# Pengembangan Kerangka Kerja Instrumentasi Terpadu Untuk Monitoring Pembangunan Sumbu Kebangsaan IKN = Framework Development of Integrated Instrrumentation for Sumbu Kebangsaan IKN Construction Monitoring

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Abstrak

Monitoring proyek konstruksi adalah proses melacak, meninjau, dan meregulasi progres dan kinerja proyek, serta mengidentifikasi masalah yang muncul selama implementasi proyek. Laporan monitoring proyek juga berfungsi untuk menyelesaikan proyek sesuai anggaran dan waktu rencana. Proses monitoring proyek secara konvensional membutuhkan banyak tenaga kerja, memakan waktu, dan rawan error sehingga tidak efektif. Oleh karena itu, dibutuhkan sebuah sistem monitoring proyek yang berlangsung secara otomatis, terintegrasi secara disgital, serta efektif dan efisien untuk diterapkan pada proyek berskala besar, seperti pembangunan Sumbu Kebangsaan IKN. Pada penelitian ini akan dibahas tentang Tinjauan literatur dilakukan untuk mengidentifikasi aktivitas monitoring proyek konstruksi, sehingga instrumen monitoring dapat disusun sesuai dengan kebutuhan aktivitas monitoring proyek konstruksi. Tinjauan literatur juga dilakukan dari berbagai sumber untuk mengumpulkan data instrumen monitoring seperti fungsi, kelebihan, kekurangan, dan haga instrumen. Kerangka kerja disusun untuk menggambarka interoperabilitas antar instrumen, serta proses pengumpulan data monitorinng dari area proyek, hingga pelaporan dan pengambilan tindakan. Pada studi kasus aktivitas monitoring proyek gedung Command Center yang terletak di area Sumbu Kebangsaan IKN, diperlukan instrumen UAV, SLAM, RGB Camera, Wide Angle Camera, LiDAR, Machine Learning, Ultra Wideband, BIM, IoT, Infrared Camera, dan WiFi.

.....Construction project monitoring is a process of tracking, reviewing, and regulating project progress and performance, as well as identifying problems that arise during project implementation. The project monitoring report also used to accomplish the project according to the planned budget and schedule. The conventional project monitoring process reuires a lot of manpower, time-consuming, and error-prone, thus not effective to be implemented. Therefore, a project monitoring that is automatic, digitally integrated, effective and efficient is needed to be apllied to large-scale projects, such as the construction of the Sumbu Kebangsaan IKN. In this study, a literature review will be discussed to identify construction project monitoring activities, so that monitoring instruments can be prepared according to the needs of construction project monitoring activities. A literature review was also conducted from various sources to collect monitoring instrument data such as the tools function, advantages, disadvantages, and price of the instrument. The framework is developed to describe the interoperability between instruments, as well as the process of collecting monitoring data fom the construction site, until reporting and acion taking. In the case study of monitoring activities for the  Command Center building located at the Sumbu Kebangsaan IKN area, the instruments reuired are UAV, SLAM, RGB Camera, Wide Angle Camera, LiDAR, Machine Learning, Ultra Wideband, BIM, IoT, Infrared Camera, and WiFi.