

IMPLEMENTASI PERPUSTAKAAN DIGITAL OFFLINE BERBASIS WPA2 DAN AES

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ABSTRACT

School libraries play an important role as learning resource centers in supporting educational activities. However, limitations in physical collections, conventional management systems, and dependence on internet connectivity often hinder the optimal utilization of school libraries. This condition is also found at SMPN 8 Bengkalis, where students' interest in library usage remains low and access to digital learning resources is still limited. Therefore, this study aims to implement an offline digital library system that can be accessed through a local network without relying on internet connectivity, while ensuring adequate network security. This study uses the Waterfall method, which consists of requirement analysis, system design, implementation, and testing stages. The digital library system is developed as a web-based application and deployed on a local server using Ubuntu Server, with access provided through a Wireless Local Area Network (WLAN). Network security is implemented using the WPA2-PSK protocol with AES-128 bit encryption to restrict unauthorized access. The system provides multi-role login, digital book searching, reading and downloading features, uploading learning reference materials by teachers, and data management by administrators. The experimental results show that the system operates properly and can be accessed by students and teachers through the WLAN without an internet connection. All main features function as designed, and network access is limited to authorized users only. The system can serve as an alternative solution to improve access to digital learning resources in schools.

Keywords : *Offline Digital Library, Network Security, WLAN, WPA2-PSK, AES-128 Bit, Web Application.*