

ABSTRACT

The Manufacturing Process Laboratory Building, or the Mangudu Building, is a facility at Telkom University designed to accommodate the university's industrial engineering department, primarily for the needs of introducing manufacturing production and also to realize Industry 4.0 concepts at Telkom University. The building is equipped with an internal network to accommodate internet access. However, the building is relatively old and has been left in its current state. The networking equipment in use can also be considered outdated. Therefore, a reevaluation is necessary to determine the extent of wireless network implementation and to identify network issues in the building. This analysis is conducted using the network development life cycle (NDLC) methodology, comprising the analysis, design, and simulation prototyping phases, followed by data collection using the wireless site survey (WSS) method at the 2.4 GHz and 5 GHz frequencies, assisted by the Ekahau AI Pro application. The condition of the wireless network in the Mangudu Building yields results indicating that the signal strength emitted by the Cisco Aironet 1700i access point on the second floor receives a very good indicator value as it has signal strength below -50 dBm. However, on the first floor, certain rooms receive a less favorable indicator value as their signal strength is above -60 dBm. Therefore, the author proposes replacing the access point with the Ruijie RG-AP880-AR and adding a second access point, with a configuration of using channel 1 for the 2.4 GHz frequency on the first floor and channel 6 on the second floor, with both having their power milliwatts adjusted to 75mW. For the 5 GHz frequency, channel 36 is suggested for the first floor, and channel 40 for the second floor, with both having their power milliwatts adjusted to 180mW. The proposed changes result in the majority of rooms on both the first and second floors having a very good indicator value, with readings below -50 dBm for both the 2.4 GHz and 5 GHz frequencies.

Keywords — Network Analysis, Ekahau AI Pro, Network Development Life Cycle, Wireless Site Survey, Coverage, Frequency, Channel, Wireless