

ABSTRACT

NETWORK DESIGN OPTIC COMMUNICATION SYSTEM FOR APPLICATION DIGITAL BILLBOARD IN CIMAHI CITY

User's high mobility in the present era implies the user's need for information, whenever and wherever he/she stands, including in the roadways. A billboard seen so far is generally static so that it ineffectively becomes significant tools which affect user in this digital era. Digital Billboard functions to transmit multimedia information. To transmit them, wide bandwidth is needed. However, the digital billboard in the present research used optical fiber for network designing.

The information searching about digital billboard installation involved three (3) institutions of Cimahi local administration; those are environmental sanitation and hygiene services (Dinas penyehatan lingkungan dan kebersihan), Regional Revenue Office (Dinas Pendapatan Daerah), and Regional Development Agencies (Badan Pembangunan Daerah). Surveying was performed to recognize the real condition. Optimum Topology was gained by using algorithm prim. The next step is by searching existing device for optic and networking support. Then, manual and Microsoft Excel calculation were performed to synchronize the calculation of power Link Budget and Rise Time Budget. The calculation of bit rate transmission of which the output gained a correct line coding, the latest calculation of digital Billboard bit rate estimated total time delay transfer during the process of data transferring.

The result of the local administration permitted twelve (12) digital billboards, with the rejection of one point by the local administration since it belongs to specific area. The optics via highway was installed underground. Topology with the combination of bus and star was using 13.36 km fiber optic multimode Graded Index. The closest point of Power link budget is Server BITC to Pintu Gerbang Baros. The Pin receiver fulfilled 34.428 dB, and power Margin in the amount of -28.572 dBm and rise time budget fulfilled $T_{total} = 62.71497248$ ns, with transmission bit rate below 11.1 Mbps with line coding NRZ, bit rate digital billboard 43.2 Mbps, transfer time 10 MB is 9.059 s.

Keywords: Digital Billboard, Rise Time Budget, Power Link Budget, NRZ, Birate, Multimode