

INSTALLATION OF AN APPLICATION-BASED ONLINE CCTV MONITORING SECURITY SYSTEM AT CICADAS VILLAGE

MUHAMMAD FADLAN MALIK, ARYA ADHIWISANA, NANA SUBARNA

Teknik Elektro, Institut Teknologi Nasional Bandung

Email: maliktechnology19@gmail.com

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ABSTRACT

This community service project plan discusses the implementation of an online CCTV monitoring security system in Cicadas Village. The main issue faced is limited access to CCTV monitoring, which can only be done offline via a server monitor, making it difficult for users outside that area. The methods used include site surveys, needs analysis, system planning, device installation, configuration, testing, and outreach to partners. The results show that the app-based CCTV system was successfully implemented and can be accessed in real-time via smartphones. This system enhances monitoring effectiveness and provides users with easy access to remote monitoring.

Keywords: Application, CCTV, Community, Monitoring, Security.

1. INTRODUCTION

In a safe community, comfort in the surrounding environment is a crucial aspect, especially for those who frequently leave their homes, making home security a top priority (**Paryanta et al., 2023**). Crimes can occur anywhere and at any time, necessitating a monitoring system that operates automatically and continuously (**Gunawan et al., 2024**). In today's modern world, people can monitor distant locations without being physically present through network-connected electronic devices such as CCTV system (**Xu et al., 2014**). The implementation of security systems offers significant benefits in preventing acts such as theft, property damage, and other security breaches (**Sidiq et al., 2025**).

Closed-Circuit Television (CCTV) is an additional security tool and is widely used in stores, offices, and even homes (**Astanto, et al., 2023**). CCTV refers to cameras capable of recording any information that can be seen, read, or heard using CCTV recording equipment (**Firmansyah, 2023**). Traditional CCTV systems require continuous monitoring by personnel and rely heavily on human observation, which is prone to fatigue or errors in detecting critical incidents (**Bintan, 2025**). Based on these issues, CCTV monitoring systems have evolved to support remote access through internet-connected mobile devices, enabling users to monitor surveillance feeds from virtually any location (**Lee & Lee, 2015**). CCTV recordings, in the form of images and videos, can be accessed in real time via a smartphone or client device with

2. METHOD

The community service activity (PKM) in Cicadas Village began with coordination with partners on October 17, 2023, to identify the need for a CCTV monitoring system and the condition of the available internet network. Furthermore, on October 31, 2023, a needs assessment was conducted, covering camera installation locations, power supply availability, internet connection quality, surveillance coverage area, and the compatibility of CCTV devices with Android-based monitoring applications. Based on the assessment results, the CCTV system was installed and configured on November 30, 2023, including remote access settings via a smartphone monitoring application, internet connectivity testing, and system training for partners.

The implementation of the community service activity (PKM), which included problem and needs identification, took place on October 31, 2023. CCTV network planning was carried out on October 31, 2023, The installation of CCTV equipment was carried out on November 30, 2023; training on the use of the online CCTV system, maintenance, monitoring, and troubleshooting was provided to the Head of RT 05, Cicadas Village, Cibeunying Kidul, on November 30, 2023; and documentation of the activities in the form of photographs was carried out on November 30, 2023.

The stages of the community service activity are illustrated in the Block Diagram in Figure 1.

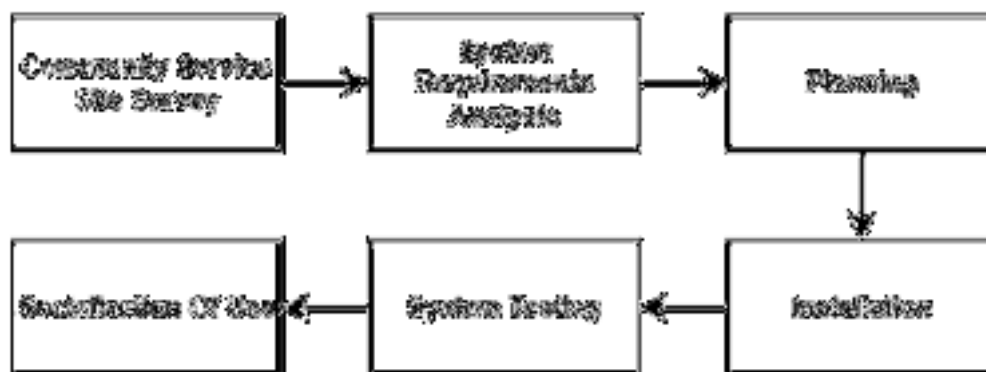


Figure 1. PKM Implementation Method

The description of the activity plan is as follows:

1. Survey of the Community Service Activity Location
The process begins with a survey of the location where the community service program partner is located. This survey is conducted by a team of students represented by the supervising lecturer.
2. System Needs Analysis
This phase identifies the need for an online CCTV monitoring security system. This is done by conducting a needs assessment at the implementation site to ensure the process runs smoothly.
3. Planning
Adding supporting hardware and software that meet the needs identified in the previous stage. Additionally, the installation locations are also noted. The next step is to coordinate the plan with partners. Plan coordination is a crucial process to ensure the online CCTV monitoring security system functions properly and meets the specified requirements.

