

## ***ABSTRACT***

*In the increasingly advanced digital era, the need for a reliable and efficient security system is crucial, especially in educational environments with valuable assets and intensive activities such as laboratories, practicum rooms, and public areas. Mangudu Building, one of the facilities owned by the Faculty of Industrial Engineering at Telkom University, currently lacks an optimal visual monitoring system. Issues identified include a limited number of CCTV cameras, inactive devices, and numerous blind spots that pose security risks such as theft, equipment damage, or unauthorized access.*

*This study aims to redesign and analyze a more effective CCTV-based visual monitoring system for the Mangudu Building. The methodology used is the Network Development Life Cycle (NDLC), which consists of six stages: analysis, design, simulation prototype, implementation, monitoring, and management. In this study, the process is carried out up to the simulation prototype stage. During the analysis phase, observations were made in eight areas of the building, revealing that only six areas had active CCTV with limited coverage. The design phase employed SketchUp software to model the repositioning and addition of CCTV units based on the room layout and critical surveillance points.*

*The proposed design includes increasing the number of cameras to 18 units with device specifications tailored to monitoring needs: Hikvision 4 MP Acusense for sensitive areas and Hikvision 2 MP ColorVu for general areas. Simulation results showed a significant improvement in surveillance coverage and visual quality, successfully eliminating blind spots. A gap analysis between the initial condition and the proposed design confirmed an increase in the system's monitoring effectiveness. The results of this study are expected to serve as a reference for developing technology-based security systems in educational settings.*

***Keywords— Visual Monitoring, CCTV, NDLC, Security Infrastructure, SketchUp, Telkom University***