ABSTRACT

The transition from analog to digital television (DVB-T2) broadcasting in Indonesia since 2012 has significantly improved broadcast quality and spectrum efficiency. This transition, culminating in the Analog Switch Off (ASO) program on November 2, 2022, aimed to enhance the viewing experience for the public. However, Indonesia's diverse demographic distribution and complex topography, with over 17,000 islands, present significant challenges in achieving equitable DVB-T2 signal coverage. Urban areas face multipath interference due to high building density, while rural areas often experience weakness or no coverage at all. Limited information regarding broadcast coverage also leads to public confusion, particularly for those who have switched to digital TV but are not yet enjoying optimal quality.

To address these issues, a web-based monitoring system for DVB-T2 digital TV service coverage mapping has been developed. This system utilizes a combination of the Laravel framework for the back-end, Bootstrap for the front-end, and MySQL as the database. The ITU-R P.1546-6 propagation model is employed for signal strength prediction, chosen for its efficiency and accuracy with relatively simple data input. Predictions are visualized on an interactive map using Leaflet.js, ESRI Basemap, Leaflet Omnivore, and Leaflet Geocoder. Features provided include location search, signal strength detection, and administrative data management capabilities, such as adding, editing, and deleting transmitter data, and uploading KMZ prediction files.

System testing yielded positive results. Visualization and signal prediction accuracy testing achieved 85%, with minor inconsistencies attributed to the use of a standard 5-kilometer grid to maintain system performance. Alpha (internal) testing demonstrated 100% functionality success for all features, for both general users and administrators. Results from User Acceptance Testing (UAT) and beta testing indicated that majority of respondents were satisfied with the *website*'s appearance, interface, functions, and overall performance, although suggestions for UI/UX adjustments on specific devices, loading speed, and additional feature development were noted. Data validation testing showed a high degree of agreement between measured and predicted field strength values, with a Mean Absolute Error (MAE) of 18.36 dBµV/m. This system is expected to help the public understand signal conditions in their areas and support the equitable distribution of digital TV coverage in Indonesia.

Keywords: DVB-T2, Monitoring System, Mapping, Signal Coverage, ITU-R P.1546.