4. Installation

After finalizing the design with our partner, the next step is to install the selected hardware and software. The installation is carried out by a team of students with experience in handling online CCTV security systems. Following the installation, the next step is to configure the online CCTV security system. This configuration involves setting the necessary parameters to ensure the system operates properly.

5. System Testing

Once configuration is complete, the online CCTV security system must be tested and inspected to ensure that it functions properly.

6. User Training

Educating stakeholders on the use of the online CCTV monitoring system is a crucial process to ensure that the system can be used effectively and efficiently by all parties involved. Key considerations in this training process include explaining the purpose of the online CCTV monitoring system and how it can help improve security, explaining how the system works, how the cameras are installed, how to access the system, and how to operate the software. It also involves providing training to those who will use the system, including how to use the hardware and software, as well as how to troubleshoot any issues that may arise.

3. RESULTS AND DISCUSSION

Security is becoming increasingly important as crime rates rise. If the neighborhood security system fails, a mechanism is needed to record crimes for investigators. In this section, we will analyze the issues in Cicadas Village.

A common problem is that when users travel out of town, they have difficulty monitoring RT 05 because CCTV monitoring results can only be accessed via the server monitor, making it difficult to monitor while traveling. Generally, CCTV monitoring of an object can only be done within a specific area. Users cannot monitor if they leave that area.



(a)



(b)

Figure 2. a. Discussion with Mentor; b. Discussion with Partner

Figure 2 illustrates the discussion process conducted by the student team with their advisor and partners to address the issues with the CCTV monitoring system in RT 05. The discussion addressed the primary challenge faced: the limited access to CCTV monitoring, which remains dependent on the server monitor, making it difficult to access flexibly when users are outside the area or out of town.

Through these discussions, the team identified the need to develop a CCTV monitoring system that can be accessed remotely (online) using mobile devices. This aims to improve monitoring effectiveness and provide users with the convenience of monitoring environmental conditions in real time without being limited by location.



(a)



(b)



(c)

Figure 3. a. Determining the Internet Cable Route; b. Installing the Internet Cable; c. Installing the Online CCTV System

Figure 3 illustrates the stages of installing an online-based CCTV system, beginning with a site survey in Figure (a) to determine an effective and efficient internet cable installation route, followed by Figure (b), which shows the process of installing and pulling network cables outside the building to ensure a stable connection, and Figure (c) illustrates the installation and configuration of the online CCTV system on the DVR, where device settings and network integration are performed to enable real-time access to the system.

Once these processes are complete, to enable remote operation of the CCTV monitoring system, configuration is required on the monitoring app on a smartphone, as shown in Figure 4 below.

