

ABSTRACT

Suren Village is a community where the majority of residents work as traders, farmers, and daily laborers. Additionally, many teenagers, after graduating from high school, start working as dropshippers. This situation has led to a high demand among the residents for personal internet services. Using a case study approach, this research employs both quantitative and qualitative methods, including community needs surveys, interviews with local figures, and field observations. Moreover, a network topology was designed by considering the distance between houses, geographical conditions, and signal availability.

The implementation utilizes devices such as the Optical Line Terminal (OLT), Optical Distribution Point (ODP), Optical Network Terminal (ONT), and Mikrotik.

Based on the simulation and FTTH (Fiber to the Home) design in Optisystem, the power link budget values obtained were -19.328 dBm, -19.362 dBm, -19.356 dBm, and -19.324 dBm. The BER (Bit Error Rate) values were 1.99518×10^{-14} , 3.6691×10^{-14} , 4.09581×10^{-14} , and 7.46405×10^{-14} . The Q-Factor values recorded were 7.5613, 7.48163, 7.46717, and 7.38774. Based on these three parameters, the evaluation of the FTTH network in Suren Village indicates that the implementation is feasible and capable of supporting connectivity for the community.

Keywords: RT/RW Net, Internet Service Provider, Network Development, Network Evaluation, rural village, internet access, case study.