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CCTV Architectural Design for Theft Detection using Intruder Detection System

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ABSTRACT

The human need for a monitoring system for certain places is increasing. In this regard, the computer laboratory belonging to the school is not free from security intruders. Security bully or in English is usually called "intruder". Intruders can be thieves, vandals, or security intruders. In this paper, we will examine the design of the school computer laboratory CCTV architecture to examine the results of the implementation of an intruder detection system design that uses a CCTV architecture with SMK N 1 Tondano as its location and observes places and areas that are allowed. The results of this study are the formulation of the effect on performance in detecting intruders at SMK N 1 Tondano which we got through direct observation and interviews and with theoretical support from books, journals, internet and other sources.

Keywords *:* Design, Intruder, School Computer Laboratory, CCTV

INTRODUCTION

The right design will produce the results according to our wishes. In connection with this, of course, we can find the meaning that a design or design that is made carefully will minimize all unwanted things when conducting trials or implementations. Most people are not serious when it comes to the design stage. There are some who miss some important aspects and points when they start designing so that the results do not match their expectations.

In connection with the above, SMK Negeri 1 Tondano recently installed CCTV in order to improve school security. Installation is done to minimize the occurrence of crime in the school area of SMK N 1 Tondano, especially in certain

places such as the Computer Laboratory. Here we will evaluate the design of the system used to determine the effect on performance in detecting intruders at SMK N 1 Tondano School generated through interviews and direct observation at the observation site.

SMK Negeri 1 Tondano is a vocational high school located on Jln. B.W Lapian Kembuan Village, North Tondano District, Minahasa, North Sulawesi with Postal code 95614. SMK Negeri 1 Tondano is a school that is basically centered on tourism schools, but there are also several other skill programs that are opposite to the tourism department. The Departments/Skills Programs available there include: Catering, Clothing, Hospitality Accommodation, Multimedia, Office Administration, and Nursing.

Figure 1. Computer Laboratory of SMK N 1 Tondano

SMK Negeri 1 Tondano has 2 computer laboratory rooms which are located in the middle behind the SMKN 1 Tondano School. Each room has 1 CCTV which is placed above the entrance and is monitored/controlled through the control room which is in the principal's room and is directly controlled by the head of SMK Negeri 1 Tondano, namely Mr. Vecky Pangerapan M.Pd. Because the layout of the Computer Laboratory of SMK N 1 Tondano is similar, CCTV is placed in the same place.

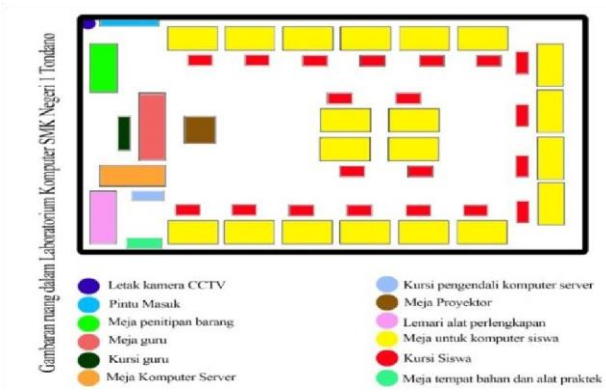

Figure 2. Layout of the computer laboratory of SMK N 1 Tondano

METHOD

The method we use is a qualitative research method. In the qualitative approach, the types of approaches are ethnographic, fieldwork, soft data, symbolic interactionism, naturalistic, descriptive, observation with role involvement,

phenomenology, documentary data, case studies, descriptive historical studies, and environmental studies, observations, reviews. document participant observer and story (Musianto, 2002).
In this research, the steps we take are to identify problems, preliminary studies related to theoretical studies, field observations and inclusive interviews with related parties who can provide accurate and reliable information.

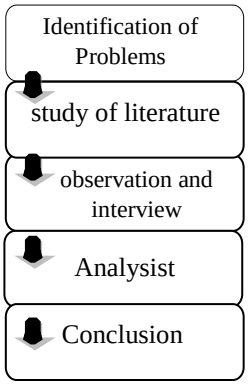

Figure 3. Research Flow

RESULTS AND DISCUSSION

1. CCTV system design and working

To make it easier for us to classify the results of the design analysis and how the CCTV system works in the laboratory of SMK N 1 Tondano into 5W + 1H form.

What

The CCTV used is CCTV with the type of IP Dome Camera. IP Dome camera is an electronic product that is placed in a location that cannot be monitored and used to record events that occur in a location. IP Dome Camera consists of parts such as high-resolution megapixel cameras ranging from 0.3 to 29 megapixels and using a wide lens with a focal length ranging from 3.6 mm to 12 mm depending on the area of the monitored location (Setiawan, 2011). The following is a complete specification of the CCTV used

Table 1. CCTV Specification Table

Type	CCTV Dome IP Camera
Merk	Panasonic
Lens	2.88 mm Fixed Focuse
Resolution	1.3 M (1280 × 960) / 720p (1280 × 720)/ D1 (704 × 480) / CIF (352 × 240)
Frame Rate	1.3 M / 720p (1 - 30fps) - D1/CIF (1 - 30fps)
Dimension	113x28
Weight	200g including box

Color	Putih
Angle View	360 derajat
Pixel	1280(H)*960(V)
Power Supply	12V DC
Record Priority	Manual>Video Detect>Schedule
Storage	Network Storage
Network Protocol	IPv4/6,HTTP,SSL,TCP/IP,UDP,UPnP,ICMP,FTP, SMTP,SNMP,DNS,dll
Remote Operation	Monitor, System SetUp, File Download, log information, dll.