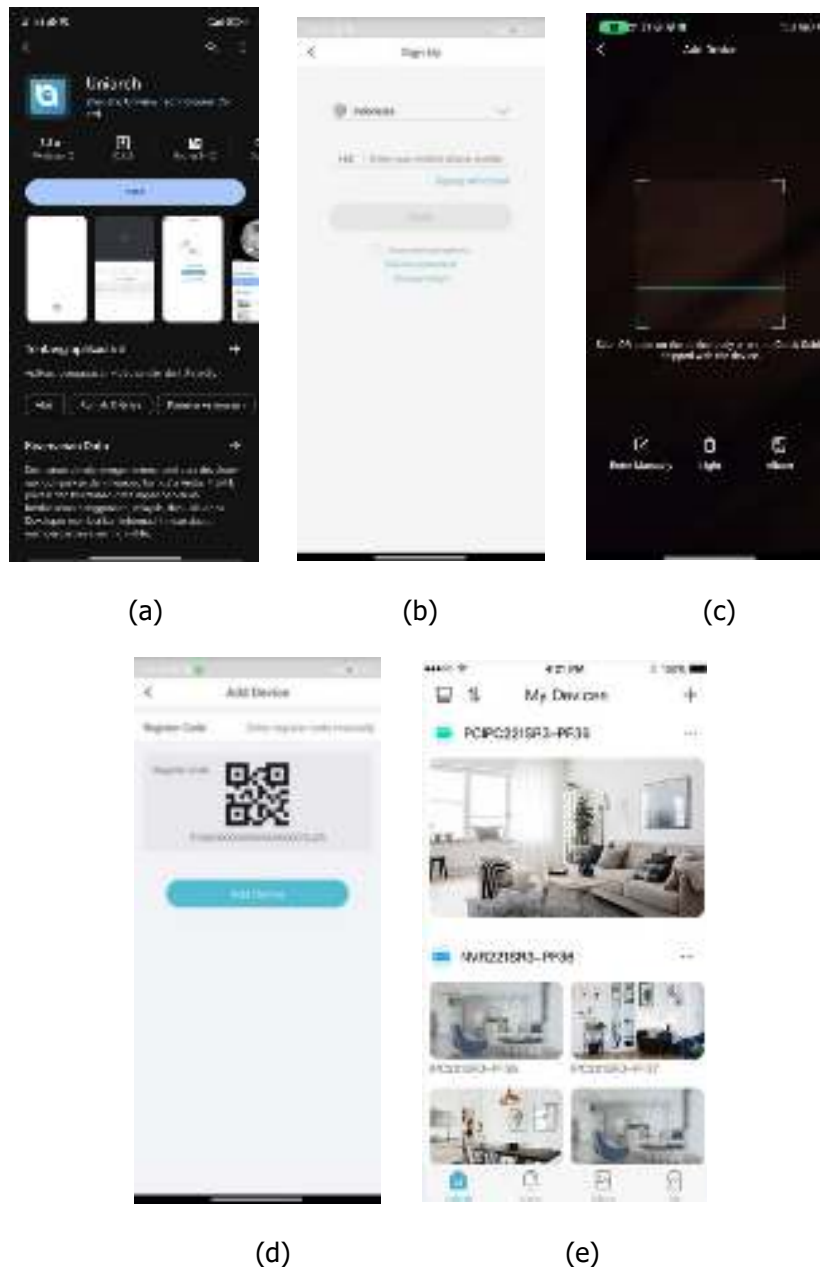


Figure 4. a. Install the App; b. App Registration; c. Add a CCTV Server by Scanning; d. CCTV Server Barcode; e. Screen After Connection

Figure 4 shows a series of steps for installing the app to access the online CCTV system, starting with downloading and installing the app on a smartphone, followed by registering a user account to access the system. After successfully logging in, the user adds CCTV devices by scanning the barcode or QR code on the device, allowing the app to recognize and connect the device to the system. Once the addition process is complete, the app will display a list of connected CCTV devices ready for use, allowing users to monitor in real time via their smartphone from anywhere.



Figure 5. Appreciation Ceremony with the PKM Partner

The outcomes achieved from this community service activity are:

1. Installation and implementation of online CCTV.
2. Availability of app-based online CCTV in Cicadas Village, Cibeunying Kidul.
3. Outreach on the online CCTV monitoring security system and its maintenance.

The outputs of the community service activities include the empowerment of partners, questionnaires completed by partners regarding the system installation results, the production of goods, the development of designs, publications in national PKM journals, and others. Figure 5 shows documentation of appreciation ceremony with the PKM partner. The activity outputs are summarized in Table 1 PKM Activity Outputs in Cicadas Village, Cibeunying Kidul.

Table1. PKM Activity Outputs

Output Category	Type of Output	Status	Evidence of Results	Achievement Target
Online CCTV installation process and its application	Installation process	An app-based online CCTV monitoring security system has been implemented	Proof of installation	Available
Partner evaluation process for community service activities	Questionnaire	Evaluation of the results of the online CCTV security system	Evidence of partner evaluation	Available



Figure 6. Installation Results

Figure 6 shows the results of the CCTV installation and remote monitoring application, successfully configured on the user's smartphone. The internet-connected system allows users to monitor environmental conditions in real time from different locations. Furthermore, the monitoring application provides easy access to live video and CCTV recordings, allowing for more effective and efficient security surveillance.

The questionnaire was administered to one partner representative responsible for operating the CCTV system. The results are presented in Table 2 and Table 3.

Table 2. Partner Evaluation Results of the Online CCTV System

No	Assessment Aspects	Score
1	Ease of accessing the CCTV system via smartphone	5
2	Speed of real-time CCTV display	5
3	Benefits of the system in monitoring environmental security	5
4	Intensity of CCTV application use	4
5	Ease of understanding how to use the CCTV application	4
6	Adequate training and outreach	4
7	Clarity of instructions for adding CCTV devices	5
8	Increased sense of security after CCTV is online	5
9	CCTV's ability to assist in incident identification	5
10	Feasibility of permanent system implementation	5
Average		4,7

Description: Rating scale 1–5, where 1 = strongly disagree and 5 = strongly agree.

