable CDE for practicum use due to its free cost, powerful specifications, ease of use, and low network latency. Meanwhile, Koyeb is deemed the most appropriate PaaS for practicum because it is free, does not require a credit or debit card, is easy to use, and offers good network latency and load time. Compared to the existing system, the cloud-based recommended system outperforms in almost all testing and evaluation parameters. This study concludes that the combination of GitHub Codespaces and Koyeb provides an inclusive, efficient, and scalable solution for web development practicum needs in an academic environment.

Keywords: Web Application Development, Cloud Development Environment, Platform-as-a-Service, GitHub Codespaces, Koyeb