Where

Kedua CCTV dilaboratorium SMK N 1 Tondano diletakkan tepat berada diatas pintu masuk laboratorium SMK N 1 Tondano, pada sudut 90 derajat.

Figure 4. Location of CCTV at SMK N 1 Tondano

When

CCTV laboratory of SMK N 1 Tondano works 1x24 hours. The Control Room itself is located in the Principal's Room of SMK N 1 Tondano with the principal as supervisor and direct controller from CCTV.

Who

CCTV is installed to avoid and minimize the occurrence of crime or chaos that occurs during teaching and learning hours and after school hours. What is monitored is of course the entire community of laboratory users as well as anyone who enters the computer laboratory of SMK N 1 Tondano.

How

The design of the system involves technicians from outside the school and from within the school so that the design can be adapted to the conditions of the school both in terms of economy, social and environment.

CCTV in the two laboratories of SMK N 1 Tondano is connected by taking an IP address (Internet Protocol) which is connected via an RJ 45 cable to the router in the computer laboratory room to get an internet network so that it can be connected directly to the NVR (Network Video Recorder) which is placed in the room. Principal of SMK N 1 Tondano.

Then from the NVR it is connected again via the Internet/Wireless network, namely using an Access Point in the head room of SMK N 1 Tondano so that it can be connected to a device for direct or indirect monitoring of recordings from a room where there is CCTV by using software downloaded from the device as a window for monitoring.

CCTV is equipped with night vision light or CCTV that can see in the dark making it easier for CCTV controllers or monitors to identify who enters the school computer laboratory room at night and what is being done in it. This CCTV is equipped with features that do not allow people who are looking at the CCTV to detect where the CCTV is moving.

2. Effect on performance in detecting intruders at SMK N 1 Tondano

In theory, the system design used in the SMK N 1 Tondano laboratory is a modern and integrated system design. Of course this is very helpful for the school in detecting unwanted activities in the school environment.

There are various effects produced in the use of CCTV in the two laboratory rooms of SMK N 1 Tondano. We got this through observations, direct interviews and theoretical support in the form of journals and books that support us in the research process. The resulting effects include:

Before using CCTV:

- There is damage to laboratory elements by irresponsible parties.
- Frequent loss of personal or school property.
- When studying, there is often a commotion during teaching and learning.

After using CCTV:

- The Computer Laboratory of SMK N 1 Tondano is safer and free of crime. Because according to the results of interviews with the person in charge of the Computer Laboratory, prior to the installation of CCTV, the computer laboratory of SMK N 1 Tondano often lost valuables and damage was done by hands. not responsible.
- Students become calmer in carrying out teaching and learning activities in the computer laboratory room because of CCTV surveillance which is directly monitored by the head of SMK N 1 Tondano, although there is a little sense of tension because they feel they are constantly being watched
- Community users of school computer laboratories are becoming more careful when using SMK N 1 goods Tondano.

3. Strengths and Weaknesses of the system design used

Each system used certainly has advantages and disadvantages. We found these strengths and weaknesses through surveys, observations and interviews, which include:

Advantages

- The system used is very well planned and in accordance with the conditions in terms of economic, social and environmental aspects.
- Not just anyone can access CCTV because it is equipped with a login Password to view the CCTV monitor window.
- The use of CCTV IP Dome Camera saves costs in terms of cable usage.
- Helping the work of school security guards and school guards.

Weakness

- Because it uses IP-based CCTV, the IP Address of the camera can be hacked by irresponsible parties and can misused for other purposes.
- One person monitoring system is not effective in conducting supervision.
- CCTV installed is only CCTV surveillance where intruder detection does not run when CCTV is active, but is carried out when a crime has occurred. Although the location of the school computer laboratory is close to the

residence of the school guard and there is a security guard who works 24 hours a day, this has not been effective in guarding.

CONCLUSION

Based on the implementation of research activities with the title Intruder Detector System Design in a Computer Laboratory at SMKN 1 Tondano with CCTV architecture by obtaining results through direct interviews and observations, it can be concluded that:

1. Until now the use of CCTV is very helpful in maintaining the security facilities of the computer laboratory of SMK N 1 Tondano.
2. The design used is a design that follows current technological advances because it uses an IP Camera System Design.

We also make suggestions for the school, with suggestions including: For monitoring, it is hoped that it is not only regulated by one person but there must be more than one person to avoid mistakes or misuse of monitoring.

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