Table 3. Partner Feedback

Aspects	Description
obstacles faced	When the internet network is poor, the process of monitoring and accessing CCTV recordings becomes unstable.
Suggestions for improvement	Improved quality and stability of internet connection so that CCTV monitoring via smartphone can run more smoothly.

Evaluation results conducted with partner representatives indicated that the implemented online CCTV system received an average score of 4.7 out of 5. Partners assessed that the system facilitated environmental security monitoring via smartphones, provided real-time access to information, and increased surveillance effectiveness. However, partners identified that internet connection stability remained a factor affecting smooth CCTV access. Overall, the implemented system was deemed beneficial and worthy of continued use in supporting environmental security.

4. CONCLUSION

The online CCTV monitoring security system is a system capable of monitoring village security in real time via the internet. This system makes village security monitoring more effective and efficient, as all incidents occurring in the village can be viewed directly via CCTV cameras connected to the internet. Additionally, this system can help identify activities or events taking place within the village. Therefore, the online CCTV monitoring security system is the right solution to enhance security in Cicadas Village, Cibeunying Kidul.

CCTV users can monitor remotely without having to look at a monitor. In this way, we can learn more about the benefits of online CCTV monitoring. As the organizers of these activities, we can learn how to install CCTV cameras and how to connect them for online monitoring. Monitoring activities in the Cicadas Village area, Cibeunying Kidul, using online CCTV can simplify and assist the village's RT (Neighborhood Association) in monitoring activities within the village.

To maintain the system's continued function, regular maintenance and inspections by managers or the local community are required, particularly of the CCTV equipment, internet network, and power supply. With regular maintenance, the online CCTV monitoring system is expected to continue to operate optimally and provide long-term benefits in supporting the environmental security of Cicadas Village.

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LIST OF REFERENCES

- Amin, A. (2018). Monitoring kamera CCTV melalui PC dan smartphone. *EEICT (Electric, Electronic, Instrumentation, Control, Telecommunication)*, 1(2), 11–20. <https://doi.org/10.31602/eeict.v1i2.1881>
- Astanto, T., Saefullah, A., Ardianto, M., Pambudi, R., Sarkum, S., Ahhari, A., & Saputri, H. (2023). Peran closed circuit television (CCTV) dalam meningkatkan keamanan di Kampus STIE Ganesha. *Jurnal Ilmiah Fokus Ekonomi, Manajemen, Bisnis & Akuntansi (EMBA)*, 2(3), 274–276. <https://doi.org/10.34152/emba.v2i03.849>

- Bintan, S. (2025). Pengembangan sistem deteksi CCTV pintar untuk meningkatkan keamanan dan keselamatan pengguna jalan tol. *Repeater: Publikasi Teknik Informatika dan Jaringan*, 3(1), 174–184. <https://doi.org/10.62951/repeater.v3i1.370>
- Firmansyah, Muhammad Rhesa. (2023). *Implementasi Pengoperasian Cctv Di Terminal Bandara Yogyakarta International Airport*. Technical Report. Institut Telkom Telkom Purwokerto. (Unpublished).
- Gunawan, D., Sidiq, Y., Widayat, W., Muslimawati, D. P., Apriliana, C. D., & Minallah, A. N. (2024). Implementasi dan pelatihan penggunaan sistem informasi presensi kehadiran guru pada MIM Taraman Sragen. *Abdi Teknayasa*, 313–318. <https://doi.org/10.23917/abditeknayasa.v5i1.5240>
- Lee, I., & Lee, K. (2015). The Internet of Things (IoT): Applications, investments, and challenges for enterprises. *Business Horizons*, 58(4), 431–440. <https://doi.org/10.1016/j.bushor.2015.03.008>
- Paryanta, P., Nugroho, E. C., & Chandra R., Z. (2023). Rancang bangun aplikasi CCTV berbasis Internet of Things. *Go Infotech: Jurnal Ilmiah STMIK AUB*, 29(2), 159–168. <https://doi.org/10.36309/goi.v29i2.213>
- Sidiq, A. P., Taqwana, M. W., Zulian, R., Kiswanta, K., & Heranudin, H. (2025). Integrasi sistem pengamanan aset melalui implementasi monitoring CCTV di Masjid Al-Husna, Cisauk. *Bhakti Nagori (Jurnal Pengabdian Kepada Masyarakat)*, 5(1), 358–364. https://doi.org/10.36378/bhakti_nagori.v5i1.4447
- Xu, L. D., He, W., & Li, S. (2014). Internet of Things in industries: A survey. *IEEE Transactions on Industrial Informatics*, 10(4), 2233–2243. <https://doi.org/10.1109/TII.2014.2300753>